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ANNUAL REPORT

1933

Project No. Va - - - - - - Extension Division

By L. B. Dietrick

Horticultural Department, V. P. I.

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Blacksburg, Virginia,
December 1, 1933.

Mr. John R. Hutcheson, Director,
Extension Division,
Blacksburg, Virginia.

Dear Sir:

I am submitting herewith the twelfth annual report of the work in Vegetable Extension, Department of Horticulture, for the period beginning December 1, 1932 and ending November 30, 1933.

PERSONNEL

The personnel for this period consisted of L. B. Dietrick, Vegetable Specialist, employed two-thirds time; and L. C. Benner, Assistant Vegetable Specialist, employed full time.

GENERAL DISCUSSION

At the end of each year, a conference is held by the personnel in Vegetable Extension to summarize the accomplishments in the various projects and to outline the work for the coming year. Since all major projects are on a long-time basis, drastic changes any one year are unnecessary. Several minor changes are made yearly, however, to keep the various projects definitely in line with cultural and economic trends of the vegetable industry in the state.

At the conference held in December, 1932, it was decided to emphasize four main projects. Three of these, the Potato, Sweet Potato, and Tomato Projects, deal with crops of considerable monetary value to the agriculture of the state. The fourth, or Home Garden Project, deals with a phase of agriculture

which is of even greater importance to the health and often to the income of the farm family. The home garden, too often neglected in the past, has come into its own. Due to the economic situation, together with other factors, the state and nation have become garden conscious. It was found necessary, therefore, to devote a larger percentage of the time to garden work, particularly of a relief nature, even though this had to be done at the expense of the other projects. The excellent results have still further emphasized the need of a full-time man on garden work in this state.

Although efforts were confined chiefly to the projects mentioned, considerable aid was given along other lines. Several institutions were aided in their production problems. The judging of vegetable products at several fairs also had to be handled. Correspondence in addition dealt with practically every vegetable crop grown in the state. The minor projects as well as the four major projects will be discussed separately in the body of this report.

Means and Agencies

The extension set-up within the counties continued to be the main agency through which Vegetable Extension information was carried to the farmers of the state. The success or failure of any project depends to a considerable degree upon the energy with which the agent gets behind the project and pushes it. The specialist is powerless without the cooperation of the agent. The specialist's first duty consists of salesmanship. Our aim has been first to sell the idea to the agent that he or she might pass it on to the people of the county. For that reason, projects were stressed primarily in those counties in which the agents were completely sold on the project under consideration. At the same time, efforts were continued to sell the work to agents in other counties where such work is needed.

Through the agents, the aid of various other organizations was enlisted in Vegetable Extension work. Among these might be mentioned marketing organizations, growers' organizations, civic leagues, farmers' clubs, garden clubs, etc.

Demonstrations were used to a great extent in putting over the program in Vegetable Extension. By this means, a far greater total number of people were reached than would otherwise have been possible. Communities have been served rather than individuals. The demand for individual service in times of economic stress naturally increases, but our aim has been to reduce such service to a minimum. The demonstrations given have covered the range of vegetable production, including demonstrations on the construction of plant growing structures, the use of good seed, seed treatment, seeding, thinning, fertilization, liming, cultivation, pest control,

harvesting, grading, storage and storage house construction, selecting exhibits, judging, etc.

Demonstrations, however, often die at the point of origin. For that reason, wherever possible, meetings or tours were held at result demonstrations to fix definitely such results in the growers' minds. Likewise, it has been our aim, in so far as possible, to make all other meetings demonstrations. For example, actual grading demonstrations were given at all meetings held to discuss grading; through the use of a blackboard, definite gardens were actually planned at meetings held to discuss garden planning, etc. It is felt that such demonstrations have added considerably to the effectiveness of the meeting as an extension agency. Publicity articles, radio talks, and circular letters have also been used to a great extent both in putting over subject matter and results.

For subject matter, the specialists have from time to time, called upon the United States Department of Agriculture and various state experiment stations. The cooperation of the Virginia Truck Experiment Station has been of particular value in this respect.

Increased Demand for Aid

Before discussing the several projects in detail, a brief statement might well be made relative to the Vegetable Extension work in general. On the whole, prices in 1933 improved for the producer of vegetables over those of 1932. In spite of better prices, however, the vegetable grower has had no bed of roses. Yields were exceptionally low. Storms took their toll of the tomato and sweet potato crops. Such conditions on top of the three previous disastrous years have resulted in a survival of the fittest. The best growers made some profit. Good growers broke even or a little better. Inefficient growers lost heavily as usual. A premium has thus been placed on efficiency of the highest type. As a result, the service rendered by this department has become increasingly important. Seventy percent of the specialists' time was devoted to field work. The nature and extent of this service are partially revealed by the following statistics:

Type of Service	Data
Days in field	364½
Days in office	152½
Mileage	45,758
Counties visited	67
Visits to agents	194
Visits unassisted by agents	46
Meetings	309
Attendance	17,151

4-H clubs met	88
Attendance	1,896
Method demonstrations	794
Attendance	5,086
Letters written	4,365
Circular letters written	22
Circular letters sent out	98,850
Press articles and radio talks prepared	65
Bulletins sent out	11,176

Although the writer does not believe that the number of miles traveled, the days in the field or office, the number of letters written, or even the meetings held and demonstrations given, are necessarily a true criterion of the work accomplished, yet taken all together they serve as an index to achievement. Viewed in this light, the above figures require no further comment.

POTATO PROJECT

The Irish potato is King of the Virginia truck crops. No other crop endangers its throne. Accomac County ranks as the fourth county in the United States in the acreage of Irish potatoes grown, and second in the production and value of the crop. The potato annually returns millions to the growers of the state. For the five-year period, 1928-1932, the state acreage in Irish potatoes has averaged 110,600 acres with an average production of 14,447,000 bushels valued at $10,871,000.

Such a return means an approximate income to the state of five dollars for every man, woman and child in Virginia and viewed in this light presents an impressive picture of the state's potato industry. On a yield per acre basis, however, the picture is far from satisfactory. The average yield per acre in 1933 was only 93 bushels compared to 103 bushels in 1932, and 126 bushels, the 1921-1930 average. Such yields are far too low and should be raised if growers are to secure economical production.

The low average yield for the state is due primarily to the use of poor and diseased seed, low fertilization, lack of cultivation, little or no pest control measures, etc. The potato project is designed to increase the production per acre at a low unit of production.

The subdivisions of the potato project will be discussed separately.

Early Irish Potato Production

The 1933 acreage of commercial early potatoes was 348,200 acres compared with 375,400 acres in 1932, a reduction of 27,200 acres or approximately 10%. Production likewise decreased from 33,360,000 bushels in 1932 to 30,112,000 bushels in 1933, a reduction of 3,248,000 bushels or approximately 9.7%. Virginia growers decreased their acreage 8.6% from 58,000 acres in 1932 to 53,000 acres in 1933 while production decreased in Virginia from 7,364,000 bushels in 1932 to 5,851,000 bushels in 1933, a decrease of 20.5%.

Due to the reduction in acreage and production, the price per bushel received by the growers in the 19 early states increased from 59 cents in 1932 to 99 cents in 1933, an increase of nearly 68%. The increase received by Virginia growers was even greater, advancing from 39 cents per bushels in 1932 to $1.21 in 1933, an advance of 108.8%. Eastern Shore growers fared somewhat better than the Norfolk growers, averaging $1.25 per bushel in comparison with $1.10 per bushel for the Norfolk section. These comparisons strikingly illustrate the value of acreage reduction and a short crop. Virginia growers as a group received $2,800,000 more for the 1933 crop than for the 1932 crop, although the production was nearly 21% less than in 1932.

Both in acreage and total production Virginia continued to rank first among the early states. Yield for her early crop, however, was only 110 bushels per acre compared with 127 bushels in 1932. Eastern Shore growers averaged 105 bushels per acre in comparison with 120 bushels in 1932 and 145 bushels, the 1923-1932 average. The Norfolk section averaged 130 bushels per acre compared to 168 bushels in 1932 and 130 bushels, the 1923-1932 average. The salvation of the individual potato grower lies not in increased total production, but in increased production per acre at minimum costs. Considerable effort has been expended, therefore, in influencing growers to adopt improved cultural practices and thus increase their individual production per acre. The use of land suitable for potato production, green manure crops, good seed, proper fertilization, and the judicious use of lime have been particularly stressed. Various phases of the early potato project work are discussed in detail in the following pages.

Outlook Information. This department cooperated with the Interstate Early Potato Committee in bringing outlook information to the attention of the growers. The Early Potato Committee conducted 65 outlook meetings in Virginia with a total attendance of 1,481. Mr. A. E. Mercker, Chairman of the Committee, had charge of the meetings and deserves considerable credit for his presentation of the facts to the growers. Dr. H. H. Zimmerley,

Director of the Virginia Truck Experiment Station, was drafted for the outlook meetings and made some very valuable suggestions on cultural practices. As Acting Chairman of the Virginia Committee on Advance Market Information and Acreage Stabilization, the writer secured valuable information from time to time from Mr. Mercker, government Intentions-to-Plant Reports, Crop Reports, etc., which was passed on to agents and growers.

It is exceedingly difficult to measure the results of outlook information. Many factors enter into the reaction of the grower. It is felt, however, that encouraging results are being secured with the potato group. Facts have been presented to this group for the past several years and regardless of the cause, grower reaction has at least been along the line indicated as advisable from a study of the facts as presented. It is not assuming too much to believe that the continued timely presentation of such information has played a part, at least in this grower reaction. The intelligent grower, armed with the facts of the case, is certainly better able to plan his production program than he who gropes in darkness. And many of them, in increasing numbers, are profiting from such information.

The 1933 Potato Outlook Report, prepared by this department, will be found in the back of this report as a part of Exhibit A.

Source-of-Seed Demonstrations. Five source-of-seed demonstration plots were conducted on the Eastern Shore. Twenty-four known sources of Cobblers were compared, ranging from strains of known inferiority to decidedly superior strains.

The plots were handled as nearly as possible according to farm practice. Cultural practices for all the seed in any one plot were identical. One variation from common practice was thought advisable. In an effort to improve the stand, the stem end of the potato was discarded when cut.

The seed was inspected just previous to planting. Records were kept on the size and maturity of each source, firmness, length of sprout, type of storage, etc. Such data serve as an index later for the interpretation of field records, particularly where discrepancies occur which might not be expected.

The performance of the various sources was observed carefully throughout the season. Germination, disease, and yield records were kept on each. Individually and collectively, the plots serve as excellent "Good Seed vs. Poor Seed" demonstrations. Accumulated records over a 11-year period also serve as valuable aids in recommendations to growers. One year's results are questionable; eleven years' consistent performance insures dependability to a high degree.

The first field record taken was a germination count. Missing hills were dug up to determine, if possible, the cause for non-germination. Among the contributing causes were weak sprouts, rot, dead eye, no eye, loss and brown stem. Loss was attributed to cultivation, rodents, and more particularly complete rot. (The averaged germination counts of the five plots are included in this report as a part of Exhibit B.)

Due to favorable seasonal conditions and to care in planting, all strains germinated remarkably well. The variation ranged from 95.4% to 100%, with an average germination of 98.64%. For all practical purposes such a stand could be considered perfect. With less than 2% as the greatest percent of missing hills for any one strain, the adjacent plants would in large part make up the loss in yield due to missing hills. The distribution of the missing hills was as follows:

Loss	0.63%
No Eye	0.21%
Brown Stem	0.19%
Weak Sprout	0.16%
Rot	0.13%
Dead Eye	0.08%
Total	1.36%

The second field record taken was a disease count. Each hill was carefully checked and disease symptoms noted. Acknowledgment is made to Dr. H. T. Cook, of the Virginia Truck Experiment Station, for his assistance in taking the disease record. (The averaged disease counts of the five plots are also included in this report as a part of Exhibit B.)

The percent disease ranged from 0% to 7.83% with an average of only 1.03%, composed of 0.54% leaf roll, 0.45% mosaic and 0.03% rhizoctonia. The five highest-yielding strains showed an average of only 0.82% disease; the five lowest-producing strains averaged 2.15% disease.

The third field record taken was the yield record. The averaged yields of the five plots on Eastern Shore have been computed in bushels per acre, and are given below. The number in parentheses directly after the name of each strain denotes the number of plots in which that particular strain occurred.

Average of All Plots

Source of Seed		Yield - Bushels Per Acre		
		Firsts	Seconds	Total
N.Y.-Porter & Sonny	(2)	137.0	34.3	171.3
S.Dak.-Stein	(5)	132.4	38.0	170.4
Me.-Prescott	(5)	128.4	42.3	170.7
S.Dak.-Radtke	(5)	126.6	31.4	158.0
Me.-Prescott #2	(5)	125.8	36.8	162.4
Me.-Corliss	(5)	123.1	32.3	155.4
Me.-Chesney	(5)	121.7	34.5	156.2
S.Dak.-Parker	(5)	121.6	36.9	158.5
N.Dak.-Thompson A.B.	(5)	120.3	35.4	155.7
N.Dak.-Thompson J.	(5)	117.3	30.9	148.2
Wis.-Miller	(5)	116.2	30.1	146.3
N.Y.-Cottrell	(5)	108.6	42.3	150.9
S.Dak.-Kornmann	(5)	109.2	24.6	133.8
Wis.-Leloski	(5)	108.0	36.4	143.4
Michigan	(5)	105.7	41.2	146.9
N.Dak.-Douglass	(5)	105.7	31.7	137.4
Me.-Home Grown	(5)	104.4	25.9	130.3
S.Dak.-Sedlin	(5)	97.2	33.7	130.9
S.Dak.-Home Grown	(5)	95.6	20.5	116.1
N.Y.-Hollenbeck	(5)	94.7	27.5	122.2
P.E.I.-Home Grown	(5)	95.3	18.7	114.0
Md.-Duke	(5)	90.7	18.3	109.0
N.Y.-Rogers	(5)	76.0	37.5	113.5
N.Y.-Wilson	(4)	55.4	23.1	78.5
Average		108.7	32.0	140.7

Yields ranged from 55.4 to 137.0 bushels of firsts per acre, a difference of 81.6 bushels between the best and poorest strains. The average yield for all strains included in the plots was 108.7 bushels of firsts per acre. Yields varied from 53.3 bushels below the average to 28.3 bushels above the average. This variation can be charged largely to source of seed.

The plots again emphasized the superiority of certified seed over home-grown seed, as illustrated by the following table:

Source of Seed	Yield - Bushels Per Acre		
	Firsts	Seconds	Total
Maine-(Av.of 4 strains)	124.8	37.0	161.8
Maine-Home-Grown	104.4	25.9	130.3
S.Dak.-(Av.of 5 strains)	117.4	32.9	150.3
S.Dak.-Home-Grown	95.8	20.5	116.3
Average - Certified	120.8	34.9	150.7
Average - Home-Grown	100.1	23.2	123.3

The difference in yield in favor of certified seed averaged 20.7 bushels of firsts per acre, due largely to the later maturity of home-grown seed and to the greater prevalence of disease in home-grown seed. That this superiority of certified seed is not due just to factors operating this year is clearly demonstrated by the records of the past eight years, summarized in the following table:

Source of Seed	Yield Bushels Firsts Per Acre
Maine-Certified	212
Maine-Home Grown	178
S.Dak.-Certified	230
S.Dak.-Home Grown	190
Average - Certified	221
Average - Home Grown	183

It will be noted from the above that the difference in yield in favor of certified seed over home-grown seed has averaged 38 bushels of firsts per acre over an eight-year period.

The data recorded from the plots are utilized in many ways. Mimeographed copies are distributed to growers, seedsmen, fertilizer dealers and others. Copies are sent to the seed growers in the several States whose seed is represented in the plots. Both the grower and the user of the seed can thus study its performance in comparison with other strains. Such a comparison should exercise a healthy influence both upon

the seed producer and the users. (A copy of the complete plot records, distributed this year, is contained in the back of this report as Exhibit B.)

In addition, the information is used as a basis for publicity articles and recommendations to growers. To emphasize the peculiar value of the plot records as a basis for recommendations, it need only be pointed out that the leading strain in the plots yielded 137.0 bushels of prime per acre, 31 bushels over the Eastern Shore average of 106 bushels, or an increase of over 29%. The five leading strains showed an increase of over 22%. The ten leading strains showed an increase of over 18%. Sixteen of the twenty-four strains yielded as well or better than the Eastern Shore average, with an average increase of 12%, while eight strains showed a decrease in yield below the Eastern Shore average. Such comparisons are all the more significant when it is remembered that several known inferior strains were included in the plots.

Cultural Practices. Economic conditions have led to increased emphasis being placed upon cultural practices. Proper fertilization, the judicious use of lime and green manure crops, have been particularly stressed.

7-6-6 has continued to prove the best fertilizer for the early potato crop. Tests at the Virginia Truck Experiment Station indicate that there is a considerable difference due to the brands of 7-6-6, but unfortunately brand names cannot be passed on to the growers. Recommendations have been made, however, as to the best sources of the constituents of the 7-6-6, which partly overcomes the problem.

The potato grower has been advised to keep his potato soil reaction between a pH of 4.8 and a pH of 5.2 which is favorable to yield and yet will not increase the prevalence of scab. Experiments at Norfolk and Onley show an increase of from 6 to 21 barrels per acre due to the judicious use of lime. These experiments corroborate results secured on Long Island and elsewhere. Such information has been passed on to the growers through the agency of meetings, lime demonstrations, correspondence, etc. The Virginia Truck Experiment Station is of untold service to the growers in running the lime requirement tests.

The grower has likewise been advised to plow under a green manure crop wherever possible. Virginia Truck Experiment Station records show increased yields ranging from 44% to 61% as a result of this practice.

Potato Tour. The eleventh annual Eastern Shore Potato Tour was held on June 15, 1935, in conjunction with the Worcester County, Maryland, Tour held the following day.

Growers, fertilizer and package salesmen, seed dealers, marketing representatives and others toured the various demonstration plots, comparing seed-source, pest control measures, stem-end plantings, lining, etc. After inspecting the plots, the crowd gathered at the Eastern Shore Experiment Station at Caisy to inspect the several experiments conducted by that station, to observe spraying, dusting, washing and packaging demonstrations, and to listen to a prepared program. Prominent speakers at this gathering were Dr. H. H. Zimmerley, Director of the Virginia Truck Experiment Station; John R. Hutcheson, Director of the Virginia Agricultural Extension Service; and R. P. Crider, of the Federal Land Bank of Baltimore. Dr. Zimmerley stressed production problems from the growers' standpoint; Director Hutcheson briefly outlined the purpose of some of the recently passed farm legislation; Mr. Crider spoke in particular concerning the farm mortgage situation.

Approximately 300 people attended the tour. A partial check-up showed representatives from Maryland, New Jersey, Florida, New York, Pennsylvania, North Carolina, North Dakota, Delaware, Indiana, Virginia, and the District of Columbia. The spirit of the growers attending the tour was very good due to the increased prices being received for the crop. Lack of rain, however, during the critical period of growth caused a reduction in yield and offset to some extent the increase in price.

Several Virginia representatives also attended the Maryland tour on the day following the Virginia tour. Such tours afford an excellent opportunity for intercontact between growers, officials, and others vitally interested in the potato industry from several states. Such associations must of necessity react to the benefit of the Virginia potato industry. A program of the tour is included in the back of this report as a part of Exhibit B.

The Production of Potatoes in Other Parts of the State

Virginia late potato growers increased their acreage 11% from 36,000 acres in 1934 to 40,000 acres in 1935. Due to increased yields per acre, production, however, increased nearly 22% from 2,318,000 bushels in 1934 to 2,818,000 bushels in 1935. Yields averaged 70.5 bushels per acre compared with 64.4 bushels in 1934. The price per bushel received by the growers will probably average from $1.00 to $1.25 per bushel or approximately double the 1934 price.

Late potato growers face practically the same problems as the producer of early potatoes. Similar aid was given, therefore, to growers in various sections as was given in the early producing area.

Demonstrations. Numerous demonstrations were given in the various phases of potato production including the use of good seed, seed treatment, recognition of pests, pest control, rogueing, grading, storage, etc.

Meetings. Twelve meetings were attended in the Potato Project, as a whole, with a total attendance of 969. Average attendance was 81.

Corn and Grain Show. Certified Irish and sweet potato exhibits were featured by this department at the Corn and Grain Show. Ten out-of-state and 23 state exhibits comprised the Irish potato exhibit.

Certified Seed Production. Considerable work was done with 6 growers of Green Mountain and Rural New Yorker varieties for certification. Excellent cooperation was secured from all growers. Martin Rosenbaum, the largest grower, states that he personally considers the assistance secured from W.P.I. of several hundred dollars value to him. A total of 15½ acres were grown consisting of 11½ acres of Rural New Yorker and 3½ acres of Green Mountain. The potatoes will not be bin inspected before January.

Assistance was given these growers on storage problems as well as along cultural lines. Two underground cellars were constructed and one cellar was remodeled. In one instance, the grower started construction without consulting this office. A chance visit from this department found that the weight of the concrete roof and dirt to be placed on it was nearly double that which could be considered safe. Changes in understructure and reinforcement were suggested to and later carried out by the grower which undoubtedly saved him considerable expense and possible personal injury at some later date.

4-H Club Work. Considerable work was done with sixty-one 4-H club members in Allegheny County. The majority of the projects actually served as result demonstrations and also presented an opportunity for work with the parents as well as with the children. As a part of the demonstration, individual projects were well fertilized and sprayed with Bordeaux mixture.

The club members secured an average yield of 100 bushels per acre, an increase of 30 bushels or 42% over the state average for late potatoes. Average gross returns were $118.05

per acre. Total cost per acre was $58.87, leaving a net profit per acre of $56.16. In addition, the club members received a total of $61.00 in prizes at fairs and potato shows.

Summary of Accomplishments - Potato Project

Cooperated with Interstate Early Potato Committee in preparing and disseminating outlook material. Sixty-five outlook meetings were held in Virginia with a total attendance of 1,491.

Twenty-three days in field devoted to Potato Project work in 8 counties.

Twelve meetings held with a total attendance of 969; average attendance 81.

Seventy-one demonstrations conducted on source-of-seed, certified seed, liming, roguing, spraying, dusting, grading, storing, etc; attendance at 38 method demonstrations, 498.

Source-of-seed plots ranged from 88.4 to 137.0 bushels of prime per acre, thus emphasizing the importance of seed source.

Certified seed yielded 20.7 bushels of prime per acre more than home grown seed; the eight-year average is 38 bushels per acre increase.

Five leading strains in source-of-seed plots yielded 22% over Eastern Shore average. Sixteen of the 24 strains averaged 12% over Eastern Shore average while 8 strains showed a decrease in yield.

Three hundred growers, seedsmen, fertilizer dealers, certification officials, and others attended potato tour.

Twenty-three state and 10 out-of-state Irish potato exhibits featured at Corn and Grain Show.

Fifteen and one-quarter acres of Irish potatoes grown for certification.

Two storage houses constructed under supervision of this office; one cellar remodeled for same purpose.

Sixty-one 4-H Potato Club members secured average yield of 100 bushels per acre, an increase of 30 bushels or 43% over the state average for late potatoes.

Average gross returns per acre for 4-H Club members, $115.03; total cost per acre, $50.87; net profit per acre, $64.16.

Section of Group Meeting at 1000 Points Mile

Spraying Demonstration - 1000 Points Mile





Source-of-Seed Demonstration Plots - 1933 Potato Tour





Interested Questioners at Source-of-Seed Plots



Group Proceeding to Seed-Source Demonstration Plot



Dr. Zimmerley Explaining Fertilizer Plots
1933 Potato Tour



Potatoes Grown For Certification



Spraying Potatoes in Washington County



2500 bu. Storage Cellar
Constructed Under Heat House



Dr. Anderson Explaining Flea Beetle Control Experiments
1935 Potato Tour



Interstate Irish Potato Exhibit - State Corn and Grain Show

SWEET POTATO PROJECT

The acreage of sweet potatoes in 1933 was materially decreased below that of 1932. Total acreage for the United States is estimated at 815,000 acres, a decrease of about 12% from the 1932 acreage of 925,000 acres, but still nearly 4% over 1931. Production is estimated at 69,743,000 bushels, a decrease of slightly more than 11% from the 1932 production of 78,494,000 bushels but about 7,000,000 bushels more than the 1926-1930 average. Yield per acre for the country as a whole is figured as 85.6 bushels per acre or only 1 bushel per acre greater than the 1932 yield. Due to the 11% reduction in the supply of sweet potatoes and to the shortage of late Irish potatoes, the sweet potato growers in 1933 experienced a reversal of the price trend after 4 years of declining prices. Farm prices on September 15 averaged 76.2 cents per bushel compared with 65.3 cents per bushel a year ago, 61.4 cents per bushel two years ago and 128.7 cents in September, 1930.

Virginia growers followed the general trend. Acreage decreased from 38,000 acres in 1932 to 37,000 acres in 1933, a reduction of 2.6%. Due to better yields, however, total production in Virginia increased nearly 10% from 3,610,000 bushels in 1932 to 4,255,000 bushels in 1933. Prices to the grower will probably average better than 55 cents per bushel compared with 30 cents in 1932, an increase of over 83%.

It is interesting to note that Virginia ranked 9th in the production of sweet potatoes in 1933 and produced approximately 6% of the total crop. Accomac County was the leading county in the United States in acreage, production, and value of this crop. The total value of the crop to the state was over $2,340,000 and was surpassed in value only by the Irish potato crop. In spite of the total value of the crop to the state and in spite of Virginia's high rank in sweet potato production, the picture is far from ideal when production per acre is considered. Virginia's yield in 1933 was only 115 bushels per acre; her five-year average, 1928-1932, was only 117 bushels. Proper cultural practices can easily double this yield; good growers often secure from two to four times the average yield. Factors contributing to the low average yield are the use of poor land, poor seed, improper fertilization, disease, careless harvesting and poor storage.

Certified Seed Production, Crop Production, and Storage House Construction, were emphasized in the Sweet Potato Project.

Certified Seed Production

Good seed is fundamental to high production per acre. The certified seed project has been of untold value in making a supply of such seed available and thus directly increasing the yield per acre.

During the past eleven years, a total of 125,707 bushels of sweet potatoes have been certified, or an average of 11,391 bushels annually. The seed has been marketed both within and without the state. At a conservative estimate of only $1.50 per bushel certification of sweet potatoes has returned to the growers of the state over $185,650. And this figure does not take into consideration the benefits of increased production per acre secured by growers using the seed, nor does it take into account the cash return from the sale of plants. A further bright side of the picture is that there is still need for a considerable expansion of the project. Even if all the seed certified were sold in Virginia, less than ⅞ of the state's bedding requirements would have been supplied. In addition, there is a continued demand from without the state. Seed or draws from Virginia have already found markets in approximately 20 states.

Rules and Regulations Governing Certification. The rules and regulations governing certification of sweet potatoes were prepared by this department and are included in the Crop Improvement Association Manual.

Inspections. Three separate inspections were given; namely, Seed Bed, Field and Bin. The seed beds were inspected primarily for black rot, soft rots and general condition of the plants. The fields were inspected for varietal mixture, black rot, blue stem, freedom from weeds, general condition, etc. The potatoes were inspected in the bin for black rot and storage rots. In 1934, all inspections in so far as possible will be made by the Virginia Crop Improvement Association. Considerable work has been done by the Vegetable Department this year in training their inspector for this work.

Scope of Work. In 1933, certification work was done with 30 growers in five counties - Accomac, Northampton, Southampton, Mecklinburg, and Caroline.

111-6/10 acres were grown for inspection, consisting of 56½ acres from draws and 55-1/10 from vine cuttings. The distribution of acreage according to varieties was as follows:

Variety	Acreage
Big Stem Jersey	51
Nancy Hall	55-6/10
Porto Rico	1-1/4
Little Stem Jersey	1-1/4
Haymen	1
Spanish	1
Priestly	1/2

All crops were produced from certified seed or plants. Over 1,666 bushels of sweet potatoes were treated and bedded by growers of certified seed under direction from this office.

Twelve thousand eight hundred sixty two bushels of sweet potatoes were eligible for inspection and of this number 12,507 bushels were certified. This figure is for the 1933 crop as this year's crop will not be certified until late in January. These potatoes were distributed according to varieties as follows:

Variety	Bushels
Big Stem Jersey	10,935
Nancy Hall	994
Porto Rico	398
Little Stem Jersey	130
Priestly	50
Nansemond	50
Spanish	50

Value of Certification Project. The certification project affords an opportunity to evaluate concretely one phase of the vegetable extension program. The primary value of the project naturally lies in the increased production per acre for users of the seed. Records on certification for the 1933 crop will not be complete until after the bin inspection in January. Growers of certified seed in 1932, however, secured an average yield per acre of 44% above the state average. Aside from increased production per acre, however, there are two items or sources of income open to the grower - that derived from the sale of slip seed and that derived from the sale of draws. In 1933, growers produced 12,507 bushels of certified seed which even at the very low estimate of $1.00 per bushel would total $12,507. Incomplete reports also show returns of $898.62 from the sale of plants, bringing the total income from certified seed and plants to approximately $13,405.62.

Of even greater importance, however, is the fact that the growers bedded 1,666 bushels of certified seed and used over 1,940,700 plants for their own plantings. The use of such improved seed by the certified growers themselves, together with the sale of such seed to their neighbors, cannot help but improve the yields in Virginia.

Crop Production

The same type of cultural information was given to the commercial growers as to the producers of certified seed. Outlook information, pest control, grading and storing were particularly stressed.

Outlook Information. The state outlook report on sweet potatoes was prepared by this office and is included in this report as a part of Exhibit A. This information was used effectively at sweet potato meetings.

Demonstrations. Ninety seven demonstrations were given in the Sweet Potato Project with a total attendance of 369. The demonstrations dealt with seed selection and treatment, disease identification, rogueing, fertilization, harvesting, grading, storing, and storage house construction.

Meetings. Ten meetings were held in the Sweet Potato Project with a total attendance of 148, or an average attendance of 14.

Corn and Grain Show. Sweet potatoes were again featured at the Corn and Grain Show. The exhibit consisted of 24 entries in the open class and 13 entries in the certified class.

Storage House Construction

This project is a cooperative one between this department and the Agricultural Engineering Department. Messrs. L. C. Bonner and H. H. Gordon are to be congratulated on the progress in this phase of the Sweet Potato Project.

Five new houses were constructed during the past year, all of wood construction. In addition, 7 wood buildings were remodeled for sweet potato storage. Including both new and remodeled buildings, 12 storage houses were constructed. The wide distribution of the houses should be noted.

County	No. of Houses
Princess Anne	3
Southampton	2
Isle of Wight	2
Greenville	1
Prince George	1
Chesterfield	1
Pittsylvania	1
Halifax	1

The total capacity of the 12 houses is 10,800 bushels or an average capacity of 900 bushels. Of this total capacity, 6060 is being utilized for the storage of 7,273 bushels of sweet potatoes, with a premium value over field marketed stock of over $5,600.00

The twelve houses constructed this year bring the total to 86 houses constructed during the last nine years. These houses are located in 21 counties and have a total capacity of approximately 189,400 bushels, or an average capacity of slightly over 2,200 bushels. During the same period, several houses have been constructed in addition to the above from plans furnished by this office. Seventeen plans were sent out during the past year to growers who were not aided in the construction of the houses.

Storage House Check-Up. A check-up was made on the number of bushels stored in 69 of these houses. It was found that a total of 87,172 bushels are so stored. House-cured sweet potatoes are selling at a premium of over 50 cents a bushel above the average price received in the field. The premium value alone, therefore, of these potatoes should net the growers over $43,500.

Summary of Accomplishments - Sweet Potato Project

Outlook information prepared for growers.

Forty two and a half days in field devoted to Sweet Potato Project work in 16 counties.

Ten meetings held with a total attendance of 148; average attendance, 14.

Ninety-seven demonstrations given with a total attendance of 369.

Certification work done in 5 counties with 30 growers.

One hundred eleven and six tenths acres of sweet potatoes grown for certification. Seven varieties entered.

One thousand six hundred sixty six bushels of seed bedded by growers of certified seed under direction of this office.

Twelve thousand five hundred seven bushels of seed certified, approximately 7% of state's requirement for bedding.

125,767 bushels of seed certified in 11 years, an average of 11,251 bushels annually.

Returns to certified growers from sale of seed and draws approximately $13,405.62.

1,940,700 plants used by growers for own planting.

Sweet potatoes featured in exhibit at Corn and Grain Show.

Twelve storage houses constructed or remodeled during past year with total capacity of 10,800 bushels; average capacity, 900 bushels; 66⅔% of total capacity used for the storage of 7,875 bushels of sweet potatoes with a premium value above field marketed stock of over $5,600.

86 houses constructed in 31 counties since project started; total capacity, 189,400 bushels; average capacity, slightly over 2,200 bushels.

Check-up shows 87,172 bushels stored in 69 houses; premium value over $45,500.



Bedding Sweet Potatoes - Caroline County



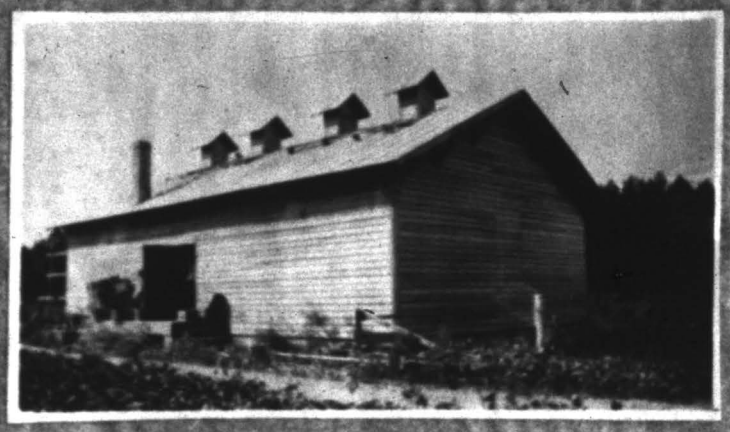
Sweet Potatoes Grown For Certification



Field Grown for Certification
Southampton County



Plowing Out Certified
Sweet Potatoes



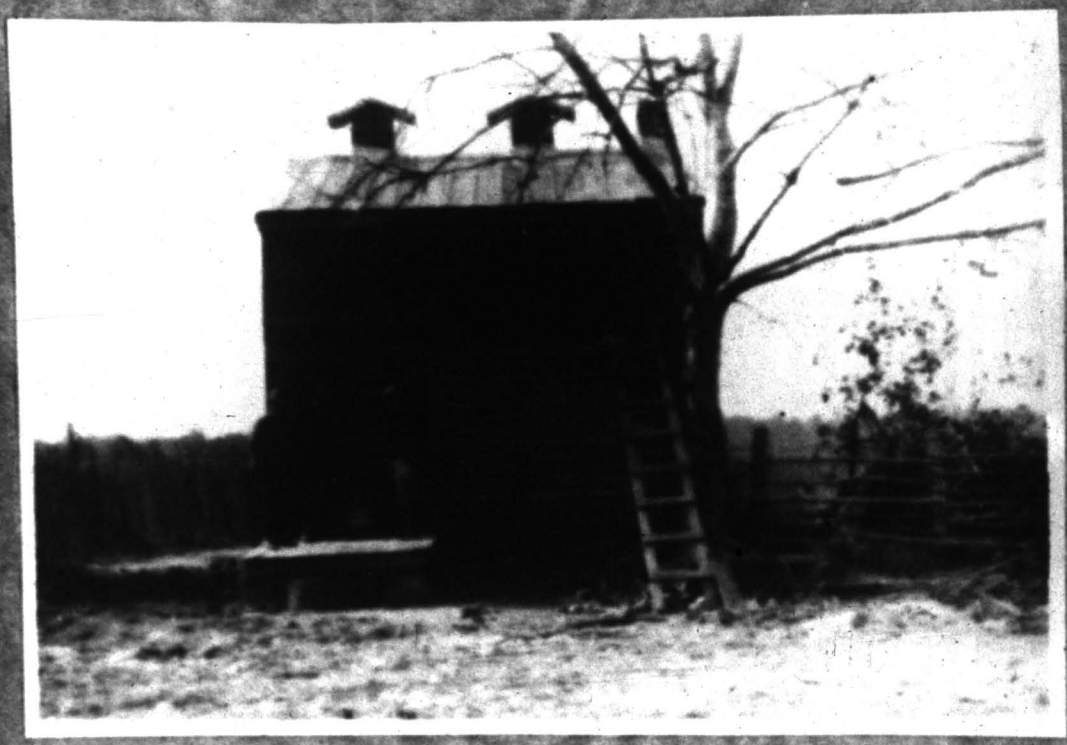
5000 bu. Sweet Potato Storage House
Isle of Wight County



Moving Sweet Potatoes Into Storage
Caroline County



500 bu. Farm Storage House
Constructed Under Supervision of This Office



Farm Building Remodeled for Storage House - Southampton County



1000 Sq. House Constructed This Year - Southampton County



Sweet Potato Exhibit - State Corn and Grain Show

TOMATO PROJECT

Tomatoes rank as the fourth most important vegetable crop of the state. For the five-year period, 1928-1932, the crop has averaged an annual return to the growers of over $750,000. This income, however, is but a small part of the potential value of this crop to the state and this without any increase in acreage. The average annual yield for canning tomatoes for the period 1928-1932 was only 2.6 tons (87 bushels) per acre; for the market crop, it was only 135 bushels per acre. Proper cultural practices can easily double such yields.

The Tomato Project naturally subdivides itself into two phases - the production of canning tomatoes and the production of the early or market crop. Each of these sub-projects will be discussed separately.

The Production of Canning Tomatoes

The production of tomatoes for manufacture in 1933 was the smallest in the last 11 years. Total production is indicated at 957,000 tons or 20% less than the 1932 production of 1,199,000 tons and slightly smaller than the light crop of 1931, when a total of 976,500 tons was produced. Compared with the peak production of 1,757,000 tons in 1930, the 1933 crop shows a reduction of about 46%. The reduced production in 1933 resulted to some extent from a decrease of 8.5% in acreage (276,000 acres in 1933 compared with 302,400 acres in 1932), but primarily from a decreased yield. The indicated average yield of only 3.49 tons per acre is the lowest during the last 15 years with the exception of 1931 and is largely the result of early season drought in many of the producing areas and damage from the severe storms that swept some of the Atlantic Coast States during the latter part of August. Prices for the country as a whole improved in 1933 due to the short crop and to late season increases of contract prices on the part of canners.

Virginia growers did not follow the trend for the country as a whole. Acreage was increased 18.9% from 13,900 acres in 1932 to 15,700 acres in 1933. However, production decreased 11.3% from 30,900 tons in 1932 to 34,500 tons in 1933 due to the exceptionally low yield of only 2.2 tons (75 bushels) per acre. The primary cause of this low yield was adverse growing conditions. Some sections of the state suffered severely from early season drought. In eastern Virginia, particularly in the Northern Neck area, the crop was very promising until the disastrous storm of August 23. At that time many fields were covered with salt water and completely destroyed. Yield for the section as a whole was probably cut at least 50% as the harvesting season had just started. Tomato fields looked as though a late October frost had passed over them. The vines were practically defoliated and the fruit was exposed to injury from the sun and later rains. The storm, however, strikingly demonstrated the importance

of proper cultural practices. Regardless of the storm, those growers who used good seed, planted early, fertilized properly and cultivated well, secured profitable yields per acre. Many growers were visited who had harvested over 100 bushels per acre before the storm came. Some had harvested nearly 200 bushels per acre. Any grower securing better than 100 bushels per acre this year should realize a profit due to the increase in tomato prices. The regular contract price at the first of the season ranged from 10 to 12½ cents per 5/8 basket. Late season advances, however, should bring this price to from 15 to 20 cents per 5/8 basket. The Tomato Project has stressed the practices mentioned above - good seed, good plants, good land, early planting, proper fertilization and cultivation.

Outlook Information. This department prepared the outlook report on canning tomatoes which will be found in the back of this report as a part of Exhibit A. This information was passed on to growers through the agents, meetings and publicity articles. In addition to the outlook report, additional outlook information on acreage, production, etc. was sent regularly to the county agents. Both growers and canners, particularly the latter, are more and more requesting this type of information.

Demonstrations. 521 demonstrations were conducted on plant bed selection, land preparation, good seed, seeding, thinning, mulching, dusting, disease identification, fertilization, cultivation, grading, packing, account keeping, etc; 418 method demonstrations are included in the above with a total attendance of 917. The nature of some of the result demonstrations will be discussed separately.

Tomato Plant Bed Demonstrations. Twenty-two tomato plant bed demonstrations were conducted in 1935. The beds ranged in size from one-sixteenth to one-quarter acre. All beds were properly fertilized and were dusted to control insect and disease pests. Information and demonstrations were given the plant bed growers in selecting a site, land preparation, fertilization, seeding, mulching, cultivation, thinning, pest control, pulling and planting.

Results of such work are accumulative. Some of the outstanding benefits are listed below:

1. Demonstrational value of beds. The plant beds actually demonstrate. Scores of growers are now following the practices demonstrated in such beds.

2. Increased spraying and dusting. The beds have strikingly emphasized the value of pest control in the production of good plants and high yields. When extension work began in the Northern Neck, no dusting was practiced. Now, it is the common practice.

In 1935, over 500 pounds were used on the demonstration beds alone. In addition, several thousand pounds were sold in this area. This one change in practice has meant thousands of dollars to the tomato growers in the Northern Neck.

3. Available supply of good plants increased. Records show a direct correlation between good plants and yield. A total of 1,089,000 plants were used from the 22 beds, sufficient to set 605 acres or over 5% of the State's total acreage planted in canning tomatoes.

Introduction of Good Seed. Specific information has been given both growers and canners as to sources of reliable tomato seed. The results of the 1932 seed-source trials were distributed to both groups. It is interesting to note that of over 140 growers in the Northern Neck keeping cost account record books, at least 90% of them were using seed in 1935 from firms whose seed showed a high record of performance in the 1932 source-of-seed tests. Since the canners purchase by far the greater amount of the seed for their growers, this project has been particularly stressed with the canners. Their response has been very encouraging. Hundreds of pounds of seed have been purchased by them from sources recommended by this office.

One hundred ounce packages of high grade seed were distributed to individual tomato growers in several counties. The growers were asked to keep a record on the performance of this seed in comparison with their own crop. Many of the fields were visited by a Vegetable Specialist and the superiority of the seed noted. In addition, several letters have been received from the growers highly commending the seed.

Seed saving has been stressed where the growers started with a high producing strain. Several demonstrations were given in staking the proper type of plant from which to save seed.

Source-of-Seed Demonstrations. Closely allied to the introduction of good seed has been the source-of-seed plots. It has already been pointed out that 90% of the cost account demonstrators used seed in 1935 from firms whose seed showed a high record of performance in the 1932 source-of-seed tests. The advantage of these tests was also brought out in another way. One concern which has consistently sold inferior tomato seed in the Northern Neck area put out seed this year which was much better than any sold by this concern in this section in the past. It is only logical to assume that the seed trials have influenced this concern in this matter. 1,500 copies of the source-of-seed plot records were distributed to growers, seedsmen, and canners. (See Exhibit C).

Six source-of-seed plots were conducted this year in cooperation with the Virginia Truck Experiment Station as a part of the better seed program. Since the plots were all located in the

wilt area, only the Marglobe variety was used in this work. Marglobe seed from 13 different sources was all planted on the same date in the same plantbed and treated in the same manner. Plants were set in the plots on the same date and received the same field treatment. Records were made on trueness to type, resistance to wilt, and yield. The summarized record on type follows:

SUMMARY TOMATO SEED SOURCE PLOTS - 1933 - TYPE STUDIES

Seedsmen	Type Studies			
	No. Plants Studied	% Fruit On-Type	% Fruit Off-Type	Rank
R. O. Dean	174	97.1	2.9	5
Landreth Seed Co.	200	94.0	6.0	8
Thos. E. Brown	204	97.5	2.5	4
T. W. Wood & Sons	203	67.5	32.5	15
Stokes Master Marglobe	200	97.5	2.5	4
Griffith & Turner	201	86.1	13.9	12
Brown-Chase Strain	202	99.5	0.5	1
Francis C. Stokes	140	90.7	9.3	9
Ferry-Morse	143	93.6	6.5	7
Associated Seed Growers				
Strain A	143	83.2	16.8	13
Strain B	95	90.3	9.7	10
Geo. Tait & Sons	137	89.1	10.9	11
Brown-Hynson Strain	198	97.9	2.1	3
Southern States Coop.	182	69.2	30.8	14
Tri-State Packers	54	93.3	6.7	6
R. O. Dean Direct	54	98.1	1.9	2
Average		90.7	9.3	

Trueness to type ranged from as high as 99.5% to as low as 67.5% with an average of 90.7%. Such a difference means dollars and cents to the grower selling on grade. The percent off-type directly limits the percent of the fruit which would grade U.S. No. 1 at the factory. In general, strains which showed a high percent of fruit on-type last year also show a high percent on-type fruit this year and vice versa.

Wilt was particularly bad this year as evidenced by a study of the following table. The total percent wilt for the Marglobe strains ranged from 8.6% to 68.4% while for the check, Greater Baltimore, it was 68.8%. The total percent wilt, however, does not give a true picture of the wilt situation. It was thought best, therefore, to differentiate between plants completely killed by wilt

and plants infested by wilt but producing fruit. Some strains, for example, showed no plants killed by wilt while others had as high as 87.5% dead from wilt. Dead plants were given a value of 2 while infested plants producing fruit were given a value of 1. The two were then added together and divided by the total number of plants to secure the "Wilt Index". The wilt index ranged from 6.6 to 92.2 with an average of 37.0 for the Marglobe strains and 114.2 for the non-wilt resistant check, Greater Baltimore. In general, the strains showing the poorest type show the greatest wilt index. Wilt resistance spells the difference between profit and loss.

SUMMARY TOMATO SEED SOURCE PLOTS - 1938 - WILT STUDIES

Seedsmen	Wilt Studies				
	No. Plants Studied	% Dead From Wilt	% Infected, But Producing Fruit	Total % Wilt	Wilt Index
R. O. Dean	130	2.3	25.0	27.5	30.0
Landreth Seed Co.	146	2.1	19.9	22.0	24.0
Thos. M. Brown	150	0.0	24.0	24.0	24.0
T. W. Wood & Sons	149	11.4	20.1	31.5	43.0
Stokes Master Marglobe	146	2.1	17.1	19.2	21.2
Griffith & Turner	147	5.4	15.0	20.4	25.8
Brown-Chase Selection	148	0.0	16.2	16.2	16.2
Francis C. Stokes	140	1.4	12.9	14.3	15.7
Ferry-Morse	143	1.4	14.7	16.1	17.5
Associated Seed Growers					
Strain A	145	0.7	17.5	18.2	18.9
Strain B	93	0.0	8.6	8.6	8.6
Geo. Tait & Sons	137	0.7	18.3	19.0	19.7
Brown-Hynson Selection	139	1.4	18.0	19.4	20.9
Southern States Coop.	133	37.5	37.5	68.4	92.2
Average		4.0	18.9	33.0	37.0
Greater Baltimore	141	45.4	25.4	68.8	114.2

The storm of August 25 all but ruined the plots from a yield standpoint. The following table gives the yields from two plots for the eleven strains that were included in both plots. The yield record is included to complete the report, but the yields should not be considered as more than possibly indicative due to the storm mentioned.

Seedsmen	Yield-Tons Per Acre
R. O. Dean	5.28
Stokes Master Marglobe	4.75
Brown-Chase Selection	4.65
Griffith and Turner	4.36
Thos. E. Brown	4.31
Landreth Seed Co.	4.28
Geo. Tait & Sons	4.21
Brown-Hynson Strain	3.99
T. W. Wood & Sons	3.98
Southern States Cooperative	3.17
Average	4.29

Tomato Tour. In order to bring the various tomato demonstrations to the attention of growers, canners, and seedsmen, a two-days' tour of Lancaster and Westmoreland Counties was planned. The program of the tour was completed (see Exhibit D) and definite assurance was received from the following seedsmen that one or more of their representatives would attend:

Associated Seed Growers, New Haven, Conn.
Francis G. Stokes Seed Co., Philadelphia, Pa.
Landreth Seed Co., Bristol, Pa.
Ferry-Morse Seed Co., Detroit, Mich.
R. O. Dean, Fredericksburg, Md.
T. W. Wood & Sons, Richmond, Va.
Southern States Cooperative, Richmond, Va.
Geo. Tait & Sons, Norfolk, Va.

Then came the storm of August 23 which practically ruined the plots and made it necessary to wire all seedsmen, canceling the tour. The tour will be held in 1934 as it is felt that such a tour attended by representatives from concerns supplying the bulk of Virginia's tomato seed should stimulate interest in better seed, both on their part and on the part of Virginia growers and canners.

Thinning Demonstrations. Thinning demonstrations were limited largely to plant bed growers as a part of the production of better plants program.

Pest Control Demonstrations. Each of the 22 plant beds served as a demonstration on pest control. All beds were dusted to control pests. Their peculiar value in this respect is emphasized under "Tomato Plant Bed Demonstrations."

Wilt is one of the most destructive diseases of the tomato area. Emphasis has been placed upon the use of the wilt-

resistant variety, Marglobe. All the seed introduced in the good seed work has been of this variety. The seed-source plots have likewise demonstrated the value of purchasing strains with a high wilt-resistance.

Grading. This department cooperated with the State Division of Markets in stressing the advantages both to growers and canners of buying and selling raw stock on grade. The canner under this system secures a better grade of fruit while the good grower receives a premium on good fruit. Grading this year was discontinued, however, soon after the harvesting season started, due to the severe storm damage.

Tomato Survey Records. Survey records were made of the 228 tomato farms whose owners cooperated in keeping cost accounts. Each survey secured information on factors pertinent to tomato production on the particular farm in question (see Exhibit E). These records will be summarized and the results presented to growers' meetings in 1934. They should be of particular value in conjunction with the cost account records kept on the same farms in interpreting causes of variations in returns from the tomato crop.

Cost Account Records. One of the most important phases of the tomato project is the cost account work. Definite information on the cost of tomato production in Virginia is sorely needed and such records will supply this information. 228 cost account record books were started with tomato growers in Lancaster, Westmoreland, Essex, Bedford, Botetourt, Shenandoah and Page Counties, in cooperation with the Economics Department. The account books completed have not been summarized as yet, but will be in time to present to meetings of tomato growers in January and February.

The data from 65 records kept in 1932 were presented in meetings early this year very effectively. A brief summarization follows:

Costs and Returns Per Acre on Tomatoes

	(65 farms)	
	Amount	Value
Use of land		3.20
Manure		2.68
Fertilizer	634 lbs.	7.27
Lime		.02
Seed		.79
Plants		.36
Spray and Dust		.17
Man Labor	62.2 hrs.	6.51
Horse Work	52.6 hrs.	5.99

(continued)

	Amount	Value
Truck Use		.17
Tractor Use		.37
Equipment Use		.30
Contract Picking		4.06
Contract Hauling		2.62
Interest		.36
Grand Total Cost		33.36
Plants Sold		1.07
Net Cost		32.49
Tomatoes Sold	308 bskts.	41.01
Profit Per Acre		8.52
Acres Per Farm	3.59	
Yield Per A. (Bskts)	308	
Cost Per Basket		10.55¢
Value Per Basket		13.32¢
Profit Per Basket		2.77¢

(For a complete summary, see Exhibit F.)

Meetings. Twenty-five meetings were held in the Tomato Project, as a whole, with a total attendance of 800; average attendance was 32.

Three special phases of tomato production were taken up at these meetings. The first was the outlook information. All the available data were presented to the growers and canners for their consideration. The second phase discussed was the source-of-seed work stressing the necessity for good seed. The third matter presented was cost of production studies described previously. The reasons why some growers secured a high profit per acre while others made a low profit or suffered a net loss were pointed out. In Lancaster County, for example, 42 growers averaged $7.61 net profit per acre. The five best growers, however, made a net profit of $47.32 per acre; the five medium growers made a profit of $10.79 per acre; while the five poorest growers suffered a net loss of $15.49 per acre. The same comparative figures hold true for Westmoreland County. There was considerable interest manifested in the studies, particularly since many of the cost account demonstrators attended the meetings.

The Production of Market Tomatoes

Virginia acreage in market tomatoes remained the same in 1933 as in 1932 at 5,000 acres, while her production decreased approximately 5% from 480,000 bushels in 1932 to 455,000 bushels in 1933. Yield was 155 bushels per acre compared to 160 bushels in 1932. Prices were considerably better than in 1932.

Extent of Work. Several days were spent in work with growers of market tomatoes in Appomattox, Northampton, and Caroline Counties. The work in Appomattox County dealt entirely with plant production under glass. In Northampton County, demonstrations were given in the construction of forcing structures for tomato plant production. In Caroline County, the growers were rather carefully supervised throughout the season. Demonstrations were given in the construction of a flue-heated hotbed, in plant growing, pest control, harvesting, grading and packing. The growers in Caroline County are a particularly fine group with whom to work. They are new at truck crop production and anxious to learn. Nine flue-heated hotbeds were constructed in the county as a direct result of one demonstration.

Summary of Accomplishments - Tomato Project

Outlook information prepared and disseminated to growers and canners throughout the year.

78 days in field devoted to Tomato Project work in 16 counties.

26 meetings held with a total atendance of 809; average attendance, 32.

581 demonstrations conducted on plant bed selection, land preparation, good seed, seeding, thinning, mulching, dusting, disease identification, fertilization, cultivation, grading, packing, account keeping, etc. Attendance at 418 method demonstrations, 917.

22 plant bed demonstrations emphasize value of good plants. 1,069,000 plants produced in beds, sufficient to set 595 acres or over 8% of the state's total acreage planted in canning tomatoes.

Use of good seed greatly increased through good seed project. 100 ounce lots distributed to individual growers in tomato counties.

6 source-of-seed demonstrations conducted comparing seed from 13 sources. Trueness to type ranged from as high as 99.0% to as low as 67.8%. Wilt index ranged from as low as 8.6 to as high as 98.2. Value of seed source strikingly emphasized.

225 tomato cost account record books started to secure information on production and marketing costs. Survey on cultural practices made on seven farms.

Growers in Appomattox, Northampton and Caroline counties aided in the production of market tomatoes. 9 flue-heated hotbeds constructed as the result of one demonstration.



Tomato Plant Bed - Note Natural Windbreak



Tomato Plant Bed - Note Artificial Windbreak



Tomato Plant Bed - Note Artificial Windbreak



Tomato Plant Bed - Natural and Artificial Windbreak



Tomato Hotbed
Note Stocky, Well Grown Plants



Tomato Hotbed - Plants Allowed to Grow Too Long
Note Legginess



Spraying Tomato Plants in Cold Frames



Tomato Plants Grown in Bush House
Constructed Under Supervision of This Office



Lantern Control for Tomato Fruit Worm Moth

HOME GARDEN PROJECT

The subject of the home garden is often dismissed as being of minor importance to the cash crops. A reasonable approach to this phase of the farm program, however, will convince one of the fallacy of any such claim. The home garden is of tremendous value to the agriculture of the state. Looking at it only from the cold standpoint of dollars and cents, the garden is the most valuable crop on the farm. Various authorities estimate the value of a good garden at from $150 to $225. Even at the lower figure, the total value of the farm gardens in Virginia reaches the astounding sum of over $21,000,000 annually. An industry which annually saves the people of the state over twenty-one million dollars is worthy of any man's study and attention.

Interest in the home garden has increased by leaps and bounds during the past few years. The country has become garden conscious. National, state, county, and local relief measures have done much to focus the attention of the public mind on this forgotten subject. Economic necessity has forced both the farmer and the urban gardener to give more serious consideration to home supplies. In cities, this interest has been further stimulated through cooperative efforts of commercial concerns with their employees. Many cities, notably Richmond, Hopewell, Petersburg, and Roanoke, have turned to community gardens as a partial solution to their relief problem.

In rural sections, garden clubs, campaigns, community leagues, extension programs, and the necessity for food, have emphasized this important subject which can hardly be over-emphasized. Short-sighted, indeed, is the farmer who does not include an all-year-round garden in his farm program. Yet the 1930 census figures indicate that 15%, or one out of every seven farmers, has no garden. Interest in gardening has increased several fold since 1930, but there is still ample room for improvement both in increasing the number of gardens and in helping gardeners solve their problems. Many an excellent farmer seems lacking in the fundamentals of elementary successful gardening. Hundreds of gardens throughout the state contain only cabbage, potatoes, tomatoes, corn and beans and farm families go without the many other common vegetables essential to health.

Calls upon this department for garden aid have necessitated the robbing of the other projects to afford time to meet even a portion of the need. During the past year, 1852½ days in the field were devoted to garden work, an increase of 57½ days, or 3½%, over the time so devoted in 1932. Double the amount of time could easily have been used in constructive garden work. A full-time man could not possibly handle all the garden work requested and yet only 1-2/3 man's time is available for all four major

projects. 107 visits were made to county agents and county home demonstration agents on definite garden work, an increase of over 50% over 1932. 46 counties were visited in this project in 1933, an increase of 30% over 1932. In addition, an opportunity to present garden information was often presented when visiting counties primarily for other projects. Various phases of the project will be discussed in the following pages.

Meetings. Meetings continued to be the chief agency for disseminating garden information. 254 meetings, an increase of 35 meetings or 32% over 1932, were held with a total attendance of 8,385 or an average attendance of 33. Total attendance in 1933 increased over 43% above 1932 attendance.

Garden work was presented to 32 4-H Garden Clubs with a total attendance of 1,396, or an average attendance of 43.

Forty-three adult garden clubs were met with a total attendance of 1,035; or an average attendance of 25.

Garden work was also presented at the Cape Henry Short Course.

Leader Trainer Work. Fifteen leader-trainer groups were met with a total attendance of 227 or an average attendance of 15. In such groups, the specialist is given an opportunity to present definite, timely garden information to a representative from each of the various clubs within a county. Such information is in turn carried back by the leader to her particular club. It is thus possible to influence a far greater number of people than would be possible by attempting to meet the individual clubs. Average attendance at the adult garden clubs met was 25. Provided each of the 227 leaders, who attended the leader-trainer meetings, justified her selection as a leader, the leader-trainer work succeeded in reaching 5,681 people in clubs throughout the counties in which leader-trainer work was conducted.

Project outlines for home garden work were furnished to the clubs covering monthly topics. The clubs decided on which topics they desired. (See Exhibit G.)

Demonstrations. 200 method demonstrations were given in the garden project with a total attendance of 2,556 or an average attendance of over 12. The number of demonstrations given increased 38% over 1932 while total attendance at the demonstrations increased 24%.

Contests. Several canning contests were conducted throughout the state by the Home Economics Department in cooperation with commercial concerns. Considerable aid was given contestants

in Nelson, Northampton, Prince William, Fairfax, and Madison Counties on their garden problems. Contest requirements were prepared for some counties by this office. (See Exhibit H.) Such contests serve to stimulate interest in gardening and afford this department an opportunity for service to the many contestants.

Aid was also given in scoring gardens in 4-H club contests. Work of this type has been restricted as much as possible, however, for economic reasons and as it is felt that the county extension agents are capable of handling the scoring themselves. (See Exhibit I for score card.)

Free Seed Distribution. 425 packages each of kale and spinach seed and 25 packages of mustard seed were distributed free to garden club members and others. The seed was distributed primarily to families who had not previously grown these greens to any great extent. Such distribution is gradually increasing the use of these greens. At least 400 families benefited from the distribution this year. At an average of four members to the family, 1,600 persons were directly affected by this service.

The seed distributed was furnished through the courtesy of the Richmond concerns, T. W. Wood & Sons, Biggs and Beadle, Southern States Cooperative; and the Norfolk concerns, Geo. Thit & Sons and the Warren Seed Company.

Bulletins. Practically every county in the state benefited from garden information in the form of bulletins and letters. Wholesale distribution of bulletins is not encouraged, but rightly used they constitute an effective extension agency.

Circular E-203, Vegetable Garden Suggestions for Virginia Farmers, was revised and reprinted. Over 60,000 copies of this circular have been distributed to date. The garden plan included in this circular was printed in the Tobacco Grower which has a distribution of 8,000 in the tobacco belt. The plan was also printed in the Farmville Herald. T. A. Burns, Agricultural Instructor at Cumberland, Virginia, had 1,000 copies of the plan printed for distribution to the farmers of his county. A copy of this circular is included in this report as Exhibit J.

Circular Letters. Sixteen circular letters were prepared for the garden project and 95,563 copies were distributed through the agents. The subjects treated in the letters were seasonal and timely. Many favorable comments have been received from various sources, both as to the content of the letters themselves and as to their effectiveness. Some of the subjects treated in the letters were as follows:

Vegetables For One Person For One Year
Suggested Garden Plan For Family of Three
Suggested Garden Plan For Family of Five
Essentials For Successful Gardening
Planning the Garden
Pest Control
Control of the Mexican Bean Beetle
Planting the Fall Garden
Storage of Vegetables

All letters were sent out under the signature of the agent to give the information a more personal touch. Samples of the garden letters are included in the appendix of this report as Exhibits K to T inclusive. Many agents, in addition to distributing the letters, used them as press articles in county papers. The Industrial and Agricultural Department of the Norfolk and Western Railway Company used the Suggested Garden Plan For a Family of Five in its marketing bulletin (see Exhibit U).

Press Articles. Twenty-eight press articles on the home garden were prepared and published in the Extension Division News, the Southern Planter, Virginia Fruit, The Tobacco Grower, county papers, etc. Eleven garden articles were prepared for the Tobacco Grower which as previously mentioned has a distribution of 8,000 in the tobacco belt where garden information is sorely needed. Twelve radio talks on the home garden were also broadcast over Station WRNL.

Garden Relief Work

A tremendous amount of garden relief work was carried on in Virginia in 1933. A check-up was made on this work in all counties having either a county agent or a county home demonstration agent. Reports were received from the agents in all counties except Nansemond. Summaries from these reports reveal some very interesting facts.

Relief work was carried on in 86 counties. Several agencies cooperated in the relief program. The E.F.C. funds furnished by far the greatest bulk of the funds for garden seed. The following table shows the agencies cooperating and the number of counties in which each was responsible for the relief program:

Agency	Counties
E.F.C.	48
County Board of Supervisors	4
E.F.C. and Red Cross	1
Red Cross	3
Red Cross and Home Demonstrn.Clubs	1
Red Cross and Welfare Board	1
Red Cross and private capital	1
Emergency Relief Committee	1
Rotary Club	1
Home Demonstration Advisory Board	1

A total of 41,444 families received garden seed. The smallest number of families receiving seed in any one county was 17 in Highland County; the largest number was 2,575 in Mecklenburg County; the average number per county was 740. The distribution by counties was as follows:

Mecklenburg	2,575	Charlotte	900	Alleghany	475
Bedford	2,000	Amelia	890	Chesterfield	385
Nelson	2,000	Prince George	800	Bath	350
Buckingham	1,500	Hanover	800	Charles City	275
Dinwiddie	1,500	Franklin	800	Fairfax	240
Tazewell,	1,500	Powhatan	785	Sussex	240
Brunswick	1,500	Fluvanna	750	Prince William	149
Campbell	1,467	Amherst	735	Montgomery	138
Pulaski	1,450	Greenville	700	Loudoun	110
Carroll	1,400	Grayson	700	Caroline	108
Wythe	1,300	Henrico	678	Isle of Wight	100
Buchanan	1,300	Orange	605	Page	100
Albemarle	1,108	Goochland	535	Elizabeth City	75
Augusta	1,000	Prince Edward	500	Essex	57
Roanoke	1,036	Tazewell	500	Frederick	55
Lunenburg	1,006	Pittsylvania	500	James City	30
Giles	1,000	Smyth	500	Madison	25
Louisa	941	Halifax	500	Highland	17
		Spotsylvania	500		

The cost of the seed per family ranged from as low as 30 cents to as high as $5.00, where potatoes and fertilizer were furnished. The unweighted average per county was $1.75 per family. In addition to seed, 18 of the 56 counties furnished fertilizer and 2 counties furnished spray materials.

Various methods were used in financing the seed orders. In 31 counties the seed was given outright. Twenty-one counties required either partial or full payment for the seed at cost in the form of work which ranged from $1 to $1.50 per day. Three counties sold the seed at cost. One of these three counties used the fund as a revolving fund for the purchase of more seed. In this manner the fund was available five times. One county gave the seed free, but required a report on the garden.

Seed was ordered from various concerns, but by far the bulk of the orders went to Virginia concerns. The following table will show the distribution of the orders:

T. W. Wood & Sons, Richmond	15
Southern States Cooperative, Richmond	14
Local concerns	14
Slate Seed Co., South Boston	1
Geo. Tait & Sons, Norfolk	1
W. Atlee Burpee, Philadelphia	5
Francis C. Stokes, Philadelphia	5
Belgiano Seed Co., Washington, D.C.	1

Twenty-eight vegetables were listed in the packages distributed, consisting of 3 green or leafy vegetables, 9 root and 11 fruit vegetables. The number of vegetables per county ranged from as low as 4 to as high as 21 with an average of 15 vegetables per county, consisting of 3 green or leafy, 4 root and 8 fruit vegetables. The number of vegetables included was largely determined by the amount of funds available for the purchase of seed and by the opinion of the local welfare board as to what vegetables should be included in the garden. The majority of the counties ordered only the more staple vegetables such as beans, tomatoes, corn, cabbage, peas, turnips, onions, potatoes and beets. A smaller number ordered the less common vegetables such as kale, spinach, parsnips, salsify, Swiss chard, carrots, lettuce, lima beans, peppers, etc. Potatoes were not included in several counties due to a lack of funds and to the belief that the families could secure potatoes for planting elsewhere. Sweet potato plants were distributed in only 3 counties for the same reason.

It is interesting to note the relative popularity of the various vegetables. The following table lists each vegetable with the number of counties including that particular vegetable in the seed package and covers 82 of the 86 counties. Four counties permitted the purchase of any seed desired by the gardener.

Beans	80	Kale	35	Mustard	11
Tomatoes	47	Carrots	32	Pumpkin	10
Corn	46	Lettuce	31	Radish	10
Cabbage	45	Squash	29	Swiss Chard	7
Beets	43	Lima Beans	25	Black Eye Peas	7
Peas	37	Spinach	19	Sweet Potatoes	5
Turnips	36	Cucumber	16	Collards	2
Onions	36	Parsnip	15	Peppers	2
Potatoes	35	Salsify	14	Navy Beans	1
		Turnip Salad	13		

Through the extension agents, this office cooperated with the county welfare boards and other agencies in charge of relief work. The first contact was a circular letter (see Exhibit V) sent to all county agents relative to the demand for garden assistance in their county. Attached to this letter were four mimeographed sheets. The first outlined the vegetables necessary for one person for one year (see Exhibit K). The second and third sheets were garden plans for a family of three and for a family of five based upon the information contained in the first sheet (see Exhibits L & M). Five thousand copies of the first sheet were distributed while 10,000 copies of the garden plan for the family of three and 15,700 copies of the garden plan for a family of five were called for. In addition, requests were received for several hundred copies of a separate mimeograph for a half acre farm garden. The fourth enclosure was a suggested letter to be

sent out with the plans. Many of the agents used this letter without changing, while others modified its contents to meet more nearly the needs of their particular county.

This office then contacted various seedsmen to secure their prices on seed collections for the two recommended gardens. Upon receipt of this information, it was forwarded to the county agents (see Exhibit H). Later we made a check-up to determine whether or not the material furnished was used by the county agents. It was found that they had used the material to advantage although naturally some of the counties did not order the complete collections due to lack of available funds and to the belief on the part of some of the welfare boards as to what vegetables were really necessary.

The garden plans were followed up by a series of cultural letters on successful gardening. One of these took up good seed and various other essentials for a successful garden. Another dealt with fertilization. One discussed pest control; one the fall garden; one home storage of vegetables. 7,200 copies of the fertilization letter were distributed. 25,200 copies of the pest control letter were required to meet the demand. 18,200 copies of the fall garden letter and 5,000 copies of the storage letter were called for.

Scores of meetings were held with the people securing relief seed throughout the state. Their number and attendance are included in the discussion of meetings under the Garden Project.

It is always interesting to receive first-hand information concerning any project. The following statements are expressions concerning the relief work from those in the front line trenches - the county agents and the county home demonstration agents:

Fairfax: "As in all such cases there were some cases that did not appreciate the gift, but as a rule the results were satisfactory. On the poor soils, the returns were not so satisfactory as on the better soils. Many families had enough vegetables for summer and [illegible] for winter from garden. One family canned 1000 quarts."

Greene: "The people as a whole made more effort to have a garden than ever before. On account of the dry season, the fall gardens were damaged. There were 38,051 containers of fruits and vegetables canned by relief families."

Charles City: "It is a matter of common knowledge that Charles City had the best gardens this year that have ever been seen. The gardens carried a great number of unemployed all summer and up to the present time. Many stored, canned and dried for winter use. The state allowance for family, $3 for small and $5 for large, was too low to provide sufficient potatoes and fertilizer with other garden seed for a complete year round garden."

Alleghany: "We feel that the E.F.C. garden campaign will mean much toward taking care of the needy families this winter. Without a doubt they have food for the winter which they otherwise would not have had."

Giles: "Without this help many families would not have had very much garden. These seed made it possible for each garden to have both a spring and fall garden and a good variety of vegetables. It was worth to the county many times the cost as it helped cut down appropriations for relief. At least 75% of these subsistence gardens put up sufficient canned vegetables for their winter use. Some failed to have sufficient land available for proper size garden for family needs."

Powhatan: "We had the best and largest gardens I have ever seen in the county. Much more canning done than ever before. Every possible food saved by storing, drying, and canning."

Henrico: "I visited about two hundred of these gardens and worked indirectly with another hundred. Gardens planted were well cared for. Food was stored, canned and dried. 35,600 quarts were canned."

Prince William: "Many had gardens that had never grown them before this time. Seed as far as I have been able to determine used to very good advantage. Better results obtained by requiring extra day's work as some who applied when they thought they were free found that they had sufficient seed at home when they had to work for them."

Campbell: "The seed were most valuable. Hundreds have gardens who wouldn't otherwise have had them. They had to work for good gardens. A check shows 1005 quarts stored for winter."

Buckingham: "It was a great help as the early gardens in the county were unusually good. I believe that each collection produced not less than $15 to $20 worth of vegetables on an average."

Prince George: "We collected reports from 176 families in various parts of county. These reports averaged 318 quarts canned per family."

Mecklinburg: "An early garden was the result of seeds furnished. More canned than ever before and much more dried. Because of a check-up made by H.D. clubs of the county the folks worked on their gardens and in most cases got results. I think the check-up and follow-up work was great; to date I have 1400 cards checked and am getting in others every day. Hope to have 2000 followed up."

Bythe: "The gardens furnished the table needs through the summer. The variety was a great help to this class of people and encouraged them to eat and can new vegetables. The value of the canned foods and those stored average $50 in value per family."

Frederick: "It's a splendid piece of work. 13,361 quarts of canned foods, 249 bushels of stored foods, and 25 bushels of dried foods have been preserved by these families for winter use. 8 to 20 different vegetables were grown in the gardens, with 2 fall vegetables."

Smyth: "60% made good use of seed and produced canned and stored food for families; 15% produced summer gardens, but did not can; 5% got very little out of the seed."

Grayson: "Most of the (60%) families receiving R.F.C. seed packages had a good garden, and have canned and stored more foodstuffs than ever before."

Goochland: "More good gardens in county and more food produced than ever before; also more canning done."

Roanoke: "In the large majority of cases these gardens were a very important source of food to families in need. At least 600 families canned, dried or stored vegetables for winter under direction of the County Home Demonstration Agent. All gardens were visited at least twice during the season by the county agent, agricultural instructor, a member of the advisory board, Salem Kiwanis Club, or a member of the agricultural high school class."

Prince Edward: "Worth every cent of cost. More and better gardens this summer than ever before. There is the largest amount of canned vegetables and fruits this fall and winter which has been put up before in years. Very few free cans or jars were secured, however, and many will have none."

Amelia: "Reports show there has been more food canned and stored this year than ever before. Most of our folks have enough food for winter."

Sussex: "Due to the very dry summer, the relief gardens or any others for that matter did not do as well as they might have. But the fact that as much trouble and expense as was gone to over this seed made everyone garden conscious, and far more effort was expended in gardens than would otherwise have been. The majority of farmers have canned an abundance of food for the winter."

Bath: "A good form of relief. Committee was too lenient in giving seed to those who did not have suitable ground for gardens and to some who did not need seed."

Hanover: "The work was worth more than it cost in actual benefit to those who received the seed. However, it's a bad policy. Too hard to find the fellow who really needs and deserves it."

Bedford: "There were 800 families who received packages containing 1 pt. potatoes and a qt. each of other vegetables such as corn, black-eyed peas, beans. This did many times the good that could have resulted from giving money for labor to buy seed."

Isle of Wight: "The families that received the seed had gardens better than ever before. They were interested and anxious to use them because the County Board passed a resolution that anyone who failed to have a good garden would not be assisted this winter."

Carroll: "700 gardens reported having fall and winter gardens and 210,000 cans fruit and vegetables canned from these. More canned products than ever in the history of county."

Orange: "Worth several thousand dollars. Probably between four and five thousand. Several families reported more food preserved and stored than they had ever had before."

Spotsylvania: "I think this help has been a great thing for the majority of the families I worked with. They have quantities of food canned - much more than before."

Albemarle: "All comments from farm families receiving seed have been very favorable. More and better gardens than ever before."

Buchanan: "The relief work has been worth while. In most cases more food is stored for winter than ever before. There is much more greens in gardens for winter. Extremely dry weather has caused failure in late gardens in some localities."

Brunswick: "The relief agencies in this county estimate that the benefits derived from the money expended were three times as great. It is planned to repeat this program next spring."

Louisa: "A large majority of the gardens were cared for and they matured. I believe that the garden products which saved buying during the summer months, together with the products that they have stored and canned, will tide many families through winter."

Amherst: "The distribution of these seeds in exchange for labor resulted in the proper use of seeds. The majority of the gardens were planted and looked after in such a way as resulted in a bountiful supply of vegetables for many families who otherwise would have had little or no garden during the year."

Page: "Without free seed it would have been impossible for these families to have put out a garden. It would have been necessary for some relief organization to feed them all summer and winter. In some cases enough vegetables were canned and stored to last practically all winter."

Lunenburg: "This work was very helpful this year as a great many more vegetables and trucks were planted than would have been planted without it. I feel that it would have been better if those men who were able to work had been required to work in order to obtain the garden seed, and that only those families who were unable to work had been furnished free seed."

Summary of Accomplishments - Home Garden Project

158½ days in field devoted to Garden Project, an increase of 37½ days or 32% over 1932.

46 counties visited in project, an increase of 30% over 1932.

107 visits to agents on definite garden work, an increase of 50% over 1932.

224 meetings held, an increase of 32% over 1932. Total attendance 8,565, an increase of over 43% above 1932 attendance.

32 4-H garden clubs met with a total attendance of 1,396; average attendance, 43.

45 adult garden clubs met with a total attendance of 1,080; average attendance, 25.

15 leader trainer groups met with a total attendance of 227; average attendance, 15. Information carried back by leaders to over 5,000 people.

200 method demonstrations given with a total attendance of 2,566; average attendance, 12.

Several counties aided in garden contests.

Free kale and spinach seed distributed to at least 400 families directly affecting 1,600 individuals.

Revised Circular B-263, Vegetable Garden Suggestions for Virginia Farmers. Over 60,000 copies distributed to date.

Sixteen circular letters written in the home garden project with a total distribution of 95,385 copies; average distribution, 5,900.

25 press articles prepared and published on various phases of the garden project.

12 garden radio talks broadcast over Station WHBF.

Cooperated in the garden relief work throughout the state. 41,444 families received garden seed in the 56 counties with agents where relief work was carried on.





Groups Inspecting Demonstration Gardens



Gardening Under Difficulties - Garden Several Hundred Feet Long and Only Few Feet Wide Along Creek Bottom



Miners Assembled at Noon Hour for Garden Meeting







Golden Group Meetings



Mountain Demonstration Garden



Garden Injured Severely By Lack of Cultivation



Talking Over Garden Problems



Kale - A Garden Vegetable Growing in Popularity





Age and Youth in the Home Garden



4-H Garden Group - Cape Henry Short Course



4-H Club - Garden Instruction Meeting







4-H Club Members Identifying Insects
Dupo Henry Short Course





Distributing Relief Garden seed

MINOR PROJECTS

An attempt was made to confine our efforts in so far as possible to the four major projects. Naturally, however, considerable aid had to be given along other lines. Sixty-nine and one-half days were spent in the field on miscellaneous projects in 1933 in 24 counties. Approximately 19% of the time in the field was therefore devoted to work other than the major projects. While the increased demand for aid aside from the major projects is gratifying, yet it serves to emphasize the keen need for additional personnel.

At the agents' meeting, this department presented a vegetable crops section. In addition to the staff, Dr. H. H. Zimmerley, Director of the Virginia Truck Experiment Station, and A. E. Mercker, Secretary of the Interstate Early Potato Committee, were secured as speakers. The meeting was attended by 23 agents, 10 specialists and 6 students. It should be understood that those attending came in for only that part of the program in which they were most interested.

A vegetable crops section was also presented at the Farmers' Institute which was attended by 45.

Considerable mimeographed material prepared by the staff of the Virginia Truck Experiment Station was distributed by this office through the county agents (see Exhibits Y, Y', and Z). The subjects covered were:

1. Nutrient Requirements of the More Important Vegetable Crops.

2. Recent Advances in the Control of Damping-Off of Vegetable Seedlings.

3. Grouping of Vegetables According to Lower Ranges of Soil Reaction for Optimum Growth.

Plant Growing Structures

There has been considerable interest over the state in forcing structures for vegetable plants. Due to the limited personnel and to a lack of time, this project has not been stressed although it is felt that there is a definite need in the state for such construction.

Two such houses were constructed in 1932 under the supervision of this office. These houses were closely checked this year and gave complete satisfaction. One of the houses practically paid for itself this year. One additional house was constructed this year. The grower did not follow the recommendations of this office in detail due probably to the necessity for

economy, but in general he profited from the plans furnished by this office and from advisory visits from the specialists. Two of the cash houses are located in Appomattox County and the third in Caroline.

Demonstrations were given in the construction of coldframes and hotbeds in Appomattox, Caroline, Powhatan, and Northampton Counties. Nine fire-heated hotbeds were constructed in Caroline County as the direct result of one such demonstration.

In addition, this office furnished scores of interested parties with plans for various types of forcing structures, where no follow-up was made to determine the actual construction.

Cabbage Production

Work with cabbage growers was largely of four types: outlook information, strain tests, pest control, and seed production.

Outlook Information. This office prepared the state outlook report on cabbage, which is included in this report as a part of Exhibit A. Additional information on cabbage acreage, prospects, production, etc., was sent to county agents from time to time.

Strain Tests. One cabbage strain test was conducted in Northampton County. Ten strains of Jersey Wakefield cabbage were compared to check on their earliness and total yield. Three harvests were made. The total percent of heads harvested ranged from 70% to 100% with an average of 86.8%. It is interesting to note the percent harvested by each cutting. The first harvest on May 15 ranged from 1% to 74% with an average of 34%; the second harvest on May 22 ranged from 11% to 88% with an average of 55.1%; the third harvest on June 1 ranged from 0% to 68% with an average of 27.1%. Date of maturity could very easily figure heavily in profit and loss.

The average weight per untrimmed head ranged from 2.86 pounds to 3.72 pounds with an average of 3.25 pounds. Average weight per trimmed head ranged from 1.6 to 2.24 pounds with an average of 1.80 pounds. Total yield per acre ranged from 6.4 tons to 9.7 tons with an average yield of 7.74 tons.

Pest Control. Considerable assistance was given growers in various sections on the timely control of the Harlequin cabbage bug and the cabbage worm. For the latter pest, it has been found necessary to change recommendations due to the arsenical residue situation.

Yellows resistant cabbage seed was furnished to growers in Greene, Prince William, Madison and Page Counties.

Seed Production. Seed production work was continued with two growers in Smyth County. The project is one of Dr. James Godkin, Plant Pathologist, and will be found discussed in detail in his report. This office cooperated in advisory visits on production practices to the growers.

Cucumber Production

Two meetings were held with cucumber growers in Caroline and King and Queen Counties at which production problems were discussed.

Market Gardening

Considerable aid has been given to individual market gardeners around Charlottesville, Lynchburg, Danville, Roanoke, Richmond and Norfolk. Such assistance has been in the nature of advisory visits with county agents, cultural information, etc.

Several cantaloupe growers in Princess Anne, Henrico, Prince Edward, Roanoke, and Albemarle Counties were furnished with trial seed of a California mildew resistant melon. Growers, as a whole, report that the variety is prolific, resistant to disease, and holds up after some of the local varieties go down. One grower adds that the melons hold in good shape after picking much longer than the local varieties. Quality shows no improvement over local strains. The chief disadvantage seems to be a smallness of size which may be a matter of acclimation. The variety will be tried again next year.

Broccoli and turnip salad broccoli were also introduced to several growers.

Fairs

The following fairs or shows were attended during the past year and products were judged at all of them:

Chesterfield County Fair	Chesterfield
Giles County Fair	Pearisburg
Alleghany County Fair	Covington
Roanoke County Fair	Roanoke
Caroline County Fair	Bowling Green
Kinsale Dahlia Show	Kinsale
Kilmarnock Flower Show	Kilmarnock
Irvington Flower Show	Irvington
Princess Anne 4-H Club Achievement Day	Oceana
Fieldale Community Fair	Fieldale
Virginia Corn and Grain Show	Suffolk
Virginia State Fair	Richmond

This department featured Irish and sweet potato exhibits at the State Corn and Grain Show at Suffolk, Virginia.

Institutional Work

The following institutions were given definite aid in their production problems:

Central State Hospital	Petersburg
Hampton Institute	Hampton
State Industrial School for Boys	Baldens
State Farm	State Farm
8 Mission Schools	Greene County
1 Mission School	Buchanan County

Radio

Fourteen radio talks were prepared on the following subjects. Eleven of the talks were given over Station WRNV and three over the Fairfax Station.

Increased Interest in Home Gardens
General Truck Outlook
Cabbage Outlook for Southwest Virginia
More and Better Groceries
Planning and Planting the Home Garden
Care of Spring and Summer Gardens
Pest Control
Prepare Now for the Fall Garden
Fall Gardens
Pest Control in the Fall Garden
Garden Short Course Work
Fall Garden Notes
Home Storage of Vegetables
Garden Sanitation

Correspondence

A considerable portion of office time was required to answer correspondence. A total of 4,365 letters were written which represents an increase of 15% over the previous high year. An average of over 25 letters were written for every day spent in the office.

Study

The demand for field work seriously limits the time which can be devoted to study. The specialists, however, strive to keep well up on the study of subject matter.

Publicity

In addition to the various publicity measures previously discussed, 48 press articles relative to the various

projects were prepared throughout the year and published in the Extension Division News, agricultural papers, newspapers, etc. This represents an increase of 110% over 1932.

This office also assisted in preparing a college folder for the Horticulture Department on planting information (see Exhibit X).

Summary of Accomplishments - Minor Projects

69½ days in field devoted to minor projects in 24 counties; 48 visits to counties made.

41 method demonstrations given; total attendance, 725; average attendance, 18.

1 plant house and 11 flue-heated hotbeds constructed.

Constructive aid given to growers of cabbage, cucumbers, celery, and watermelons, and to market gardeners.

14 fairs or shows judged.

Definite aid given to 8 institutions.

Fourteen radio talks prepared.

4,383 letters written.

48 press articles prepared and published.



Flue Heated Hotbed Under Construction
Caroline County



Completed Flue Heated Hotbed
Note Coldframes in Background





Pine Heated Hotbeds - Caroline County
Nine Beds Constructed As Result of One Demonstration



Old Type of Raised Bottom



Compost Pile to Provide Soil For Bush House



Thorough Soil Preparation Pays



Beets Grown Under Irrigation



Peppers Thrive Under Irrigation



Broccoli - One of the Newer Crops for Market Gardeners



Group Meeting at Onion Lining Experiment
1935 Potato Tour



Inspecting Size of Onion Set Test
1935 Potato Tour



Egyptian or Top Onions
A Good Crop for the Home or Market Garden



Cabbage Seed Production Demonstration
Smyth County



One of the Largest Cross Fences in Virginia

OUTLOOK FOR 1934

The vegetable work in 1934 will be continued along the same general lines as in 1933. No drastic changes should be necessary. Minor changes will be made to fit the requirements of the work as conditions arise making such changes necessary. Emergency and relief work will very probably increase and cause a shifting of the time devoted to the various projects. Increased emphasis will be placed upon outlook information for all vegetable crops and upon high acre production at a low unit cost of production. Additional personnel is urgently needed to handle adequately the increased service requested from this department.

In the Potato Project, close cooperation with the Interstate Early Potato Committee will be maintained. The value of outlook information will be impressed upon the growers. In an effort to increase production per acre, the use of good land, cover crops, good seed, proper fertilization, and the judicious use of lime will be stressed.

In the Sweet Potato Project, outlook information, seed certification, efficient crop production, and storage house construction will be emphasized.

In the Tomato Project, outlook information, demonstration plant beds, source-of-seed demonstrations, high grade seed of the proper varieties, fertilization, grading and the saving of seed will be stressed as factors in an economic production program. At least 100 tomato surveys and cost account records will be taken.

In the Home Garden Project, an effort will be made to increase the number of all-year-round gardens and to aid gardeners in solving their problems. Garden relief work will require considerable time. The demand for garden work is such as to utilize efficiently a full-time man.

The Minor Projects will be given as much consideration as time will permit.

The work will be carried on as in the past mainly through the county extension agents. Aid will be required from the United States Department of Agriculture in the form of

1. Intentions-to-Plant Reports, Acreage and Production Forecasts, Crop Reports, Market Reports, etc.
2. Publications and other literature.
3. Information as to successful extension methods.

STATISTICAL DATA

The following statistics are summarized from the monthly reports. The data are given for the personnel of the Vegetable Extension collectively:

Days in field	366½
Days in office	128½
Days annual leave	20
Counties visited	67
Visits to county agents	138
Visits to county home demonstration agents	58
Visits to counties unassisted by agents	46
Meetings attended	309
Total attendance	17,131
Average attendance	55
4-H Clubs visited	38
Total attendance	1,306
Average attendance	50
Adult clubs visited	43
Total attendance	1,026
Average attendance	24
Letters written	4,383
Circular letters prepared	28
Distribution of circular letters	98,056
Average distribution	4,498
Bulletins sent out	11,178
Method demonstrations	794
Total attendance	5,066
Miles traveled by auto	39,110
Miles traveled by rail	6,224
Miles traveled by other means	418
Total mileage	45,752

Potato Project

Days in field	25
Counties visited	8
Visits to agents	6
Visits unassisted by agents	9
Meetings	12
Total attendance	969
Average attendance	81
Method demonstrations	33
Total attendance	498
Average attendance	15

Acres grown for certification	15½
Storage cellars constructed or remodeled	3
Tours attended	2
Attendance at Virginia Potato Tour	500
Exhibits staged	2

Sweet Potato Project

Days in field	42½
Counties visited	16
Visits to agents	33
Visits unassisted by agents	7
Meetings	10
Attendance	148
Average attendance	15
Method demonstrations	97
Total attendance	369
Number of certified seed growers	30
Bushels bedded by certified growers	1,665
Number draws used by certified growers	1,940,700
Acres grown for certification	111-6/10
Bushels submitted for inspection	12,862
Bushels certified	12,507
Total bushels certified since project began	125,767
Storage houses constructed	12
Average capacity	900
Storage houses construc.since project begun.	26
Average capacity	2,200
Exhibits staged	2

Tomato Project

Days in field	76
Counties visited	16
Visits to agents	38
Visits unassisted by agents	3
Meetings	25
Total attendance	909
Average attendance	32
Method demonstrations	418
Total attendance	917
Plant bed demonstrations	22
Plants sold or used from beds	1,069,000
No.of source-of-seed demonstrations	8
Ounce samples of seed furnished to growers	100
Surveys made & cost account records started.	228
Flue-heated hotbeds constructed	10

Home Garden Project

Days in field	158½
Counties visited	46
Visits to agents	52
Visits to home demonstration agents	55
Visits unassisted by agents	3
Meetings	224
Total attendance	8,585
Average attendance	38
4-H clubs met	32
Attendance	1,306
Average attendance	41
Adult clubs met	43
Attendance	1,026
Average attendance	23
Leader-trainer groups met	15
Attendance	227
Method demonstrations	200
Attendance	2,806
Average attendance	15
Circular letters written	16
Distribution of circular letters	95,363
Average distribution	5,960
Press articles and radio talks	40
Packages of free seed distributed	875
Families receiving seed	400
Number of individuals affected	1,800
Families receiving relief garden seed	41,444
Average per county (56 counties)	740
Average cost per co.per family (unweighted)	$175

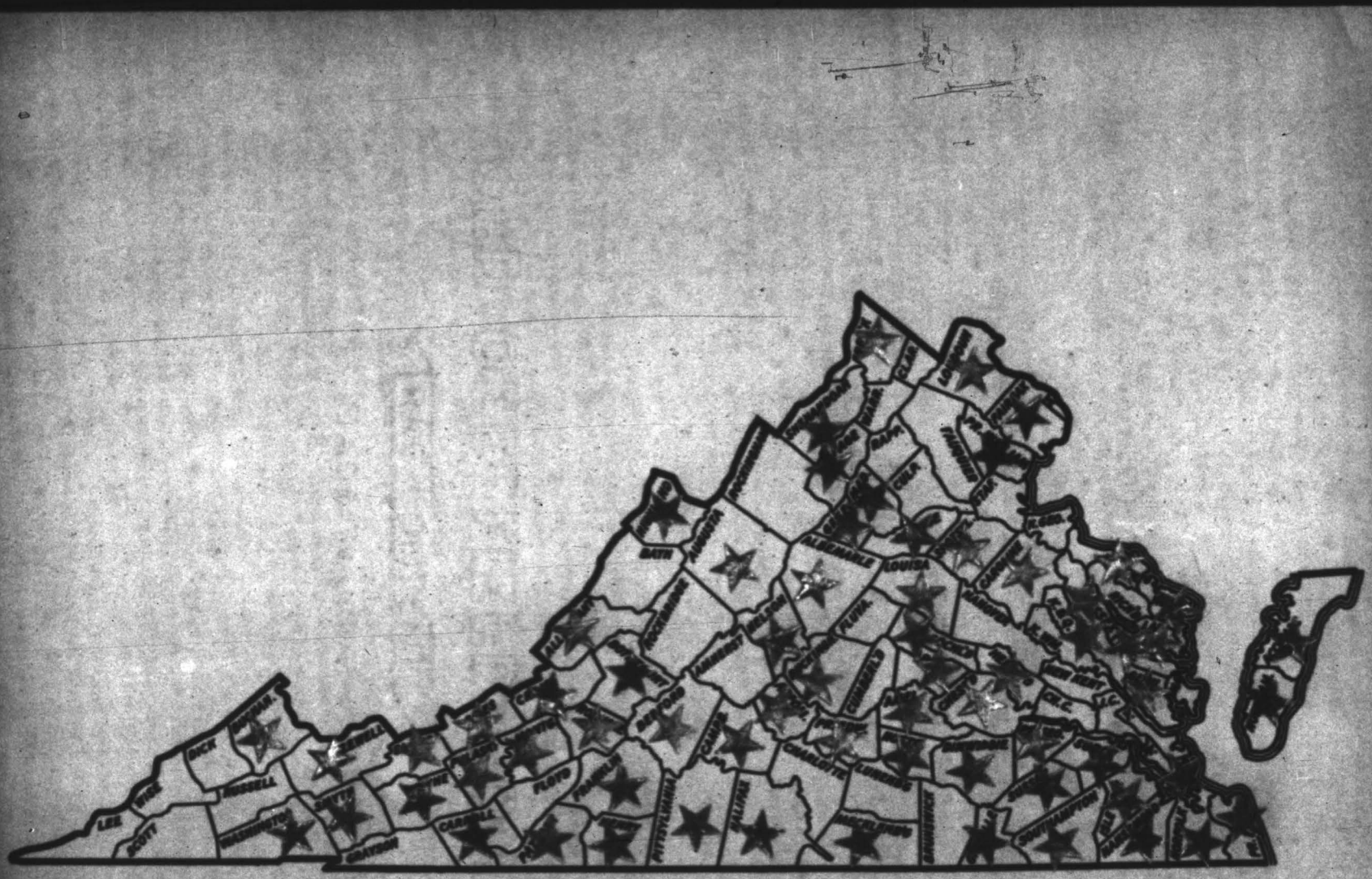
Minor Projects

Days in field	69½
Counties visited	24
Visits to agents	27
Visits unassisted by agents	21
Flue-heated hotbeds constructed	11
Plant houses constructed	1
Institutions aided	8
Radio talks	14
Fairs judged	12
Publicity articles	48

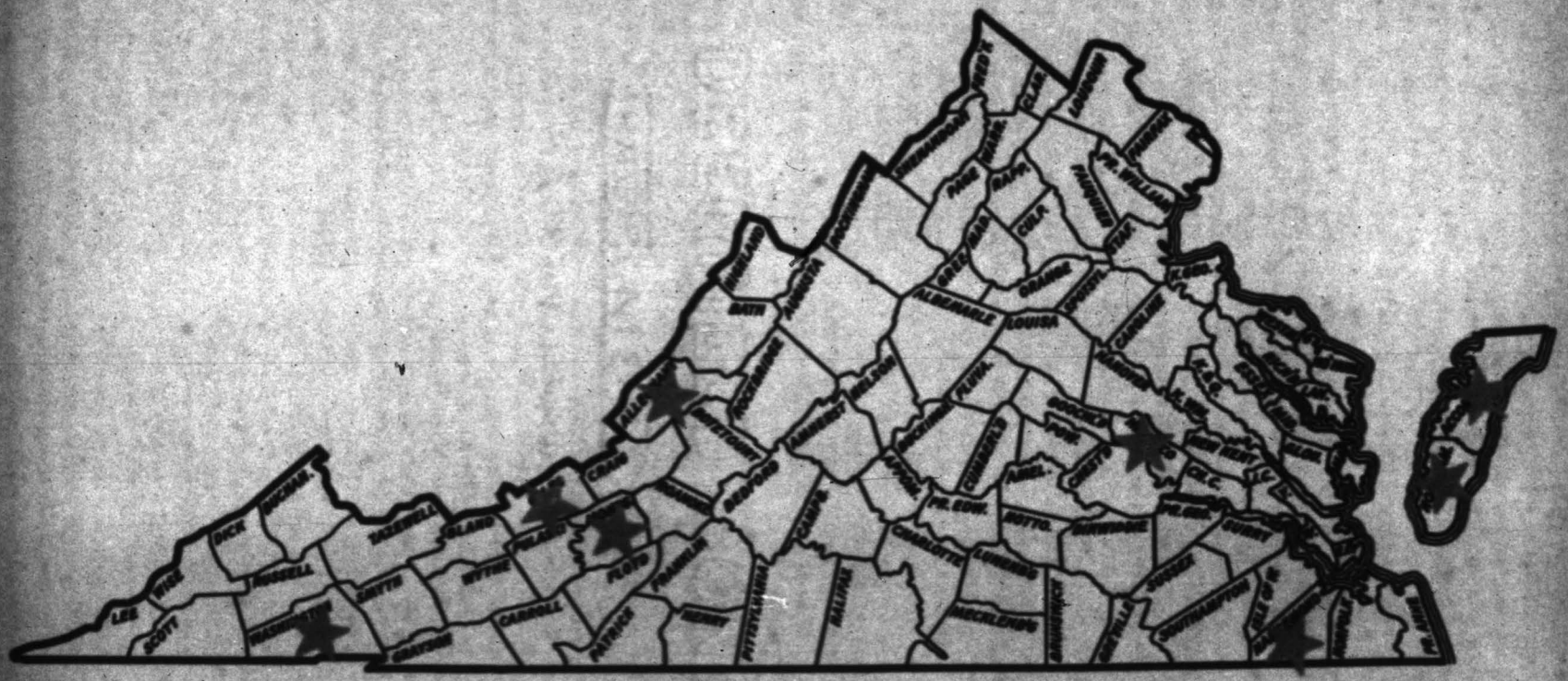
Respectfully submitted,

L. B. Dietrick,
In Charge of Vegetable Extension

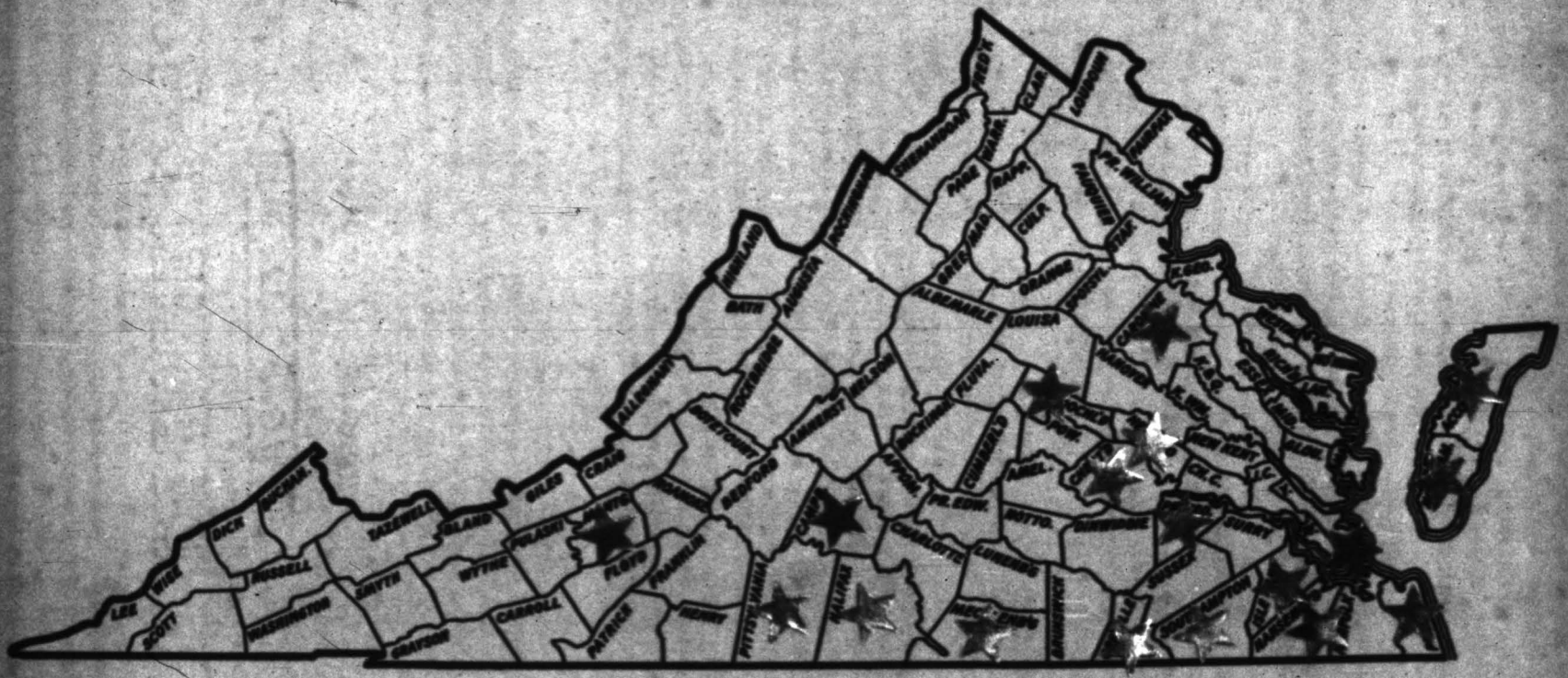
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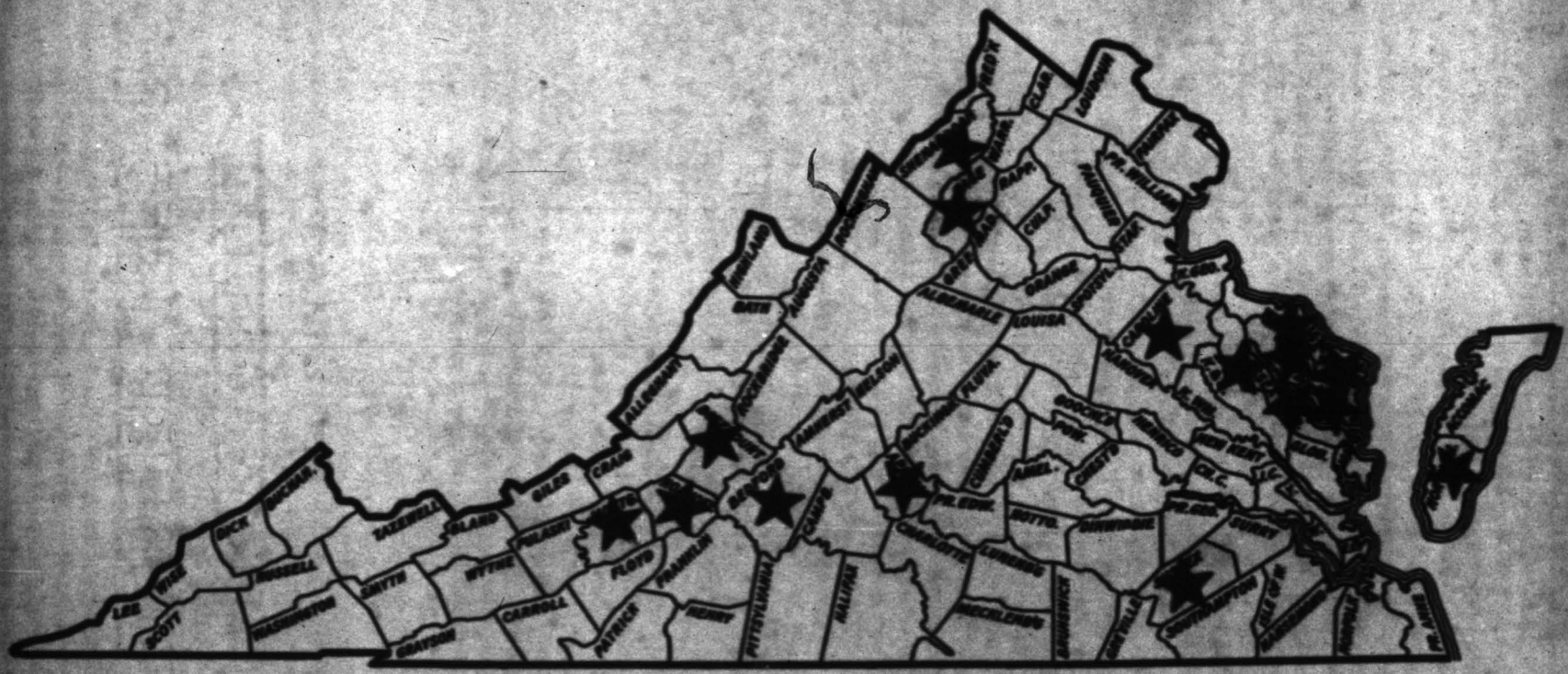
Counties Visited in 1933



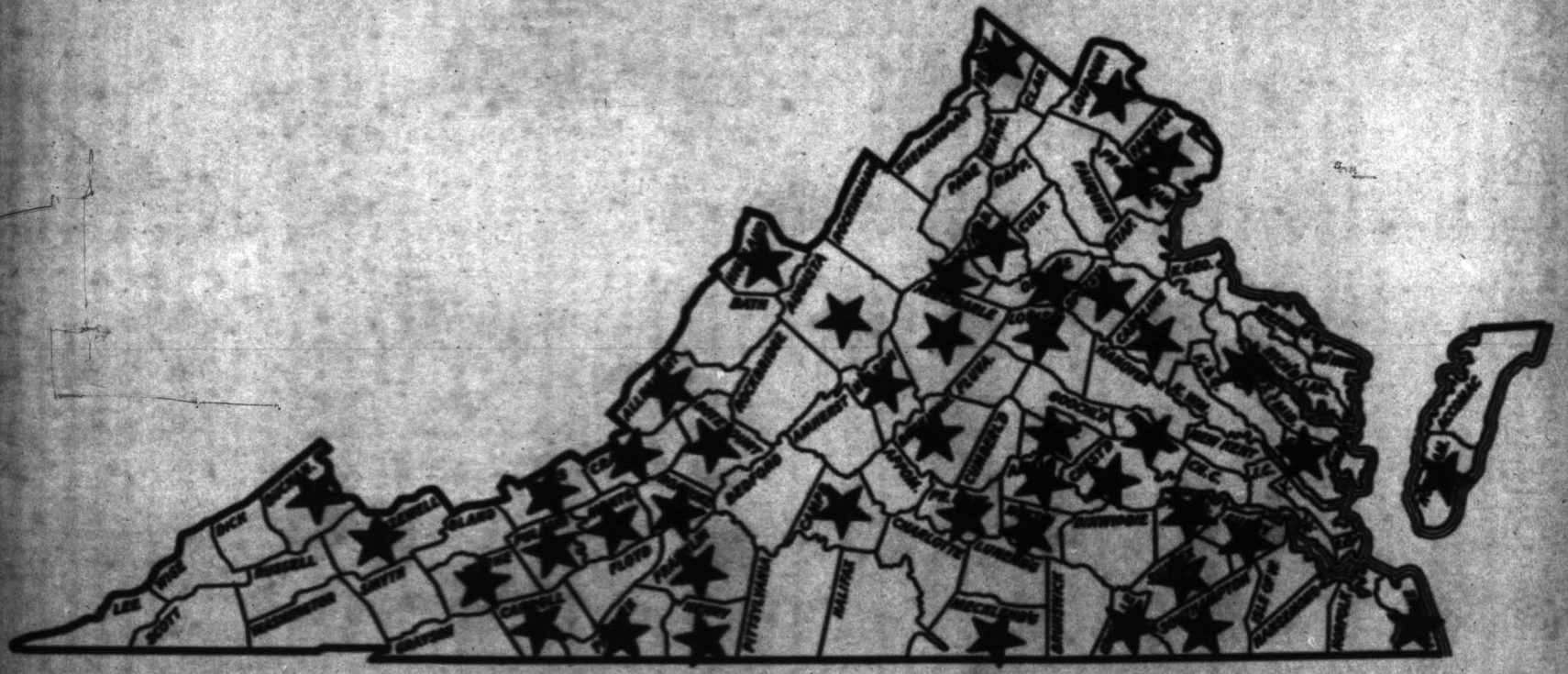
Counties Visited in Potato Project



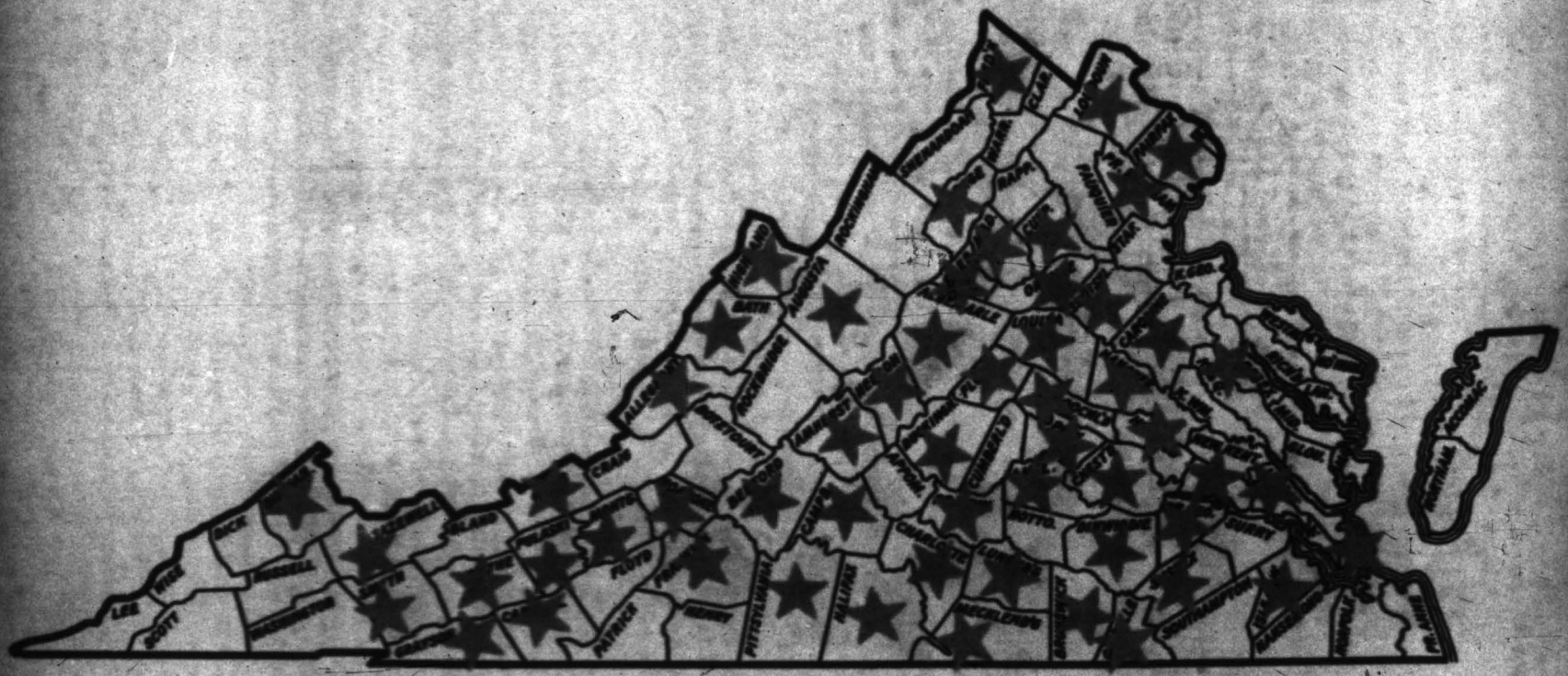
Counties Visited in Sweet Potato Project



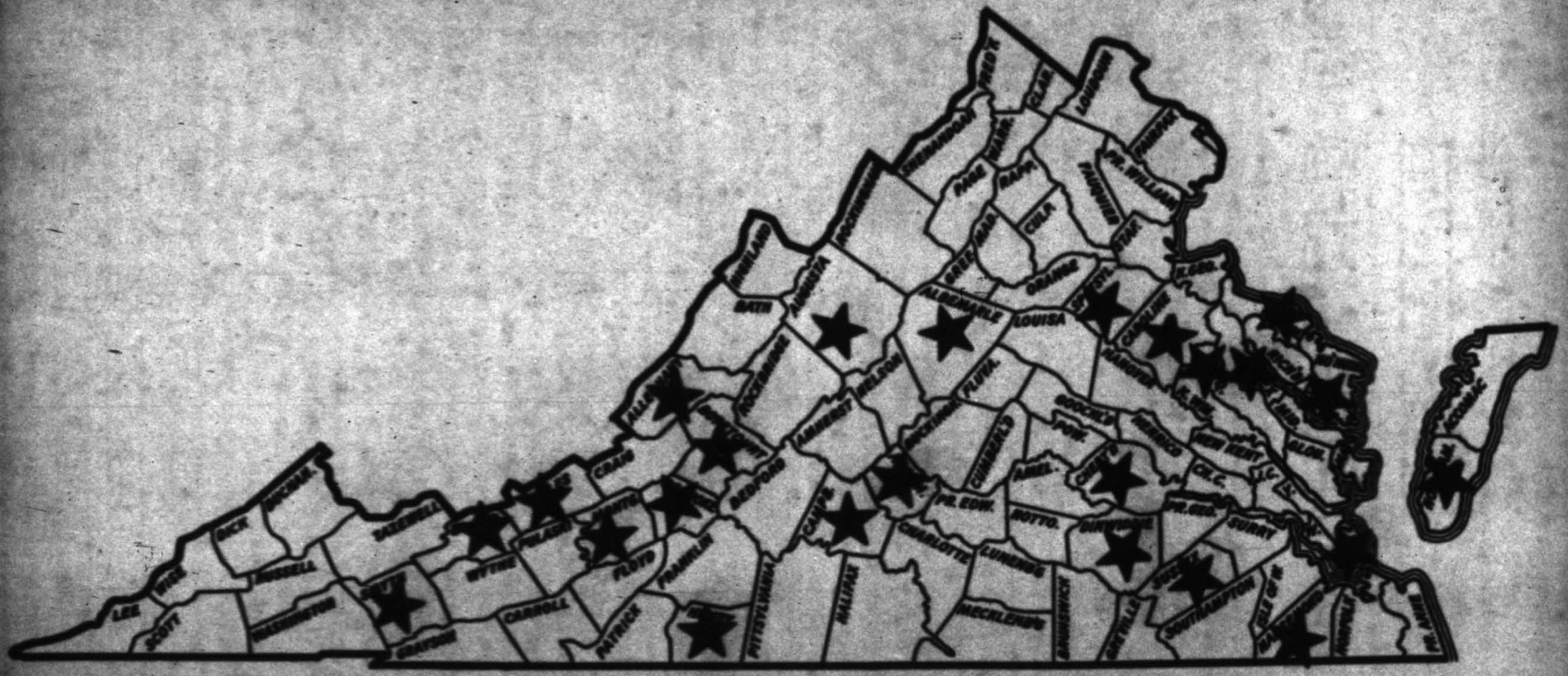
Counties Visited in Tomato Project



Counties Visited in Home Garden Project



Counties in Which Relief Garden Work Was Done



Counties Visited in Minor Projects

VIRGINIA AGRICULTURAL AND MECHANICAL COLLEGE AND POLYTECHNIC INSTITUTE AND U. S. DEPARTMENT OF AGRICULTURE, Co-operating
EXTENSION DIVISION, JNO. R. HUTCHESON, DIRECTOR, BLACKSBURG, VIRGINIA

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THE AGRICULTURAL OUTLOOK FOR 1933

See pages 3 and 4

SUGGESTIONS TO VIRGINIA FARMERS

Jno. R. Hutcheson, Director

In times like the present it is exceedingly difficult to predict accurately what is going to happen even one day ahead. However, careful study of the accompanying outlook statement would indicate that unless something unforeseen happens the general level of prices of farm products in 1933 will not be materially higher than in 1932. With such an outlook, Virginia farmers should plan their operations with exceeding care.

In an effort to get worthwhile suggestions to pass on to Virginia farmers, I have carefully observed the practices of the most successful farmers with whom I have come in contact during recent months. These observations lead me to the conclusion that the farmers who are faring best are those who have done the things which are italicized and discussed in the following paragraphs:

Shun debts during falling price levels. — In periods of rising price levels for farm products and increasing prices for farm lands, farmers who are good managers can profit by borrowing money for the purposes of expanding their operations and increasing efficiency. In periods of falling prices and low exchange value of farm products, very few farmers can afford to borrow money. In such periods wise farmers pay cash where possible and live within their incomes, even though this calls for tightening their belts until it hurts. Where money has to be borrowed, it should be secured on credit statements at the lowest possible rate of interest.

Raise sufficient food for the family and feed for the livestock. — There has never been a time when it did not pay most Virginia farmers to raise a large part of the food for their families and feed for their livestock. This is doubly important in periods when the farmer's dollar is worth only fifty to sixty cents when exchanged for the products produced by others. At no time during the last ten years has the average farmer's dollar been worth more than ninety cents in exchange value, and during the coming year there is little indication that it will be worth even this much. Under such circumstances the farmer who does not produce a good garden, sufficient bread, meat and fruits, and plenty of grain and roughage for his livestock, would seem to be pursuing a very unwise policy. The county farm and home demonstration agents can be of great assistance to farm people in Virginia in working out suitable "live-at-home" programs for different sized farms.

Carefully cull flocks and herds. — During the last few years animals have brought relatively greater returns than crops. This has led to the keeping of many cows, sows, ewes and hens which are unprofitable. All flocks and herds should be drastically culled during the next few months if this favorable ratio is to be maintained. All livestock owners should keep accurate records in

(Continued on page 8)

At the beginning of each year for several years the extension division of the Virginia Polytechnic Institute has cooperated with the federal government in collecting supply and demand information on farm products from all parts of the world and bringing this information to the attention of farmers. Heretofore this information has been published in bulletin form and distributed to the farmers of this state, but this year, due to limited finances, it has been decided to print the complete outlook report in the Extension Division News for January.

Reports received from farmers and business men throughout Virginia indicate that those who have studied and used this type of information in planning their farm operations have profited thereby. It is, therefore, urged that every reader of the Extension Division News study carefully the outlook material presented in this issue.

The General Situation

The agricultural depression is still with us. From June 1930 to January 1932 farm prices in Virginia fell from an index of 151 to 67, a decline of 66 per cent. No such severe decline in prices has occurred in this state within recent times. Since January 1932 the Virginia index of farm prices has shown no definite trend but has fluctuated between 67 and 79. On October 15, 1932, the price of every product sold by Virginia farmers was below the 1910-14 pre-war level.

The low prices farmers receive for what they have to sell would not be so bad if the things which they have to purchase could be bought at equally low prices. However, this is not the case, and the purchasing power of farm products continues at a very low level. On October 15, 1932, the prices paid farmers in the United States were 56 per cent of the 1910-14 average, while the prices paid by farmers were 107 per cent of the pre-war average.

There are more people on the farms of the United States at present than there were last year. We can, therefore, pretty safely conclude that there will not be much reduction in the supply of most farm products if farmers can get the money with which to farm. From the present outlook it would appear that production credit will be very difficult to secure in 1933. But in recent years farmers in the United States have somehow always seemed to be able to get sufficient credit to make large crops if the weather was favorable. Therefore, it would not seem to be safe to count too strongly on a marked decrease in the *supply* of farm products in 1933.

During the month of September 1932 there were 38 per cent fewer persons employed and 58 per cent less money received by city workers than the 1923-25 average. The outlook is unfavorable for much improvement in the general business situation during the next few months. It is not likely that there will be any permanent improvement in the business situation until building and other heavy industries begin to pick up. Therefore, the outlook for any general increase in the *demand* for farm products is not good.

The supply and demand situation as it affects the various crops and forms of livestock grown in Virginia will now be presented in some detail. It will pay every producer of such products to study carefully the present situation and to keep up with the changes that occur from month to month.

TOBACCO

Flue Cured. — The most important development in the flue-cured tobacco situation in 1932 was the drastic curtailment in production. Domestic consumption and exports have also declined, but these decreases are much less than the decrease in production. Prices per pound up to October 1 averaged about 11.5 cents, compared with 9.0 cents for the same period in 1931 and the five year average, 1926-30, of 16.0 cents.

The most important use of flue cured tobacco in the United States is in the manufacture of cigarettes, but considerable quantities are used in smoking and chewing tobacco. For the first nine months of 1932 cigarette consumption declined about 10 per cent as compared with the same period of 1931. Smoking and chewing tobacco combined declined about 4 per cent during the first nine months of 1932.

Viewed from the standpoint of all flue cured products, it appears that domestic consumption for the first nine months of 1932 has been reduced about 5 per cent below that of the same period of 1931.

Exports of flue cured tobacco for the year ended July 1, 1932, totaled 285,500,000 pounds. This is one-third less than the quantity exported in 1930-31 and 20 per cent below that for the five year average 1925-26 to 1929-30. Competition of flue cured tobacco grown in other countries is increasing and further substitution of these types seems probable.

Flue cured stocks reported at the beginning of the present market season totaled 745,207,000 pounds. The 1932 production was forecast as of October 1 at 350,452,000 pounds. This will give a total supply of 1,095,600,000 pounds for the 1932-33 season, which is 13 per cent less than the average for the five year period of 1926-27 to 1930-31. However, the disappearance for the year ending July 1, 1932 was 13 per cent less than the disappearance for the same five year period.

Preliminary reports indicate that farmers intend to increase the 1933 acreage over that of 1932 by *6 per cent in Virginia*, 18 per cent in North Carolina, 40 per cent in South Carolina, and 40 per cent in Georgia. The total acreage for the four states shows a 20 per cent increase.

It appears that the carry-over next fall will be around 500,000,000 pounds. If the 1933 yields are normal, the small 1932 acreage would give a supply and prices about the same as at present. If the planned increase of 20 per cent in acreage is actually planted and the yields are normal, the large crop will depress prices unless business con-

ditions and consumer demand pick up much more than now seems possible.

Virginia Fire Cured. — The area planted to Virginia fire cured tobacco was reduced from 39,000 acres in 1931 to 23,400 acres in 1932. This compares with an average of 33,000 acres for the years 1927 to 1930. The total production in 1932 was estimated at 13,750,000 pounds on October 1 and the total supply for the year promises to be around 45,000,000 pounds. In 1931 the production was 28,300,000 pounds and the total supply 56,900,000 pounds. Prices in 1931 averaged 4.9 cents per pound which was the lowest in the last 22 years.

Total disappearance for the year ended October 1 appears to be around 25,000,000 pounds, which is slightly larger than for the preceding year. Exports which usually account for one-half to two-thirds of the disappearance totaled 13,284,000 pounds for the year ended October 1, 1932, which represents an increase of 12 per cent over 1930-31, but is about 33 per cent less than the average for the preceding five years.

Preliminary reports indicate that Virginia dark fired growers intend to increase the 1933 acreage 25 per cent over 1932. With normal yields and the prospective carry-over in 1933 this would give a total supply of 40,000,000 pounds available for consumption in 1933-34. This is about 5,000,000 pounds less than the present stocks, and would indicate, unless business conditions get worse, a slightly higher price for the 1933 crop. However, if yields are unusually good, or the acreage increased more than 25 per cent, it is likely to result in prices being lower than at the present time.

Burley. — When the 1932 crop of burley tobacco is added to the carry-over, the stocks on hand for use during 1933 will be larger than those of a year ago.

The average quality of the crop is reported to be rather good this year. While growers may receive slightly higher prices for their undergrades this year it is questionable whether the average price received by the grower will be much, if any, higher than a year ago.

Recommendations. — From the information above it appears that prices for flue cured tobacco in 1933 will be lower than in 1932, if the intended increase in the flue cured acreage is actually planted. The proposed acreage increase should not materialize, and it is recommended the *1933 acreage not be increased.* It is further recommended that flue cured tobacco be planted only on those soils well adapted to the production of high quality tobacco.

Observations on the markets this year again indicate the extreme importance of selecting soil types for tobacco. It appears that under present demand conditions it is practically impossible to produce flue cured tobacco on the Cecil soils with red subsoils and other soils of similar type. With careful attention to cultural methods it still seems to be possible for a farmer to at least make expenses on flue cured tobacco if the tobacco is planted on Durham, Granville, Appling and Norfolk soils, but the heavier soils will not produce flue cured tobacco of the quality in demand at the present time. We, therefore, strongly advise against planting flue cured tobacco on the heavier type soils.

The dark fired situation is not much different. It is recommended that Virginia dark fired growers plant tobacco only on those soils in a high state of fertility, and adapted to the production of high quality tobacco. It is further recommend that dark fired growers *not increase the 1933 acreage materially* over the 1932 acreage.

It is recommended that the Virginia burley tobacco growers do not increase the acreage of tobacco in 1933. We feel that burley tobacco growers are not justified in plowing up well established blue grass sods for the planting of tobacco, and strongly advise against it.

For the tobacco situation as a whole, it seems desirable for our tobacco growers to first consider the home needs for livestock, vegetables and crop products, and produce these in sufficient quantity to meet the home needs and supply any local sales demand. Tobacco should then be produced according to the recommendations above, on the best tobacco soils and cared for so as to insure the production of a high quality product.

COTTON

The world supply of American cotton for 1932-33 is now estimated at 24,400,000 bales. This is 1,600,000 bales below the record supply of 1931-32, but 900,000 bales above the large supply of 1926-27. The supply for 1932-33 is 1,200,000 bales greater than the total world consumption of American cotton for the last two years.

The carry-over constitutes the largest part of the American supply this year. At 13,000,000 bales, it is 4,100,000 bales larger than a year ago and 3,600,000 bales larger than the previous record carry-over of 1921-22.

The cotton crop of the United States was reduced in 1932 to 11,947,000 bales, according to the November crop forecast. This is the smallest crop since 1923 and is about 400,000 bales below world consumption of American cotton in 1931-32. This reduction came from a 10 per cent decrease in acreage and low yields.

The world consumption of all cottons remained practically unchanged from the low level of 1930-31. World consumption of American cotton increased 1,400,000 bales in 1931-32. This increase was made at the expense of foreign cottons, and reflects the small supply and relative high price of Chinese and Indian cotton. Indications for a larger 1932-33 crop in both China and India, and lower prices, would indicate that a further increase in world consumption of American cotton in 1932-33 will require an increase in total world demand.

Consumption of all cottons in the United States fell 400,000 bales in 1931-32. The most of this decline was in industrial usage, and improvement will depend upon recovery in industrial production.

One of the important problems at present is the time required to reduce the supply of cotton to normal proportions. The 36,600,000 acres for harvest in 1932 is 4,800,000 acres below the 1921 to 1930 average acreage. The 1932 acreage, according to November estimates, produced 11,947,000 bales of cotton. Contrasted with this, world consumption of American cotton for the same ten-year period averaged 13,400,000 bales, and 12,300,000 bales in 1931-32. At the low 1931-32 rate of consumption, the present acreage and average yields would reduce the carry-over only 700,000 bales. If the consumption should return to ten-year average, it would require about four years to reduce the supply to normal.

Taking into account the carry-over next fall and the world production for 1933, it appears that the total supply for 1933-34 will be between 22,500,000 and 25,500,000 bales. This would indicate a price for the 1933 crop about the same as for the 1932 crop.

Recommendations. — From the indication of a large 1933-34 supply of cotton, and prices no better than in 1932, coupled with the probability of heavier boll weevil damage in 1933 than in 1932, Virginia farmers do not seem justified in planting the normal acreage of cotton in 1933.

Since Virginia is at the northern limit of the cotton belt, the crop is speculative at best and offers little promise of profit in view of the present outlook. It, therefore, seems advisable to plant cotton only on those lands which normally produce a bale or more per acre. These lands must be cultivated and fertilized for the highest possible yield. The high cost of production makes the producing of average yields of cotton in Virginia prohibitive, even in normal years.

PEANUTS

The acreage of peanuts harvested for nuts in 1932, according to preliminary October estimates, is about 12 per cent above the previous record of 1931, but the yield per acre is low and the estimated production of 1,018,885,000 pounds is about 6 per cent less than the record crop of 1931. The 1932 crop is, however, the second largest thus far produced, and exceeds the average annual production for the five-year period ending with 1930 by about 200,000,000 pounds, or 25 per cent.

The acreage in 1932 increased over 1931 in each of the important states except Virginia, where a decrease of 8 per cent is indicated. Yields in 1932 are low, and unfavorable weather conditions have caused a low quality product.

Both the acreage and production in Virginia, North Carolina, and Tennessee, which produce principally the Virginia type nuts, are indicated to be less than in 1931 by 1 per cent and 23 per cent respectively. Importations of Oriental peanuts, which are the Virginia type, are the smallest in 30 years, amounting to less than 1,000,000 pounds in terms of peanuts in the shell. The carry-over of farmers' stocks is reported substantially larger than the small carry-over of 1931-32 crop, but smaller than the carry-over of the 1928-29 season, the quality being much better than the 1932 crop.

For the entire region the 1931 crop was the largest ever grown and the carry-over of old crop peanuts in the producing areas at the beginning of the current marketing season was considerably larger than the small carry-over into the 1931-32 season. Consumption of peanuts, and peanut products, greatly increased over the level of recent years. This increase is attributed largely to the low price of these products to the consumer.

Prices in the southeastern states have been slightly above the low prices at the beginning of the 1931-32 season. In the Virginia-North Carolina section and Southwest, prices are lower than a year ago.

Recommendations. — With the large production of peanuts in 1932 and the prevailing low price, with no indication of material improvement, it does not seem advisable for Virginia farmers to increase the 1933 acreage over that of 1932, which was about 8 per cent less than the 1931 acreage.

Virginia farmers should produce the Jumbo types and only those lands suited to the production of high quality nuts should be planted to peanuts. Such lands should be cultivated and fertilized for high quality production.

FEED CROPS

Feed supplies in the United States for 1932-33 are larger than those for last season, with the increase in feed-grain and hay crops more than offsetting the prospective reduction in by-product feeds. The total tonnage of feed-grain production is 14 per cent larger than last season and about 10 per cent in excess of the 1924-28 average. In addition, large supplies of wheat are available for feed purposes. The hay crop is 11 per cent larger than a year ago, but 7 per cent below the average. Small feedstuff supplies are in prospect, owing to reduced demand for the main products and smaller supplies of certain oil seeds, especially cotton seed. Feed requirements as indicated by animal numbers are not materially changed from that of a year ago. Freight rates remain relatively high, compared to feed cost, and tend to limit normal movement of feed grains from surplus to deficit areas. As a result, numerous shifts in feed-

ing practices are taking place, especially in deficit feed-grain producing areas.

The total production of feed grains (corn, oats, barley and grain sorghum) for the 1932-33 feeding season is about 111,780,000 tons compared with 97,000,000 tons last year and the five-year average (1924-28) of 102,000,000 tons. These feed supplies are much more normally distributed this year than in either 1930 or 1931. No marked shortage of feed is in prospect in any large area.

The estimated production of hay, as of October 1, is nearly 80,000,000 tons compared with 72,300,000 tons last year and a five-year average of 85,800,000 tons, the principal increase being in alfalfa hay production.

The 1932 production of feed-grain crops in the 12 southern states from Virginia to Florida westward to Louisiana and Arkansas are somewhat below last year and slightly below average because of reduced corn yields in 1932. The lower corn production is partially offset by larger-than-average oat and barley crops. The total tonnage of feed grains for these 12 states for 1932 was 11,886,000 tons, compared with 13,000,000 tons last year and a five-year average of 12,065,000 tons.

The 1932 hay production for these states was 6,621,000 tons compared with 7,184,000 tons in 1931 and a five-year average of 6,617,000 tons. However, the carry-over of old hay on May 1 was 2,000,000 tons, which is four times larger than that of 1931 and twice as large as average.

Prospective domestic supplies of high-protein feeds for the 1932-33 season are smaller than those for recent years. However, the prospective demand for feed-grains and feedstuffs in 1932-33 is not much different from that of the past season. The supply of feed-grain and hay will offset the prospective reduction of by-product feeds.

Recommendations. — From the above it appears that there is an abundant supply of feed, although the movement is somewhat decreased. However, since Virginia is a consuming rather than a producing area, it is recommended that Virginia farmers produce sufficient grain and hay crops to take care of all home needs and supply any local demand. In the tobacco, peanut and cotton area it is recommended that the feed crops be increased as a forerunner to more livestock. All farmers should produce enough feeds to enable liberal feeding so as to keep livestock in an efficient, productive condition.

IRISH POTATOES

Early potato growers in Virginia in 1932 averaged about 50 cents per bushel compared with 55 cents in 1931 and 41 cents in 1928, which was the lowest price in thirteen years. Such prices prevailed in 1932 in spite of an approximate 25 per cent decrease in acreage and an approximate 30 per cent decrease in production. The yield per acre was 128 bushels compared with 138 bushels in 1931.

Virginia growers in 1933 will face the prospect of competition from a carry-over equally as great as in 1932. On November 10 the production for the United States was estimated at 359,000,000 bushels compared with 376,000,000 bushels in 1931, which compares with the five-year average (1924-1928) of 361,000,000 bushels. Most of this reduction, however, was in the early producing states. Production in the thirty late states is forecast at 295,000,000 bushels, a reduction of only 1 per cent, or 3,000,000 bushels, below the 1931 production. Carlot shipments from the thirty late states up to November 1, 1932, amounted to 30,800 cars compared with 48,300 cars to November 1, 1931. This reduction of approximately 36 per cent in view of a total supply about the same as last year indicates that a larger proportion than usual will be available for marketing after January 1. Therefore, the marketings of early potatoes from those states shipping from March through June of 1933 can expect as much competition from old potatoes as they did in 1932 when 62,000 cars of old potatoes were shipped during this period.

Competition at the time Virginia potatoes come on the market may very probably be equally as great as in 1932. North Carolina may increase her acreage and, with good yields, market more potatoes in 1933 than in 1932. Oklahoma, Arkansas, Kansas and Missouri, which ship at approximately the same time, or just before, Virginia, had very good yields in 1932, while Virginia had a low yield. Even though the yields per acre in these states may be materially lower in 1933, these reduced yields may be offset by probable higher yields in Virginia. The acreage of home grown potatoes planted by the unemployed can be expected to be as large in 1933 as it was in 1932. Furthermore, there is a tendency among commercial producers in many of the late states to plant earlier maturing varieties which compete with production from Virginia in July and August.

In addition to a carry-over equal to or greater than that of 1932 and competition from certain competing areas, the low purchasing power of the consumer will tend to greatly reduce the luxury premium that new potatoes generally obtain. This will necessitate the selling of new potatoes at prices nearer those of old potatoes unless the new crop is sufficiently small to keep early potatoes in a class of luxury foods, as was the case in 1923, 1925, 1929 and to a lesser extent in 1932, for the states of Texas, Alabama, Louisiana, Georgia and South Carolina.

There is very little probability of any appreciable increase in business activity which would increase consumer purchasing power in time to be reflected in prices paid for 1933 early potatoes. There is then, little likelihood that the demand for southern potatoes in 1933 will be materially better than in 1932.

Recommendations. — In view of these facts, economical production in 1933 becomes imperative. Maximum yields per acre at a low unit cost of production should be the aim of every grower. To that end the following recommendations are made:

1. Plant only such land to potatoes as will normally produce 50 barrels or more of No. 1 potatoes per acre. A study on the cost of producing Irish potatoes in 1932, indicates that a yield of 50 barrels of No. 1 potatoes per acre is necessary if the grower is to cover his costs of production and marketing.

2. Use only good seed. Potato acreage intended for certification in 1932 is sufficient to supply the 1933 demand at reasonable prices.

3. Fertilize adequately and properly. Fertilizer prices have continued to decline and it is unlikely that they will advance materially in 1933. Consult your county agent for specific recommendations on fertilization and other cultural practices.

SWEET POTATOES

The acreage in sweet potatoes has steadily increased throughout the last few years. The total acreage in 1932 for the country as a whole was 872,000 acres which represents a 13 per cent increase over the five-year period 1924-1928. Total production is forecast at 75,834,000 bushels, an increase of approximately 13,000,000 bushels, or 20 per cent over the 1931 production and a 31 per cent increase over the five-year period 1924-1928. The price received by the grower in 1932 will probably average a third less than last year.

Virginia growers have not increased their sweet potato acreage as rapidly as have growers in other sections of the sweet potato area. The 1932 acreage remained the same as in 1931, 38,000 acres. The 1932 acreage represents only a 3 per cent increase over the 1930 acreage and less than a 9 per cent increase over the five-year period 1924-1928, compared to a 36 per cent increase for the entire country. Total production in Virginia for 1932 is forecast at 3,610,000 bushels, a decrease of 1,140,000 bushels or 24 per cent from 1931 and a decrease of 22 per cent from the five-year average 1924-1928. Regardless of the decreased production for the state, however, Virginia growers shared the common fate of all. Their crop was harvested in competition with a much larger acreage in the cotton belt and a total production for the entire country 13 per cent higher than the large crop of 1931. Virginia prices reached a new low, being even worse than the 1931 low price of 35 cents per bushel.

The low price received for the 1932 crop will tend to discourage farmers from making any further increases in the acreage of sweet potatoes grown for sale in 1933. Virginia growers in common with growers in other commercial areas will probably show a substantial reduction in the 1933 acreage. In most parts of the south, however, the reduction in acreage is likely to be moderate because only a small part of the total acreage is grown for sale and prices of alternative crops, particularly cotton, are also low. In the past the cotton grower has continually shown a marked tendency to increase his sweet potato acreage when the price of cotton is low. With the present extremely low price of cotton, this group may even increase the sweet potato acreage regardless of the low prices received for the 1932 crop. The 1932 yield per acre was only 85 bushels compared with 91 bushels for the 10-year average. With average weather conditions in 1933 there may also be some moderate increase in yield per acre.

Recommendations. — The 1933 sweet potato crop in Virginia will probably have to be harvested in competition with another large total crop from the country as a whole. Since this situation exists, Virginia producers are urged to follow a practical production program. Strict attention should be given to reducing production costs without sacrificing yield per acre. Growers are particularly urged—

1. To bed only good, disease-free seed.
2. To practice seed treatment for the control of disease.
3. To fertilize adequately and properly.
4. To plant only such land to sweet potatoes as will yield a high production per acre.

TOMATOES

Market Tomatoes. — Tomato acreage in the intermediate states, Arkansas, Tennessee, Missouri, Virginia, Maryland, New Jersey, California, southeastern Ohio and Union County, Illinois, has shown a steady increase since 1929. The acreage increase in 1932 was approximately 12 per cent over 1931, while both the 1931 and 1932 production established successive records. The 1931 price was the lowest ever previously recorded for this group. The 1932 price was 20 per cent below the 1931 average.

Virginia acreage increased from 2,800 in 1931 to 3,000 in 1932, a gain of approximately 7 per cent, while the production increased approximately 15 per cent. The price received by the Virginia growers declined 33 per cent, from 75 cents per bushel in 1931 to 50 cents per bushel in 1932.

Conditions do not justify any expansion in acreage. Virginia growers of market tomatoes are urged to follow such production practices as will produce high acre yields and to cut the cost of production by planting only such land to tomatoes as will produce such yields.

Canning Tomatoes. — The pack of canned tomatoes has steadily decreased from its peak of 19,770,000 cases, on a basis of No. 3 cans, in 1925. The average pack for the five-year period 1926-1930 was 12,458,000

EXTENSION DIVISION NEWS

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Farmers are not spectacular performers, do not furnish sensations for the country, work in and out of season, but they are recognized as the backbone of the country, the real army that preserves us as a nation. If the farmer can find something helpful in the suggestions given in this paper every month it will have fulfilled its mission.

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cases. The 1931 pack decreased approximately 44 per cent, to 9,573,000 cases. The 1932 pack is estimated at 10,980,000 cases. While the 1932 pack is estimated at 15 per cent more than the 1931 pack, it is still 35 per cent less than the 1930 pack, 12 per cent less than the five-year average pack for 1926-1930, and 44 per cent less than the peak pack of 1925. Both the 1931 and 1932 packs have been well under the apparent consumption of American canned tomatoes which has averaged slightly less than 13,000,000 cases during the ten-year period ended 1929. In view of this fact, such a reduced pack, particularly during the last two years, should have resulted in a distinct rise in the price received by the canner. A rise has taken place, but not at all commensurate with the decreased size of the pack. From the canner's standpoint it would seem, therefore, that substantially better prices for his pack must await improved economic conditions.

The total acreage in canning tomatoes in 1932 in the United States decreased to 273,000 acres, a reduction of 7 per cent from 1931 and 9 per cent from the five-year period preceding 1931. Total production is estimated at 1,125,600 tons, which is approximately 15 per cent larger than the 1931 production but 13 per cent less than the average production for the five-year period preceding 1931.

Virginia acreage decreased from 12,000 in 1931 to 9,700 in 1932, a reduction of 19 per cent from the 1931 acreage, but less than 2 per cent from the five-year period preceding 1931. Yields in 1932 were low, but better than in 1931. The 19 per cent reduction in acreage resulted in a yield of only slightly less than three per cent under the 1931 production, but 26 per cent under the five-year period preceding 1931. Prices received by Virginia growers in 1932 were exceptionally low and will probably not average over 20 cents to 25 cents per bushel.

Preliminary figures on tomato production costs in the Northern Neck of Virginia indicate that a yield of at least 130 bushels per acre is necessary to cover the costs of production and marketing at 1932 contract prices for raw stock. Virginia growers are urged, therefore, to plant only such land to tomatoes as will yield at least 150 bushels per acre. They are further urged to use every possible means of lowering the cost of production, provided such reduction is not secured at the expense of yield per acre. Wise growers will make use of good seed, proper fertilization, cultivation and pest control measures to insure high yields per acre. Production costs should be reduced by efficient utilization of labor and by planting only such land as will produce high yields per acre.

CABBAGE

Growers in the early states (California, Louisiana and Texas) decreased their acreage 14 per cent in 1932 and secured smaller than average yields. Production amounted to only 173,500 tons compared with 247,000 tons in 1931 and 174,000 tons for the 1926-1930 average. Prices to growers in 1932 in these states averaged $26 per ton compared with $11 per ton in 1931. Growers in this group report intentions to increase their plantings 34 per cent in 1933 over that actually harvested in 1932.

Acreage in the second early states (Mississippi, Alabama, Georgia, the Carolinas and eastern Virginia) was reduced 19 per cent in 1932 to 10,800 acres. Yields were also much below those in 1931 and the five-year average for this group. Production decreased to 53,000 tons compared with 85,300 tons in 1931 and 84,100 tons for the 1926-1930 average. As a result of this small production, together with the small carry-over of late cabbage, prices to growers averaged $42 per ton in 1932 compared with $15 per ton in 1931. Virginia's acreage and production decreased somewhat less than the group as a whole. In view of the relatively favorable price received in 1932, there is danger that the acreage in these states in 1933 will be increased materially, possibly as much as 20 to 30 per cent.

Acreage in the intermediate shipping group, which includes Arkansas, Kentucky, Tennessee, southwest Virginia and ten other competing areas in northern, central and western states, remained practically the same as in 1931, at 21,960 acres, compared with 22,220 in 1931. Production, however, was approximately 15 per cent less than in 1931. Southwest Virginia's acreage in 1932 was 2,650, an increase of 8 per cent over 1931, but her production is estimated at approximately half that of 1931. Prices to growers in the intermediate states averaged about the same as in 1931.

Taking the southern cabbage crop as a whole, acreage and yields will probably be greater in 1933 than in 1932. Production is likely to equal or exceed the large crop of 1931 which resulted in record low prices. Competition from the late type cabbage may be expected to be even more severe than in 1931.

Growers in both sections of Virginia are urged to adopt such cultural practices as will insure high yields per acre and to plant only such land to cabbage as will give a high production per acre.

APPLES

At present there are about 6,940,000 acres in the world planted to apple trees, or approximately 415,000,000 trees yielding on an average of around 550,000,000 bushels of apples a year. Thirty-five per cent of the acreage is located in the United States; 14 per cent in Russia; 10.5 per cent in France; 10.5 per cent in Germany; 3 per cent in Poland, and 24 per cent in all other countries.

In per capita consumption for all purposes, France leads with 60 pounds; Germany 52.7 pounds; United States 51.6 pounds; Switzerland 40.5 pounds; Australia 39.7 pounds; Poland 36.5 pounds; New Zealand 36.5 pounds; United Kingdom 31.7 pounds and Canada 28.8 pounds.

During the three-year period, 1928-1929 to 1930-31, an average of 36,000,000 bushels of apples entered into foreign trade a year. Of this amount the United States exported on an average 17,200,000 bushels, or 47.8 per cent of the total.

The United Kingdom and Germany are most important importing countries. They took on an average 72 per cent of the 36,000,000 bushels of apples entering into international trade in this period.

U. S. Production in 1932. — The total apple crop in the United States for 1932 is placed at 138,976,000 bushels as compared with 202,385,000 bushels in 1931 and a commercial crop of 85,155,000 bushels or 28,385,000 barrels, for 1932 as against 34,592,000 barrels in 1931.

Most of this decrease took place in the barrel sections of the east and was due to a combination of factors such as severe March freeze; dry weather during growing season; weakened trees because of heavy bearing during 1931, and lack of funds on the part of some growers to properly care for these trees.

The commercial crop for Virginia in 1932 is given as 1,740,000 barrels as compared with the 1931 commercial crop of 3,500,000 barrels.

Because of the prevalence of scab, codling moth, small apples due to drought conditions, and poor spraying, the quality of the crop was not up to the good standard of some previous years. Some varieties also failed to color up properly because of dry weather.

Storage stocks of Virginia apples will be much lighter than usual, due to the heavy truck movement of low grade and ungraded fruit into the South where the apple crop is extremely short.

Demand and Prices. — The low price of apples has encouraged domestic buying on the part of the low income groups in the southern apple market territory. These groups are affording a ready outlet for the ungraded Virginia fruit which the trucks are able to supply in small quantities at reasonably low cost.

On the supply side many growers who were unable to lay out capital for grading, packing and packages have been able, through the trucker, to market their ungraded fruit with little outlay and a fair return. While the farm price of apples has been lower than for a number of years, the price in relation to other farm prices has been favorable from the standpoint of the grower. Prices started out rather low, but as stocks have been cleaned up, there has been considerable improvement. Foreign markets are of outstanding importance to the apple industry of the United States and of especial importance to Virginia because of the large amount of fruit of varieties especially adapted for export markets. Virginia exports from 40 per cent to 70 per cent of her commercial crop annually.

During the 1931-1932 season the total exports of apples from the United States amounted to 18,032,000 bushels. Of this amount, 2,855,000 were barrels, which amount is 10.2 per cent greater than the average shipments of 2,605,000 barrels in the previous five seasons and 3.3 per cent greater than the 2,764,000 barrels shipped in the big crop season of 1930-1931. This increase of barrel exports was made in the face of English embargoes. Export prices were lower for the 1931-1932 season than for the season of 1930-1931, due to depressed business conditions and the drop in exchange.

Further restrictions and increased duties have been placed on export shipments this year. Demand, however, has been good for Virginia fruit. Because of better packing, better quality and better condition on arrival, Virginia fruit has been outselling stocks from duty-free countries.

Outlook for Future.—Apple supplies from the short crop in the United Kingdom and most of the other countries of Continental Europe are moving into consumption rapidly. Storm injured fruit in Canada has put into immediate consumption a large per cent of the Canadian crop. This, together with a lightening up on restrictions by France, Argentina and other export countries, and the fact that the demand from Germany and Holland is showing an increase, indicates that there will be a considerable increase in export demand for the export stocks that are on hand in Virginia. If the condition and quality of apple exports from Virginia continue to improve, the price for the balance of the year should show some improvement as the season advances.

Prospects are for a larger apple crop in the United States in 1933. The year 1933 will be the *on* year in Virginia and, due to the short crop in the Winesap sections, production will be higher in the state in 1933 than the crop of 1932 dependent upon favorable weather conditions. In the light of increased apple production in 1933 and the competition that the apple will encounter from other fruits, and with the trade becoming more discriminating, it is going to be highly important that Virginia growers put on the market a more dependable pack of superior quality and less of the low grade fruit. High yields of good colored fruit are important. Thorough spraying to meet the sanitary restrictions of the export markets is essential. Since growers cannot expect an increase in prices, it is important that each grower reduce his production costs wherever possible. Further improvement should be made in handling the fruit.

PEACHES

The 1932 peach crop of 46,380,000 bushels was about 39 per cent less than the 77,000,000 bushel crop of 1931, and the carlot movement of 20,141 cars for 1932 was less than half of the 1931 movement of 46,070 cars. The 5,500,000 bushel crop in 1932 for the peach states of North and South Carolina, Georgia, Florida, Alabama, Tennessee, Mississippi, Louisiana, Texas and Oklahoma was less than one-fourth as large as the crop produced by these states in 1931. The southern peach crop was the smallest since 1899.

Virginia produced 306,000 bushels of peaches in 1932 as against 1,600,000 bushels in 1931. Virginia shipped 83 cars in 1932 as against 416 cars in 1931.

Prices.—While prices in Virginia and other southern shipping points for 1932 were higher than the low prices received by the growers for the large crop of 1931, they were not as high as would be indicated by the relation between production and price during previous seasons. Unsatisfactory demand conditions and lower prices generally were responsible factors. Another important reason for the low prices of this year was the competition that southern peaches encountered in the large markets from California shipments.

Although peaches move to market from California and Virginia at the same time, normally only a small per cent of the California crop goes to the same markets. In 1932, however, the supply from California was extremely heavy in these markets and caused a sharp drop in prices. Competition from this source may be expected in future years when the crop in the southern states is small.

In 1925 there were 89,000,000 peach trees in the United States. In 1930 there were about 79,000,000;—a decline of 10,000,000 trees in this five-year period. In the southern peach states the decline has been even more rapid, especially during the last two years. Most of the peach trees in the south have reached the age of their greatest production. The average life of a commercial peach orchard in the south is about fourteen years. Many trees are in poor condition because growers have not been able to realize enough money from the low prices of the last few years to take care of their trees properly. There are very few young trees and recent plantings in Virginia and other southern peach states are not sufficient to maintain the present number of bearing trees. The trend in production is downward. It is not expected that production will fall sharply but that it will be slow and gradual. Even the present number of trees under favorable conditions are capable of producing a large commercial crop of peaches. In fact, the very short crop in 1932 has given the trees a rest and has put them in a condition to set a good crop in 1933, if weather conditions are favorable.

Future Plantings.—From the long time point of view, moderate plantings sufficient to maintain the present commercial orchards in Virginia seem advisable. Sites that will not produce annual crops and soils that will not produce high yields should not be planted to peach trees. Heavy plantings at one time should be avoided in order to avoid over-production. Georgia and other states that compete with Virginia growers in the markets are planting a large number of peach trees of the early varieties. It is not advisable to plant the extremely early varieties in Virginia except for local markets, as they must compete with the better varieties from the earlier producing states. Varieties maturing later than Elberta should also be avoided because of the carry-over of oriental moth, which is heavy with the late varieties. For the same reason it is not advisable to interplant apples with peaches.

STRAWBERRIES

It is estimated that the commercial strawberry growers in the United States will pick 202,300 acres in 1933. This is 4.5 per cent more than the 193,650 acres picked in 1932; 31 per cent more than the 154,190 acres picked in 1931, and only about 2 per cent less than the record acreage of 1928.

Most of the increases are in the second early group of states, which includes Virginia, and the intermediate states, which move a large part of their crop to market during Virginia's harvesting season. Virginia had 5,520 acres in 1931; 6,350 acres in 1932 and 7,000 acres are intended for 1933.

Yields and Prices.—For the United States as a whole the yield per acre in 1932 exceeded that of any other year since 1926, with one exception. But in the second early states, which include Virginia, the yield per acre was below the average. Production was only 26 per cent larger than in 1931 for an acreage that was 50 per cent larger.

Prices to growers in 1932, because of poor quality of the berries due to weather conditions and low buying power of consumers, were lower than they had been for many years. Virginia growers received 12 cents a quart in 1931, and 6.5 cents in 1932, the lowest price since 1916.

With an increase in acreage in sight for 1933, and barring adverse weather conditions, it can be reasonably expected that the 1933 harvest will be equal to or larger than the 1932 crop. It is, therefore, recommended that growers concentrate on securing higher yields per acre and improving the quality of the crop rather than increase their expenditures by expanding the acreage.

EGG AND POULTRY

The number of laying birds in farm flocks throughout the United States the first part of 1933 is likely to be little if any greater than during the first half of 1932. The number of birds in laying flocks during the fall of 1932 averaged about 2 per cent under the previous year. There are about 5 per cent more young pullets than last year and the relatively favorable prices of eggs in comparison with the discouragingly low prices for chickens will probably lead farmers to add to the laying flocks as they come into production. If fewer pullets than now seems probable are added to the laying flocks, the number of laying birds producing during the spring will be less than the year before.

Feed supplies, especially corn, are much more abundant in the principal producing regions of the middle west than they were last winter and prices are lower. Egg production is one of the more favorable farm enterprises and will probably continue so unless egg prices experience more than the usual seasonal drop during the late winter and early spring. As long as egg prices continue relatively favorable in comparison with feed costs, farmers will probably hold at least the normal number of old hens and maintain fairly large production during the spring months.

Total supplies of eggs for consumption during the opening months of 1933 will be considerably less than they were last winter. Storage stocks of shell eggs are less than 60 per cent of last year's volume and the combined stocks of shell and frozen eggs are less than two-thirds of the 1932 figures and of the five-year average. Even an open winter will not raise production sufficiently to boost supplies to the large volume of the opening months of 1932. Production during the spring of 1933 can scarcely be larger than it was in 1932, unless farmers hold an unusual number of old hens during the late winter and spring. This is not likely because egg prices will probably follow about the normal downward seasonal trend during the winter. The shortage of home grown grains in Virginia will tend to stimulate heavy marketing of fowl in the late winter and early spring. However, this reduction in laying birds in Virginia will have very little effect upon the receipts on the large northern markets. Market receipts of eggs during the spring will probably be curtailed somewhat if the farm price of eggs drops as low as it did in 1932, because a larger proportion will be used on the farms.

Fall production and receipts of fresh eggs will depend on the number of old hens held through the summer and the number of early laying pullets. Unless egg prices drop more than now seems likely during the late winter and early spring, the number of early hatched pullets will be larger than it was last year. The more favorable comparison between feed costs and egg prices will have the stimulating effect of increasing the number of chicks hatched in 1933. If the larger number of chicks is hatched, receipts of fresh eggs in the fall of 1933 will be larger than they were in the fall of 1932.

The number of young birds on farms October 1, 1932 was 5 per cent greater than for the year before. The Atlantic Coast states showed an even greater excess. Receipts of poultry at the important markets have not been particularly heavy since that date so that there are more birds available for marketing during the winter months than a year ago. Farm consumption has been increased this year by the low prices of poultry and the volume shipped depends largely on the prices offered. With the prices on chickens below the prices of fowl on some markets, there is little incentive to ship the young birds. A larger proportion than usual are being held and fed with cheap corn. This will increase the number of birds of roaster size reaching market this winter. On account of the smaller number of old hens on farms, the amount of fowl marketed this winter will be below that of last year, unless egg prices decline more drastically than is anticipated.

Winter broiler production will probably be little, if any, larger than a year ago. The more efficient producers made a little money last winter, but the heavy supplies and low prices this fall are likely to discourage some people. Producers who can raise well over 90 per cent of their chicks and have low feed costs will probably continue to produce at capacity.

Price Prospects.—Consumer demand for all farm markets is unusually low, for the reasons discussed in the section of the outlook report on demand. With the prospect for a continuing low general price level and very slow recovery of consumer purchasing power, the outlook is for the continuance of about the 1932 price levels for eggs through the coming year.

During the storage period in the spring, prices are likely to be slightly above the 1932 levels, unless the larger number of pullets now on farms is all added to the laying flocks. Consumer demand cannot be expected to be as great as it was last spring,

but this will be about offset by the better financial position of the storage operators. Storers of eggs made substantial profits on their 1932 operations and, with the general price level apparently stabilizing, they will be more optimistic in employing their improved finances in storage operations.

Prices of fresh eggs next fall are not likely to be higher than during 1932. The bigger pullet crop in prospect will have a depressing influence on prices and consumer demand will be no better than last fall unless business picks up more than now seems probable.

Poultry prices display mixed prospects. Prices of broilers this winter will probably not be any higher than last year because producers can supply all the market will absorb at about last year's prices. If the increase in hatching in the spring materializes, prices of broilers will be as low or lower than in 1932 and will probably continue lower through most of the year unless business picks up materially.

Storage holdings of fryers are over 40 per cent larger than last year and there are nearly 20 per cent more roasters in storage. With larger supplies of birds on farms, prices will be the lowest at which the farmers will turn their birds loose for marketing.

Fowl prices are likely to compare more favorably with those of last winter and spring. Storage stocks are 4 per cent less and the number of old hens on farms is 5 per cent less than a year ago. As long as egg prices hold up and maintain a favorable relationship with feed costs, farmers will probably market no more than a normal number of their old birds. Prices of fowl during the summer and fall will depend upon the number marketed and this will be determined by the relationship between egg prices and feed costs.

Recommendations.—The returns available from the poultry flocks in this state are at present favorable in relation to most other farm enterprises. This favorable situation will probably continue for a time, but will be a strong stimulus to better feeding and an increase both in the size of flocks and the number of commercial flocks.

Although the relation of the price of eggs and chickens to the price of feed at present is favorable to production in this state, it is more favorable for other regions. The competition from these other regions, particularly the middle west, will probably be of increasing intensity. Such competition will be greater for those producers in Virginia who are producing low grade poultry products and those who do not have special outlets for their products.

From a study of these facts, the following conclusions are drawn:

1. Present conditions and the immediate outlook do not justify the development of new, or the expansion of present, commercial poultry enterprises in the state.
2. Present equipment on farms and poultry plants may safely be used to its normal capacity.
3. In certain sections of the state the development of farm flocks is advisable where home grown grains with the proper supplements are available.
4. The efficiency of the poultry flocks must be strengthened through better breeding, more timely hatching, and better methods of incubation and growing poultry.
5. More attention must be given to the production of quality products.
6. Future development of poultry industry in Virginia depends to a considerable extent upon the development of a marketing program which will give to Virginia poultry products a favorable position on the eastern markets.

TURKEYS

Turkey production in the United States during 1933 is likely to hold up to about the 1932 volume. Even with the low prices, farmers are securing better returns from their turkey enterprises than from most other products. Turkeys are readily salable and, with grain prices so low, the cost of production is remarkably low for efficient producers. The low prices during the fall of 1932 will probably reduce 1933 production along the Atlantic Coast.

Turkey prices next fall are not likely to be much higher than in 1932. The crop will doubtless be large again and consumer demand cannot be expected to pick up materially by that time.

DAIRYING

Today there are about four per cent more cows in the United States than a year ago. Ten per cent more cows freshened in the fall of 1932 than a year ago. In addition, greater supplies of hay and grain are on hand than last year. The 1932 corn crop was the largest since 1921 and the hay crop was about eleven per cent larger than that of last year.

Production per cow will probably continue below that of a year ago. Farmers are feeding less grain, especially purchased concentrates, and they are not culling their herds stringently because of low beef prices. Very likely there will be many more cows in production in 1933, but whether the total volume of milk will exceed that of 1932 will depend upon whether better market prices will stimulate increased grain feeding and better production per cow.

Prolonged heavy production is in prospect for 1933. Low beef prices have discouraged herd culling and it is not likely that farmers will market their low producers as long as they have abundant supplies of cheap home grown grain and hay that can still be marketed advantageously in the form of milk and butterfat. Furthermore, the crop of heifers coming into production is above normal. Fewer heifer calves were saved in 1932, but this will not affect production for about two years.

Better pastures are in prospect for next spring and summer following two seasons of drouth. This expected improvement of pastures is likely to offset the effect of the shift to fall freshening.

There are about five per cent more cows in Virginia than last year. The margin between milk and butterfat prices and the prices of feeds is still favorable to the dairyman. Home grown feed supplies in Virginia are about ten per cent less than in 1931 and four per cent below normal. The drouth injury of the past season was general over the state, particularly to the corn crop. Smaller supplies of cottonseed meal are in prospect for 1933. Cream producers are not buying feed concentrates and this may result in lower cream production during the late winter. Cream production next spring and summer will depend upon pasture conditions.

Supplies of milk for fluid consumption and sweet cream have been ample in all Virginia markets. With low prices for grain and hay, dairymen have continued to produce large volumes of low priced, surplus milk.

The incomes of city people are low. About 25 per cent of the gainfully employed workers, excepting farmers, are out of work. This decreased consumer buying power has decreased fluid milk consumption 5 to 10 per cent below last year. In some Virginia cities the decrease was 20 per cent. The consumption of manufactured dairy products has decreased, while the storage stocks are larger than a year ago. Butter stocks are now about 18 per cent above those of last year.

The prospects are that all dairy prices in Virginia will continue at a relatively lower level as compared to previous years. Fluid milk prices have declined about in line with canned milk and other dairy product prices. Prices for surplus milk will continue low because of the depressed butter market. Cream markets will be well supplied. The increasing competition among distributors for the shrinking market for fluid milk is likely to result in a general price reduction on some markets. The large milk cow population and the extremely low feed prices in the Mid-West will have a potential influence on keeping eastern markets well supplied with butter and cream and the prices relatively low.

Recommendations.—(1) Now is a good time for Virginia dairymen to initiate a concerted educational drive to encourage the consumption of more Virginia produced milk and dairy products. The per capita consumption of milk and dairy products has fallen off at least 20 per cent during the past year in spite of the superior food value of dairy products and their economy in the human dietary.

(2) Dairymen contemplating the sale of milk for fluid consumption should proceed with extreme care. The immediate future for fluid milk production in Virginia is not bright. The drastic enforcement of sanitary requirements has greatly increased production costs. Mounting surpluses of high quality milk, and declining consumer demand with lower prices, are making the business of fluid milk production more speculative.

(3) Considering the present spread between feed prices and the price of butterfat, a farmer can make some profit from cream production for butter providing he can maintain an average annual production of at least 6,000 pounds of milk and 250 pounds of butterfat in his herd; raise all the good quality roughage his herd needs; keep enough cows to justify cream deliveries at least twice a week; maintain high quality in the cream; and finally, keep enough hogs and poultry to feed all the skim milk profitably on the farm.

(4) More attention must be given to lowering dairy production and dairy manufacturing costs if Virginia dairymen hope to get the greatest benefit from their markets. No matter how many advantages proximity to market may provide, these advantages may be easily dissipated through inefficient dairy production and manufacturing practices during this period of narrow profit margins.

(5) Any effort to cull the herd or to adjust the feeding and breeding program should be made on the basis of records. Cattle prices are likely to remain low, but low beef prices should not prevent close herd culling in connection with a progressive herd building program. Membership in a good herd improvement association will pay most dairymen.

(6) Dairymen should proceed now to fortify the future profitableness of their herds by using only the best purebred bulls, and by raising heifer calves only from the best cows in the herd. This is no time to let cattle buyers take the best cows from the herd. It is better to cull from the bottom.

(7) Quality is of first importance in the market. Consumers are now demanding low bacteria counts, absolute absence of sediment, clean flavor and odor, and at least 4 per cent butterfat, in the milk they buy. Good business practice dictates, therefore, that the producer should try to meet the consumer's demands.

(8) Individually, dairymen can affect the market but little. Collectively, they can exert a great influence towards stabilizing the market, rendering more efficient service to the consumer, and maintaining prices. Hence every dairyman should take advant-

ago, where feasible, of cooperative methods of marketing.

BEEF CATTLE

There have been successive cycles of increasing and decreasing numbers of cattle on farms in the United States since 1880 and the duration of each of these cycles has been about sixteen years. Another cycle got under way in 1928 and cattle numbers have been increasing since that year, while the number slaughtered has been decreasing since 1926. The striking feature of this increase is that it has been confined largely to cows and calves. The number of cows on farms January 1, 1933 probably will be the largest ever reached in this country and the 1933 calf crop may be the largest on record.

In view of the prevailing low prices of all grades of cows, it seems probable that marketing of such animals will continue small during the winter. Indications point to a larger supply of grain fed cattle during the early winter than during the corresponding period a year earlier. Larger supplies of better grade fed cattle will also be available for market during the spring and summer of 1933 than in 1932.

Consumer demand for beef and veal continued to decline during 1932. Per capita consumption was 7½ per cent smaller in the first nine months of 1932 than for the corresponding period in 1931, and the smallest on record for a similar period. Consumer demand is not expected to improve during the first part of 1933.

Despite the small slaughter supplies of cattle in 1930 and 1931, the trend of prices was downward during both years. Cattle prices in May 1932 reached the lowest point since 1911. With no improvement in demand expected during the first part of 1933, and an increased supply of cattle available for slaughter, favorable prices are not indicated for this period. The increase in breeding stock points to increased slaughter supplies during the next few years. Prices favorable to producers will depend largely on the extent to which consumer purchasing power increases.

Recommendations. — Despite the probability of an unfavorable beef cattle situation during the next few years, producers whose farms are best adapted to handling beef cattle should continue to handle them. However, in many cases individual farmers can make adjustments to better meet conditions.

(1) More effort should be made to meet consumer demand. The present trend is toward lighter beef, with only a limited demand for heavy steer carcasses.

(2) More attention should be given to the quality of cattle produced. There continues to be a wide spread between cattle of the upper and lower grades.

(3) Many Virginia cattlemen should grow stockers rather than buy them. This would help remove speculation from the cattle business.

(4) The growing tendency to market heifers at lighter weights should be encouraged. Heifer calves may be started on feed at weaning time and marketed at from 700 to 900 pounds to good advantage.

(5) Producers should consider seasonal trends in marketing beef cattle. The prices of good steers usually reach their seasonal peak in the fall months. Low grade steers usually bring their highest price of the year in the spring or early summer.

(6) Cow herds already established should be culled rigidly, eliminating those that are poor milkers and irregular breeders.

HOGS

The increases in both the spring and fall pig crops of 1931 in the United States indicated that the upward trend in a hog production cycle was getting under way. While the expansion was checked with a 7 per cent smaller pig crop in 1932 than 1931, the June pig survey indicated that it is being resumed. The fall pig crop of 1932 is expected to be at least as large as that of 1931, which was 7 per cent larger than the five-year average. The large feed crops available in the corn belt and the favorable relationship between hog prices and feed prices are likely to result in a larger spring pig crop in 1933. Such conditions will also encourage putting more weight on hogs during the winter, which will tend to offset the reduced numbers of the 1932 spring pig crop.

Supplies of hog products in storage on October 1 were not excessive, being 5 per cent larger than a year earlier but 6 per cent below the 5 year average.

Domestic demand for pork products has continued downward during the past three years. Due both to increased supplies and to decreased exports, domestic consumption of pork and lard has been the largest on record, but has only been accomplished at greatly reduced prices.

Exports of pork products during the 1931-32 marketing year were the smallest for any similar period in the present century. Pork production in Europe which has been at a high level is expected to decline during the 1932-33 marketing year, but reduced supplies are not likely to stimulate U. S. exports as in the past, due to higher tariff duties and other barriers adopted in several importing countries.

While supplies during the early part of 1933 will not be excessive, the tendency to put on weight and the weak domestic and foreign demand will keep prices at low levels. With an increase in supplies indicated, prices may become more unfavorable to producers during the last part of 1933 unless there is a distinct tendency toward business improvement.

Recommendations. — (1) All farmers should produce sufficient hogs for home use, and methods of curing and canning should be employed that will provide an adequate supply of pork products throughout the year.

(2) The demand for feeder pigs should be supplied locally. Prices continue relatively high in certain sections, due to the small supply of pigs available.

(3) Herds of near average size should be maintained on farms that are particularly adapted to hogs. Producers should make maximum use of by-products of the farm, pasture, and home grown grains, and take advantage of seasonal price trends. Market hogs are usually highest in August and September and again in March or early April. All practices that will reduce production costs or methods of marketing that will increase the price received should be employed.

SHEEP

The number of sheep in the United States increased steadily from 1922 and on January 1, 1932 reached the highest point ever reported in this country. The number of sheep and lambs slaughtered during the marketing year ending April 30, 1932 was also the largest on record. The 1932 lamb crop was 8 per cent smaller than the 1931 crop and less than 1 per cent larger than the 1930 crop. The 1932 lamb crop in the western sheep states, including Texas and South Dakota, was 12 per cent smaller than the 1931 crop, while that in the native sheep states was little different from that of the previous year.

All present indications point to a sharp decrease in lamb feeding in the corn belt this year. For the three months from July to September, shipments of feeder lambs from markets into the corn belt were 47 per cent smaller than in the same months last year and were the smallest for a like period in fourteen years. It is not likely that shipments during the remainder of the season will be large enough to bring the total for the six months, July to December, much above the smallest total in the last thirteen years, which was in 1921. Numbers fed in the far western states are expected to be as large or larger than last year.

The decline in consumer demand for lamb and mutton, which began in the last half of 1929, continued through 1931 and thus far in 1932. The increased slaughterings of sheep and lambs during this period were moved into consumption only at greatly reduced prices.

Slaughter supplies of sheep and lambs for 1933 should be less than those of 1932, although there is no indication that there will be any decrease in the native lamb area. However, Virginia producers will benefit to some extent by a lessened number in the west, due to the overlapping of the marketing season. The sheep industry as a whole is in a more favorable position than a year ago and prices should respond to any improvement in demand. However, it is not expected that demand will improve during the first part of 1933.

World wool production remained large in 1932, although production in the United States decreased 5.6 per cent from 1931. Domestic production has almost reached average domestic consumption, but consumption during the first eight months of 1932 was only 70 per cent of the average of the previous five years. Supplies of domestic wool, therefore, appear ample for present needs and imports are likely to be confined to small amounts of wool for specialty purposes.

The United States farm price of wool fell from 38.7 cents in June 1928 to 7 cents in July 1932, the lowest price since 1897. Early August prices on grease wools at Boston ranged from 12 to 15 cents; on October 8 they reached a range of prices of 16 to 23 cents and remained near the latter figures to December 1.

Recommendations. — Considering the conditions prevailing in 1932, Virginia producers received fairly good returns for lambs, particularly if they possessed quality and finish. Since the sheep situation is becoming more favorable as to numbers, better prices for lambs and wool should result from any improvement in business and industry. Virginia sheepmen should, therefore, retain their flocks and at the same time make adjustments that will increase their income.

With fairly large supplies indicated for the native lamb area, it is expected that a wide spread in prices between top lambs and the lower grades will continue during the 1932 season. Every effort possible should be made to produce quality lambs.

The first means of securing quality is to use good purebred rams of one of the mutton breeds. Second, dock and trim all lambs.

Third, flocks should be treated regularly for stomach worms. Fourth, good feeding and care should be practiced. Creep feeding is recommended on early lambs.

Methods of marketing lambs so that the grower will be paid on a quality basis should be practiced. Grading lambs and the establishment of lamb pools which require quality production should be encouraged. In the marketing of wool, fleeces should be prepared in the best possible manner.

The year 1932 will be a good time to replace old ewes with young ones of better quality. Farmers that have been considering establishing small flocks can still do so at a low cost in 1933.

HORSES AND MULES

Horse numbers in the United States declined steadily from 1920 to 1932, the decrease during this period amounting to 37 per cent in the United States and 45 per cent in the south. Mule numbers during the same period declined 8.5 per cent in the

United States and 6.5 per cent in the east. In Virginia there were 312,000 horses in 1929 and 310,000 January 1, 1932.

The [illegible] decrease in work stock between 1920 and 1930 was partly offset by an increase in the number of tractors and a small decrease in the acreage of farm lands. Apparently work stock is being used more effectively now than in 1920, but in view of the high average age of horses and mules and the small number being raised, a shortage seems probable within a few years.

The average value of horses in the United States was $64.14 in 1927 and increased steadily to 1930 when it was $70.69. It then dropped to $69.17 by January 1, 1931 and to $60.69 by January 1, 1932. The drop in horse prices during the last few years has not been as great as the average of all other farm commodities.

The declining horse and mule numbers in the United States and the high average age of work stock are factors which should encourage increased horse production. The comparatively low initial cost of horses and mules and their extremely low cost of maintenance should also encourage greater use of this source of power on the farm.

SUGGESTIONS TO VIRGINIA FARMERS

(Continued from page 1)

order to determine definitely just what animals are paying. There has never been a time when membership in such organizations as dairy herd improvement associations would pay greater returns. On small farms the unprofitable poultry and other animals can be eaten. On larger farms they should be sold, even though they bring very low prices. Now is an excellent time to trade off two or three scrubs for one good purebred.

Consider carefully acreage devoted to money crops. — It is not sound farm management to recommend at any time that all farmers decrease the acreage planted to so-called money crops. Some farmers may have already reduced the acreage planted to such crops too much for efficient operation. However, if there ever was a time when farmers should consider carefully the acreage devoted to commercial crops, it would seem that this time is now. With corn and wheat bringing less than fifty cents a bushel, with potatoes selling at less than a dollar a barrel, and with cotton and tobacco around seven cents per pound, it is indeed an optimistic farmer who will borrow money to maintain his present acreage of such crops. Yet hope springs eternal in the farmer's breast, and there will probably be quite a few farmers next spring who will be tempted to increase their acreage with the hope that other farmers will decrease. It would seem far wiser for all farmers and all who furnish credit for crop production to study carefully the outlook reports before deciding on the acreage to be planted to money crops.

Use most efficient methods on acreage cultivated. — When it has been definitely decided from a careful study of the supply and demand situation just what acreage of crops would seem to be most profitable, the intelligent farmer will plan to use the most efficient methods possible in the production of such crops. This is no time to follow slipshod methods. Good fertilization, good cultivation, and good rotation are more essential than ever before. Thousands of dollars were lost in Virginia in 1932 by farmers who tried to grow tobacco and other crops without sufficient plant food. With most crops grown in this state it is more profitable to cultivate a few acres properly than many acres without fertilization.

Take care of land not in cultivation. — Many acres were brought into cultivation in Virginia from 1919 to 1929 which will not farm profitably. Within the [illegible] years such lands [illegible] a profit. What should be done with [illegible] land? The best farmers are utilizing a part of the labor which they formerly gave to the production of so-called money crops to keeping such lands from washing and growing up in briars and bushes. They are spending about a dollar an acre in Korean lespedeza seed and a little time in shrubbing and terracing. They reason rightly that such a procedure is much more economical than letting this land wash away and having to spend ten or fifteen dollars per acre to bring it back into cultivation a few years hence. There is, of course, some land on most farms that can never be utilized profitably for either pastures or crops. Such lands should be developed permanently as woodlots and forests, but should be handled with as great care as the crop lands.

Cooperate in buying and selling. — If the family size farm of the south is to survive in competition with large scale operators on one hand and monopolies and chain distribution systems on the other, the operators of such farms must cooperate not only in production but also in buying and selling. I would, therefore, recommend that Virginia farmers give increased attention during 1933 to learning how to cooperate. However, exceeding care should be exercised in the formation of cooperative associations. Such organizations should not be established unless there is reasonable chance for their success, and more attention should be given to the business management of such associations. Such things as adequate financing, adequate volume of business, proper price policies, efficient use of labor and capital, and the development of a real cooperative spirit need to be stressed at this time.

Support general farm organizations. — Farmers can accomplish many things through good individual farm management practices, but when it comes to dealing with problems such as currency, overproduction, foreign policies and taxes, farmers as individuals are practically helpless. Therefore, every Virginia farmer would profit in 1933 from membership in a strong general farm organization. The Grange and the Farm Bureau have active units in operation in this state at this time, and those interested should get in touch with the leaders of those organizations. Farmers who are not willing to join with their fellow farmers in correcting inequalities from which they are suffering do not deserve much sympathy.

Aid in the development of recreational facilities. — There should be in every farm community in Virginia in 1933 a place where farm people can come together for play and recreation. It has been amply demonstrated in recent years that farm people can furnish their own entertainment and recreation at low cost. In taking an active part in such activities people forget their own troubles and through cooperation develop a spirit which is very helpful in overcoming daily difficulties.

Have faith in self and neighbor. — Someone has said that had it not been for the farmer's faith in himself, his neighbor and his God that the rest of the population would have perished from the earth long ago for lack of food. Be that as it may, farmers have need for increased faith at this time. Farm products cannot go much lower. It is reasonable to believe that during the next few years the price of things the farmers buy will decrease, and the price of things that farmers sell will gradually increase. This will mean increased purchasing power for farmers and a gradual return of prosperity. A good slogan this year would be: "In times of depression prepare for prosperity."

HOME AGENTS AND 1932

Miss Maude Wallace, state home demonstration agent, says she is often asked this question, What do home demonstration agents do? and that her answer is usually something like this, "The 49 home demonstration agents in Virginia direct their work to the farm home and focus it there. They work with rural women and girls in all phases of home making and production activities, such as gardening, poultry, food preservation, food preparation, clothing construction, household pest control, home sanitation, etc." However Miss Wallace finds in going over her agents' reports that she can give some very convincing facts that show, in part, something of the very practical and efficient work these forty-nine home agents did in 1932 with the women and girls in Virginia. Here are just a few of the many fine things these agents did:

Home demonstration agents (white) carried on, with the aid of local committees, an extension program in 697 communities. Negro home demonstration agents carried on, with aid of local committees, an extension program in 114 communities. Therefore, 811 communities in the State of Virginia were reached by home demonstration work in 1932.

In 1932 there were 552 home demonstration clubs organized to carry on adult home demonstration work with 13,297 rural women in these clubs. There were 688 4-H clubs under the direction of the home demonstration agents with 14,222 members of which 2,051 were boys and 12,171 were girls.

During the year the home demonstration agents made a total of 29,794 home visits in the interest of extension work to 21,112 different homes. There were 279 training meetings held at which 276 men and 4,643 women were trained to help with the adult work and 219 training meetings at which 2,262 leaders were trained to help with 4-H club work. This makes a grand total of 498 meetings and 7,181 leaders trained to assist with the program.

In vegetable gardening we find an estimated value of $556,576.00 of vegetables in 4-H and adult gardens. In poultry there was a record of $13,200.43 of profit made by farm flock improvement contestants. The home demonstration markets showed a sale of $71,421.00 worth of home products in the past year.

Ten thousand and seventy-five women studied along the lines of food and nutrition and made improvements in the feeding of their families; 4,313 homes planned a family food budget for the year; 5,311 homes studied and served balanced meals for their families; 4,133 homes improved the packed lunch for school children; 7,531 women and 3,341 girls have followed the "live at home" guide and report that they practically live at home by producing all possible food there.

One hundred and eighty-nine steam pressure cookers were purchased under the advice of the agents. Almost 5,000 club girls and 3,027 women were enrolled in clothing work during the past year. Two thousand three hundred and sixty-eight women and 3,430 girls followed directions in remodeling clothing. One thousand five hundred and forty-seven women improved the storage space in their homes; 901 kitchens were improved; 772 homes followed recommendations in securing labor saving equipment; 5,426 homemakers improved their homes in some way and 2,222 girls studied home improvement.

Two thousand seven hundred and fifty-one chairs and stools were seated; 954 articles were slip-covered or upholstered; 3,111 pieces of furniture repaired or refinished; with a total of 4,879 rooms improved. Fifty-six water systems were installed according to recommendations. One thousand one hundred and fifty-five homes screened according to advice of home demonstration agents.

Exhibit B

COBBLER SEED SOURCE DEMONSTRATION

ACCOMACK COUNTY

VIRGINIA

Eleventh Annual

POTATO TOUR and FIELD DAY

June 15, 1933

Seed Plots Located on the Following Farms:

D. F. Mason, Oak Hall, Va. J. L. Turner, Painter, Va.
R. F. Mason, Mappsville, Va. C. C. Bonniwell, Harborton, Va.

Eastern Shore Experiment Station, Onley, Va.

- -

W. O. Strong, County Agent
H. M. Nichols, Assistant

COBBLER SEED SOURCE DEMONSTRATION

Accomack County, Virginia

1933

INTRODUCTION

Each strain is represented by the same number of hills in any one plot.

In the Bonniwell, R. F. Mason, D. F. Mason, and Turner plots, the yield per row in pounds is equivalent to the yield in barrels per acre. In the Experiment Station plot, one-half the total yield per each strain is equivalent to the yield of that strain in barrels per acre.

A special effort has been made to determine the cause of missing hills. Each missing hill was dug up and the reason indicated. A considerable number of missing hills are indicated under "Lost". Such hills are largely the result of complete rot or of being harrowed out. Brown stem also accounts for a considerable number of missing hills in this year's plots.

None of the seed were treated before planting as it is not customary with our local growers. It was thought desirable to handle this work as nearly like average farm practice as possible. However, in an effort to improve the stand, the stem end eye of the potato was discarded when cut.

The disease counts were made June 6 and 7, by Dr. Harold T. Cook, Plant Pathologist of the Virginia Truck Experiment Station. No spindle tuber counts are recorded; however, strains showing a large number of spindle tuber type plants are indicated in the individual plots.

A study of the enclosed data shows conclusively how good Certified Seed, intelligent use of fertilizer, and careful cultural practices influence the stand and yield, thus lowering the cost per unit of production - the first step in successful marketing.

STUDY THE PLOTS AND SUMMARIES

Strains and Sources of Seed Used In Test Plats

1933

Strain	Grower or Source
1. Stems	From South Dakota Seed
2. P. E. I., Rail, Ho. Gr.	R. C. Hall, Parksley, Va.
3. Maine, #1	John Prescott, Presque Isle, Me.
4. Maine, #2	" " " " "
5. Maine	C. E. Hussey and Son, Presque, Isle, Me.
6. Maine	Fred R. Corliss, Sherman Mills, Me.
7. Maine, Ho. Gr.	C. M. Wise, Onancock, Va.
8. South Dakota	Louis Stein, Watertown, S. Dak.
9. " "	Leonard Parker, Hazel, S. Dak.
10. " "	Brunel Kornmann, Thomas, S. Dak.
11. " "	John Radtke, Watertown, S. Dak.
12. " "	E. A. Redlin, Watertown, S. Dak.
13. " " , Ho.Gr.,2d yr.	C. M. Wise, Onancock, Va.
14. North Dakota	Joe Thompson, Nash, N. Dak.
15. N. Dak.	R. L. Douglass, Park River, N. Dak.
16. "	A. B. Thompson, Grafton, N. Dak.
17. Wisconsin	Felix Zeloski, Antigo, Wis.
18. "	Albert Miller Co., Chicago, Ill.
19. Michigan	A. D. Robinson, Pellston, Mich. (Furnished by courtesy P. R. R., R. C. East, Agent)
20. Maryland	W. J. Dukes, Girdletree, Md.
21. *New York	Porter and Bonney, Elba, New York
22. *New York	Wilson Farms, Gainesville, N. Y.
23. *New York	W. P. Rogers, Williamson, N. Y.
24. **New York	F. S. Hollenbeck, Tully, N. Y.
25. New York	Bruce Cottrell, Homer, New York

* Grown on muck soil
** Late strain of Cobblers

DESCRIPTION OF SEED JUST BEFORE PLANTING

March 18, 1933

Strain	Size	Sprout Length (8ths)	Mature	Immature	Firm	Extra	Medium	After Crack	Date Rec'd.	Place Stored
1. Stems, S. Dak.										
2. P.E.I., Rair., Ho.Gr.	S-M	-	-	x	x	-	-	-	3-17	Parksley, Va.
3. Me., Prescott, #1	M-L	1	x	-	x	-	-	tr	3-8	Island Falls, Me.
4. Me., Prescott, #2	S	1	x	-	x	-	-	tr	3-8	" " "
5. Me., Hussey	S-L	1	x	-	x	-	-	tr	3-19	Presque Isle, Me.
6. Me., Corliss	M-L	1	x	-	x	-	-	tr	3-16	Sherman Mills, Me.
7. Me., Ho.Gr., Wise	S-M	2	-	x	x	-	-	-	3-18	Onancock, Va.
8. S.Dak., Stein	M-L	3	x	-	-	-	x	tr	3-3	Eastville, Va.
9. S.Dak., Parker	M	2	x	-	x	-	-	tr	3-3	" "
10. S.Dak., Kortmann	M	1	x	-	-	-	x	tr	3-3	" "
11. S.Dak., Reiche	M-L	3	x	-	x	-	-	tr	3-7	" "
12. S.Dak., Meehan	M-L	1	x	-	x	-	-	tr	3-7	" "
13. S.Dak., Ho.Gr., 21 yr.	S-M	tr	-	x	x	-	-	-	3-18	Onancock, Va.
14. N.Dak., Joe Thompson	L	2	x	-	x	-	-	tr	3-8	Nash, N. Dak.
15. N.Dak., Douglass	M-L	2	x	-	x	-	-	tr	3-3	Park River, N. Dak.
16. N.Dak., A.B.Thompson	S-M	1	x	-	-	-	x	tr	3-8	Grafton, N. Dak.
17. Wisconsin, Zeloski	S-M	1	x	-	-	x	-	tr	3-6	Antigo, Wis.
18. Wisconsin, Miller	S-M	tr	x	-	x	-	-	tr	3-6	Chicago, Ill.
19. Mich., Robinson	M	tr	x	-	x	-	-	tr	3-6	Pellston, Mich.
20. Md., Dukes	S-M	tr	x	-	-	x	-	tr	3-15	Marlboro, Md.
21.* N. Y., Porter & Bonney	M-L	1	x	-	-	x	-	tr	3-14	Elba, N. Y.
22.** N.Y., Wilson	S-M	tr	x	-	x	-	-	tr	3-24	Gainesville, N. Y.
23.* N.Y., Rogers	M-L	2	x	-	x	-	-	tr	3-8	Williamson, N. Y.
24.** N.Y., Hollenbeck	M-L	2	x	-	x	-	-	tr	3-8	Tully, N. Y.
25. N.Y., Cottrell	M	1	x	-	x	-	-	tr	3-8	Homer, New York

* Grown on muck soil
** Late Strain of Cobblers

D. F. Mason, Oak Hall, Va.
Planted with Iron Age Planter - 3/30/33
Rows 36" apart - Hills 18" apart

Source of Seed	Missing Hills							Diseased Hills						Weak	Injury
	Total	Rot	Dead Eye	Nose Sy	Weak Sp.	Lost	Br. St em	Total	Mosaic	Leaf Roll	Sp. T. T.	B. L.	Rhiz.		
1. Stems	2	-	-	-	-	2	-	0	-	-	*	-	-	-	-
2.** Check, Porter and Bonney	1	-	-	-	-	1	-	0	-	-		-	-	-	-
3. P.E.I. Rail, Ho. Gr.	1	1	-	-	-	-	-	0	-	-	*	-	-	-	-
4. Me., Prescott	1	-	-	-	1	-	-	0	-	-		-	-	-	-
5. " " #2	0	-	-	-	-	-	-	1	-	1		-	-	-	-
6. " , Hussey	1	-	-	-	-	1	-	0	-	-		-	-	-	-
7. " , Corliss	0	-	-	-	-	-	-	0	-	-		-	-	-	-
8.** " , Ho. Gr., C.M. Wise	1	-	-	-	1	-	-	5	2	3	*	-	-	-	-
9. Ck., Porter and Bonney	4	-	-	1	-	3	-	0	-	-		-	-	-	-
10. S.Dak., Stein	0	-	-	-	-	-	-	1	1	-		-	-	-	-
11. " , Parker	1	-	-	-	1	-	-	0	-	-		-	-	-	-
12. " , Kornmann	3	-	1	-	-	2	-	0	-	-		-	-	-	-
13. " , Radtke	1	-	-	-	-	1	-	0	-	-		-	-	-	-
14. " , Redlin	2	-	-	-	1	1	-	0	-	-		-	-	-	-
15. " , Ho. Gr. 2i. yr. Wise	1	-	-	-	1	-	-	0	-	-	*	-	-	-	-
16. N.Dak., Joe Thompson	2	1	-	-	-	1	-	1	1	-		-	-	-	-
17. " , Douglass	3	-	-	-	-	3	-	3	3	-		-	-	-	-
18. " , Thompson, A.B.	0	-	-	-	-	-	-	0	-	-		-	-	-	-
19. Wisconsin, Zeloski	0	-	-	-	-	-	-	0	-	-		-	-	-	-
20. " , Miller	2	-	-	-	-	2	-	0	-	-		-	-	-	-
21.** Michigan, Robinson	3	-	-	-	-	3	-	0	-	-		-	-	-	-
22. Check, Porter and Bonney	4	-	-	-	-	4	-	0	-	-		-	-	-	-
23. Md., Dukes	1	1	-	-	-	-	-	3	-	3		-	-	-	-
24. N.Y., Wilson Farms	3	-	-	-	3	-	-	0	-	-	*	-	-	-	-
25.** " , W.P. Rogers	0	-	-	-	-	-	-	3	-	3		-	-	-	-
26. " , Hollenbeck	1	-	-	-	-	1	-	2	-	2	*	-	-	-	-
27. " , Cottrell	2	-	-	-	-	2	-	0	-	-		-	-	-	-
28.** Ck., Porter and Bonney	5	-	1	-	1	3	-	0	-	-		-	-	-	-

* Many spindle tuber type hills
** Grown on muck soil

R. F. Mason, Mappsville, Va.
Planted with Iron Age Planter - 3/30/33
Hills 15" apart - Rows 30" apart
Rows 100 ft. long

Source of Seed	Missing Hills							Diseased Hills						Weak	Injury
	Total	Rot	Dead Eye	Nose	Weak Sp.	Lost	Bor. Stem	Total	Mosaic	Leaf Roll	Sp. T. T.	S. L.	Rhiz.		
1. Stems	2	-	-	1	-	1	-	0	-	-	*	-	-	-	-
2**Check, Porter and Bonney	1	1	-	-	-	-	-	0	-	-		-	-	-	-
3. P.E.I., Rail, Ho.Gr.	1	-	-	-	-	1	-	0	-	-		-	-	-	-
4. Me., Prescott	1	-	-	-	-	1	-	0	-	-		-	-	-	-
5. " " #2	0	-	-	-	-	-	-	0	-	-		-	-	-	-
6. " , Hussey	0	-	-	-	-	-	-	0	-	-		-	-	-	-
7. " , Corliss	5	-	-	2	-	3	-	0	-	-		-	-	-	-
8. " , Ho.Gr., C.M.Wise	0	-	-	-	-	-	-	0	-	-		-	-	-	-
9**Ck., Porter and Bonney	0	-	-	-	-	-	-	2	-	2		-	-	-	-
10. S.Dak., Stein	0	-	-	-	-	-	-	0	-	-		-	-	-	-
11. " , Parker	0	-	-	-	-	-	-	0	-	-		-	-	-	-
12. " , Kornmann	0	-	-	-	-	-	-	0	-	-		-	-	-	-
13. " , Radtke	2	-	-	1	-	1	-	0	-	-		-	-	-	-
14. " , Redlin	4	3	-	-	-	1	-	0	-	-		-	-	-	-
15. " , Ho.Gr., 2d yr., Wise	1	-	-	-	-	1	-	0	-	-	*	-	-	-	-
16. N.Dak., Joe Thompson	0	-	-	-	-	-	-	0	-	-		-	-	-	-
17. " , Douglass	3	-	-	-	-	3	-	2	2	-		-	-	-	-
18. " , A. B. Thompson	0	-	-	-	-	-	-	0	-	-		-	-	-	-
19. Wisconsin, Zeloski	1	-	-	-	-	1	-	1	1	-		-	-	-	-
20. " , Miller	1	-	-	-	-	1	-	0	-	-		-	-	-	-
21. Michigan, Robinson	2	-	-	2	-	-	-	0	-	-		-	-	-	-
22**Ck., Porter and Bonney	0	-	-	-	-	-	-	0	-	-		-	-	-	-
23. Maryland, Dukes	0	-	-	-	-	-	-	0	-	-		-	-	-	-
24. N. Y., Wilson Farms	0	-	-	-	-	-	-	0	-	-		-	-	-	-
25**N. Y., W. P. Rogers	1	-	-	-	-	1	-	15	-	15		-	-	-	-
26. N. Y., Hollenbeck	1	-	-	-	-	1	-	0	-	-		-	-	-	-
27. N. Y., Cottrell	1	-	-	-	-	1	-	0	-	-		-	-	-	-
28. **Ck. Porter and Bonney	0	-	-	-	-	-	-	0	-	-		-	-	-	-

* Many spindle tuber type hills
** Grown on muck soil

Eastern Shore Experiment Station
Onley, Virginia
Planted and Fertilized with New Iron Age Planter with Spacer Attachment - Planted 5/24/33 - Rows 212' long (168 hills) Rows 30" and Hills 15" Apart.

Source of Seed	Rank	Cer. Count	Missing Hills							Diseased Hills						Weak	Injury
			Total	Rot	Dead Eye	Wo Eye	Weak Sp.	Lost	Br. Stem	Total	Mosaic	Leaf Roll	Sp. T. T.	B. L.	Hiz.		
1. Stems	2	110	12	2	-	4	3	3	-	0	-	-		-	-	-	-
2.* Check, P. and Bonney	1	143	2	2	-	-	-	-	-	2	-	2		-	-	-	-
3. P.E.I., Ho. Gr.	3	83	18	-	-	-	-	-	18	0	-	-	*	-	-	-	-
4. Me., Prescott #1	1	141	1	-	-	1	-	-	-	0	-	-		-	-	-	-
5. " " #2	1	151	0	-	-	-	-	-	-	0	-	-		-	-	-	-
6. " , Hussey and Son	1	156	1	-	-	1	-	-	-	0	-	-		-	-	-	-
7. " , Corliss	2	141	2	-	-	-	-	1	1	4	-	4		-	-	-	-
8. " , Ho. Gr.	3	124	5	1	-	1	2	1	-	0	-	-		-	-	3	-
9. Ck., Porter and Bonney	2	141	0	-	-	-	-	-	-	2	2	-		-	-	1	-
10. S.Dak., Stein	1	142	0	-	-	-	-	-	-	1	1	-		-	-	-	-
11. " , Parker	1	150	1	-	-	-	-	-	1	0	-	-		-	-	-	-
12. " , Kornmann	2	155	0	-	-	-	-	-	-	0	-	-		-	-	1	-
13. " , Radtke	1	133	1	-	-	-	-	1	-	0	-	-		-	-	-	-
14. " , Redlin	1	161	1	-	-	-	-	-	1	0	-	-		-	-	-	-
15. " , Ho. Gr.	3	94	6	1	-	-	2	2	1	7	7	-		-	-	-	-
16. N.Dak., Joe Thompson	1	134	2	-	-	1	1	-	-	4	4	-		-	-	-	-
17. " , Douglass	1	134	3	-	-	2	-	1	-	5	5	-		-	-	2	-
18. " , A.B.Thompson	1	141	0	-	-	-	-	-	-	1	1	-		-	-	-	-
19. Wis., Zeloski	1	142	1	1	-	-	-	-	-	5	5	-		-	-	-	-
20. " , Miller	1	155	3	-	-	-	1	2	-	0	-	-		-	-	-	-
21. Mich., Robinson	1	162	1	-	-	-	-	-	1	0	-	-		-	-	-	-
22. Ck., Porter and Bonney	1	140	3	-	-	-	-	2	1	1	-	1		-	1	-	-
23. Md., Dukes	3	96	6	-	-	2	-	3	1	2	1	1		-	-	-	-
24.** N. Y., P. and B.	2	153	3	-	-	1	-	2	-	0	-	-		-	-	-	-
25.** N. Y., " "	2	152	4	-	-	1	-	3	-	0	-	-		-	-	-	-
26. N. Y., Wilson	3	86	2	1	-	-	-	1	-	0	-	-	*	-	-	1	-
27. N. Y., Rogers	1	142	1	-	-	-	-	-	1	13	-	13		-	-	-	-
28. N. Y., Hollenbeck	1	143	2	-	-	-	-	-	2	0	-	-		-	-	-	-
29. N. Y., Cottrell	1	146	2	-	-	-	-	2	-	2	-	2		-	-	-	-
30.** Check, P. and B.	1	134	1	-	-	-	-	1	-	2	-	2		-	-	-	-

* Many spindle tuber type hills
** Grown on muck soil.

J. L. Turner, Painter, Va.
Planted by hand 3/23/33
Hills 15" apart Rows 30" apart
85 pieces

Source of Seed	Missing Hills							Diseased Hills						Weak	Injury
	Total	Rot	Dead Eye	Net Necrosis	Leak Sp.	Lost	Br. Stem	Total	Mosaic	Leaf Roll	Sp. T. T.	B. L.	Rhiz.		
1. Stems	3	-	-	2	-	1	-	1	1	-	*	-	-	-	-
2.*Check, P. and Bonney	0	-	-	-	-	-	-	3	-	3		-	-	-	-
3. P. E. I. No. Gr.	0	-	-	-	-	-	-	0	-	-	*	-	-	-	-
4. Me., Prescott #1	1	-	-	1	-	-	-	0	-	-		-	-	-	-
5. " " #2	3	-	-	2	-	1	-	0	-	-		-	-	-	-
6. " , Hussey and Son	1	-	-	-	-	1	-	0	-	-		-	-	-	-
7. " , Corliss	0	-	-	-	-	-	-	0	-	-		-	-	-	-
8. " , No. Gr.	0	-	-	-	-	-	-	0	-	-	*	-	-	-	-
9. Ck., Porter and Bonney	1	-	-	-	1	-	-	1	-	1		-	-	-	-
10. S. Dak., Stein	0	-	-	-	-	-	-	0	-	-		-	-	-	-
11. S. Dak., Parker	0	-	-	-	-	-	-	0	-	-		-	-	-	-
12. S. Dak., Kornmann	0	-	-	-	-	-	-	0	-	-		-	-	-	-
13. S. Dak., Radtke	1	-	-	-	-	1	-	0	-	-		-	-	-	-
14. S. Dak., Redlin	0	-	-	-	-	-	-	3	-	3		-	-	-	-
15. S. Dak., No. Gr.	0	-	-	-	-	-	-	0	-	-	*	-	-	-	-
16. N. Dak., Joe Thompson	0	-	-	-	-	-	-	2	2	-		-	-	-	-
17. N. Dak., Douglass	0	-	-	-	-	-	-	6	6	-		-	-	-	-
18. N. Dak., A. B. Thompson	0	-	-	-	-	-	-	1	1	-		-	-	-	-
19. Wis., Zeloski	0	-	-	-	-	-	-	0	-	-		-	-	-	-
20. Wis., Miller	3	-	-	-	-	3	-	0	-	-		-	-	1	-
21. Michigan, Robinson	0	-	-	-	-	-	-	3	-	2		-	1	-	-
22.**Ck., Porter and Bonney	0	-	-	-	-	-	-	3	-	3		-	-	-	-
23. Mi., Dukes	0	-	-	-	-	-	-	0	-	-	*	-	-	-	-
24.**N.Y., Porter and Bonney	3	-	-	1	-	2	-	3	-	3		-	-	-	-
25. N.Y., Porter and Bonney	2	-	-	-	-	2	-	9	1	8		-	-	-	-
26. N. Y., Wilson	1	-	-	-	-	1	-	2	-	2	*	-	-	-	-
27.** N.Y., Rogers	0	-	-	-	-	-	-	6	-	6		-	-	-	-
28. N.Y., Hollenbeck	0	-	-	-	-	-	-	2	-	2		-	-	-	-
29.** N.Y., Cottrell	1	1	-	-	-	-	-	0	-	-		-	-	-	-
30. N.Y., Ck., Porter and Bonney	-	-	-	-	-	1	-	9	-	9		-	-	-	-

* Many spindle tuber type hills
** Grown on muck soil

G. C. Bonniwell, Harberton, Va.
Planted by Hand - 5/23/33
Hills 18" Apart - Rows 30" Apart
94 Pieces

Source of Seed	Missing Hills							Diseased Hills						Weak	Injury
	Total	Rot	Dead Eye	Nose	Wesk Sp.	Lost	Br. Stem	Total	Mosaic	Leaf Roll	Sp. T.	S. L.	Rhiz.		
1. Stems	5	-	3	-	2	-	-	1	-	1		-	-	1	-
2.** Ck., Porter and Bonney	0	-	-	-	-	-	-	0	-	-		-	-	-	-
3. P.E.I. Rail, Ho. Gr.	0	-	-	-	-	-	-	0	-	-	*	-	-	2	-
4. Me., Prescott	0	-	-	-	-	-	-	0	-	-		-	-	-	-
5. Me., " #2	0	-	-	-	-	-	-	0	-	-	*	-	-	1	-
6. Me., Hussey	2	-	-	-	-	2	-	0	-	-		-	-	-	-
7. Me., Carliss	0	-	-	-	-	-	-	0	-	-		-	-	-	-
8. Me., Ho. Gr., C.M. Wise	1	-	-	-	-	1	-	0	-	-	*	-	-	-	-
9.** Ck., Porter and Bonney	0	-	-	-	-	-	-	0	-	-		-	-	-	-
10. S.Dak., Stein	1	-	-	-	-	1	-	0	-	-		-	-	-	-
11. S.Dak., Parker	0	-	-	-	-	-	-	2	-	2		-	-	-	-
12. S.Dak., Kornmann	3	3	-	-	-	-	-	0	-	-		-	-	-	1
13. S.Dak., Radtke	0	-	-	-	-	-	-	0	-	-		-	-	-	-
14. S.Dak., Redlin	0	-	-	-	-	-	-	0	-	-		-	-	-	-
15. S.Dak., Ho. Gr. 2d yr., Wise	1	-	-	-	-	1	-	1	1	-	*	-	-	1	-
16. N.Dak., Joe Thompson	2	-	-	-	-	2	-	2	-	2		-	-	-	-
17. N.Dak., Douglass	3	1	-	-	-	2	-	2	2	-	*	-	-	-	-
18. N.Dak., A.B. Thompson	0	-	-	-	-	-	-	5	5	-		-	-	-	-
19. Wis., Zeloski	0	-	-	-	-	-	-	0	-	-		-	-	-	-
20. Wis., Miller	3	-	1	1	-	1	-	0	-	-		-	-	-	-
21. Michigan, Robinson	1	-	-	-	-	1	-	0	-	-		-	-	-	-
22. Md., Dukes	0	-	-	-	-	-	-	0	-	-		-	-	-	-
23.** N.Y., Porter and Bonney	0	-	-	-	-	-	-	0	-	-	*	-	-	-	-
24. N.Y., " " "	0	-	-	-	-	-	-	1	-	1	*	-	-	-	-
25. N.Y., Wilson Farms	0	-	-	-	-	-	-	4	3	-	*	-	1	-	-
26.** N.Y., W.P. Rogers	2	-	-	1	-	1	-	4	4	-		-	-	-	-
27. N.Y., Hollenbeck	0	-	-	-	-	-	-	0	-	-		-	-	-	-
28. S.Dak., Cert., G.C.B.	40	14	5	7	-	14	-	0	-	-		-	-	20	
29. N.Y., Cottrell	0	-	-	-	-	-	-	0	-	-		-	-	-	-
30. Check, Porter and Bonney	0	-	-	-	-	-	-	0	-	-		-	-	-	-

* Many spindle tuber type hills
** Grown on muck soil

GERMINATION COUNTS

1933

Source of Seed	Total No. Hills	% Miss. Hills	Cause of Missing Hills					
			% Weak Sp.	% Rot	% Dead Eye	% No Eye	% Lost	% Brown Stem
1. P.E.I., Rail, Ho.Gr.	520	3.84	000	0.19	0.00	0.00	0.19	3.46
2. Me., Prescott #1	520	0.76	0.19	0.00	0.00	0.38	0.19	0.00
3. Me., Prescott #2	520	0.57	0.00	0.00	0.00	0.38	0.19	0.00
4. Me., Hussey	520	0.96	0.00	0.00	0.00	0.19	0.77	0.00
5. Me., Corliss	520	1.34	0.19	0.00	0.00	0.38	0.77	0.00
6. Me., Ho. Gr.	520	1.33	0.57	0.19	0.00	0.19	0.38	0.00
7. S.Dak., Stein	520	0.19	0.00	0.00	0.00	0.00	0.19	0.00
8. S.Dak., Parker	520	0.38	0.19	0.00	0.00	0.00	0.00	0.19
9. S.Dak., Kornmann	520	1.14	0.00	0.57	0.19	0.00	0.38	0.00
10. S.Dak., Radtke	520	0.96	0.00	0.00	0.00	0.19	0.77	0.00
11. S.Dak., Redlin	520	1.33	0.19	0.57	0.00	0.00	0.38	0.19
12. S.Dak., Ho.Gr., 2d yr	520	1.71	0.57	0.19	0.00	0.00	0.77	0.19
13. N.Dak., JoeThompson	520	1.14	0.19	0.19	0.00	0.19	0.57	0.00
14. N.Dak., Douglass	520	2.30	0.00	0.19	0.00	0.38	1.73	0.00
15. N.Dak., A.B.Thompson	520	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16. Wis., Zeloski	520	0.38	0.00	0.19	0.00	0.00	0.19	0.00
17. Wis., Miller	520	2.30	0.19	0.00	0.19	0.19	1.73	0.00
18. Mich., Robinson	520	1.34	0.00	0.00	0.00	0.38	0.77	0.19
19. Md., Dukes	520	1.33	0.00	0.19	0.00	0.38	0.57	0.19
20. N.Y., P. and B.	520	2.10	0.19	0.00	0.19	0.38	1.34	0.00
21. N.Y., Wilson	520	1.14	0.57	0.19	0.00	0.00	0.38	0.00
22. N.Y., Rogers	520	0.95	0.00	0.00	0.00	0.19	0.57	0.19
23. N.Y., Hollenbeck	520	0.76	0.00	0.00	0.00	0.00	0.38	0.38
24. N.Y., Cottrell	520	1.14	0.00	0.00	0.00	0.00	1.14	0.00
25. Stems	520	4.59	0.96	0.38	0.57	1.34	1.34	0.00

DISEASE COUNTS
1933

Source of Seed	Total Plants	% Diseased Plants	% Various Diseases			% Weak Plants
			Mosaic	Leaf Roll	Rhizoctonia	
1. P.E.I., Rail, Ho.Gr	520	0.00	0.00	0.00	0.00	0.38
2. Me., Prescott #1	520	0.00	0.00	0.00	0.00	0.00
3. Me., Prescott #2	520	0.19	0.00	0.19	0.00	0.19
4. Me., Hussey	520	0.00	0.00	0.00	0.00	0.00
5. Me., Corliss	520	0.77	0.00	0.77	0.00	0.00
6. Me., Ho.Gr.	520	0.95	0.38	0.57	0.00	0.57
7. S.Dak., Stein	520	0.38	0.38	0.00	0.00	0.00
8. S.Dak., Parker	520	0.38	0.00	0.38	0.00	0.00
9. S.Dak., Kornmann	520	0.00	0.00	0.00	0.00	0.38
10. S.Dak., Radtke	520	0.00	0.00	0.00	0.00	0.00
11. S.Dak., Redlin	520	0.57	0.00	0.57	0.00	0.00
12. S.Dak., Ho.Gr. 2d yr.	520	1.52	1.52	0.00	0.00	0.19
13. N.Dak., Joe Thompson	520	1.72	1.34	0.38	0.00	0.00
14. N.Dak., Douglass	520	3.46	3.46	0.00	0.00	0.38
15. N.Dak., A.B.Thompson	520	1.34	1.34	0.00	0.00	0.00
16. Wis., Zeloski	520	1.14	1.14	0.00	0.00	0.00
17. Wis., Miller	520	0.00	0.00	0.00	0.00	.19
18. Mich., Robinson	520	0.57	0.00	0.38	0.19	0.00
19. Md., Dukes	520	0.95	0.19	0.76	0.00	0.00
20. N. Y., P. and B.	520	0.57	0.00	0.57	0.00	0.00
21. N. Y., Wilson	520	1.14	0.57	0.38	0.19	0.19
22. N. Y., Rogers	520	7.88	0.77	7.11	0.00	0.38
23. N. Y., Hollenbeck	520	0.77	0.00	0.77	0.00	0.19
24. N. Y., Cotrell	520	0.38	0.00	0.38	0.00	0.00
25. Stems	520	0.38	0.19	0.19	0.00	0.19

1932 YIELDS - CORBLER SEED SOURCE DEMONSTRATIONS

The average yield of the five source of seed plots in 1932 are given below. The number in parentheses directly after the name of each strain denotes the number of plots in which that particular strain occurred.

Average of All Plots

Source of Seed		Yield - Barrels Per Acre Primes	Seconds	Total
1. N.Y., Hollenbeck	(5)	67.0	15.4	82.4
2. N.Y., Rogers	(5)	63.0	16.0	79.0
3. Me., Prescott #1	(5)	62.8	13.0	75.8
4. N. Y., Gottrell	(5)	61.8	18.8	80.6
5. Wis., Zelenski	(5)	61.8	16.8	78.6
6. Minn., Exchange	(5)	61.2	21.0	82.2
7. N.Y., P. and B.	(5)	60.8	15.4	76.2
8. [illegible] Hussey	(5)	60.6	15.4	76.0
9. Vt., Jerolyn	(5)	60.6	13.2	73.8
10. N.B., Godin	(5)	60.4	15.4	75.8
11. Me., Corliss, Special	(5)	59.4	17.4	76.8
12. S.Dak., Parker	(5)	57.4	15.8	73.2
13. S.Dak., Kornmann	(5)	57.4	14.0	71.4
14. Me. Corliss, New	(5)	56.6	16.6	73.2
15. S.Dak., Radtke	(5)	55.0	14.4	69.4
16. Wis., Channing	(5)	54.2	18.0	17.2
17. N.Y., Wilson	(5)	53.8	14.2	68.0
18. N.Dak., Miller	(5)	53.2	17.4	70.6
19. P.E.I., Boat	(5)	53.0	12.0	65.0
20. S.Dak., Redlin	(5)	52.8	14.8	67.6
21. Spring Crop	(5)	51.3	12.5	63.8
22. S.Dak., Sour	(5)	50.8	14.4	65.2
23. Md., Dukes	(5)	50.4	11.8	62.2
24. S.Dak., Ho. Gr.	(5)	49.8	9.2	59.0
25. P.E.I., Ho. Gr.	(5)	49.0	11.6	60.6
26. Me., Prescott #2	(5)	48.4	16.2	64.6
27. Me., Ho.Gr.	(5)	47.8	10.6	58.4
28. N.Y., Ho. Gr.	(5)	47.6	13.0	60.6
29. P.E.I., Rail	(3)	46.7	17.0	63.7
30. Wis., Ho. Gr.	(5)	46.4	15.2	61.6
31. N.Dak., Kriewald	(1)	46.0	17.0	63.0
32. N.Y., Rayton	(3)	35.3	15.0	50.3
Average -		54.4	14.9	69.3

Yields ranged from 35.3 to 67.0 barrels of primes per acre, a difference of 31.7 barrels between the best and poorest strains. The average yields for all strains included in the plots was 54.4 barrels of primes per acre. Yields varied from 19.1 barrels below the average to 12.6 barrels above the average. This variation can certainly be charged largely to source of seed.

1932 YIELD - COMPARISON OF CERTIFIED AND HOME GROWN SEED

The plots again emphasized the superiority of certified seed over home grown seed, as illustrated by the following table:

Source of Seed	Yield - Barrels Per Acre		
	Primes	Seconds	Total
1. Me., (Av. of 5 strains)	57.6	15.7	73.3
2. Me., Ho. Gr.	47.8	10.6	58.4
3. P.E.I. (Av. of 2 strains)	50.6	13.0	63.6
4. P.E.I., Ho. Gr.	49.0	11.6	60.6
5. N.Y., (Av. of 5 strains)	61.3	15.9	77.2
6. N.Y., Ho. Gr.	47.6	13.0	60.6
7. S.Dak., (Av. of 5 strains)	54.7	14.7	69.4
8. S.Dak., Ho. Gr.	49.8	9.2	59.0
9. Wisconsin (1 strain)	54.2	18.0	72.2
10. Wis., Ho. Gr.	46.4	15.2	61.6
Average - Certified Seed	55.7	15.5	71.2
Average - Home Grown	48.1	11.9	60.0

In every instance, certified seed outyielded home grown seed, originally from the same source. The difference in favor of certified seed ranged from 1.6 to 13.7 barrels of primes per acre, with an average difference of 7.6 barrels. This difference is due largely to the later maturity of home grown seed and to the greater prevalence of disease in home grown seed.

That the superiority of certified seed is not just an accident due to certain conditions prevailing in 1932, is demonstrated by the record of the past seven years, condensed in the following table:

Source of Seed	Yield Barrels Primes Per Acre
P. E. I., Certified	72
P. E. I., Home Grown	65
Maine, Certified	75
Maine, Home Grown	62
South Dakota, Certified	82
South Dakota, Home Grown	68
Average-Certified	76
Average-Home Grown	65

It will be noted from the above that over a seven-year period, the variation in yield in favor of certified seed has ranged from seven to fourteen barrels of primes per acre, with an average difference of eleven barrels.

FLEA BEETLE CONTROL EXPERIMENTS

Conducted On

The B. P. Paradee and David Miles Farms Near Mione, Virginia
By Virginia Truck Experiment Station

INSECTICIDES USED

1. Lead Arsenate Spray - 2-50
2. Lead Arsenate-Bordeaux Spray - - - - - - - - - - - - - 2-4-6-50
3. Lead Arsenate-Zinc Sulphate-Lime Spray - - - - - - - - 2-1½-1½-50
4. Dutox-Flour Dust - 1-3
5. Calcium Arsenate Spray - - - - - - - - - - - - - - - - - 2-50
6. Calcium Arsenate-Bordeaux Spray - - - - - - - - - - - - 2-4-6-50
7. Calcium Arsenate-Bordeaux-Bl.40 Spray - - - - - - - - - 2-4-6-(1-400)-50
8. Calcium Arsenate-Zinc Sulphate-Lime Spray - - - - - - - 2-1½-1½-50
9. Calcium Arsenate-Oxobordeaux Spray - - - - - - - - - - 2-4-50
10. Zinc Arsenate Spray - - - - - - - - - - - - - - - - - - - 2-50
11. Dutox Spray - 2-50
12. Paris Green-Zinc Sulphate Spray - - - - - - - - - - - - 1-1½-1½-50
13. Bordeaux Spray - 4-6-50
14. Super Agricultural Spray - - - - - - - - - - - - - - - - 1-200
15. Serrid Spray - 1-400
16. Zinc Sulphate-Lime Spray - - - - - - - - - - - - - - - 1½-1½-50
17. Lead Arsenate-Lime Dust - - - - - - - - - - - - - - - - 1-1
18. Lead Arsenate-Paris Green Dust - - - - - - - - - - - - 5-1
19. Lead Arsenate-Paris Green-Zinc Sulphate-Lime Dust - (5-1)1-(2.4-4)1
20. Calcium Arsenate-Lime Dust - - - - - - - - - - - - - - 1-1
21. Calcium Arsenate-Copper-Lime Dust - - - - - - - - - - 1-1-3
22. Calcium Arsenate-Zinc Sulphate-Lime Dust - - - - - - - 1-1-1
23. Copper-Lime Dust- 1-4
24. Dutox-Lime Dust - 1-3
25. Lime-Dust - Undiluted
26. Powdered Air Float Derris Root-Inert C Dust - - - - - - 1-7
27. Powdered Air Float Derris Root-Inert C Dust - - - - - - 1-3
28. A. Powdered Air Float Derris Root-Inert C Dust - - - - 1-7
29. B. Calcium Arsenate-Bordeaux Spray- - - - - - - - - - - 2-4-6-50
29. Calcium Arsenate-Pyrox Spray - - - - - - - - - - - - - 2-7-50
30. Check

ARRANGEMENT OF PLATS

South

	6	12	18	24	30	8	20	2	14	26	10	28	16	4	22	
	5	11	17	23	29	7	19	1	13	25	9	27	15	3	21	
	4	10	16	22	28	6	18	30	12	24	8	26	14	2	20	
East	3	9	15	21	27	5	17	29	11	23	7	25	13	1	19	West
	2	8	14	20	26	4	16	28	10	22	6	24	12	30	18	
	1	7	13	19	25	3	15	27	9	21	5	23	11	29	17	

North

Those plats receiving a mixture of Bordeaux and stomach poison are in a much better condition than the others.

1933 **PROGRAM** 1933

Eleventh Annual Potato Tour, Eastern Shore of Virginia, Thursday, June 15, 1933

Purpose: To bring about a better understanding among seed producers, dealers, farmers who grow Table Stock and Seed, and others interested in the Potato Industry; and to observe and study potato demonstrations and experiments.

Northern Section

9.00 a. m. Assemble at B. P. Peradee's Farm near Mona. Observe flea beetle control experiment. L. D. Anderson in charge.
9.45 a. m. Stop at D. F. Mason's plat, south of Oak Hall Post Office.
10.00 a. m. Stop at R. F. Mason's plat, south of Mappsville.

Southern Section

9.30 a. m. Assemble at J. L. Turner's source of seed plat, Painter, Va.
10.00 a. m. Stop at G. C. Bonniwell's plat, Pungoteague, Va.

10.30 a. m. Arrive at E. S. Experiment Station

EXPERIMENTS

Copper Nutritional Experiment - Commercial Fertilizer reinforced with fifty lbs. copper sulphate per ton. Planted 3/17/33.

Virus Disease Plat - Study of the effect of various virus diseases on several varieties and in different sections. Portions of the same seed planted at Onley are also planted in Mississippi and Florida. Planted 3/23/33.

Seed Source Plat - Planted and fertilized with Iron Age Potato Planter. Twenty-five different strains or sources of seed. Planted 3/23/33.

Seed Corn Maggot Control Experiment - Twenty-four rows. Comparison of fresh cut and suberized (cured) seed. Twelve rows on left treated with 200 lbs. of nitrate of soda per acre to aid decomposition of cover crop. Planted 3/17/33.

Lime Experiment - Open formula 7-6-5 fertilizer. Planted 3/13/33.

Six-row plats with the following kinds of lime applied January 23, 1932:

1. Warner's Hydrated Calcium Lime.
2. Warner's Dolomitic Lime.
3. Falling Spring Lime.
4. Keeling-Easton Cyster Shell Flour Lime.
5. Warner's Dolomitic Limestone, 100-mesh.
6. Warner's Calcium Limestone, 100-mesh.

Rate of application equivalent to 2000 pounds and 1000 pounds of calcium carbonate. Potatoes planted with New Iron Age Planter with spacer and fertilizer attachment. Fertilizer placed in bands 2 inches on each side of seed piece and on same level.

Fertilizer Placement Experiment with Irish Potatoes - U. S. D. A. Bureau of Chemistry and Soils cooperating. South Dakota Cobbler Seed. 6-6-5 and 12-12-10 fertilizers. Planted 5/14/35.

1. 4" band, 2" below seed.
2. In furrow, mixed with soil.
3. Bands two in. from each side and on same level as seed.
4. Bands two in. from each side and two in. below seed.
5. Bands four in. from each side and on same level as seed.
6. Bands one in. from each side and on same level as seed.
7. 4" band, 1" below seed.
8. Local method, 15-inch band on surface, cultivated in before planting.
9. No fertilizer.

Comparison of Commercial Brands of Fertilizer on Irish Potatoes - Eighty-five rows. First two rows of each brand applied in row regular method and cultivated in. Second two rows in bands two inches each side of seed piece and on same level.

12.15 p. m. DINNER SERVED BY LADIES OF THE ONLEY COMMUNITY LEAGUE: SOFT DRINKS, CANDY, ETC., FOR SALE BY ACCOMACK COUNTY 4-H CLUB MEMBERS

1.30 p. m. Short Program - Speakers: Dr. H. H. Zimmerley, Dir. Va. Truck Exp. Sta.
Dir. J. R. Hutcheson, V. P. I., Blacksburg, Va.
E. P. Crider, Secy. Fed. Land Bank, Baltimore.

Sources of Nitrogen and Potash Fertilizer Tests on Irish Potatoes, U.S.D.A., coop.

Strawberry Variety Tests - Attempts to secure varieties of superior quality.

Onion Experiments - Effect of lime and size of sets.

Sweet Potato Experiments - Triangulation fertilizer experiment - Plant treatment to control blue stem - Disease resistant varieties.

Fertilizer Placement Experiment on Lima Beans - Note effect on stand.

DEMONSTRATIONS

Irish Potato Packages

Soil Testing Demonstration

Spraying and Dusting Demonstration

EXHIBITS

Specimens of Irish Cobbler Seed used in Source of Seed Demonstration Plots.

Economic Insect Exhibits With Special Reference to the Mexican Bean Beetle and Japanese Beetle.

Potato Machinery Exhibit, Including Planters, Fertilizer Distributors, Sprayers, Dusters, Graders, Etc.

- - -

Attend: Worcester County, Maryland, Potato Tour and Field Day - June 16.
New Jersey Potato Growers' Meeting - June 17.

- - -

ASK QUESTIONS **COME AGAIN**

Exhibit C

13,644

Tomato Seed Source Demonstrations

Good seed is the basis of sound economical production. Efficient management cannot change a scrub calf into a thoroughbred bull. No more can efficient management secure high yields of quality tomatoes from low-grade, inferior seed.

In an effort to locate reliable sources of seed for tomato growers, seven source-of-seed plots were conducted in the Northern Neck of Virginia in 1932 as a part of the better seed program. The plots were supervised by the Extension Division and by the Virginia Truck Experiment Station. Since the plots were all located in the wilt area, only the Marglobe variety was used in this work. Marglobe seed from 14 different commercial concerns was all planted on the same date in the same plantbed and treated in the same manner. Plants were set in the plots on the same date and received the same field treatment. Records were made on trueness to type, resistance to disease, and yield. Although the records are for only one year, they should at least prove indicative of what may be expected. The summarized record on type and disease resistance for 6 plots follows:

SUMMARY TOMATO SEED SOURCE PLOTS 1932 - TYPE AND WILT STUDIES

Seedsman	No. of Plants Studied:	Type Studies: % Fruit On-Type	% Fruit Off-Type:	Wilt Studies: Marsh Plot % Wilt	English Plot % Wilt
Tait	270	86.3	13.7	36	6
Griffith & Turner	299	56.9	43.1	58	33
J. Manns Co.	287	80.2	19.8	38	8
Virginia Seed Service	302	84.4	15.6	37	8
T.W.Wood & Sons	293	82.9	17.1	47	7
Ferry Morse, No. 1	294	87.4	12.6	16	1
" " , No. 2	281	89.3	10.7	21	3
Campbell Soup Co.	277	80.5	19.5	18	1
Edgar Hurff	279	79.9	20.1	19	3
Stokes - Marglobe	268	77.2	22.8	19	16
" - Master Marglobe	386	81.3	18.7	11	4
Tri-State Packers	284	82.7	17.3	15	4
Wood's Special	31	83.9	16.1	x	x
Thos. M. Brown	243	89.3	10.7	4	x
Dean	46	91.3	8.7	x	x
Average		83.3	17.7	26.1	7.8

x - Did not occur in this plot

It is significant that trueness to type ranged from as high as 91.3% to as low as 56.9% with an average of 83.3%. Such a difference would mean considerable to the grower selling on grade. The percent off-type directly limits the percent of the fruit which would grade U.S.No.1 at the factory. Fruit showing 43% off-type could hardly be marketed profitably on a graded basis. Fruit showing less than 25% off-type certainly stands a better chance of returning a profit to the grower.

Wilt appeared in only two plots, the Marsh plot and the English plot. In the Marsh plot the wilt was evidently progressive from one side of the field to the other. The true picture of the wilt situation, therefore, is revealed in a study of the English plot. In this plot, wilt ranged from 1% to 33%, with an average infection of 7.8%. It can hardly be laid to coincidence that the strain showing the highest percent wilt also showed the highest percent off-type.

The keeping of yield records involved a considerable amount of labor and some expense. Records were kept, therefore, on only four plots, the summarized record of which follows:

SUMMARY TOMATO SEED SOURCE PLOTS 1932 - YIELD RECORD

Seedsman	Yield-Tons per Acre	Weight-Ounces per Fruit**
Tait*	6.42	4.4
Griffith & Turner	6.97	4.6
J. Manns Co.	7.51	4.3
Va. Seed Service	8.37	4.5
T.W.Wood & Sons	8.11	4.7
Ferry Morse, No. 1	7.84	4.8
" " , No. 2	8.33	4.7
Campbell Soup Co.	7.01	4.5
Edgar Hurff	7.78	4.4
Stokes - Marglobe	7.52	4.5
" - Master Marglobe	8.73	5.4
Tri-State Packers	7.58	5.0
Wood's Special**	6.04	4.2
Thos. M. Brown***	8.79	4.2
Average	7.64	4.6

* Yield influenced by position in plot - outside row.
**Record on 1 plot only. ***Occurred in only 3 plots.

Yields ranged from 6.04 tons per acre to 8.79 tons per acre, with an average yield of 7.64 tons per acre. The variation in yield between the lowest and highest strains was 2.75 tons. The variation in yield alone is more than the average yield for the state and represents $25.29 variation per acre due primarily to seed source. Value per acre at 1932 prices ranged from $55.57 to $80.86 with an average value of $70.29. Thus is the value of source of seed emphasized.

Records were kept on one plot on the weight of fruit. Average weight per fruit ranged from 4.2 ounces to 5.4 ounces. Although no striking correlation was noted between size of fruit and yield it is worth while to note that some such relation does apparently exist as will be observed from the following table:

Yield of Strain In Tons Per Acre	Average Weight in Ounces Per Fruit
6.51 to 7.50	4.3
7.51 to 8.50	4.6
8.51 to ----	4.7

All fruit was of fair size, however, and this year, at least, size played no important part. Regardless of the apparent correlation it is interesting to note that both the highest and the lowest yielding strains averaged 4.2 ounces per fruit as compared with 5.4 ounces for the second highest yielding strain and 4.6 ounces for the average of all strains.

The high correlation between type, disease resistance, and yield should be noted. Thus, if we except the Tait strain which was on the outer edge of the plot and the Wood's Special which was represented in only one plot, the five highest strains yielded 8.36 tons per acre and averaged only 14.6% off-type and 5.2% wilt while the five lowest strains yielded only 7.32 tons per acre and averaged 24.5% off-type and 12.4% wilt. The lowest yielding strain showed 43.1% off-type and 33% wilt and yielded 6.97 tons per acre as compared to 10.7% off-type, 4% wilt, and a yield of 8.79 tons per acre for highest yielding strain.

Thus is the value of good seed emphasized. Consult your county agent or write to the Vegetable Extension Service, Blacksburg, Virginia, relative to sources of outstanding seed.

Exhibit C'

13,653

1932 Tomato Seed Source Demonstrations - Virginia

Seven source-of-seed plots were conducted in the Northern Neck of Virginia in 1932 as a part of the better seed program. The plots were supervised by the Extension Division and by the Virginia Truck Experiment Station. Since the plots were all located in the wilt area, only the Marglobe variety was used in this work. Marglobe seed from 14 different commercial concerns was all planted on the same date in the same plantbed and treated in the same manner. Plants were set in the plots on the same date and received the same field treatment. Records were made on trueness to type, resistance to disease, and yield. The summarized record on type and disease resistance for 6 plots follows:

SUMMARY TOMATO SEED SOURCE PLOTS 1932 - TYPE AND WILT STUDIES

Seedsman	No. of Plants Studied:	Type Studies: % Fruit On-Type	% Fruit Off-Type	Wilt Studies: Marsh Plot % Wilt	English Plot % Wilt
Tait	270	86.3	13.7	36	6
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J. Manns Co.	287	80.2	19.8	38	8
Virginia Seed Service	302	84.4	15.6	37	8
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Ferry Morse, No. 1	294	87.4	12.6	16	1
" " , No. 2	281	89.3	10.7	21	3
Campbell Soup Co.	277	80.5	19.5	18	1
Edgar Hurff	279	79.9	20.1	19	3
Stokes - Marglobe	268	77.2	22.8	19	16
" - Master Marglobe	386	81.3	18.7	11	4
Tri-State Packers	284	82.7	17.3	15	4
Wood's Special	31	83.9	16.1	x	x
Thos. M. Brown	243	89.3	10.7	4	x
Dean	46	91.3	8.7	x	x
Average		83.3	17.7	26.1	7.8

x - Did not occur in this plot

Trueness to type ranged from as high as 91.3% to as low as 56.9% with an average of 83.3%. Such a difference would mean considerable to the grower selling on grade. The percent off-type directly limits the percent of the fruit which would grade U.S. No. 1 at the factory. Fruit showing a large percent off-type could hardly be marketed profitably on a graded basis. Fruit showing less than 25% off-type certainly stands a better chance of returning a profit to the grower.

Wilt appeared in only two plots, the Marsh plot and the English plot. In the Marsh plot the wilt was evidently progressive from one side of the field to the other. The true picture of the wilt situation, therefore, is revealed in a study of the English plot. In this plot, wilt ranged from 1% to 33%, with an average infection of 7.8%.

The keeping of yield records involved a considerable amount of labor and some expense. Records were kept, therefore, on only four plots, the summarized record of which follows:

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T. W. Wood & Sons	8.11	4.7
Ferry Morse, No. 1	7.84	4.8
" " , No. 2	8.33	4.7
Campbell Soup Co.	7.01	4.5
Edgar Hurff	7.78	4.4
Stokes - Marglobe	7.52	4.5
" - Master Marglobe	8.73	5.4
Tri-State Packers	7.58	5.0
Wood's Special**	6.04	4.2
Thos. M. Brown***	8.79	4.2
Average	7.64	4.6

* Yield influenced by position in plot - outside row.
** Record on 1 plot only. ***Occurred in only 3 plots.

Yields ranged from 6.04 tons per acre to 8.79 tons per acre, with an average yield of 7.64 tons per acre. The variation in yield between the lowest and highest strains was 2.75 tons. The variation in yield alone is more than the average yield for the state and represents $25.29 variation per acre due primarily to seed source. Value per acre at 1932 prices ranged from $55.57 to $80.86 with an average value of $70.29.

Records were kept on one plot on the weight of fruit. Average weight per fruit ranged from 4.2 ounces to 5.4 ounces. Although no striking correlation was noted between size of fruit and yield, it is worth while to note that some such relation does apparently exist as will be observed from the following table:

Yield of Strain In Tons Per Acre	Average Weight in Ounces Per Fruit
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8.51 to ----	4.7

All fruit was of fair size, however, and this year, at least, size played no important part. Regardless of the apparent correlation it is interesting to note that both the highest and the lowest yielding strains averaged 4.2 ounces per fruit as compared with 5.4 ounces for the second highest yielding strain and 4.6 for the average of all strains.

The high correlation between type, disease resistance, and yield should be noted. Thus, if we except the Tait strain which was on the outer edge of the plot and the Wood's Special which was represented in only one plot, the five highest strains yielded 8.36 tons per acre and averaged only 14.6% off-type and 5.2% wilt while the five lowest strains yielded only 7.32 tons per acre and averaged 24.5% off-type and 12.4% wilt.

Exhibit C"

13,702 COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va.A.& M.College & Poly.Inst.& U.S.D.A.Cooperating
EXTENSION SERVICE

Dear Canner and Tomato Grower:

Good seed is the basis of sound economical production. Efficient management cannot change a scrub calf into a thoroughbred bull. No more can efficient management secure high yields of quality tomatoes from low-grade, inferior seed.

In an effort to locate reliable sources of seed for tomato growers, seven source-of-seed plots were conducted in the Northern Neck of Virginia in 1932 as a part of the better seed program. The plots were supervised by the Extension Division and by the Virginia Truck Experiment Station. Since the plots were all located in the wilt area, only the Marglobe variety was used in this work. Marglobe seed from 14 different commercial concerns was all planted on the same date in the same plantbed and treated in the same manner. Plants were set in the plots on the same date and received the same field treatment. Records were made on trueness to type, resistance to disease, and yield. Although the records are for only one year, they should at least prove indicative of what may be expected. The summarized record on type and disease resistance for 6 plots follows; and yield records for 4 plots.

SUMMARY TOMATO SEED SOURCE PLOTS 1932 - TYPE AND WILT STUDIES

Seedsman	No. of Plants Studied	Type Studies: % Fruit On-Type	% Fruit Off-Type	Wilt Studies: Marsh Plot %Wilt	English Plot %Wilt	Yield-Tons Per Acre
1	270	86.3	13.7	36	6	6.42*
2	299	56.9	43.1	58	33	6.97
3	287	80.2	19.8	38	8	7.51
4	302	84.4	15.6	37	8	8.37
5	293	82.9	17.1	47	7	8.11
6	294	87.4	12.6	16	1	7.84
7	281	89.3	10.7	21	3	8.33
8	277	80.5	19.5	18	1	7.01
9	279	79.9	20.1	19	3	7.78
10	288	77.2	22.8	19	16	7.52
11	386	81.3	18.7	11	4	8.73
12	284	82.7	17.3	15	4	7.58
13	31	83.9	16.1	x	x	6.04**
14	243	89.3	10.7	4	x	8.79***
15	46	91.3	8.7	x	x	
Average		83.3	17.7	26.1	7.8	7.64

* Yield influenced by position in plot - outside row
**Record on 1 plot only ***Record on 3 plots only
x - Did not occur in this plot

It is significant that trueness to type ranged from as high as 91.3% to as low as 56.9% with an average of 83.3%. Such a difference would mean considerable to the grower selling on grade. The percent off-type directly limits the percent of the fruit which would grade U. S. No. 1 at the factory. Fruit showing 43% off-type could hardly be marketed profitably on a graded basis. Fruit showing less than 25% off-type certainly stands a better chance of returning a profit to the grower.

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The keeping of yield records involved a considerable amount of labor and some expense. Records were kept, therefore, on only four plots. Yields ranged from 6.04 tons to 8.79 tons per acre, with an average yield of 7.64 tons per acre. The variation in yield between the lowest and highest strains was 2.75 tons. The variation in yield alone is more than the average yield for the state and represents $25.29 variation per acre due primarily to seed source. Value per acre at 1952 prices ranged from $55.57 to $80.86 with an average value of $70.29.

The high correlation between type, disease resistance, and yield should be noted. Thus, if we except strain No. 1 which was on the outer edge of the plot and the strain No. 13 which was represented in only one plot, the five highest strains yielded 8.36 tons per acre and averaged only 14.8% off-type and 5.2% wilt while the five lowest strains yielded only 7.32 tons per acre and averaged 24.5% off-type and 12.4% wilt. The lowest yielding strain showed 43.1% off-type and 33% wilt and yielded 6.97 tons per acre as compared to 10.7% off-type, 4% wilt, and a yield of 8.79 tons per acre for highest yielding strain.

Thus is the value of good seed emphasized. Consult your county in regard to sources of outstanding seed.

County Agent

Exhibit D

PROGRAM

NORTHERN NECK TOMATO TOUR

August 30 - 31, 1933

Virginia Truck Experiment Station

and

Virginia Agricultural Extension Service Cooperating

Exhibit D

WESTMORELAND COUNTY
Wednesday, August 30, 1933

9:30 Tomato Seed Source Demonstration, located on farm of Joseph Onohundro, Maple Grove (near Potomac Beach)

10:30 Tomato Seed Source Demonstration on farm of E. T. Hynson, Leedstown

12:00 Noon - Lunch at Wakefield

2:00 Tomato Seed Source Demonstration on farm of E. A. Smith Templemans Cross Roads (planted late)

2:45 Tomato Seed Source Demonstration on farm of L. B. Minor, Templemans CrossRoads (on highway from Templemans to Mt. Holly)

4:00 Tomato Seed Source Demonstration on farm of L. W. English, Acorn

LANCASTER COUNTY
Thursday, August 31, 1933

9:00 Assemble at Lively. Visit R. H. Haynie's and other tomato growers

10:30 Ray P. Carter's farm, Kilmarnock

11.00 W. E. Currell's farm, comparison of Stone and Marglobe varieties

12:00 Seed Source Demonstration on farm of Carter Chase, White Stone

1:00 Lunch - Kilmarnock

2:00 Speaking - Dr. H. H. Zimmerley, Director Virginia Truck Experiment Station

3:30 Adjournment

Hotel Accommodations: Guests attending the tour can secure accommodations for Tuesday night, August 29, at Fredericksburg, Colonial Beach, Warsaw or Tappahannock, at reasonable prices. Tourist homes are also available. Accommodations for Wednesday night, August 30, may be had at Warsaw, Kilmarnock, White Stone or Irvington.

WRITE COUNTY AGENT S. J. DAWSON, MONTROSS, VA., OR COUNTY AGENT C. CARTER CHASE, WHITE STONE, VA., FOR HOTEL ACCOMMODATIONS, INFORMATION, ETC.

EXHIBIT 2

13,184 TOMATO CROP RECORD - 1933

Grower_____ Post Office_____ Acreage_____

Variety_____

Source of Seed_____ Cost_____

Seed Bed Management

Date of Seeding_____ Method: Hand_____ Seeder_____ Stand_____

Fertilization: Material_____ How Applied_____ When Applied_____

Manure: Kind_____ Amount_____ When Applied_____

Cultivation: Hand_____ Cultivator_____ No. of Times_____

Pest Control: Sprayed_____ Dusted_____ No. of Times_____

Materials_____ Thinned: Yes_____ No_____

Field Management

Type of Soil_____ When Plowed_____ Replowed_____

Soil Preparation: Times Harrowed: Disc_____ Spike_____ Spring_____ 5 Tooth___

Manure: Kind_____ Amount_____ When Applied_____ How Applied_____

Cover Crop: Kind_____ Growth: Poor_____ Medium_____ Good_____

Disced before Turning: Yes_____ No_____

Crop Rotation: 1930_____ 1931_____ 1932_____ 1933_____

Fertilization: Materials_____ Amt. per Acre_____ When Applied_____

How Applied: Hand_____ Drill_____ In Row_____ Broadcast_____

Single Application_____ Split Applications_____

Sidedressing: Material_____ State of Growth Applied_____

Planting: Date_____ Hand_____ Machine_____

Replants: Times_____ Dates_____ Per Cent_____ Final Stand_____

Cultivation: Level_____ Ridge_____ Sided Off: Yes_____ No_____

Times_____ Method_____ Deep_____ Shallow_____

Pest Control:_____

_____

_____

Harvesting: Date Started_____ Date Completed_____

Yield (5/8 basket): Total_____ Per Acre_____

Distribution: U.S.No.1_____ U.S.No.2_____ Culls_____

Marketing: On Grade_____ Contract_____ Price_____

Remarks:_____

_____

_____

_____

Costs and Returns Per Acre on Tomatoes - Crop Season of 1932 on 63 Virginia and 21 Westmoreland County Farms

	State (1) (63 farms)		Westmoreland County (21 Farms		Westmoreland County (5 High Farms)		Westmoreland County (5 Middle Farms)		Westmoreland County (5 Low Farms)	
	Amount	Value	Amount	Value	Amount	Value	Amount	Value	Amount	Value
Use of Land		3.20		2.99		4.30		2.69		2.56
Manure		2.68		3.80		5.51		2.84		2.02
Fertilizer	634 lbs.	7.27	518 lbs.	5.16	520 lbs.	6.35	678 lbs.	5.97	482 lbs.	5.00
Lime		.02		.04		-		.09		.06
Seed		.79		.84		.91		1.12		.14
Plants		.38		.51		.17		.11		1.44
Spray and Dust		.17		.19		.23		.30		.08
Man Labor	62.2 hrs.	6.51	63.7 hrs.	7.04	99.1 hrs.	10.80	40.8 hrs.	4.69	62.0 hrs.	7.62
Horse Work	52.8 hrs.	3.99	56.2 hrs.	4.32	78.3 hrs.	6.06	43.8 hrs.	3.15	54.3 hrs.	4.40
Truck Use		.17		.14		.58		.14		-
Tractor Use		.37		.36		-		1.00		.17
Equipment Use		.50		.50		.50		.50		.50
Contract Picking		4.55		3.41		1.74		5.54		2.69
Contract Hauling		2.62		1.61		1.74		1.78		1.22
Interest		.36		.35		.47		.30		.31
Grand Total Cost		33.56		31.28		39.36		30.22		27.85
Plants Sold		1.07		1.47		2.54		2.94		-
Net Cost		32.49		29.81		36.82		27.28		27.85
Tomatoes Sold	308 Bskts.	41.01	326 Bskts.	39.63	578 Bskts.	74.92	307 Bskts.	34.52	205 Bskts.	23.91
Profit Per Acre		8.52		9.82		38.10		7.24		-3.94
Acres Per Farm	3.58		4.4		2.95		5.38		4.4	
Yield Per A.(Bskts)(2)	308		326		578		307		205	
Cost Per Basket		10.55¢		9.14¢		6.37¢		8.89¢		13.56¢
Value Per Basket		13.32¢		12.14¢		12.96¢		11.26¢		11.64¢
Profit Per Basket		2.77¢		3.00¢		6.59¢		2.36¢		-1.92¢
R.P.H.M.L. (3)		.242		.270		.494		.292		- .054
% No. 1's	55.41		41.64		45.27		30.28		-	
% No. 2's	39.96		56.85		53.29		68.00		-	
% Culls	4.63		1.51		1.44		1.72		-	

Note: (1) The figures in the above table were secured from records kept by 21 Westmoreland and 42 Lancaster County farmers in 1932.
(2) Yield per acre is given in terms of baskets - where tomatoes were sold on grade 30 pounds was considered a basket.
(3) R. P. H. M. L. = Returns per hour of man labor.

Exhibit F

11,487

Exhibit G

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A & M. College & Poly. Inst. & U.S.D.A. Cooperating
EXTENSION DIVISION

THE HOME GARDEN

1932-33

Project Outline - For Women's Home Demonstration Clubs -

- - - -

1. PLANNING THE HOME GARDEN
Value of the home garden, size, what, when, and how much to plant, utilization of space, succession crops, arrangement, distance between rows, importance of good seed.

2. PLANNING THE HOME GARDEN EQUIPMENT - GARDEN RECORDS
Gardening as work or pleasure, hand tools, advantages of wheel hoe, sprayers and dusters. Keeping the garden record book.

3. FEEDING THE GARDEN - PEST CONTROL
Food requirements of vegetables, functions of various fertilizing elements, essentials of a good garden fertilizer, time, amount, and method of application Principal garden insects, type of injury, method of control, common diseases of the home garden and their control.

4. PLANTING THE HOME GARDEN
The soil, the home of the vegetable, soil preparation, time and depth of planting, purpose of "firming soil", growing young plants, transplanting.

5. WEEDS OR VEGETABLES - MARKETING OF SURPLUS VEGETABLES
Relation of vegetable growth to water supply, weeds as robbers, how cultivation thwarts this constant robbery, artificial mulches, lazy man's mulch, paper mulch, etc., grading vegetables, attractive bunching, packages, etc.

6. PLANNING AND PLANTING THE FALL GARDEN
Winter food requirement of the family, varieties, time and method of planting securing good germination, transplanting.

7. CARE OF THE FALL GARDEN
Cultivation, fertilization, watering, pest control, marketing, etc.

8. SELECTING FAIR EXHIBITS
Why exhibit? What to exhibit, uniformity in size, color, shape, maturity, etc., sportsmanship in exhibiting.

9. STORAGE OF GARDEN PRODUCTS
Essentials of good storage, methods of storage, adaptability of type of storage to individual conditions, storage methods for particular vegetables.

10. GARDEN CLEAN-UP - CHECK-UP ON RECORD BOOKS
Pride in appearance, aid in controlling insect pests, diseases which live over in the garden, complete record books.

11. WINTER CARE OF THE HOME GARDEN
Manure and lime on the garden, fall and winter plowing, hotbed and coldframe construction and repair.

12. GENERAL MEETING OF ALL CLUB MEMBERS
Discussion of failures and successes during the past year, awarding of prizes if any, plans for the coming year.

Exhibit H

13,589 COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A. & M. College & Poly. Inst. & U.S.D.A .Cooperating
EXTENSION SERVICE

REGULATIONS AND SUGGESTIONS FOR LOULOUN COUNTY GARDEN CONTEST

Size of Garden It is suggested that the minimum size requirement for this garden be 1/8 of an acre, and the maximum size 1/2 of an acre.

Location The garden should be located on fertile, well drained soil and, if possible, with a southern or southeastern exposure. Above all, the garden should be conveniently located to the house.

Plan of the Garden A suggestive garden plan for a family of five is attached. It will help you determine your plan.

Selection of Vegetables Vegetables are roughly divided into three groups, (1) leafy; (2) root; (3) fruit. The contest garden must contain at least 5 vegetables from each group in sufficient amount to supply an abundance of fresh, canned or stored food throughout each month of the year. For your convenience, a few of the more common vegetables in each class are listed below:

Green or Leafy Vegetables	Root Vegetables	Fruit Vegetables
Lettuce	Carrots	Tomatoes
Spinach	Beets	String Beans
Kale	Turnips	Lima Beans
Mustard	Salsify	Peas
Collards	Parsnips	Corn
Endive	Radishes	Peppers
Turnip Salad	Potatoes	Squash
Broccoli	Sweet Potatoes	Pumpkins
Cabbage	Onions	Okra
Celery	Rutabagas	Cucumbers
Asparagus		
Swiss Chard		

Fertilization One of the best methods of fertilizing the home garden is the application of farm pen manure. It is recommended that an application of from 10 to 20 tons per acre be applied before plowing. If available, it is also recommended that from 600 to 1000 pounds per acre of a 5-8-5 or other good garden fertilizer be applied.

Cultivation The garden should be kept free from weeds at all times. Frequent shallow cultivation should be practiced to prevent injury to the root systems.

Pest Control Early plowing, a thorough clean up, crop rotation (within the garden) and hand picking will help much in the control of pests. In addition, it may be necessary to spray or dust to control certain pests. Further information on this subject may be obtained from your county agent.

Record A simple garden record must be kept on the attached forms.

Prizes The garden will be scored in June and September. Prizes will be awarded on the basis of the attached score card. It is far more important to produce an adequate supply of vegetables for family use than to win a prize.

13,690

GARDEN SCORE CARD

County _____ Community _____ 1933

Name _____ Address _____

	Perfect Score	Spring Score	Fall Score
Location	10	____	____
Arrangement	5	____	____
Adequate Supply for Family Needs	25	____	____
Selection	25	____	____
Cultivation	15	____	____
Pest Control	15	____	____
Record	5	____	____
Total Score	100		

Average or Final Score _____

Remarks: _____

Exhibit I

Exhibit J

VEGETABLE CHART

B-263 Revised June, 1939

Vegetable Garden Suggestions for Virginia Farmers

L. B. DIETRICK
Vegetable Gardening Specialist

Virginia Agricultural and Mechanical College and Polytechnic Institute
and the United States Department of Agriculture, Cooperating.
Extension Division, Jno. R. Hutcheson, Director.
Blacksburg, Virginia

VEGETABLE CHART—Continued

Vegetable	*Variety*	*Seed for 100 feet of row*	*Planting time*	*Distance between rows*		*Distance between plants in row*	*Yield per 100 feet of row*
				Horse cultivation	*Hand cultivation*		
Parsnips	Guernsey	½ to 1 oz.	March and April	2½—3 ft.	1—1½ ft.	4—5 in.	1 to 2 bushels
Peas	Thomas Laxton Laxtonian Telephone (Late)	1 to 2 lbs.	February to May	3 ft.	2—2½ ft.	1—3 in.	1 bushel
Peppers	Ruby King California Wonder	66 plants	May	3 ft.	2—2½ ft.	18 in.	25 to 50 dozen
Potatoes	Irish Cobbler (Early) Green Mountain (Late)	½ peck	March to May	3 ft.	2½ ft.	12 in.	1 to 1½ bushels
Pumpkin	Virginia Mammoth Cashaw	½ oz.	May	6 ft.	4 ft.	48 in.	3 to 5 dozen
Radish	Scarlet Globe Icicle Celestial (Winter Radish)	1 oz.	March to May August and September	2—3 ft.	1—1½ ft.	2—3 in.	30 to 50 dozen
Rhubarb	Victoria	25 to 35 roots	March and April October and November	4 ft.	4 ft.	36—48 in.	100 bunches (100 to 150 pounds)
Salsify	Sandwich Island	2 oz.	April and May	2½—3 ft.	1—1½ ft.	4—5 in.	1 to 1½ bushels
Spinach	Virginia Savoy (Blight Resistant) Long Standing Bloomsdale Savoy	1 to 2 oz.	March and April August and September	2—3 ft.	1½—2 ft.	4—8 in.	1½ bushels
Spinach (Summer)	New Zealand	1 to 2 oz.	April and May	2—3 ft.	1½—2 ft.	4—8 in.	3 to 5 bushels
Squash (Summer)	White Bush Cocozelle Yellow Straight Neck	½ oz.	April to June	5 ft.	3—5 ft.	36—60 in.	6 to 8 dozen
Squash (Winter)	Hubbard	1 oz.	April and May	5 ft.	3—5 ft.	36—60 in.	3 to 5 dozen
Sweet Potato	Porto Rico Nancy Hall	66 to 100 plants	May and June	3—4 ft.	3 ft.	12—18 in.	1 bushel
Swiss Chard	Lucullus	2 oz.	March and April	3 ft.	2 ft.	6—8 in.	3 to 5 bushels
Tomato	Early—Bonny Best Globe Late—Brimmer Marglobe (Wilt Resistant)	33 to 50 plants	May and June July	4 ft.	2½—3 ft.	24—36 in.	6 bushels
Turnips	Purple Top White Globe Yellow Aberdeen	1 oz.	March and August	3 ft.	2—2½ ft.	4—6 in.	2 to 3 bushels
Turnip Salad	Seven Top Pomeranian White Globe	1 oz.	March and August	3 ft.	2—2½ ft.	4—6 in.	3 to 5 bushels
Watermelon	Stone Mountain Kleckley Sweet	½ oz.	May and June	6 ft.	4—5 ft.	36—72 in.	2 to 5 dozen

The planting dates in the above chart are for average Virginia conditions. In Eastern Virginia, planting may begin one week to two weeks earlier than the date given on the chart. In Western Virginia, planting should be delayed one to two weeks for the planting of spring vegetables, and advanced one to two weeks for the fall planting of vegetables.

Additional garden information may be obtained upon request from the Vegetable Extension Service, Blacksburg, Virginia.

SUGGESTIVE GARDEN PLAN FOR VIRGINIA FARMERS

(100 x 200 ft. = approximately ⅛ acre)

Distance Between Rows

6 ft.	Hot bed 6 ft. x 6 ft.	Cold frame 6 ft. x 6 ft.	4 ft. Asparagus 120 ft.				Rhubarb 60 ft.		4 ft.
6 ft.			4 ft. Potato Onions 180 ft.						4 ft.
5 ft.	Parsnips 200 ft.								3 ft.
3 ft.	Carrots 100 ft.				Salsify 100 ft.				3 ft.
3 ft.	Swiss Chard 100 ft.				Spring Kale 100 ft.				3 ft.
3 ft.	Lettuce 100 ft.		Followed by Fall Beets 100 ft.		Spinach 100 ft.		Followed by Fall Radishes 100 ft.		3 ft.
3 ft.	Radishes 100 ft.		Followed by Fall Spinach 100 ft.		Beets 100 ft.		Followed by Fall Lettuce 100 ft.		3 ft.
3 ft.	Onion sets 200 ft.				Followed by Fall Spinach 200 ft.				3 ft.
3 ft.	Onion sets 200 ft.				Followed by Late Cabbage 200 ft.				3 ft.
3 ft.	Onion sets 200 ft.				Followed by Fall Snap Beans 200 ft.				3 ft.
3 ft.	Early Cabbage 200 ft.				Followed by Fall Snap Beans 200 ft.				3 ft.
3 ft.	Peas 200 ft.				Followed by Fall Kale 200 ft.				3 ft.
3 ft.	Peas 200 ft.				Followed by Fall Kale 200 ft.				3 ft.
3 ft.	Peas 200 ft.				Followed by Fall Carrots 200 ft.				3 ft.
3 ft.	Snap Beans 200 ft.				Followed by Fall Celery 200 ft.				3 ft.
3 ft.	Snap Beans 200 ft.				Followed by Turnip Salad 200 ft.				3 ft.
3 ft.	Early Tomatoes 200 ft.				Followed by Turnips 200 ft.				3 ft.
3 ft.	Early Potatoes 200 ft.				Followed by Turnips 200 ft.				3 ft.
3 ft.	Early Potatoes 200 ft.				Followed by Turnips 200 ft.				3 ft.
3 ft.	Late Potatoes 200 ft.								3 ft.
3 ft.	Late Potatoes 200 ft.								3 ft.
3 ft.	Late Tomatoes 100 ft.				Eggplant 50 ft.		Peppers 50 ft.		3 ft.
3 ft.	Lima Beans 200 ft.								3 ft.
3 ft.	Lima Beans 200 ft.								3 ft.
3 ft.	Sweet Potatoes 200 ft.								3 ft.
3 ft.	Sweet Potatoes 200 ft.								3 ft.
5 ft.	Cucumbers 50 ft.		Muskmelons 50 ft.		Summer Squash 50 ft.		Watermelons 50 ft.		5 ft.
5 ft.	Sweet Corn 200 ft.								5 ft.
3 ft.	Sweet Corn 200 ft.		Pumpkins planted in corn				Winter Squash planted in corn		3 ft.
3 ft.	Sweet Corn 200 ft.								3 ft.
4 ft.									4 ft.

Distance Between Rows

The above plan is only suggestive. It will not entirely suit your needs. It should be of value to you, however, by helping you to definitely plan your own garden. With a definite plan, intelligently thought out, you have gone a long way toward having a successful garden.

Further essentials are (1) Locate the garden on fertile, well-drained soil, convenient to the house. (2) Plow as early as possible, preferably in the fall. (3) Plant only good seed. (4) Apply manure annually at the rate of from 20 to 30 tons per acre. (5) Use plenty of fertilizer. General recommendations are 1,000 pounds of 5-8-5 per acre. (6) Practice frequent shallow cultivation. (7) Follow a thorough pest control program. For information on this subject see Farmers Bulletin 1371, Diseases and Insects of Garden Vegetables.

VEGETABLE CHART

Vegetable	*Variety*	*Seed for 100 feet of row*	*Planting time*	*Distance between rows*		*Distance between plants in row*	*Yield per 100 feet of row*
				Horse cultivation	*Hand cultivation*		
Asparagus	Mary Washington	66 to 80 roots	February and March, or October and November	4—5 ft.	3—4 ft.	15—18 in.	50 bunches (100 pounds)
Beans, Bush[†]	Stringless Green Pod Bountiful Hodson Wax Pencil Pod Black Wax	1 to 2 lbs.	April to August	3 ft.	2 ft.	3—6 in.	1 to 2 bushels
Beans, Lima	Fordhook (Large Seeded) Prolific (Small Seeded) Henderson Bush (Small Seeded)	1 lb.	May	3—3½ ft.	2—2½ ft.	12—18 in.	1½ bushels
Beets	Crosby's Egyptian Detroit	2 oz.	March to August	2½—3 ft.	1—1½ ft.	4—6 in.	3 bushels
Cabbage	Early—Charleston Wakefield Jersey Wakefield Copenhagen Market Medium—All Seasons Late—Late Flat Dutch Danish Ballhead Wisconsin All Seasons[†]	66 to 80 plants	March and April (Late) July	3 ft.	2 ft.	15—18 in.	100 to 150 pounds
Carrots	Chantenay	1 oz.	March to July	2½—3 ft.	1—1½ ft.	3—4 in.	1 to 2 bushels
Cauliflower	Early Snowball	66 to 80 plants	Set plants in April and July	3 ft.	2—2½ ft.	15—18 in.	3 to 6 dozen heads
Celery	Easy Blanching Winter Queen	120 to 150 plants	Set plants in July	3 ft.	1½—2 ft.	8—10 in.	100 stalks
Corn	Golden Bantam Howling Mob Stowell's Evergreen Country Gentleman	¼ to ½ lb.	April to July	3 ft.	2—2½ ft.	10—15 in.	6 to 8 dozen ears
Cucumber	Arlington White Spine Long Green	½ oz.	May and June	5 ft.	3—4 ft.	36—48 in.	30 dozen
Eggplant	Black Beauty	50 plants	May and June	3 ft.	2—2½ ft.	24 in.	12 dozen
Kale (Spring)	Hanover Salad	1 to 2 oz.	March to May	3 ft.	1½—2 ft.	8—10 in.	150 pounds
Kale	Dwarf Blue Curled Scotch Siberian	1 to 2 oz.	March, August and September	3 ft.	1½—2 ft.	12—18 in.	150 pounds
Lettuce	Grand Rapids (Leaf) New York (Head) Big Boston (Head)	¼ oz.	March to May August	2—3 ft.	1½ ft.	8—10 in.	10 to 12 dozen heads
Muskmelon	Hearts of Gold Hale's Best	1 oz.	April and May	5 ft.	3—4 ft.	36—48 in.	6 to 12 dozen
Mustard	Fordhook Japanese Spinach Mustard[†]	1 oz.	March and April August	2—3 ft.	1—1½ ft.	4—6 in.	3 to 5 bushels
Okra	Perkin's Mammoth	1 oz.	May and June	3 ft.	2—2½ ft.	18—24 in.	1 to 3 bushels
Onions	Japanese or Ebenezer Southport Yellow Globe	1 to 2 lbs.	March and April	2—3 ft.	1—1½ ft.	3—4 in.	1 bushel
Winter Onions	Potato	2 to 3 lbs.	Sept., Oct., and Nov.	3 ft.	1½—2 ft.	4—6 in.	1 bushel

[†]Yellows Resistant. [†]Heat Resistant.

Exhibit K

15,712 COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A. & M. College & Poly. Inst. & U.S.D.A. Cooperating
EXTENSION SERVICE

THE VEGETABLE SEED ORDER

Vegetables for One Person for One Year

Prepared by Vegetable Extension Service, Blacksburg, Va.

Vegetable	Variety	Feet of Row	Amount of Seed		
Beans, Snap	Stringless Green Pod	100	1 lb.	*	S
Beets	Crosby's Egyptian	25	½ oz.	***	S
Cabbage, early	Jersey or Charleston Wakefield	15	1/10 pkt.		
Cabbage, late	Late Flat Dutch or Danish Ballhead	50	1/5 pkt.	**	
Carrots	Chantenay	50	½ oz.	***	S
Corn	Golden Bantam & Country Gentleman	100	3/8 lb.	*	S
Cucumber	Early Fortune	2-3 hills	1/5 pkt.	*	
Kale	Dwarf Blue Curled Scotch	35	1/3 oz.		
Lettuce	Grand Rapids (leaf) or	15	1/5 pkt.		
	Big Boston (head)	8	1/10 pkt.		
Onion Sets	Ebenezer or Yellow Globe	40	2/5 lb.	**	
Parsnips	Guernsey	25	1/5 oz.	**	
Peas	World's Record & Thomas Laxton	60	3/5 lb.	*	S
Potatoes, early	Irish Cobbler	50	¼ pk.	**	
Potatoes, late	Green Mountain	100	½ pk.	**	
Pumpkin	Virginia Mammoth and Cashaw	2-3 hills	1/5 pkt. each	***	
Salsify	Sandwich Island	15	1/5 oz.	**	
Spinach	Longstanding Bloomsdale Savoy or				
	Virginia Savoy (blight resistant)	50	1 oz.	*	S
Squash	White Bush and Yellow Crookneck	2-4 hills	1/5 pkt. each		
Sweet Potatoes	Nancy Hall and Porto Rico	100	100 plants	**	
Swiss Chard	Lucullus	10	1/5 pkt.		
Tomatoes	Bonny Best and		1/5 pkt.	*	
	Marglobe or Brimmer	35	1/5 pkt.	*	
Turnips	Purple Top White Globe	40	2/5 oz.	**	S
Turnip Salad	Pomeranian White Globe	25	½ oz.	*	S
Asparagus	Mary Washington	15	10 roots	*	
Beans, Lima	Fordhook (large) or Prolific (small)	75	¾ lb.	*	
Cantaloupes	Hearts of Gold or Bottomley	2-3 hills	1/10 pkt.		
Celery	Easy Blanching or Golden Plume	15	1/10 pkt.	**	
Eggplant	Black Beauty	5	1/10 pkt.		
Kale, spring	Plain	10	1/5 pkt.	*	
Mustard	Southern Curled or Spinach Mustard	20	1/5 oz.		
Okra	Perkins Mammoth	10	1/10 pkt.	*	
Peppers	Ruby King	6	1/10 pkt.	*	
Radish	Scarlet Globe	15	1/3 pkt.		
Rhubarb	Myatt's Victoria	8	3 crowns	*	
Watermelon	Kleckley Sweet or Stone Mountain	2-3 hills	1/10 pkt.		

It is suggested that all the vegetables above the dotted line be included in your garden. Those below the line may be included if desired. Multiply any figure by the number in your family to determine the necessary amount for your garden.

Several plantings should be made of those crops marked with an "S". Thus, the 100 feet of beans should not all be planted at one time, but three or more plantings should be made.

The amount of space required for the vegetables listed above the dotted line will be from 20 to 30 feet wide and 100 feet long, depending on whether hand or horse cultivation is used. This space may be reduced considerably by using portions of the garden to produce two or more crops in succession.

* Part to be canned. ** Part to be stored. *** Part to be canned and stored.

Consult your county agent, county home demonstration agent, or write to the Vegetable Extension Service, Blacksburg, Va., for garden plans and additional information on the home garden.

Exhibit L

13,713 COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A. & M. College & Poly.Inst. & U.S.D.A.Cooperating
EXTENSION SERVICE

SUGGESTED GARDEN PLAN FOR FAMILY OF THREE

Ft.of Row	Vegetable	Variety	Seed Required	Planting Date
75	Parsnip	Guernsey	1 oz.	Mar. and Apr.
50	Salsify	Sandwich Island	1 oz.	Apr. and May
25	Swiss Chard	Lucullus	1 pkt.	Mar.,Apr. and May
150	Carrot	Chantenay	1/2 oz.	Mar.,Apr. and May
75	Beet	Crosby's Egyptian	1/2 oz.	Mar.,Apr. and May
75	Spinach	Long St.Bloomsdale Savoy or:		
		Va.Savoy (Blight Resistant)	1/2 oz.	Mar. and Apr.
175	Peas	World's Record	3/5 lb.	
		Thomas Laxton	1-1/5 lb.	Feb. to May
120	Onion Sets	Ebenezer or Yellow Globe	1-1/5 lb.	Mar. and Apr.
25	Lettuce	Grand Rapids (Leaf) or	1/2 pkt.	Mar.,Apr. and May
		Big Boston (Head)	1/2 pkt.	Mar. and Apr.
50	Cabbage,early	Jersey, or		Set plants Mar.
		Charleston Wakefield	1 pkt.	and April
200	Snap Beans	Stringless Green Pod	2 lb.	Apr. and May
100	Kale	Dwarf Blue Curled Scotch	1 oz.	Mar. and Apr.
150	Potatoes,early	Irish Cobbler	2/3 pk.	Mar. and Apr.
300	Potatoes,late	Green Mountain	1 1/2 pk.	Mar. and Apr.
100	Tomatoes	Bonny Best	1 pkt.	Set plants
		Brimmer or Marglobe	1 pkt.	after frost
300	Sweet Potatoes	Nancy Hall and Porto Rico	300 plants	Set plants May & June
300	Corn	Golden Bantam	1/2 lb.	Apr.,May and June
		Country Gentleman	1/2 lb.	Apr.,May and June
In Corn	Pumpkin	Virginia Mammoth	1 pkt.	May
		Cushaw	1 pkt.	May
6-12 Hills	Squash	White Bush	1 pkt.	Apr. and May
		Yellow Crookneck	1 pkt.	Apr. and May
6-9 Hills	Cucumber	Early Fortune	1 pkt.	May

SUCCESSION CROPS

100	Beans	Stringless Green Pod	1 lb.	July 15-Aug.15
				after onions
150	Cabbage	Late Flat Dutch or		Set plants in July
		Danish Ballhead	1 pkt.	after peas
25	Lettuce	Grand Rapids (Leaf)	1/2 pkt.	July 15-Sept.1
				after spinach
75	Spinach	Long St.Bloomsdale Savoy or:		Aug.15-Sept.15
		Va.Savoy (Blight Resistant)	1/2 oz.	after beans
125	Turnip	Purple Top White Globe	1 oz.	Aug. after beans
75	Turnip Salad	Pomeranian White Globe	1/2 oz.	Aug. " on.potatoes

The above plan should be of value to you in planning your garden. The following suggestions are also offered: (1) Locate your garden on fertile, well drained soil, convenient to the house. (2) Plow as early as possible. (3) Plant only good seed. (4) Apply manure at the rate of from 10 to 20 tons per acre, if available. (5) If possible, fertilize with from 600 to 1000 lbs. of 5-8-5 per acre. (6) Practice frequent shallow cultivation. (7) Follow a thorough pest control program. For further information on gardening consult your county agent or write the Vegetable Extension Service, Blacksburg, Va.

Exhibit H

13,714 COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A. & M. College & Poly. Inst. & U.S.D.A.Cooperating
EXTENSION SERVICE

SUGGESTED GARDEN PLAN FOR FAMILY OF FIVE

Ft.of: Row	Vegetable	Variety	Seed Required	Planting Date
125	Parsnip	Guernsey	1 oz.	Mar. and Apr.
75	Salsify	Sandwich Island	1 oz.	Apr. and May
50	Swiss Chard	Lucullus	1 pkt.	Mar.,Apr. and May
250	Carrot	Chantenay	2½ oz.	Mar.,Apr. and May
125	Beet	Crosby's Egyptian	2½ oz.	Mar.,Apr. and May
125	Spinach	Long St.Bloomsdale Savoy or:		
		Va.Savoy (Blight Resistant)	2½ oz.	Mar. and Apr.
300	Peas	World's Record	1 lb.	
		Thomas Laxton	2 lb.	Feb. to May
200	Onion Sets	Ebenezer or Yellow Globe	2 lb.	Mar. and Apr.
50	Lettuce	Grand Rapids (Leaf) or	½ pkt.	Mar.,Apr. and May
		Big Boston (Head)	½ pkt.	Mar. and Apr.
75	Cabbage,early	Jersey or		Set plants Mar.
		Charleston Wakefield	1 pkt.	and April
300	Snap Beans	Stringless Green Pod	3 lb.	Apr. and May
175	Kale	Dwarf Blue Curled Scotch	1½ oz.	Mar. and Apr.
250	Potatoes,early	Irish Cobbler	1½ pk.	Mar. and Apr.
500	Potatoes, late	Green Mountain	2½ pk.	Mar. and Apr.
175	Tomato	Bonny Best	1 pkt.	Set plants
		Brimmer or Marglobe	1 pkt.	after frost
500	Sweet potatoes	Nancy Hall and Porto Rico	500 plants	Set plants May& June
500	Corn	Golden Bantam	½ lb.	Apr.,May and June
		Country Gentleman	1½ lb.	Apr.,May and June
In Corn	Pumpkin	Virginia Mammoth	1 pkt.	May
		Cashaw	1 pkt.	May
10-15 Hills:	Squash	White Bush	1 pkt.	Apr. and May
		Yellow Crookneck	1 pkt.	Apr. and May
10-15 Hills:	Cucumber	Early Fortune	1 pkt.	May
		SUCCESSION CROPS		
200	Snap Beans	Stringless Green Pod	2 lbs.	July 15-Aug.15 after onions
250	Cabbage	Late Flat Dutch or		Set plants in July
		Danish Ballhead	1 pkt.	after peas
50	Lettuce	Grand Rapids (Leaf)	½ pkt.	July 15-Sept. 1 after spinach
125	Spinach	Long St.Bloomsdale Savoy or:		Aug.15-Sept.15
		Va.Savoy (Blight Resistant)	2½ oz.	after beans
200	Turnips	Purple Top White Globe	2 oz.	Aug.after beans
125	Turnip Salad	Pomeranian White Globe	1 oz.	Aug.after ea.potatoes

The above plan should be of value to you in planning your garden. The vegetables may be planted in the order listed. The following suggestions are also offered: (1) Locate your garden on fertile, well drained soil, convenient to the house. (2) Plow as early as possible. (3) Plant only good seed. (4) Apply manure at the rate of from 10 to 20 tons per acre if available. (5) If possible, fertilize with from 600 to 1000 pounds of 5-8-5 per acre. (6) Practice frequent shallow cultivation. (7) Follow a thorough pest control program. For further information on gardening, consult your county extension workers or write the Vegetable Extension Service, Blacksburg, Virginia.

Exhibit H

13.810

COOPERATIVE EXTENSION WORK
IN
AGRICULTURE AND HOME ECONOMICS
State of Virginia

Va.A. & M. College
& Poly. Inst. & the
U.S.D.A.Cooperating

EXTENSION SERVICE

Dear Gardener:

You either have or will soon secure your garden seed. The best of garden seed, however, will not produce good vegetables by itself. Certain other conditions must be met.

After good seed, the first thing to consider is the preparation of the land. The best time to plow is in the fall. If your garden has not been plowed, plow at once. Just previous to planting, the land should be harrowed or worked down with hand implements into a firm seed bed. The better the preparation of the soil--the home of the growing vegetable--the better will be your garden.

The next essential of successful gardening is to give the vegetables something to grow on. One of the best ways of doing this is through the application of stable manure. If available, make a heavy application--from ten to twenty tons per acre--before plowing. Inaddition to adding plant food to the soil, the manure will help the land hold the moisture for use by the vegetables. This is an important consideration since vegetables average over 75% water.

Commercial fertilizer may also be used to advantage. A 5-8-5 at the rate of 1000 pounds per acre will give excellent results on good land. Two-thirds of this fertilizer should be used on the spring and summer garden and the balance on the fall garden. This fertilizer may be broadcast or put in the row. In either case it should be thoroughly mixed with the soil to avoid injuring the plants. If you cannot secure fertilizer, however, do not be discouraged as excellent vegetables may be grown where plenty of manure has been applied.

The next essential of successful gardening is thorough care after the vegetables are planted. Good weeds and good vegetables cannot be produced in the same garden. You must make your choice. Practice thorough, frequent, shallow cultivation to keep the garden free from weeds. Weeds rob your vegetables of the plant food and moisture which rightfully belong to the vegetable crops. Get rid of them before they have caused much injury.

Insect pests will undoubtedly attack your garden crops. Early plowing, a general clean-up and hand picking will help to control these. A later letter will deal at greater length with pest control.

If I can be of any service to you, do not hesitate to call on me.

Yours very truly,

Agent.

Exhibit O

13,715 COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A. & M. College & Poly. Inst. & U.S.D.A. Cooperating
EXTENSION SERVICE

Dear Gardener:

Interest in the home garden has increased tremendously throughout Virginia in the last few years. Several factors have contributed to this increase. National and State relief measures have made the country as a whole garden conscious. Economic necessity has forced both the farmer and the urban gardener to give more serious consideration to home supplies. Yet, notwithstanding this fact, the 1930 census figures indicate that one out of every seven farmers in Virginia has no garden.

At present few city dwellers, and certainly no farmer, can afford to do without a garden. Various Government estimates place the value of a good garden at not less than $150 just for the food produced. In addition, it is worth much more than that to the health of the family.

Plan now for your 1933 garden!

The attached plan should be of interest to you in planning your garden. It contains only staple vegetables which should be in every garden. The selection is well balanced between green or leafy vegetables such as kale, spinach, lettuce and cabbage; root vegetables such as carrots, parsnips, salsify and potatoes; and fruit vegetables such as peas, beans, corn, tomatoes and pumpkins. Such a selection should provide vegetables for every month in the year either in the fresh state or canned and stored.

The plan also lists varieties recommended for the home garden, seed requirements and planting dates. If I can be of any further service to you in planning your garden, call at my office or write me.

Yours very truly,

Agent

Exhibit P

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A. & M. College & Poly. Inst. & U.S.D.A. Cooperating
EXTENSION SERVICE

Buckingham, Va.
April 13, 1933

Dear Gardener:

Recently you have been supplied with a collection of garden seed. Most of these vegetables you have grown before; some of them you probably have never grown. I feel sure, however, that you will enjoy growing and eating them. The following plan will give you some suggestions as to the number of feet of row which the seed in the collection will plant, the arrangement, and the planting dates.

Vegetable	Seed furnished for family of 3	Seed furnished for family of 5	Feet of row for family of 3	Feet of row for family of 5	Planting Date
Salsify	1 oz.	1 oz.	75	75	April and May
Carrot	1½ oz.	2½ oz.	150	250	March April and May
Beet	1½ oz.	2½ oz.	75	125	March April and May
Spinach	1½ oz.	2½ oz.	75	125	March and April
Peas	1½ lb.	2 lb.	125	200	February to May
Early Cabbage	1 pkt.	1 pkt.	75	75	Set Plants March and April
Beans	1 lb.	1½ lb.	100	150	April and May
Potatoes	½ bu.	½ bu.	400	400	March and April
Tomatoes	2 pkt.	2 pkt.	175	175	Set plants after frost
Corn	1 lb.	1½ lb.	200	350	April May and June
Squash	2 pkt.	2 pkt.	10-15 hills	10-15 hills	April and May
SUCCESSION CROPS					
Beans	1 lb.	1½ lb.	100	150	July 15 to Aug.15 after onions
Late Cabbage	1 pkt.	1 pkt.	250	250	Set plants in July after peas
Turnip	1 oz.	2 oz.	125	250	August after beans
Turnip Salad	½ oz.	1 oz.	100	125	August after early potatoes

The seed furnished you is high grade. Good seed in itself, however, cannot insure a successful garden. Certain other conditions must be met.

First, thoroughly prepare your soil. If your land has not been plowed, plow at once. Just previous to planting, the land should be harrowed or worked down with hand implements into a firm seedbed. A little time spent in thorough soil preparation before planting will greatly reduce the amount of cultivation necessary after planting.

If available, apply from ten to twenty tons of manure per acre before plowing. In addition to adding plant food to the soil, the manure will help the land hold the moisture for use by the vegetables. This is an important consideration, since vegetables average over 75% water.

Families of 3 have been supplied with 100 lb. of a 7-5-5 fertilizer; families of 5 with 200 lb. Apply the fertilizer broadcast, or put it in the row. In either case it should be thoroughly mixed with the soil to avoid injuring the plants. Excellent results may also be secured by applying one-half of this fertilizer in the row one to two weeks before planting and using the balance as a top-dressing after the crop is planted and cultivating it in.

Thoroughly cultivate your garden after planting. Good weeds and good vegetables cannot be produced in the same garden. You must make your choice. Practice thorough, frequent shallow cultivation to keep the garden free from weeds. Weeds rob your vegetables of the plant food and moisture which rightfully belong to the vegetable crops. Get rid of them before they have caused much injury.

Insect pests will undoubtedly attack your garden crops. Early plowing, a general clean-up, and hand picking, will help control these.

If I can be of any service to you, do not hesitate to call on me.

Yours very truly,

R. S. Ellis

R. S. Ellis
County Agent

RSE:LPM
13,856

Exhibit C

13,939 COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A. & M. College & Poly. Inst. & U. S. D. A. Cooperating
EXTENSION SERVICE

Dear Gardener:

Thousands of gardens are destroyed annually by insects, yet practically all can easily be controlled if proper spraying or dusting is practiced. Garden insects are classed chiefly as chewing and sucking insects. The spray or dust that will control one will not usually control the other.

Chewing insects, such as the Mexican bean beetle, potato beetle, cabbage worm and others, may be controlled by spraying or dusting in the following proportions:

Spray - Magnesium arsenate, 5 level tablespoonfuls
Water, 3 gallons

Dust - Magnesium arsenate, 1 part
Hydrated lime, 3 parts

Place the poison where the insect feeds. For the bean beetle this means putting it on the undersides of the leaves. Thoroughness is essential for control. Start spraying or dusting when the insect first appears.

For sucking insects, such as aphids or plant lice, use nicotine sulphate (Black Leaf 40) in the following proportions:

Nicotine sulphate, 1½ teaspoonfuls
Soap, 1-inch cube
Water, 1 gallon

Remember it is necessary that the spray hit a sucking insect to kill it. Thoroughness as well as timeliness is essential.

Certain insects cannot be controlled satisfactorily by spraying or dusting with the above materials. The Harlequin cabbage bug may be killed in its younger stage by spraying with Black Leaf 40. Adults must be controlled by hand picking or other methods. A new spray material known as Pysol has given promising results in killing the adults.

The squash stink bug in its younger stages may also be killed by spraying with Black Leaf 40. The adults must be hand picked or trapped. If a board or shangle is placed under the plant, the insects will collect underneath it at night. They can then be killed in the early morning.

The cucumber beetle may be controlled by dusting with calcium arsenate at the rate of 1 part to 15 parts hydrated lime. They may also be repelled by using turpentine at the rate of 1½ teaspoonfuls mixed with a quart of ashes and distributed around five or six hills.

Cut worms may be controlled by poison bran mash, or by protecting the plants with paper or cardboard bands at the base of the plant.

Many of our worst garden diseases of tomatoes, potatoes, cucumbers, cantaloupes, etc., may be controlled by spraying with Bordeaux mixture made up in the following proportions:

Bluestone (copper sulphate), 4 ounces
Rock lime, 4 ounces
Water, 3 gallons

Dissolve the bluestone in a small amount of hot water and then add water to make 1½ gallons. Slake the lime in a small amount of water and then add water to make 1½ gallons. Pour the two solutions together just before spraying.

Magnesium arsenate and Black Leaf 40 may be combined with Bordeaux mixture if either chewing or sucking insects are present.

If I can be of any help to you at any time, either call at my office or write me.

Agent.

Exhibit R

15,043 COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A. & M. College & Poly. Inst. & U.S.D.A. Cooperating
EXTENSION SERVICE

Dear Grower:

The Mexican bean beetle destroys thousands of bushels of beans annually. Yet it may be easily controlled if timely and thorough control measures are practiced. Start such control measures now. Don't wait for the second and third generations.

Description of the insect: The adult insect is about the size of a pea, yellowish or copper colored, with sixteen small dark spots upon the back of the wing cover, eight on each wing cover. The larvae are bright yellow, one-eighth to three-eighths inches in length and covered with spines.

Character of Injury: Both the adult and the larva feed mostly on the undersides of the leaves. The injury is characteristic in that the larger veins and much of the upper leaf surface is left untouched, thus giving the leaf a lace-work appearance.

Control: Spraying with magnesium arsenate in the following proportions is recommended:

For large mix:	Magnesium arsenate	1 lb.
	Water	50 gals.
For small mix:	Magnesium arsenate	1 oz. (5 level tables poonfuls)
	Water	3 gals.

Magnesium arsenate may also be applied as a dust as follows:

Magnesium arsenate	1 part
Hydrated lime	3 parts

Since the pest feeds largely on the undersides of the leaves, it is essential that the material be applied to the undersides of the bean foliage. It is a waste of material and energy to spray or dust only the upper sides of the plant.

Apply as soon as the beetles appear and repeat applications sufficiently often to keep the foliage covered until the pods begin to form.

Magnesium arsenate is poisonous to man and care should be exercised in its use. It is not recommended that treatments with arsenical poisons be made after the pods have begun to form. Any beans treated while in the bearing stage should be rinsed twice in clear water before they are marketed or consumed. If necessary to spray or dust after the pods are well formed, some insecticide, poisonous to insects but non-poisonous to man, such as pyrethrum, may be used.

Do not use lead arsenate or Paris green on beans, as these poisons burn the foliage severely.

Agent.

Exhibit S

12,177 COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, V. A. & M. College & Poly. Inst. & U.S.D.A. Cooperating
EXTENSION SERVICE

Dear Gardener:

Hundreds of home gardeners in Virginia will have no fresh vegetables during the fall and winter months. Will you? Now is the time to plan your fall garden. Good seed is the first requisite for a successful fall garden. Order your seed at once from some reliable seedsman. The following list will give you information on vegetables and planting dates for the fall garden.

Vegetables	Varieties	Planting Dates: Tidewater and Middle Virginia	Planting Dates: Piedmont and Western Virginia
Beans	Stringless Green Pod	August 1-20	July 15-Aug. 10
Beets	Crosby's Egyptian	August 1-20	July 15-Aug. 10
Cabbage	Danish Ball Head	Set plants July 15 to August 15	Set plants July 10-20
	Late Flat Dutch		
Carrots	Chantenay	August 1-10	July 10-20
Collards	Carolina Short Stem	August 1-10	July 10-20
Celery	Easy Blanching	Set plants July & August	Set plants July 10-20
	Winter Queen		
Corn	Golden Giant	August 1-15	July 10-20
	Country Gentleman		
Kale	Dwarf Blue Curled Scotch	September	July 15-Aug. 10
Lettuce	Big Boston (head)	August-September	August 1-20
	Grand Rapids (leaf)	August-September	August-September
Mustard	Japanese Spinach Mustard	August	July 15-Aug. 10
Onion	Potato	October-November	October
Radish	Scarlet Globe	September	August
	White Icicle		
Spinach	Virginia Savoy, or Long-standing Bloomsdale Savoy	August 15-Nov.15	August-September
Swiss Chard	Lucullus	August 1-10	July 1-August 1
Tomato	Marglobe	Set plants July 15-August 10	Set plants July 1-20
Turnip	Purple Top Globe	August	August 1-10
	Yellow Aberdeen		
Turnip Salad	Seven Top, or Pomeranian White Globe	August-September	August

Further essentials for a successful fall garden are:

1. Thorough soil preparation
2. Liberal fertilization. Use a 5-8-5 or a 4-12-4 fertilizer at the rate of from 400 to 1000 pounds per acre (10 to 25 pounds per 1000 square feet).
3. Thorough shallow cultivation
4. Thorough pest control measures. Magnesium arsenate at the rate of one ounce (5 level tablespoonsful) to 3 gallons of water, will control the Mexican bean beetle and other chewing insects. Nicotine sulphate (Black Leaf 40) at the rate of 1½ teaspoonsful to a gallon of water, will control aphids or plant lice and other sucking insects. Bordeaux mixture (4-4-50) will control many of the worst garden diseases.

Consult me at any time concerning any of your garden problems. Plan now for an excellent fall garden.

Agent.

Exhibit T

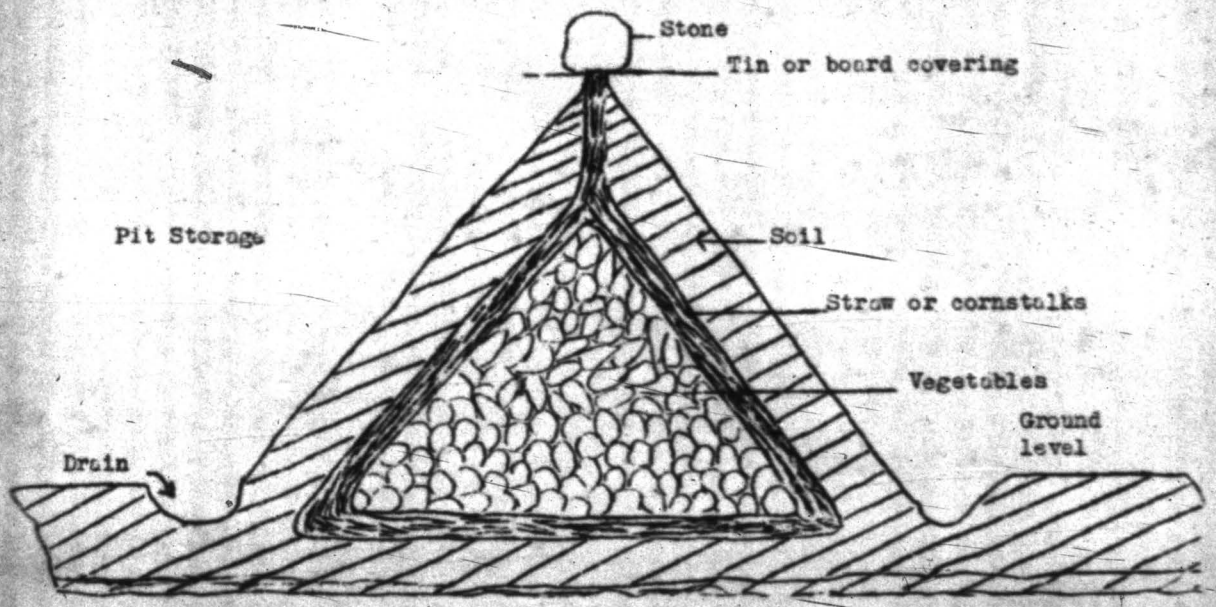
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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A. & M. College & Poly. Inst. & U.S.D.A. Cooperating
EXTENSION SERVICE

Dear Garden Club Member:

The season of garden planting is over for another year. There is, however, still an abundance of food available in your garden. A goodly share of this will soon cease to exist. A little care will prevent this loss and at the same time supply the farm table with an abundance of fresh vegetables through the winter months. Store this food and thereby reduce the cost of the winter menu, as well as improve the health of the family.

There are two chief types of storage--cellar storage and pit storage. Many gardeners lack a good storage cellar but can easily resort to pit storage.



If pit storage is to be used, select a well-drained place in the garden or in some place convenient to the kitchen. Dig out the soil to a depth of 6 to 8 inches over an area sufficiently large to accommodate the vegetables to be stored. As a matter of convenience, it is suggested that several small pits be constructed rather than one large one. Place a layer of three or four inches of straw or corn stalks in the bottom of this pit and place the vegetables in a conical pile on top of this material. They are generally piled to form a mound about 2½ or 3 feet in height. They should then be covered with a layer of straw or corn stalks. Over this should be placed a layer of dirt to the depth of 2 or 3 inches. As winter approaches, the dirt covering should be increased until it is from 4 to 6 inches deep. Ventilation should be secured through a small opening in the top of the pit, loosely filled with straw or corn stalks and covered to prevent rain entering the pit.

Among the vegetables that may be kept in pit storage are Irish potatoes, beets, carrots, turnips, rutabagas, parsnips and salsify. Parsnips and salsify may be left in the ground if desired, as freezing does not injure these two crops. Spinach and kale will also live through the winter in normal years. Sweet potatoes for home use should be placed in the basement near the furnace, on a shelf near the kitchen stove, or near the chimney on the second floor.

Onions should be stored in a dry, well-ventilated place such as the attic. Pumpkins and squash may be kept in dry, well-ventilated cellars, but a dry, frost-proof place above ground is best. Individual specimens should not be allowed to touch each other. Cabbage may be stored in out-door cellars or in pits. Celery may also be stored in a specially constructed trench, or in a hotbed pit.

Store the surplus food for winter use.

Agent.

Exhibit U
See Back Page

NORFOLK AND WESTERN RAILWAY COMPANY

INDUSTRIAL AND AGRICULTURAL DEPARTMENT

ROANOKE, Va., MARCH 1st, 1933.

LIVESTOCK BULLETIN

LIVESTOCK FOR SALE, EXCHANGE OR WANTED as indicated below:

This department assumes no responsibility in any transaction that may result from information furnished through this Bulletin.

FOR SALE

KIND—BREED	NUMBER, AGE, ETC.	OWNER	ADDRESS
CATTLE:-			
Aberdeen-Angus	1 pure bred bull, 1 year	W. W. Aven	Abingdon, Va.
	6 pure bred heifers, 1 to 2 years	E. A. Hicks	Evington, Va.(Shipping point, Forest, Va.)
	2 pure bred bulls, 1 year	E. A. Hicks	Evington, Va.
	Pure bred cows, heifers and bulls	F. H. T. Walton	Forest, Va.
	Pure bred cows, heifers and bulls	C. B. Peagans	Lynchburg, Va., Rt. 3.
	2 pure bred bulls, 1 and 3 years	Alex M. Davis	Max Meadows, Va.
	10 pure bred heifers, 1 to 2 years	Alex M. Davis	Max Meadows, Va.
Guernsey	1 pure bred bull, 3 years	R. S. Brydie	Blackstone, Va.
	3 pure bred bulls, 6 months to 3 years	E. C. Harnsberger	Luray, Va.
	1 pure bred cow, 3 years	W. E. Jefferson	Penhook, Va.(Shipping point, Rocky Mount, Va.)
	1 pure bred bull calf, 3 months	W. E. Jefferson	Penhook, Va.
	Pure bred cows, heifers and bulls, all ages	Stone Gate Farm	Petersburg, Va.
	1 pure bred bull calf, 6 months	S. D. Mangus	Vesuvius, Va.
	2 pure bred bulls, 10 months and 3 years	Jno. A. Keyser	Washington, Va.(Shipping point, Front Royal, Va.)
Hereford	100 pure bred cows, heifers, bulls and calves	H. L. Benham	Chilhowie, Va.
	Pure bred cows, heifers and bulls	F. H. T. Walton	Forest, Va.
	1 pure bred bull, 2 years	John S. Cox	Galax, Va.
	25 pure bred cows and bull calves	C. G. Summers	Snowville, Va.
	1 pure bred bull, 15 months.	M. M. Long	St. Paul, Va.
	10 pure bred cows, heifers and bulls	Hugh A. Coyner	Waynesboro, Va.
Hereford - Polled	10 pure bred cows, heifers and bulls	Hugh A. Coyner	Waynesboro, Va.
Holstein-Friesian	Pure bred cows, heifers and bulls	Stone Gate Farm	Petersburg, Va.
	1 pure bred heifer	J. S. Brown	Rural Retreat, Va.
	1 pure bred bull, 3 years	Jno. A. Keyser	Washington, Va.(Shipping point, Front Royal, Va.)
Jersey	2 pure bred cows, 3 years, fresh	S. H. Hamilton	Belfast, O. (Shipping point, Peebles, O.)
	Pure bred heifers and calves	Mt. Pleasant Stock Farm	Fairfield, Va. (Shipping point, Vesuvius, Va.)
	25 pure bred cows, heifers, bulls and calves	W. B. Gates	Rice, Va.
Shorthorn	2 pure bred bulls	A. G. Black	Baldwin, N. C.
	25 pure bred cows, bulls and calves	Marcus C. Finney	Glasgow, Va.
	3 pure bred heifers	J. S. Brown	Rural Retreat, Va.
	1 pure bred bull, 16 months.	Jno. A. Keyser	Washington, Va. (Shipping point, Front Royal, Va.)
Shorthorn - Milking	2 pure bred heifers, 2 years, bred	B. H. Price	Blacksburg, Va., Rt. 2.
Shorthorn - Polled	2 pure bred bulls	C. B. Teagardin & Sons	Duvall, O.
	Pure bred cows, heifers and calves	C. B. Teagardin & Sons	Duvall, O.

KIND-BREED	NUMBER, AGE, ETC.	OWNER	ADDRESS
CATTLE:-(Cont'd)			
Miscellaneous	3 grade cows and bulls	A. C. Black	Baldwin, N. C.
	1 grade bull calf,3 months	Jas. M. Wolfe	Charles Town, W. Va.
	2 grade cows, fresh, 3 and 4 years	L. L. Stewart	Evergreen, Va.
	Grade Aberdeen-Angus cows, heifers and bulls	F. H. T. Walton	Forest, Va.
	Grade Hereford cows, heifers and bulls	F. H. T. Walton	Forest, Va.
	4 grade cows, bred, 4 to 7 years	John S. Cox	Galax, Va.
	1 Shorthorn-Jersey cow, 6 years, bred	H. B. Witt	Montvale, Va.
	2 grade Jersey cows, 3 and 6 years	Charles Gibson	Swords Creek, Va.
	2 grade calves, 3 months	Charles Gibson	Swords Creek, Va.
	1 grade Guernsey cow	Hugh A. Coyner	Waynesboro, Va.
	1 grade Jersey cow	Hugh A. Coyner	Waynesboro, Va.
DOGS:-			
Collie	2 pure bred males, 2 years	K. S. Frost	Cliffview, Va.
	1 pure bred male puppy, 8 months	K. S. Frost	Cliffview, Va.
	1 pure bred puppy, 4 months	D. Mills Goodman	West Jefferson, N. C.
GOATS:-			
Toggenburg	2 pure bred kids, 3 weeks	Archie Horton	Blackstone, Va.
Miscellaneous	30 grade bucks and does	Alex M. Davis	Max Meadows, Va.
	25 grade bucks and does	Hugh A.Coyner	Waynesboro, Va.
HOGS: -			
Berkshire	Pure bred boars, gilts and pigs	Patterson & Beard	New Hope, Va.(Shipping point, Grottoes, Va.)
	Pure bred pigs, 12 weeks	J. B. Meade	Pamplin, Va.
	Pure bred gilts, bred	Maplehurst Farm	Vernon Hill, Va.(Shipping point, Halifax, Va.)
Duroc-Jersey	3 pure bred sows, 1 to 3 years, bred	E. A. Hicks	Evington, Va. (Shipping point, Forest, Va.)
	Pure bred boars and sows, all ages	E. A. Hicks	Evington, Va.
	Pure bred boars and gilts.	F. H. T. Walton	Forest, Va.
Hampshire	Pure bred boars and bred gilts	Sagamore Stock Farm	Circleville, O.
	2 pure bred sows, 1 and 2 years, bred	C. E. Reid	Farmville, Va.
O. I. C.	Pure bred boars, bred gilts, shoats and pigs	Wm. Locke	Lynchburg, Va., Rt. 1.
Poland-China	Pure bred sows and bred gilts	S. E. Hamilton	Belfast, O.(Shipping point, Peebles, O.)
	1 pure bred sow, 2 years	K. S. Frost	Cliffview, Va.
	Pure bred boars, bred gilts and pigs	Mt. Pleasant Stock Farm	Fairfield, Va.(Shipping point, Vesuvius, Va.)
	Pure bred pigs	Harold Fisher	Hebron, Va.
	21 pure bred boars and sows	G. G. Hollandsworth	Max Meadows, Va.
	Pure bred pigs, 3 months	M. M. Long	St. Paul, Va.
	8 pure bred shoats, 4 months	Charles Gibson	Swords Creek, Va.
	3 pure bred sows, 3 years	Hugh A. Coyner	Waynesboro, Va.
	15 pure bred shoats, 3 months	Hugh A. Coyner	Waynesboro, Va.
Poland-China-Spotted	Pure bred sows and pigs	K. S. Frost	Cliffview, Va.
Yorkshire	Pure bred boars and gilts.	F. H. T. Walton	Forest, Va.
Butcher and Feeder.	30 grade hogs	Jas. M. Wolfe	Charles Town, W. Va.
Miscellaneous	125 grade Poland-China boars, sows and shoats	Jas. M. Wolfe	Charles Town, W. Va.
	8 grade Poland-China and O. I. C. shoats	J. C. Ford	Charles Town, W. Va.
	4 grade sows, bred	G. W. Stratton	Petersburg, Va.
HORSES:-			
Belgian	1 pure bred stallion, 3 years	C. A. Bradley	Luray, Va.

KIND-BREED	NUMBER, AGE, ETC.	OWNER	ADDRESS
SHEEP:-(Cont'd) Shropshire-(Cont'd)	4 pure bred rams	G. G. Hollandsworth	Max Meadows, Va.
Miscellaneous	1 grade ram	Jas. M. Wolfe	Charles Town, W. Va.
	Grade Hampshire rams, ewes and lambs	F. M. T. Walton	Forest, Va.

EXCHANGE

CATTLE:- Guernsey	1 pure bred bull calf for heifer, same breed, mule colt, or brood sow	H. H. Jefferson	Penhook, Va.(Shipping point, Rocky Mount, Va.)
	1 pure bred bull calf, 6 months, for heifer, same breed	S. D. Mangus	Vesuvius, Va.
Hereford	1 pure bred cow, or bull calf, for bull, 15 or 18 months	Mrs. Lena Roberts	Flatridge, Va., Box 71.
HORSES:- Percheron	1 pure bred stallion for brood mare, same breed	S. H. Hamilton	Belfast, O.(Shipping point, Peebles, O.)
POULTRY:- Jersey Black Giant.	Pure bred cocks and hens for buckwheat, onions, soy beans and lespedeza	Miss Mary Bonham	Chilhowie, Va.
SHEEP:- Shropshire	1 pure bred ram for ram, same breed	S. D. Mangus	Vesuvius, Va.

WANTED

CATTLE:-	20 Aberdeen-Angus, Hereford, or Shorthorn breeding cows to keep on shares	Ben L. Howell	Stuarts Draft, Va.
DOGS:- Collie	1 pure bred puppy	Samuel H. Williamson	Brookneal, Va.
MULES:	2 colts, 6 months to 1 year.	I. Louis Worrell	Hillsville, Va.

LIME PLANTS ALONG THE NORFOLK AND WESTERN RAILWAY

The Bertha Mineral Co.	Austinville, Va.	Ground Agricultural Limestone
James River Hydrate & Supply Co.	Buchanan, Va.	Hydrated & Crushed Limestone
Alba Marl Lime Co.	Charles Town, W. Va.	Marl
Natural Lime Marl Co.	Charles Town, W. Va.	Precipitated Lime
Green Bag Cement Co.	Kenova, W. Va.	Ground Limestone & Hydrated Lime
Limeton Lime Co.	Limeton, Va.	Burnt, Hydrated and Agricultural Lime
Lone Jack Limestone Co., Inc.	Lynchburg, Va.	Crushed Limestone
W. F. Culbert & Sons	Marion, Va.	Crushed & Agricultural Limestone
Blue Grass Lime Co.	Maxwell, Va.	Burnt, Ground & Hydrated Lime
Winborne & Co.	Norfolk, Va.	Burnt & Raw Shell Lime
A. S. Lee & Sons Co., Inc.	Norfolk, Va.	Burnt Oyster Shell Lime
Chas. W. Priddy & Co., Inc.	Norfolk, Va.	Burnt & Raw Shell Lime
Smith-Douglass Co., Inc.	Norfolk, Va.	Burnt Oyster Shell Lime
Peery Lime Co.	North Tazewell, Va.	Burnt & Hydrated Lime, Crushed & Fluxing Stone
O. S. Baggess Co.	Oakvale, W. Va.	Agricultural Lime
Pembroke Limestone Corp.	Pembroke, Va.	Crushed Limestone
Pounding Mill Quarry Corp.	Pounding Mill, Va.	Ground Limestone
Limestone Dust Corp.	Pounding Mill, Va.	Pulverized Limestone
R. N. Horton	Richlands, Va.	Burnt Lime
Ripplemead Lime Co.	Ripplemead, Va.	Burnt Lime
Virginia Limestone Corp.	Ripplemead, Va.	Crushed Limestone
Pamunkey Marl Lime Co.	Riverside, Va.	Marl
Riverton Lime Co.	Riverton, Va.	Chemical, Burnt & Hydrated Lime
Blue Ridge Stone Corp.	Roanoke, Va.	Ground Limestone
Roanoke Stone Co., Inc.	Roanoke, Va.	Ground Limestone
Marlbrook Lime Co.	Roanoke, Va.	Precipitated Lime
Kimballton Lime Co., Inc.	Shawsville, Va.	Chemical, Burnt, Hydrated & Spray Lime
Five Oaks Lime & Stone Co.	Tazewell, Va.	Chemical, Burnt & Hydrated Lime

KIND-BREED	NUMBER, AGE, ETC.	OWNER	ADDRESS
POULTRY:-(Cont'd)			
Rhode Island Red-S.C. (Cont'd)	Pure bred cockerels	R. W. Hix	Salem, Va.
	Pure bred cockerels	Mrs. Chas. E. Lewis	Vera, Va.
Wyandotte - Golden Laced	Pure bred cocks and hens	Archie Horton	Blackstone, Va.
Wyandotte - Silver Laced	Pure bred pullets	Lone Oak Farm	Abingdon, Va.
Wyandotte - White ...	Pure bred cockerels and pullets	Frank Martin	Farmville, Va.
	Pure bred cockerels	Miss Gladys Mayberry	Tazewell, Va.
DUCKS:-			
Indian Runner	Pure bred drakes.....	Robt. Calhoun	Belspring, Va.
GUINEAS:-			
Pearl	12 pure bred cocks and hens	S. W. James	Amy, N. C.
	Pure bred cocks and hens	Mrs. H. S. Fisher	Hebron, Va.
TURKEYS:-			
Bourbon Red	1 pure bred hen	G. G. Hollandsworth	Max Meadows, Va.
Mammoth Bronze	Pure bred toms	Miss Mary Bonham	Chilhowie, Va.
	Pure bred toms and hens.	Miss Ida Chumbley	Draper, Va.
	Pure bred toms and hens.	Mrs. Chas. H. Belchin	Farmville, Va.
	Pure bred toms and hens.	H. H. Ames	Farmville, Va.
	Pure bred toms and hens.	Miss Myrtle Hurt	Gardners, Va.
	Pure bred toms and hens.	Mrs. J. P. Davis	Gromsclose, Va.
	Pure bred toms and hens.	Mrs. H. S. Fisher	Hebron, Va.
	Pure bred toms and hens.	D. A. Jones	Pulaski, Va.
Narragansett	Pure bred toms and hens.	Gus Hand	Damascus, Va.
	Pure bred toms and hens.	Mountain Home Farms	Pulaski, Va., Box 704.
	Pure bred hens	Mrs. Fred Settle	Stinson, Va.
	Pure bred toms	Mrs. Mabel Mayberry	Tazewell, Va.
RABBITS:- American White, French Silver, Havana and Dutch Belted	Pure bred bucks and does	Archie Horton	Blackstone, Va.
Chinchilla	Pure bred bucks and does	Archie Horton	Blackstone, Va.
	15 pure bred bucks and does	G. B. Walch	Blue Ridge, Va.
	Pure bred bucks	Wayne Gray	Copper Hill, Va.
	Pure bred bucks and does	L. E. Wheeley	East Radford, Va.
	Pure bred bucks and does	Mountain Home Farms	Pulaski, Va.
	Pure bred bucks and does	W. H. Trent	Roanoke, Va., P. O. Box 1061.
	Pure bred bucks and does	W. B. Graves	Roanoke, Va., Rt. 8.
	Pure bred bucks and does	Mount View Rabbitry.....	Taylors Valley, Va.
New Zealand White....	Pure bred bucks and does	Miss Edith H. Reed	Nace, Va.
	Pure bred bucks and does	Mountain Home Farms	Pulaski, Va., Box 704.
	Pure bred bucks and does	W. H. Trent	Roanoke, Va., P. O. Box 1061.
	Pure bred bucks and does	L. Cook	Roanoke, Va., Rt. 8.
	Pure bred bucks and does	Mount View Rabbitry	Taylors Valley, Va.
SHEEP:-			
Dorset	3 pure bred rams, 3 years..	Hugh A. Coyner	Waynesboro, Va.
Hampshire	23 pure bred ewes, 2 to 4 years	Mohawk Farm	Buckingham, Va.(Shipping point, Farmville, Va.)
	19 pure bred rams, ewes and lambs	E. A. Hicks	Evington, Va.(Shipping point, Forest, Va.)
	Pure bred rams, ewes and lambs	F. H. T. Walton	Forest, Va.
	3 pure bred rams, 1 to 3 years	C. L. Goss	Lansing, N. C.
	3 pure bred rams, 1 to 2 years	Jno. A. Keyser	Washington, Va.(Shipping point, Front Royal, Va.)
	1 pure bred ram	Hugh A. Coyner	Waynesboro, Va.
Shropshire	24 pure bred rams, ewes and lambs	E. A. Hicks	Evington, Va.
	1 pure bred ram	F. H. T. Walton	Forest, Va.

KIND-BREED	NUMBER, AGE, ETC.	OWNER	ADDRESS
HORSES:-(Cont'd)			
Percheron	3 pure bred stallions, 2 to 9 years	S. H. Hamilton	Belfast, O.(Shipping point, Peebles, O.)
	1 pure bred stallion, 2½ years	F. H. T. Walton	Forest, Va.
	3 pure bred stallions, 6 months to 5 years	Hugh A. Coyner	Waynesboro, Va.
	18 pure bred mares, 2 to 10 years	Hugh A. Coyner	Waynesboro, Va.
Miscellaneous	2 grade Percheron horses	Jas. H. Wolfe	Charles Town, W. Va.
	2 grade Percheron horses, 4 years	K. S. Frost	Cliffview, Va.
	1 grade saddle mare, 8 years	E. A. Hicks	Evington, Va.(Shipping point, Forest, Va.)
	1 grade mare, 6 years	W. H. McNeill	Jefferson, N. C.
	6 grade hunters	Frank Jones	Washington, Va.(Shipping point, Front Royal, Va.)
	30 grade hunters, 4 to 5 years	Jno. A. Keyser	Washington, Va.(Shipping point, Front Royal, Va.)
MULES:-	1 mule	Cloverdale Red Farm	Cloverdale, Va.
	2 mules	C. L. Goss	Lansing, N. C.
	1 jack, 11 years	Bruce Anderson	Lynchburg, Va.
	1 mule, 4 years	John I. Hardy	Rustburg, Va.
	6 mules	Hugh A. Coyner	Waynesboro, Va.
PONIES:-			
Shetland	1 pure bred pony	T. W. Neff	Abingdon, Va.
PHEASANTS:-			
Ringneck	7 pure bred cocks and hens.	Dennis W. Baugher	Elkton, Va.
	10 pure bred cocks and hens.	T. O. Williams	Petersburg, Va.
PIGEONS:-			
Different Breeds	Any number	Mrs. Elizabeth Armstrong	Bedford, Va., 624 Ashland Avenue.
	Any number	J. D. Pritchett	Roanoke, Va., 218 -6th St., Vaseen.
POULTRY:-			
Banten	Pure bred cockerels and pullets	Mrs. R. W. Gannaway	Guinea Mills, Va.
	Pure bred cockerels	J. D. Pritchett	Roanoke, Va., 218 -6th St., Vaseen.
Brahma - Light	12 pure bred pullets	O. W. Knighton	Blue Ridge, Va., Rt. 1.
	1 pure bred cock	O. W. Knighton	Blue Ridge, Va., Rt. 1.
Plymouth Rock-Barred	Pure bred cockerels	Miss Ida Chumbley	Draper, Va.
	Pure bred cocks, cockerels, hens and pullets	E. A. Hicks	Evington, Va.(Shipping point, Forest, Va.)
	Pure bred pullets	Ashton Lewis	Ford, Va.
	2 pure bred cocks	I. Louis Worrell	Millsville, Va.
	10 pure bred pullets	W. A. Moore, Jr.	Spout Spring, Va.
	1 pure bred cockerel	W. A. Moore, Jr.	Spout Spring, Va.
	15 pure bred cocks and cockerels	Miss Wilhelmena Coyner	Waynesboro, Va.
Plymouth Rock-Buff	3 pure bred pullets	O. W. Knighton	Blue Ridge, Va., Rt. 1.
	1 pure bred cockerel	O. W. Knighton	Blue Ridge, Va., Rt. 1.
	15 pure bred pullets	Mrs. C. M. Doome	Roanoke, Va., Rt. 6.
Plymouth Rock - Partridge	10 pure bred cockerels	Miss Ida Chumbley	Draper, Va.
Plymouth Rock - White	10 pure bred hens	O. W. Knighton	Blue Ridge, Va., Rt. 1.
	Pure bred cocks, hens and pullets	Mrs. C. B. Mayo	Halifax, Va.
	Pure bred cockerels	Mrs. A. S. Poindexter	Lowry, Va.
Rhode Island Red-S.C.	15 pure bred pullets	C. L. Knighton	Blue Ridge, Va., Rt. 1.
	100 pure bred cockerels	Cloverdale Red Farm	Cloverdale, Va.
	Pure bred cocks and cockerels	Elbert S. Crosscleee	Damascus, Va.
	Pure bred cocks and cockerels	Mrs. W. R. Norris	Max Meadows, Va.
	1000 pure bred cocks, cockerels hens and pullets	Blanks Red Farm	Nathalie, Va.

PLAN AND PLANT A VEGETABLE GARDEN

Economic conditions have increased interest in gardening among farm and urban people. A good vegetable garden properly managed under favorable growing conditions should provide vegetables throughout the year either fresh, canned or stored.

PREPARATION AND MANAGEMENT:

1. Plan the garden to insure vegetables for every month of the year.
2. Locate convenient to house on well-drained, fertile soil.
3. Use a liberal application of manure.
4. Plow land as early as possible. Fall plowing is preferable.
5. Plant only good high quality seed.
6. Use liberal application of a high grade complete fertilizer.
7. Cultivate garden frequently in order to eliminate weeds and conserve moisture. Shallow cultivation should be practiced.
8. Spray or dust for control of insects and fungous diseases.

SUGGESTED GARDEN PLAN FOR FAMILY OF FIVE

Ft.of: Row	Vegetable	Variety	Seed Required	Planting Date
125	Parsnip	Guernsey	1 oz.	Mar. and Apr.
75	Salsify	Sandwich Island	1 oz.	Apr. and May
50	Swiss Chard	Lucullus	1 pkt.	Mar.,Apr. and May
250	Carrot	Chantenay	2½ oz.	Mar.,Apr. and May
125	Beet	Crosby's Egyptian	2½ oz.	Mar.,Apr. and May
125	Spinach	Long St. Bloomsdale Savoy or		
		Va. Savoy (Blight Resistant)	2½ oz.	Mar. and Apr.
300	Peas	World's Record	1 lb.	
		Thomas Laxton	2 lb.	Feb. to May
200	Onion Sets	Ebenezer or Yellow Globe	2 lb.	Mar. and Apr.
50	Lettuce	Grand Rapids (Leaf) or	½ pkt.	Mar.,Apr. and May
		Big Boston (Head)	½ pkt.	Mar. and Apr.
75	Cabbage, early	Jersey or		Set plants Mar.
		Charleston Wakefield	1 pkt.	and April
300	Snap Beans	Stringless Green Pod	3 lb.	Apr. and May
175	Kale	Dwarf Blue Curled Scotch	1½ oz.	Mar. and Apr.
250	Potatoes, early	Irish Cobbler	1½ pk.	Mar. and Apr.
500	Potatoes, late	Green Mountain	2½ pk.	Mar. and Apr.
175	Tomato	Bonny Best	1 pkt.	Set plants
		Brimmer or Marglobe	1 pkt.	after frost
500	Sweet potatoes	Nancy Hall and Porto Rico	500 plants	Set plants May & June
500	Corn	Golden Bantam	2 lb.	Apr.,May and June
		Country Gentleman	1½ lb.	Apr.,May and June
In Corn	Pumpkin	Virginia Mammoth	1 pkt.	May
		Cashaw	1 pkt.	May
10-15 Hills	Squash	White Bush	1 pkt.	Apr. and May
		Yellow Crookneck	1 pkt.	Apr. and May
10-15 Hills	Cucumber	Early Fortune	1 pkt.	May

SUCCESSION CROPS

300	Snap Beans	Stringless Green Pod	2 lbs.	July 15-Aug. 15, after onions
250	Cabbage	Late Flat Dutch or Danish Ballhead	1 pkt.	Set plants in July,after peas
50	Lettuce	Grand Rapids (Leaf)	½ pkt.	July 15-Sept.1, after spinach
125	Spinach	Long St.Bloomsdale Savoy or		
		Va. Savoy (Blight Resistant)	2½ oz.	Aug.15-Sept.15,after beans.
300	Turnips	Purple Top White Globe	2 oz.	Aug. after beans
125	Turnip Salad	Pomeranian White Globe	1 oz.	Aug. after early potatoes

(Courtesy Vegetable Extension Service - Blacksburg, Va.)

The foregoing plan is based on Virginia conditions and might not fully meet your requirements, however, it should be of assistance in planning your garden. Bulletins and circulars containing other plans and information of value to those interested in vegetable gardening are listed below. These and other similar publications may be secured free by writing direct or from this department. Free copies of Farmers' Bulletins published by the U. S. Department of Agriculture, may be secured from your U. S. Senator or Congressman.

Bulletin 116, "Home Gardening" - Ohio State University, Columbus, O.
Circular 128, "The Farm and Home Garden Manual" - N.C. State College, Raleigh, N. C.
Bulletin 31, "The Home Garden in West Virginia" - W. Va. Dept. of Agriculture, Charleston, W. Va.
Circular E-265, "Vegetable Garden Suggestions" - Va. Extension Service, Blacksburg, Va.
Farmers' Bulletin 1673, "The Farm Garden" - U. S. Dept. of Agriculture, Washington, D. C.
Farmers' Bulletin 879, "Home Storage of Vegetables" - U. S. Dept. of Agriculture, Washington, D. C.
Farmers' Bulletin 1471, "Canning Fruits and Vegetables" - U. S. Dept. of Agriculture, Washington, D. C.
Farmers' Bulletin 1371, "Diseases and Insects of Garden Vegetables" - U. S. Dept. of Agriculture, Washington, D. C.
Farmers' Bulletin 984, "Farm and Home Drying of Fruits and Vegetables" - U. S. Dept. of Agriculture, Washington, D. C.

SHIP AND TRAVEL VIA NORFOLK AND WESTERN RAILWAY

Communications relative to information desired to be published in future Bulletins may be addressed to any Agent of this Company or to: --

T. GILBERT WOOD, Industrial & Agricultural Agent,
J. J. BAKER, Assistant Agricultural Agent,
Norfolk & Western Railway Co., Roanoke, Va.

If any business results, kindly notify this office. This Bulletin is mailed to anyone requesting to be placed on Mailing List.

13,716 COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A. & M. College & Poly.Inst. & U.S.D.A. Cooperating
EXTENSION SERVICE

Exhibit V

Blacksburg, Va.
February 9, 1933

To All Extension Agents:

I am sending the following letter and other information which Mr. Dietrick has prepared for county extension workers relative to garden work.

"Judging from the correspondence reaching this office, the demand for assistance along gardening lines is increasing tremendously. Numerous agents, both men and women, have asked for help particularly on relief garden work. For this reason, this department has prepared some material which we believe will be of value to you in your garden work. Copies of this material are enclosed.

"The first enclosure is a sheet entitled "Food for One Person for One Year". This sheet gives the number of feet of row necessary to produce the food required by one person throughout the year. In addition, varieties, amount of seed required, etc., are given. It is felt that this information should be of particular value to the agents themselves, and to a lesser extent for distribution.

"The second enclosure is a suggested garden plan for a family of three, giving the recommended variety, number of feet or row, amount of seed required, and planting dates for each of the various vegetables. The information is based upon the facts given in enclosure No. 1. In some instances the number of feet recommended in the plan is not exactly three times that recommended in enclosure No. 1, as it was felt advisable to keep the row length in multiples of 25.

"The third enclosure is identical to the second except that it is a suggested garden plan for a family of five. By use of these two plans the recommended number of feet of row and seed order would be available for families of 3, 5, 6, 7, 8, 9 and 10. For example, the seed order for a family of 8 would be the combined seed order for the two plans; for a family of 9, three times the seed order for a family of 3, etc. In case of a family of 4, the seed order for either a family of 3 or 5 could be taken, depending upon the age of the children, etc. Likewise, for a family of 7 either the seed order for a family of 6 (double 3) or for a family of 8 (3 plus 5) could be taken.

"The fourth enclosure is a suggested letter to send out with the plans. You may prefer to write and have mimeographed a letter which would be more applicable to your county than such a general one could be. If so, we will be glad to assist you in every way possible.

"This office has written the various seed companies relative to special prices on seed collections as recommended in the two plans in lots of 20 or more. As soon as the information is received, it will be forwarded to you.

"It should be kept in mind that the enclosed plans, while of value for the farm garden, have been prepared primarily from the standpoint of relief work. It is felt that the garden as suggested in circular E-263 "Vegetable Garden Suggestions for Virginia Farmers", more nearly meets the need of the farm garden. The farmer can spend somewhat more for seed than his unfortunate brother."

With best wishes, I am

Yours very truly,

Asst. Director

Exhibit W

13,755 COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A & M College & Poly.Inst. & U.S.D.A. Cooperating
EXTENSION SERVICE

Blacksburg, Va.
February 20, 1933

To All Extension Agents:

On February 9 you received from this office various mimeographed material on home gardening, which contained among other things suggested garden plans and seed orders for a family of three and for a family of five.

During the past week special prices on these collections have been received from various seed concerns both within and without the state. The prices quoted are given for your information. In ordering from any of these concerns it is suggested that you secure confirmation of the price listed.

SEED ORDER FOR FAMILY OF THREE

Size of Order	Geo.Tait and Sons: Norfolk	T.W.Wood & Sons: Richmond	A.C.Diggs: Seed Co. Richmond	VSS: Richmond	Warren Seed Co: Norfolk	Diggs & Beadles: Richmond	Dreer Seed Co.: Phila.Pa	Francis C. Stokes & Co.: Phila.Pa.
25	1.90	2.00	2.00	1.70	3.00	2.00	1.25	.98*
50		1.70	1.90	1.65		1.75		
100		1.60	1.85	1.60				
500		1.50	1.75	1.55				

SEED ORDER FOR FAMILY OF FIVE

Size of Order	Geo.Tait and Sons: Norfolk	T.W.Wood & Sons: Richmond	A.C.Diggs: Seed Co. Richmond	VSS: Richmond	Warren Seed Co: Norfolk	Diggs & Beadles: Richmond	Dreer Seed Co.: Phila.Pa	Francis C. Stokes & Co.: Phila.Pa.
25	2.60	3.00	3.00	2.40	4.10	2.40	1.90	1.48*
50		2.65	2.90	2.35		2.15		
100		2.45	2.80	2.30				
500		2.35	2.75	2.25				

Prices quoted for the collections are on a delivered lot basis with the exception of two concerns. A. C. Diggs Co., Richmond, quotes prices F.O.B. Richmond. George Tait & Sons, Norfolk, do not state whether the price is F.O.B. Norfolk or delivered.

George Tait & Sons, the Warren Seed Co., and the Dreer Seed Co. only quote prices on lots of 20 or more. These concerns would undoubtedly make substantial reductions for large orders.

*The Francis C. Stokes' quotation for the family of three is on the basis of collections of 12 or more gardens per order and for the family of five on the basis of eight or more gardens per order.

Potatoes and sweet potatoes are not included in any of the quotations. Special quotations should be secured on Irish potatoes. Sweet potato plants could be purchased at the time of setting.

These quotations should be of value to you in presenting the work to the relief committees and welfare agencies in your county. In addition to furnishing definite prices from certain seed concerns they should serve as a basis of comparison in dealing with seed concerns not listed.

It is entirely possible that the welfare committee in your county may not be disposed to put sufficient money into the seed order necessary to secure these collections. In that event, bids could be secured from the various seed companies on collections submitted. Several of the companies are offering limited collections at special prices. Although this office does not feel that these limited collections meet the requirements of an all year round garden, they are to be recommended where sufficient funds are not available to purchase a well rounded collection. For that reason, this office is requesting some of these concerns to forward you information on their special collections.

The collections recommended in the plans forwarded to you from this office should be of particular value to the self-sustaining farmer, garden clubs, etc., throughout the state. A substantial saving may be secured through their purchase. It is likewise felt that many counties will take advantage of them in their relief garden work.

Yours very truly,

L. B. Dietrick
In Charge Vegetable Extension

LBD:MPM

Exhibit X

7

PLANTING INFORMATION



Students Working in the V. P. I. Greenhouse

THIS INFORMATION PREPARED BY
THE HORTICULTURAL DEPARTMENT
AT
VIRGINIA POLYTECHNIC INSTITUTE
BLACKSBURG, VIRGINIA

Exhibit X

Planting Information

The Four-Year Course in Horticulture at V. P. I.

HORTICULTURE is one of the most important agricultural industries of this state. Virginia holds third place in the United States for its apple crop, while the large trucking industry of Tidewater constitutes one of the most important trucking areas on the Atlantic Seaboard. The growth of vegetable crops and flowers under glass is receiving much attention at the present time and our home owners are beginning to landscape their properties. The horticultural graduate can readily equip himself for high school and college teaching while many of our graduates are engaged in various types of research work in horticulture and allied sciences. The four-year scientific course in horticulture furnishes an ideal basis for subsequent professional study in forestry, entomology, and plant pathology. For the student who owns his own estate and who plans to live in the country, this course should make a strong appeal; and it should appeal to the woman student whether she plans to be a homemaker or to engage in some special type of horticulture. For those who elect this curriculum, opportunity will be afforded for specialization in fruit growing, vegetable gardening, plant breeding, and landscape design.

For further information, write to Dean H. L. Price, Blacksburg, Virginia.

Planting Distances for Vegetable Crops

Vegetable	Distance between rows		Distance between plants in row
	Horse cultivation	Hand cultivation	
Asparagus	4–5 ft.	3–4 ft.	15–18 in.
Beans, bush	3 ft.	2 ft.	3–6 in.
Beans, lima	3–3½ ft.	2–2½ ft.	12–18 in.
Beets	2½–3 ft.	1–1½ ft.	4–6 in.
Cabbage	3 ft.	2 ft.	15–18 in.
Carrots	2½–3 ft.	1–1½ ft.	3–4 in.
Celery	3 ft.	1½–2 ft.	8–10 in.
Corn	3 ft.	2–2½ ft.	10–15 in.
Kale	3 ft.	1½–2 ft.	12 in.
Lettuce	2–3 ft.	1½ ft.	8–10 in.
Onion sets	2–3 ft.	1–1½ ft.	3–4 in.
Parsnips	2½–3 ft.	1–1½ ft.	4–5 in.
Peas	3 ft.	2–2½ ft.	1–3 in.
Peppers	3 ft.	2–2½ ft.	18 in.
Potatoes	3 ft.	2½ ft.	12 in.
Radish	2–3 ft.	1–1½ ft.	2–3 in.
Rhubarb	4 ft.	4 ft.	36–48 in.
Salsify	2½–3 ft.	1–1½ ft.	4–5 in.
Spinach	2–3 ft.	1½–2 ft.	4–8 in.
Sweet potato	3–4 ft.	3 ft.	12–18 in.
Tomato	4 ft.	2½–3 ft.	24–36 in.
Turnips	3 ft.	2–2½ ft.	4–6 in.

Seed Requirements and Estimated Yields

Vegetable	Seed for 100 feet of row	Yield per 100 feet of row
Asparagus	66 to 80 roots	100 pounds
Beans, bush	1 to 2 pounds	1 to 2 bushels
Beans, lima	1 pound	1½ bushels
Beets	2 ounces	3 bushels
Cabbage	66 to 80 plants	100 to 150 pounds
Carrots	1 ounce	1 to 2 bushels
Celery	120 to 150 plants	100 stalks
Corn	¼ to ½ pound	6 to 8 dozen ears
Kale	1 to 2 ounces	150 pounds
Lettuce	¼ ounce	10 to 12 dozen heads
Onion sets	1 to 2 pounds	1 bushel
Parsnips	½ to 1 ounce	1 to 2 bushels
Peas	1 to 2 pounds	1 bushel
Peppers	66 plants	25 to 50 dozen
Potatoes	½ peck	1 to 1½ bushels
Radish	1 ounce	30 to 50 dozen
Rhubarb	25 to 35 roots	100 to 150 pounds
Salsify	2 ounces	1 to 1½ bushels
Spinach	1 to 2 ounces	1½ bushels
Sweet potato	66 to 100 plants	1 bushel
Tomato	33 to 50 plants	6 bushels
Turnips	1 ounce	2 to 3 bushels

Planting Distances for Fruit Crops

Kind of fruit	Distance apart
Apples (standard)	30 to 40 feet each way
Apples (dwarf)	10 to 15 feet each way
Pears (standard)	20 to 30 feet each way
Pears (dwarf)	10 to 15 feet each way
Peaches, apricots and nectarines	20 to 25 feet each way
Quinces	10 to 15 feet each way
Figs	20 to 25 feet each way
Grapes	8 to 12 feet each way
Cranberries	1 to 2 feet each way
Currants and gooseberries	4 by 6 feet
Raspberries	3 to 4 by 6 feet
Blackberries	4 by 6 feet
Strawberries	1 by 3 feet

Number of Plants to Set Acre of Ground at Above Distances

4 in. x 1 ft.	130,680	8 ft. x 12 ft.	453
4 in. x 1½ ft.	87,120	10 ft. x 15 ft.	290
6 in. x 1 ft.	87,120	15 ft. x 15 ft.	193
6 in. x 1½ ft.	58,080	15 ft. x 20 ft.	145
1 ft. x 1 ft.	43,560	20 ft. x 20 ft.	108
1 ft. x 1½ ft.	29,040	20 ft. x 25 ft.	87
1 ft. x 2 ft.	21,780	20 ft. x 30 ft.	72
1½ ft. x 2 ft.	14,520	25 ft. x 25 ft.	71
2 ft. x 2 ft.	10,890	25 ft. x 30 ft.	58
1 ft. x 3 ft.	14,520	30 ft. x 30 ft.	48
3 ft. x 6 ft.	2,420	30 ft. x 42 ft.	34
4 ft. x 6 ft.	1,185	35 ft. x 35 ft.	35
6 ft. x 6 ft.	1,210	40 ft. x 40 ft.	27

Exhibit Y

Nutrient Requirements of the More Important Vegetable Crops

GROUP I - High N - Medium P - Medium K

Spinach	Broccoli
Kale	Brussels Sprouts
Collards	Loose Leaf Lettuce
Turnip Greens	Endive
Swiss Chard	Early Beets
Early Cucumbers	

For these crops apply a 7-6-5 before planting and side dress or top dress with a fertilizer high in nitrogen as a 10-5-4 or with soluble nitrogen salts as nitrate of soda or sulphate of ammonia.

GROUP II - Well balanced fertilizer carrying amounts of N - P - K in approximately 1-1-1 ratio, such as 7-6-5.

Potatoes	Eggplant
Head Lettuce	Celery
Beets	Peppers
Carrots	Early Snap Beans

GROUP III - Medium N - High P - Medium K, as a 5-8-5, 5-10-5, or 4-10-6.

Beans	Watermelons
Peas	Squash
Tomatoes	Onions
Cantaloupes	Sweet Corn

GROUP IV - Medium to low N & P - High K

Sweet Potatoes - 3-3-15

Prepared by Dr. H. H. Zimmerley, Director
Virginia Truck Experiment Station
Norfolk, Virginia

Exhibit Y'

#13,013

RED OXIDE OF COPPER AS A SEED TREATMENT FOR THE CONTROL OF DAMPING-OFF OF TOMATO AND EGGPLANT SEEDLINGS

by

Harold T. Cook, Plant Pathologist, Virginia Truck Experiment Station

Red oxide of copper (cuprous oxide) dust has recently been found to be a very effective fungicide for use as a seed treatment for the control of damping-off of tomato, spinach, and other seedlings.

Experiments by Dr. Horsfall of the New York State Agricultural Experiment Station, have demonstrated the great benefits that may be obtained from the use of this material on tomato, pepper, and eggplant seeds. The following table based on data from Bulletin 615 by Dr. Horsfall will illustrate the increases in stand that have been obtained with this material as a seed treatment.

Kind of Seed	Percent of Seedlings Emerged	
	Untreated	Treated
Tomatoes	65.6	87.9
Eggplants	32.9	58.5
Peppers	30.1	61.5
Cabbage	41.9	52.1

Experiments have been conducted at the Virginia Truck Experiment Station during the past year to determine the effect of the red oxide of copper seed treatment on spinach in this state. The following table will illustrate the results that have been obtained.

Treatment	*Stand of Seedlings	*Stand after Thinning	Yield in Bu. per acre
Untreated	1134	474	158
Red oxide of copper	4650	794	237
Untreated	1356	494	173

* The stand is based on the number of plants per 100 feet of bed.

One preliminary experiment on the use of this seed treatment for improving the stand of tobacco showed that it was not injurious to the seed and gave a marked increase in stand.

The red oxide of copper seed treatment is easily applied. The red oxide dust and the seed are placed in a fruit jar, paper sack, or other container and shaken vigorously for a few minutes to coat thoroughly each seed with the dust. The seed may then be sown immediately or stored until ready for use. One pound of dust for ten pounds of seed is recommended for tomatoes while one pound of dust for 50 pounds of seed is recommended for spinach.

Red oxide of copper cannot ordinarily be obtained locally, but it may be purchased from laboratory and chemical supply houses. The technical grade which retails at from 40 to 60 cents a pound is satisfactory for use as a seed treatment. Care should be taken that the dust is bright red in color, as a darker color indicates that some of it has changed into the black oxide of copper which is not effective as a fungicide.

Exhibit Z

14,317

Grouping of Vegetables According to Lower Ranges of Soil Reaction for Optimum Growth

pH 5.0 - Strongly Acid	pH 5.5 - Medium Acid	pH 6.0 - Slightly Acid
Tomatoes	Snap Beans	Asparagus
Sweet Potatoes	Lima Beans	Beets
Watermelons	Carrots	Brussels Sprouts
Potatoes	Cabbage	Cauliflower
	Collards	Celery
	Cucumbers	Canteloupes
	Eggplant	Leeks
	Kale	Onions
	Mustard	Peas
	Parsnips	Spinach
	Peppers	Swiss Chard
	Squash	
	Pumpkins	
	Turnips	
	Radishes	

Soil reaction should not exceed pH 6.5 for vegetable crops.

Liming Recommendations for Soils in Eastern Virginia

Pounds of CaO or M_2O per Acre to Change Soils*				
From pH	To pH	Light Sandy	Sandy Loam	Loamy Soil
5.5	6.5	900	1250	1700
4.5	5.5	800	1120	1400

Note: Limestone runs about 50 - 56% CaO, or CaO + MgO; hydrated burnt oyster shell runs about 56% CaO and best grades of hydrated 70 - 80% CaO, or CaO + MgO.

To calculate quantity of lime to use on a soil, the following example may be used:

$$\frac{100}{\% \text{ CaO} + \text{MgO}} \times \text{quantity indicated in table.}$$

For example: To change a sandy loam soil from pH 4.5 to pH 5.5, using hydrated burnt oyster shell lime, we have

$$\frac{100}{56} \times 1120 = 2000 \text{ lbs. per acre.}$$

The fineness to which a liming material is ground governs the rapidity with which it acts with the soil. For quick results, limestone should be ground so finely that 80% will pass through 100-mesh screen.

*If soils have a high organic content, more lime will be required to change the reaction than is indicated in the table.

Prepared by Dr. H. H. Zimmerley, Director, Va. Truck Experiment Station.

V I R G I N I A

LANDSCAPING ANNUAL REPORT - 1933

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MPL

Annual Report

of

Mary C. McBryde

Specialist in Landscape Gardening

Blacksburg, Va.
January 22, 1934

Mr. John R. Hutcheson, Director
Extension Division, Virginia Polytechnic Institute
Blacksburg, Virginia

My dear Sir:

The following is my report for the year ending November 30, 1933.

Report of Time

Days Resident Teaching, December 1932.	19
Days in the Field.	76
Days in the Office	198
Days Leave	22
Days Sick Leave.	5

Statistics

Counties Visited	40
Visits to Counties	48
Home Demonstration Agents Visited.	28
Farm Agents Visited.	18
Home Grounds and Other Grounds Visited	301
Plans Sketched in the Field.	227
Demonstrations on Grounds.	411
Plans Drawn in Office.	31
Schools and Other Civic Grounds Improved	34
School, Civic and Garden Groups Cooperating.	43
Number of Meetings	85
Attendance	2985
Letters Written.	540
Circulars and Bulletins Sent Out	4702
Miles Traveled	8244

Besides the 40 counties visited, 16 other counties were aided through letters, circulars, and bulletins. One specialist is employed for this work. The specialist is Mary C. McBryde, Department of Horticulture.

Administrative changes effective July 1, 1933 put the work on a full-time instead of a part-time basis.

This is a horticultural project offered as a minor study in Home Demonstration. It also allows the use of the specialist for lecture and demonstration in counties not having the Home Demonstration Program.

It is adult work, chiefly with womens groups. The junior phase is limited to occasional talks to groups of children in school and 4-H Clubs.

Of the counties visited:

37 counties used the work in relation to Home Demonstration
16 counties used it for other adult groups
4 counties had lecture demonstrations for juniors

Field work is outlined by agents and their counsellors. The specialist's part is to fit the subject to their needs.

The goal is toward helping people of modest means, particularly Farm and Village people, to satisfactory improvement of their Homes and their Home Environment.

The year's goal was to outline the subject simply in a sequence of units of study for average people; to present them as a guide to garden thinking as well as garden making; to carry as far as possible ideas of good taste, along with ideas of utility; to select topics that might be presented either simply or much more fully as needs and conditions might require.

Teaching Methods

Lectures and Lecture Demonstrations
Demonstration to Groups on Grounds
Demonstration by Plans Made on Grounds
Bulletins and Circulars
Radio and Extension News
Contests
Minor Projects, Womens Clubs
Talks to Junior Groups
Letters Answering Inquiries

The agent or group asking for the service designates the method desired.

The home-making side of this work is emphasized. The home-environment

side is secondary, and is approached through the home-makers interest and activity. Usually they work in unison with school, civic or garden groups to achieve some project to better the home surroundings.

The outline enclosed is made with reference to what has been asked for in this project by Extension and other groups, more especially in the past three years. Almost every topic listed has been presented at some time by request. Attempts were made to relate topics and collect them under suitable headings in a way to suggest a general view of the subject as well as special views of separate phases. "Planning" and "Making" the garden both have the same steps of procedure; "Principles" and "Growing Practices" become part of the "Making"; Past and Present "History" bear directly on economy and design, and open the view toward their use in the future, and the nature of their importance. The Unit on "Landscape Design" is intended to remove as many confusions as possible in regard to garden arrangement, and so give the average person more confidence in undertaking it. It opens the way to appreciation and enjoyment of landscape a phase of the subject that the national administration programs have suddenly made more important. For if promises are fulfilled for the future of Rural Life and other Life, landscape projects will play a considerable part in architectural and horticultural fields. The need of landscape education, as well as landscape service for average people will grow as the projects grow. The Landscape Committee of the President's Conference on Housing, in December 1931, devoted in their recommendations, eleven of the fifteen articles to suggestions for public education, the other four giving suggestions for surveys and plans for future land development. Their suggestions for popular education include such items as requiring teachers trained in design; appreciation courses in institutions for popular interest and instruction; landscape advice to small-home owners at nominal cost, landscape "clinics" and demonstrations (not encroaching on professional activities); broadcasting; a popular Digest Magazine (approved by authorities); free literature; programs through Extension and other agencies; a primer of Landscape for Modest Homes (edited by persons qualified in the art of Landscape Design); an annual bibliography with references to literature of all kinds treating of Design and Maintenance of small Home Grounds.

The helps are suggested as much for giving the proper outlook as for giving aid in work.

The recommendations are valuable as suggestions, but as yet the helps they recommend are not forthcoming as guides and aids to popular teaching, analyzing the average needs and applying a highly technical art to simple uses. They would be especially welcome in field work from institutions not emphasizing Landscape Architecture and Courses in Ornamental Growing.

This project is very inexpensively carried on. Very little mimeographed material is used, ready prepared circulars and bulletins are used whenever possible. Lectures are demonstrated with blackboard drawing and Clipped Illustrations. Demonstrations on grounds are the best means of teaching allowing home-maker, agent and group to share in the project.

When a good home-maker, influential in her group and community is willing to develop her grounds as a Home Demonstration Project, a properly scaled plan is made for the place and is useful in itself as a demonstration in plan-making.

A few scaled plans are made for homes of good average type, and for schools able to carry out and maintain a development that demonstrates.

The plans are penciled on tracing paper and scaled over squared off "ten scale" paper. This method avoids elaborate work with scale and T-square, eliminates tracing in ink, and by delivering the plan direct, saves expense of blueprinting. Time is economized by sending a layout only, omitting detailed planting plans unless, or until, they are needed.

In general, only small sketch plans made in the field are provided for homes. They are approximately scaled over graph-sheets and are made in conference with agent, home-maker, and a group of neighbors or club members. They are left with the owner, and a record of them kept for reference, as many must be made in a limited time, planting plans can only be suggested, not shown in detail. These sketch plans fix ideas agreed on and give the vision.

In field demonstrations problems rise to give special opportunity for teaching, making the most of what is at hand, overcoming the difficulties, make the problems interesting, preserving the best in old places; subduing the ugliness of nondescript places; organizing new places, are topics best taught on the grounds.

We believe that in connection with these field demonstrations in thousands of cases we have, in the past few years, prevented hideous light obstructing porches, impossible driveways, useless grading expense, ugly painting, and unsuitable structures. We feel that in many instances good old houses have been kept unspoiled, simple old gardens restored, some good old trees and shrubs saved. Boxwoods have been saved as garden heirlooms and "Landscaping" absurdities contrived by commercial outcomes have been corrected. We have helped home-makers to adjust their grounds to highway changes and tried to show their real problems to school committees improving the grounds.

We have encouraged women to grow their flowers and herbs and enjoy working out-of-doors, and helped mothers to make pleasant yards for children's play and whenever a few extra words could be inserted, we have said them for out-of- doors interests and conservation. We have helped Progressive Farmer Contest homes asking our aid. A good deal of propagating has been done and other plans followed to increase the home supply of attractive planting material at little cost.

There have been more demands for assistance in C.W.A. than could be met. One district alone asked for help in design for 65 schools. Park, Cemetery and Roadside projects have also asked for help. Help has been given locally and in office as time and resources allowed. Some county work was done in November anticipating the use of C.W.A. funds.

Prince William county did well planned work in contest and landscape meetings. The contest developed one outstandingly good Home Grounds Demonstration situated where it can often be observed. The meetings resulted in home propagation of good varieties of shrubs and garden Roses.

Madison county is doing good work with homes and with flower growing and propagation.

Bedford and Botetourt counties have a sustained garden interest.

Accomac county has homes improving and has school improvement for community projects.

Dinwiddie county has a good demonstration at McKenny School, especially in "construction". Highway engineers cooperated to do the grading plan made by the Extension Service.

Amherst county has need of landscape work and shows a good deal of intelligent interest in work begun there.

Prince George and Surry counties are using extension plans prepared in advance for C.W.A.

Henrico county gave extension lectures to a garden school of federated clubs.

In Henry county one new home promises well for a good yard demonstration.

Rappahannock and Appomattox counties are developing home and civic projects.

In nearly all of the 40 counties served, garden groups and other groups have had extension lectures, and have worked with local extension agencies in landscape projects.

There is a growing appreciation of the value of plan and design. More grounds were improved this year than last, and more instruction and literature have been asked for.

According to opportunity, topics of the outline will be prepared for mimeographing and photographic material now in preparation arranged for their illustration. Material is at present in miscellaneous forms for talks and lectures and news articles, as helps to mail to agents asking for material on specified topics.

Outline of Subject Matter

I. Garden Planning - The Survey - The Estimate - The Vision

a. Layout

1. For Service - Use - Comfort
2. For Design - Beauty - Enjoyment

b. Construction

1. The Ground Work
2. Structures
3. Alterations and Repairs

c. Planting

1. Plants Adapted to Conditions
2. Plants Appropriate to Uses
3. Plantings for Utility
4. Plantings for Beauty

d. Upkeep

1. Reasonable Effort
2. Reasonable Cost

II. Garden Making - The Work - The Achievement

a. Testing the Layout with Stakes and Line

1. For Practical Points
2. For Points in Design

b. Construction Work

1. Levels and Slopes, Roads and Paths, Paving and Surfacing
2. Fencing and Gateways, Walls, Steps, Curbs
3. Reconditioning, Building
4. Painting Wood Structures
5. Local Material for Construction
6. Garden Furniture, Garden Features

c. Planting Work

1. Preparing Soil for Planting
2. Planting Surfaces, Grass, Ground Cover
3. Planting Utilities, Hedges, Screens, Windbreaks
4. Planting Ornamentals, Mass Group, Single Specimens
5. Planting Vines
6. Planting Annuals for Quick Results, Flowers, Foliage
7. Planting Perennials for Permanence, for the Seasons

8. Planting Rose Gardens
9. Planting Bulb Gardens
10. Planting Reserve Gardens for:
    - Flower Crops
    - Herbs and Small Perennial Vegetables
    - Seedlings and Cuttings
    - Growing Plants in Frames and Pots
    - Trial Plantings
11. Planting Pools and Rockeries
12. Planting Wood Plants as Ornamentals
13. Planting to Attract Birds
14. Transplanting from Woods and Fields
15. Conserving Material for Compost and Mulching
16. Coldframes and Hotbeds for Protection and Propagation

d. Upkeep Work

1. Controlling Growth, Clipping, Edging, Pruning, Handling Litter
2. Cultivation - Weeding, Tilling, Watering, Mulching, Feeding
3. Protection - Pests, Diseases, Injuries
4. Renewing - Lifting, Dividing, Resetting Storing
5. Care of Roads and Paths, Fences, Gates, other Structures
6. Care of Service Area
7. Equipment and Supplies

III. Gardening Principles - The Study - The Progress

a. About Plants

1. How Plants Live and Grow
2. Good and Bad Conditions for Plant Growth
3. Propagation of Plants
4. Principles of Pruning and Transplanting
5. How Pests, Diseases and Injuries Affect Plant Growth

b. The Plant's Environment

1. Conditions of Region, Site, Spot
2. Soil, Moisture, Temperature
3. Companion Plants

c. Care of Plants

1. Proper Feeding, Sufficient Moisture
2. Protection from Injury
3. Control of Pests and Diseases
4. A Calendar for Controlling Garden Enemies

IV. Ornamental Plants for Virginia Gardens - Trees, Shrubs, Vines, Flowers

a. Old Standbys

1. Garden Types
2. Natural Types

b. Some Less Familiar Plants

1. Plants Recently Brought to Notice
2. New and Improved Varieties of Well Known Sorts

c. Native Virginia Plants

1. Some Ornamental Natives Common to State or Sections
2. Some Rarer Native Plants

V. Flower Growing - Bloom, Fragrance, Flavor, Decoration

a. Annuals

1. Growing Annuals - The Usefulness of Annuals
2. Annuals for Children's Gardens
3. Annuals for Flower Crops
4. New and Improved Annuals
5. Annual Vines and Foliage Plants

b. Perennials for Borders

1. The Culture of Perennials - Uses of Perennials
2. Perennials for Borders - Rear, Middle, Front Edge, Accent
3. Perennials for the Seasons - Foliage, Flower, Fruit, Color
4. Perennials Color and Texture of Bloom and Leaf
5. Perennials for Flowers Massed, Scattered, Solitary
6. Perennials Blooming the First Year from Seed
7. Perennials Adapted to Special Conditions of Soil and Exposure
8. Perennials in Congenial Groups

c. Perennials for Flower Crops

1. Culture of Perennials for Cut-Flowers
2. Varieties for Cut-Flowers

d. Roses

1. Growing Roses, Rose Species, Rose Types
2. Roses for Landscape Uses
3. Roses for Flower Crops
4. Pests and Diseases of Roses

e. Bulbs

1. Growing Bulbs, Bulb Types, Bulb Species
2. Bulbs for Landscape Uses
3. Bulbs for Flower Crops - Outdoors, Indoors

f. Potted Flowers

1. Early Potting for Flowers in Fall and Winter
2. Late Potting for Flowers in Winter and Early Spring

g. Flowers and Foliage for Fragrance and Flavor

1. Perfumed Flowers and Fragrant Leaves
2. The Useful Pot-Herbs and Seasonings

h. Flowers for Decoration

1. Flowers for Home Decoration
2. Flowers for Occasions
3. Flowers for Exhibition
4. Flowers for Market
5. Flower Arrangement

VI. Some Teachings of Garden History - The Past - The Present

a. Garden Types

1. Gardens for Home Living
2. Gardens for Ceremony
3. Gardens for Luxury
4. Gardens for Out-of-Doors Work and Play

b. Typical Garden Arrangement

1. The Courtyard Garden
2. The Terraced Garden
3. Parks and Pleasure Grounds
4. The Cottage Garden

c. Gardens in America

1. Early American Gardens
2. Modern American Gardens
3. Colonial Gardens of Virginia

VII. Modern Landscape Ideals - The Present - The Future

a. Homes and Home Environment

1. Needs - Human Requirements
   Land Uses and Values
   Landscape Education and Service for all the People
2. Standards - Well Established Ideas for Approved Conditions of Safety, Utility, Beauty in Ground Development for all Homes, Communities, Highways.

3. Objectives - Efficient Zoning, Planning, Conditioning, Planting to Fill the Needs and to Meet the Standards for the Benefit of Every Home
4. Recommendations for Farm Home Grounds - Arrangement Relating the Family Life to Farm Business, to Farm and Home Work and Contributing to Personal Respect and Social Welfare of the Family and the Individuals

b. Conservation for Economy and Beauty

1. What Everyone Needs to Know About
   Our Lands
   Our Waters
   Our Forests
2. Conservation of our Birds, Wild Flowers and Wild Animals
3. The Need of Preserving Wilderness Areas

VIII. Landscape Design - Accepted Ideas

a. The Human Side of Garden Design

1. Use and Beauty Must be Combined
2. There are Three Kinds of Human Enjoyment
3. Experience is the Basis of Appreciation
4. Design Must Be Reasonable, Practical, Human, Beautiful
5. The Human Idea of Beauty is Fitness and Completeness of Organization

b. Some Useful Landscape Terms Explained

1. Type, Taste, Ideal
2. Character, Style, Effect

c. Landscape Composition

1. Orderly Relation - Plan and Organization
2. Relation of Sizes and Shapes - Scale and Proportion
3. Sufficient Interest in Proper Sequence - Emphasis
4. Textures Related to Sizes and Shapes
5. Light, Tone, Color
6. Deception and Imitation - Illusion and Delusion
7. The Composition as a Picture - The Scene - Type
   The Setting - Frame - Foreground
   The Angle of Vision

d. Planting Design

1. The Plants - Their Form, Color, Texture, Character
2. Plant Arrangement - Line, Mass, Group, Specimen
3. Plant Uses - Enclosure, Emphasis, Interest Accent

4. Plantings Related to Property and Building Lines
5. Plantings Related to Lines of Motion and Lines of Vision
6. Plantings related to centers (axes), Intersections, Turns and Endings (Points and Centers)
7. Plants in Borders Related to
   - Form of Beds
   - Form of Plants
   - Time of Bloom
   - Color
   - Character
   - Surface Decoration
8. Plants in Relation to Topography, to Architecture

e. Structures as Features in Design

1. Dominant or Subordinate
2. Form, Grouping, Texture, Color
3. Shelters
4. Terraces, Walls, Steps
5. Fencing, Lattices, Gateways
6. Roads and Paths
7. Features and Ornaments
8. Material in Structures

f. The Garden "An Enclosure for Man-Made Plantings"

1. Formal and Non-Formal Arrangement
2. Composition, Style, Distinction
3. Materials for the Enclosure and the Floor

g. Some Points to Look for in Observing the Design of the Following:
   - Grounds of an Estate
   - Grounds of a School
   - A Cemetery
   - A Park or Public Plot
   - A Roadside Development

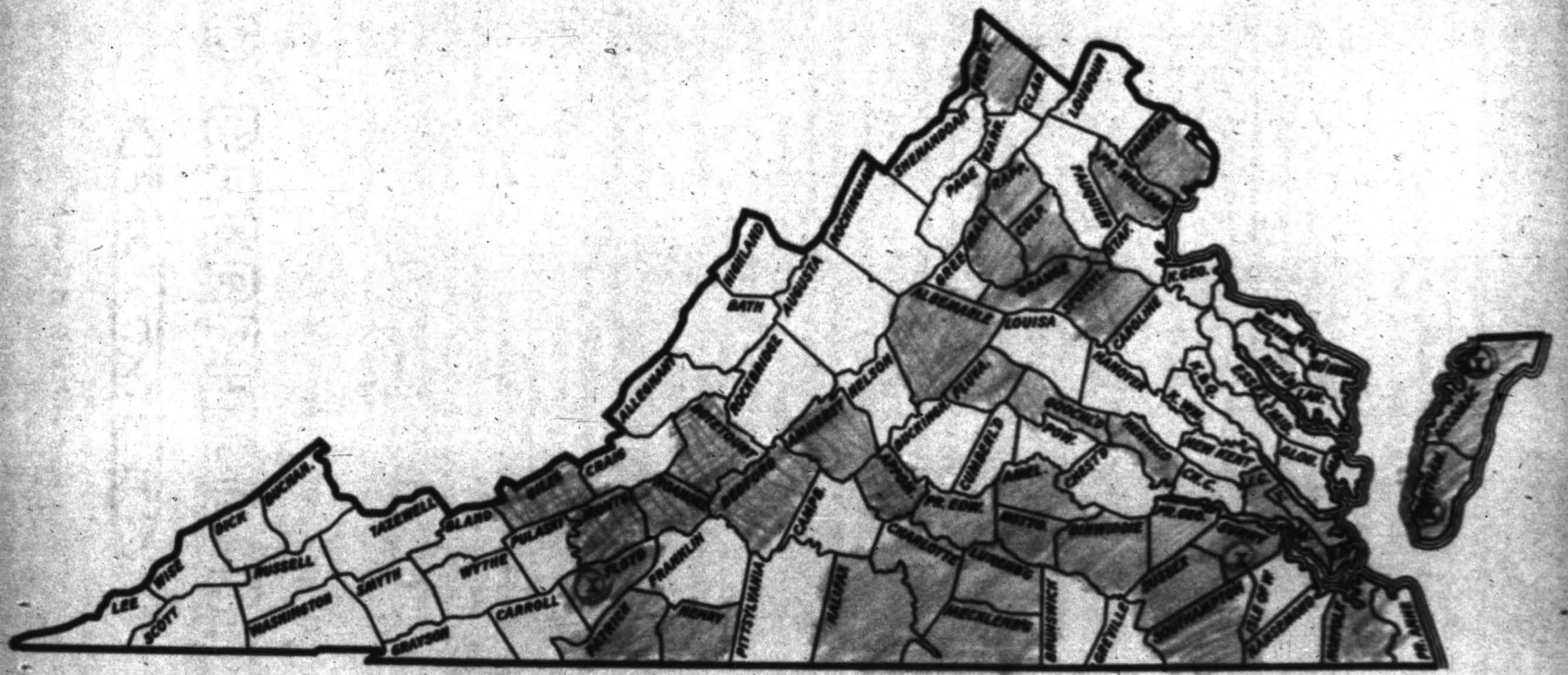
h. Things to Appreciate in the Natural Landscape

1. Design in Formation and Character of Earth, Water, Rocks
2. Design in Character of Hill, Valley, Plain, Stream or Body of Water
3. The Wide View, the Narrow View, The Panorama
4. The Advantage of Landscape Appreciation as a Means to Culture

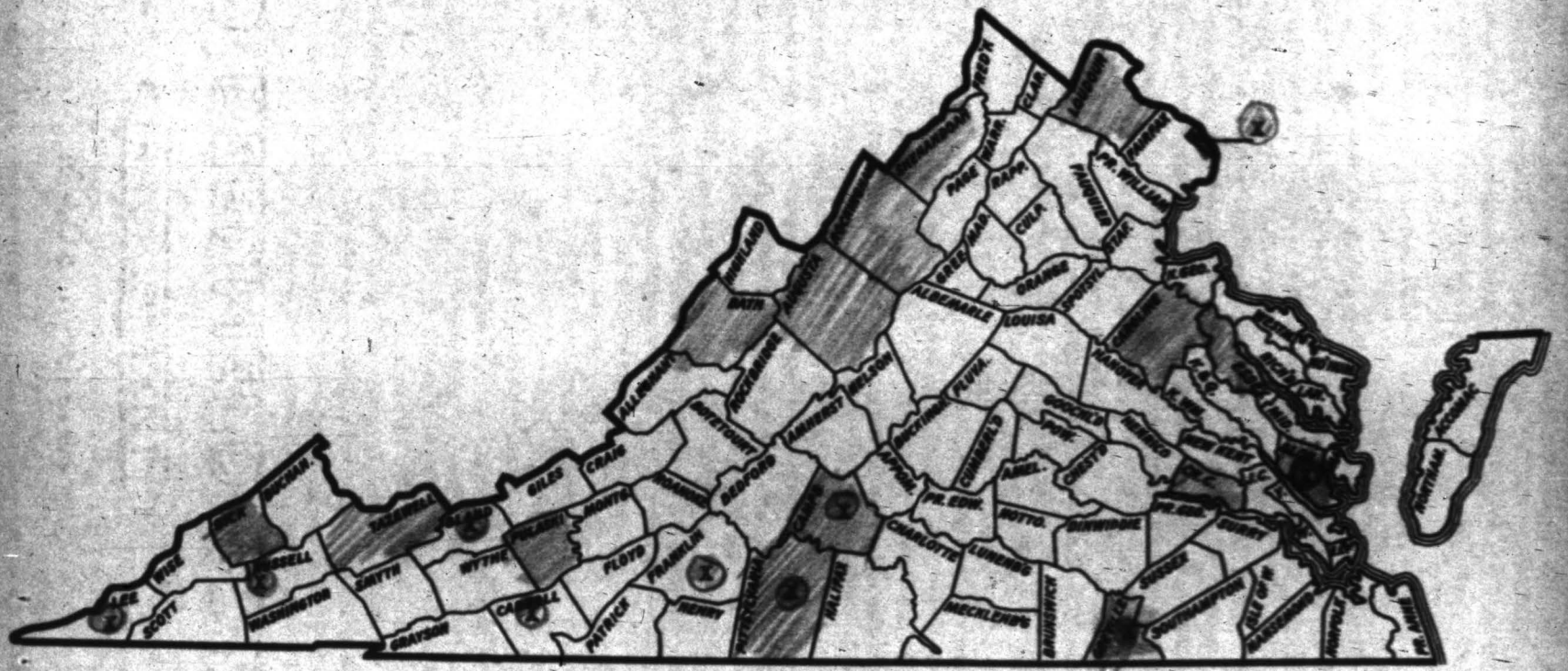
Respectfully Submitted,

M. C. McBryde

Mrs. Mary C. McBryde
Landscape Specialist



40 Counties Visited
4 Counties Checked Had Junior Meetings



16 Counties Helped Through Correspondence and Literature
10 Counties Asking Help Not Possible to Reach

14.6.25

Planting Gladiolus Bulbs

When to Plant April is the month to set out gladiolus bulbs. In the warmest parts of Virginia they can be planted earlier; in the coldest parts the last half of the month is safer than the first half. A good deal depends on the season. The rule is to plant them as soon as the soil is in good condition and not in danger of being cold enough to chill the bulbs.

Plantings can be made every two weeks until the middle of June to give a long season of bloom. The average time for blooming is eighty to ninety days after planting. Some varieties, however, bloom in seventy and some in a hundred and ten days. By selecting some of these early and late varieties, the season may be prolonged. Bulbs planted in boxes set in the ground can be moved at will when in bloom.

Bulbs planted early grow larger, have greater vigor and produce better bulblets. Bulblets should be planted as early as possible to allow them to develop strongly. Early planted bulbs do better the next year.

Where to Plant The gladiolus needs all day sunshine to do its best. Where to plant the bulbs depends on what is expected of them. If they are intended as decorations for the garden, plant them in groups to get masses of one color. They will be attractive in the perennial border, but the flowers will probably not be of maximum size, and they cannot be cut freely without spoiling the decoration. If the largest and finest for cut flowers are required, the best place to plant the bulbs is in rows in the vegetable garden where they can get full sun and proper cultivation.

It is best to avoid planting the bulbs where gladiolus have been grown the year before.

Favorable Soil The gladiolus does well in garden soil suited to potatoes. Sandy loam is considered ideal but some growers prefer soils containing clay. Soils heavy with clay or lime, unless made porous and less alkaline, are not good for growing gladiolus. Humus and phosphate are generally used to put them into condition. If the soil is light the bulbs can be planted six inches deep. In ordinary soil four inches is deep enough.

Preparing for Planting Take five or six inches of top soil from the space or row to be planted. Loosen the bottom soil to a depth of eight or nine inches and work in the needed amount of fertilizer, then level and lightly firm the surface on which the bulbs are to be set. Allow for spacing the bulbs four to six inches apart. In the rows there may be two or three staggered lines of bulbs. Rows may be spaced the same distance apart as garden rows.

For growing bublets, prepare a four inch trench and allow for planting in a single line one inch deep.

Setting the Bulbs Set the bulbs carefully top side up in the prepared surface six inches apart, in staggered lines. Cover them carefully(so as not to alter their position) with two or three inches of top soil. On this soil scatter a thin cover of fertilizer. Over the fertilizer spread more top soil. Leave what top soil remains to rake around the planting two weeks later to discourage weeds. If the ground is dry at planting time, apply water to wet the lower soil but not to soak it.

Plant bulblets in a straight row, thicker like peas, and cover them an inch deep. If the planting, soil, exposure and fertilizer are right, what remains to be done later is weeding, tilling, once-a-week watering (not sprinkling) and sidedressing of fertilizer when stalks begin to come.

Fertilizers to Use Sheep manure or well rotted and shredded cattle manure with acid phosphate or calodial phosphate are recommended. Although bone meal is excellent, these phosphates are considered more discouraging to wire worms. The manure is worked into the soil and the phosphates are put on as a top dressing and raked in.

Selecting Bulbs Gladiolus bulbs are really corms. A number one corm is an inch and a half or more in diameter. A number six corm is only half an inch. Other numbers vary between these sizes. For large flowers it pays to plant the

larger corms, though smaller ones will give good results. The corms should be clean and free from insects and disease. If there is any fungous disease, soak the bulbs two hours in a solution of one pint of formaldehyde in thirty gallons of water, or treat them five minutes as one does potatoes with hot formaldehyde solution, two pints in thirty gallons of water 122 to 125 degrees F. Corms that have been carefully cured and cleaned when they are harvested are usually free from insects and diseases.

To free corms from thrips, put them in a paper bag and sprinkle with naphthalene flakes; one ounce will do for 100 corms. Then fold over the top of the bag and leave the corms in the flakes for two or three weeks. Do not use tin containers for this process.

Selecting Types and Varieties The types of gladiolus are the grandiflorus, large and heavy with open flowers and the primulinus, smaller, more graceful, with hooded flowers; the primulinus hybrids are crosses of the two types.

Gladiolus flowers are plain petaled, ruffled or fringed. The stems are erect, curved or twisted. The colors of the flowers range from violet-blue through violet, reds, oranges and yellows. In tones these colors range from dark shades through medium and pale tints to pure white. The flowers are some plain and some marked with splotches and markings of contrasting colors. Some types have more flowers to a stalk than others. Some have larger flowers, some have more flowers open on a stalk at once.

It is so easy to hybridize gladiolus that new varieties are constantly being offered. To recommend varieties is useless because there are so many good ones that every body prefers to choose for himself. The plain colored ones usually make the best landscape effects. Some of the ruffled ones like "Bright Wings", "Little John", are very attractive; "Orchid" is a beautiful fringed one; "Oregon Sunset" is a good yellow; "Europa" is a lovely graceful white; "Scarlet King" and "Color Marvel" are fine reds; but one must choose for himself.

Gladiolus bulbs are inexpensive, ranging in price from 60¢ a dozen to more for special novelties. Anyone can afford to have them. They are easy to grow and they are cheerful, gay, even brilliant and they are never coarse. They can be grown from seed as well as from corms and cormlets, but how to do this is another story.

Prepared by Mrs. M. .. McBryde
Specialist in Landscape Gardening
V.P.I. Extension Service

14,623

#13,276

Insects and Diseases of Boxwood and Other Evergreens

(Prepared by the Plant Pathology and Entomology Departments, Extension Division, V.P.I., Blacksburg, Va.)

Mites or red spiders are as a rule dry weather pests, which may appear anytime from May first to November first. Rainy weather tends to hold them in check. The very dry season of 1930, the dry late fall of 1931 and the present season of light rainfall have caused mites to become more generally widespread and injurious than usual.

The spruces, especially Norway and white spruce are quite susceptible to mite injury. The arbor vitaes are also subject to serious injury. Such low growing types as compactas, globes, and Berkman's appear to be more susceptible, but the tall varieties such as American, Chinese and the pyramidals are often seriously damaged by mites. The Retinosporas, however, appear to be quite immune.

Mites generally appear first in local spots or on individual plants. On boxwood more or less irregular yellow areas appear on the upper surface of the leaves. Such characteristic markings are easily detected. On conifers the injured foliage is stippled with yellow areas. The best way to locate light infestations is to shake a few limbs over a sheet of white paper. If present, the tiny mites can be seen crawling on the paper.

To control mites use sulphur dust, miscible oils or the glue treatment.

Sulphur.- Use only fine dusting sulphur. This may be applied alone or mixed with one part hydrated lime to 8 or 9 parts of sulphur by weight. Apply with a duster which blows a good blast or cloud. Use liberal quantities and make applications when the air is still and when plants are dry or in the late afternoon or early evening. Sulphur dusts are best in hot weather when days are bright and the nights warm and moist. In cool spring and fall seasons dustings are not so effective. Sulphur dusts are preferable for boxwood.

Oil Emulsions.- An oil emulsion is a contact insecticide. Sunoco, Verdol and Volck are effective oil emulsions. For overwintering eggs use a 3 per cent emulsion (3 gallons of oil to 97 gallons of water) and apply just before growth starts in the spring. After growth starts and during the summer use a 1 per cent emulsion (1 gallon of oil to 99 gallons of water or 3 tablespoonfuls to 1 gallon of water). Do not apply when temperature is around freezing or above 90° Fahrenheit. On very tender new growth there is danger of burning when the temperature is above 85° Fahrenheit. In spraying, thoroughly drench the infested plants from all sides, especially on the lower sides of the leaves and limbs where mites and eggs are generally found. Best results are obtained by using a pressure around

200 pounds. In mixing this solution place the required amount of oil in a container or bucket, then add about one-fourth as much water as oil and stir until the solution is like milk. Add this to the remainder of water in sprayer and stir well. Further agitation is not necessary if used immediately.

Glue treatment.- This method is recommended for use on conifers only. Use 1½ pounds of glue to 10 gallons of water. Soak the glue in water then dissolve with heat and strain into the spray tank. Sometimes tips of new growth may have a tendency to stick together or ball up. This can be overcome by spraying with water. Make two applications of the glue solution at an interval of about 4 weeks.

Boxwood blight appears as a browning of the leaves and twigs on the ends of the branches. Oftentimes these leaves and twigs are dead back to a distance of twelve or more inches from the tips. Sometimes the entire plant is killed. The trouble is generally due to an insufficient water and food supply.

Control.- Supply the soil with manure and prepare well. This will increase the water holding capacity of the soil and provide favorable conditions for the development of a vigorous root system. Add manure from year to year and commercial nitrogenous fertilizers from time to time. Make fertilizer applications in the spring. Keep the plants free of parasitic insects and diseases. If boxwoods are transplanted, keep them shaded until the root system is well established. Water them often after transplanting. Provide protection to the plants from winds during windy seasons.

13,270

PLANTS AND THEIR RELATIONSHIP TO SOIL

Section of Landscape Gardening, Virginia Polytechnic Institute
Blacksburg, Virginia

Always there is interest in why certain species and varieties of plants thrive in one location rather than in another. Investigation discloses several important and interesting factors. Among these factors are soil, climate and exposure. Sub-factors to consider under soil are drainage, soil type, chemical ingredients and vegetative matter.

A soil may be formed by the breaking down of talc or mica schist, in which case it is know as Chandler soil. White pine grows well on the Chandler soil, but it is a poor soil for cultivating and cropping. Also there is the Ashe soil that is formed from granitic rock, Frederick soil, formed in the disintegration of limestone and Muskingum and Upshur soils formed from Sandstone and shales. In addition to these and others there are types of loam soils. Soil types are characterized by certain plant species or combination of species.

In general these soils are slightly acid and for many plants lime needs to be added. The Chandler soil has a p H of about 5, Ashe soil a p H of about 5.4, Frederick a p H of 5.5, Muskingum a p H about 4.6 to 4.8 and Upshur slightly more acid.

Another factor known is that plants of one genera or species prefer an alkaline soil, those of another prefer an acid soil. By means of test kits obtainable on the market, one can readily ascertain the degree of alkalinity or acidity in a given soil and from the following list choose plants that prefer this particular degree of alkalinity or acidity. If there are existing plants in the soil which have a yellow coloring and weak habits, or appear to be in poor health, a test made of the soil may show reason for this. Lime applied to an acid soil will neutralize or sweeten the soil. Ammonium sulphate, aluminum sulphate, tannic acid, peat moss, decayed leaf-mold, and other decayed vegetative matter may turn a neutral or sweet soil acid-reacting.

Most soils in Virginia are lacking in sufficient vegetative matter. For this reason it is often desirable to grow cover crops of soy beans, cow peas, lespedeza and other crops and to plow these into the ground. Do not plant any of the higher and more ornamental plants on barren soil. The tendency towards over acidity in the decomposition of these leaves is corrected by applications of lime. Lime is also used for plants preferring alkaline or sweet soils.

Group I. Plants apparently preferring neutral or near neutral soil. p H 7.9 - p H 6.1

Abelia	Maidenhair Fern	Alyssum
Anemone	Butterflybush	Asparagus
Aster	Common Box	Calendula
Astilbe	Beautyberry	Canna
Begonia	China-aster	Clematis
Barberry	Bellflower	Coreopsis
Beet	Bittersweet	Cotoneaster

Group I. Continued

Crocus	Chrysanthemum	Pumpkin
Dahlia	Common Coleus	Hydrangea
Larkspur	Common Cosmos	Juniper
Deutzia	Cucumber, Melon, Squash	Privet
Forysthia	Carnation, Pink	Geranium
Gladiolus	Euonymus, Wintercreeper	Mockorange
Sunflower	Hibiscus, Rosemallow	Garden Phlox
Narcissus	Common Hyacinth	Bluegrass
Peony	Honeysuckle	Primrose
Poppy	Virginia Bluebells	Buttercup
Rose	Arborvitae	Spirea
Yew	Violet, Pansy	Lilac
Tulip	Wisteria	Yucca
Zinnia	Evening-primrose	Iris

Group II. Plants apparently preferring near neutral to slightly acid soil, but not thriving in alkaline soil. p H 6.9 - p H 6.1

Soft Acanthus	Spreading Dogbane	Red Buckeye
Chive	Colorado Columbine	Redtop
Shadblow	Hybrid Colorado Columbine	Oakfern
Goldenstar	Golden Columbine	Dropwort
Watermelon	Devils-walkingstick	Bowmansroot
Coreopsis	Starry Cerastium	Common Sunrose
Orange Larkspur	Common Woodfern	Bluets
Flax	Toothed Woodfern	Birdsfoot Trefoil
Woodbine	Evergreen Candytuft	Oswego Beebalm
Rock Selaginella	European Blue Lupine	Rose Trillium
Oriental Catchfly	Common Adderstongue	Beaked Hazelnut
Common Sweetleaf	Small Roundleaf Orchis	Pootpink, Silene

Group III. Plants apparently preferring moderately acid soil p H - 6.0 - p H 5.1

Carpet Bentgrass	Rhode Island Bentgrass	Fir
Sky-drop Aster	Upland Lady Fern	Chokeberry
Seaside Aster	Yellow Wild-indigo	Stiff Aster
Bigleaf Aster	Cutleaf Grapefern	Heather
Hairy Lipfern	Broadleaf Grapefern	Azalea
Sweet Birch	Triangle Grapefern	Pipsissewa
Feather Bluebell	Pink Turtlehead	Clethra
Speckled Clintonia	Rose Turtlehead	Chinquapin
Jersey-tea	White Fringetree	Sweetfern
Trefoil Coreopsis	American Bugbane	Leatherleaf
Rose Coreopsis	Carolina Springbeauty	Hairy Coreopsis
Threadleaf Coreopsis	Lily-of-the-valley	Scotch Broom
Mountain Woodfern	Ramshead Ladyslipper	Stonemint
Dwarf Pothorgille	Fringed Bleedingheart	Boott Woodfern
Clinton Woodfern	Downy Rattlesnake-plantain	Wintergreen
Heath	Lesser Rattlesnake-plantain	Huckleberry
Button-snakeroot	Carolina-jessamine	Satyr Orchid
Green Fringe Orchid	Yellow Fringe-orchid	Loblolly-bay

Group III. Continued

One-leaf Rein-Orchid	Large Purple Fringe-orchid	Hooker Orchid
Rose-spire Orchid	Southern Bluefleg Iris	Japanese Iris
Great Silverbell	Mountain Juniper	Leucothoe
Hairy Alumroot	Creeping Juniper	Orangecup Lily
Sun-dial Lupine	Mountain-laurel	Dahoon
Inkberry	Grassleaf Geyfeather	Runningpine
Partridgeberry	American Turkscap Lily	Groundcedar
American Holly	Mountain-holly	Indianpipe
Magnolia	Common Pricklypear	Bayberry
Sandhill Phlox	Rhododendron	Mountain Phlox
Spruce	English Stonecrop	Creeping Phlox
Pines, many species	Fragrant Goldenrod	Willow Oak
Post Oak	Mountain Stewartia	Hardhack
Easterbells	American Snowbell	Birdsfoot Violet
Blueberry	Dwarf Spiderwort	Spike Speedwell
Carolina Hemlock		Groundpine

Group IV. Plants apparently preferring rather strongly acid soil p H 5.0 - 4.1

Bog-rosemary	Greenland Sandwort	Arethusa
Arnica	Mottled Wildginger	Red Milkwood
Lobed Spleenwort	Appalachian Spleenwort	Wild Calla
Grass-pink Orchid	Broom-crowberry	Whitecedar
Goldthread	Pink Ladyslipper	Bluebead
Bunchberry	California Pitcherplant	Venus Flytrap
Sundew		Crowberry

Note: Information based upon the work of Dr. Edgar T. Wherry of the United States Department of Agriculture. Plant names used herein are largely taken from "Standardized Plant Names" , published by the American Joint Committee of Horticultural Nomenclature, Salem, Mass. 1923 . A.H.R.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

9785 U. S. DEPARTMENT OF AGRICULTURE AND STATE LAND-GRANT COLLEGES COOPERATING

YARD IMPROVEMENT RECORD - Date (year) _____ ero 8-3888

1. Did you plant according to a plan? _____
2. Did you paint or whitewash your house? _____
3. Did you improve gates or fences _____ outbuildings? _____
4. Did you construct or improve walks? _____ driveways? _____
5. Did you plant at entrance _____ gate? _____ corners? _____
6. Did you plant along foundation? _____ boundary? _____ walks? _____
7. How many trees were used ____ shrubs-vines? ____ flowers? _____
8. Did you improve your lawn? _____
9. Did you make your back yard attractive? _____
10. Did you add arbor? ____ seats? ____ game courts? ____ pool? _____
11. Did the children take part in the work you did? _____
12. Is your improvement permanent? _____
13. Does it tempt you to spend more time out of doors? _____
14. Did you propagate any of your plant material? _____
15. What feature of your improvement gives you the most satisfaction? _____

9791

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A. & M. College & Poly.Inst. & U.S.D.A.Cooperating
EXTENSION SERVICE

1. Suggestions to Accompany Yard Improvement Record Card

1. A plan is a record of ideas to be developed. There are two ways of recording a yard plan. One is to write out the ideas, thus expressing them verbally. The other is to express them graphically in lines and spaces. The graphic way is easiest and best. The proper way to do it is to use cross section paper on which is made a map of correct scale and proportion and to trace on thin paper laid over the map such ideas as are to be tried out for a plan of arranging the yard, its spaces, its routes, and positions of its plantings. It is best to do at least the first one of these plans for oneself and to get help in improving it from someone competent to criticise.

2. The appearance of your house has much to do with the appearance of your yard, because it is really the main interest of the home landscape. Fresh paint or whitewash, and blinds repaired and painted, can make an exterior homelike and attractive. Minor changes and neat repairs to steps and porches also help amazingly. Proper use of tone, hue and "trim" are of importance.

3. Delapidated fences, crooked or broken gates, poor or inappropriate design in gates and fences, mar the home landscape because they call attention to their own faults rather than to the attractions of the yard.

Unsightly outbuildings can be so improved as to take their place in the home landscape. Outbuildings are an important part of the home place and, if they are in good order, add to the general interest. If they are not useful enough to deserve improvement and their share of planting, they should be removed. Outbuildings on another's property that cannot be improved or removed should be blotted out of sight by shrubs, vines or trees.

4. Walks and driveways are the means provided for entering and leaving the home and for connecting different parts of the grounds to the house and to each other. They are, therefore, essentially practical in their nature. But viewed as areas of length and width, they can become factors for good or bad in the appearance of a yard. It makes a difference whether you have a middle walk or a side one, a middle drive or a side one, a "U" drive or a circular drive, a round turn or a "Y" turn, or no turn at all. A wide walk or a narrow walk, a concrete, sand or brick walk, may also have their effect and the same is true of the width and surface of driveways.

5. Where you place your plantings and why you do so is a matter for consideration. Plants placed by gates and by doorways, if properly chosen and arranged, call attention to their importance as entrances to house and grounds and also make them interesting and inviting in either a simple or a stately manner as best suits the spirit of the home. Entrance plantings should emphasize the function of gateways and doorways and suggest hospitality.

The corners of house and yard may require filling or rounding out to take away an empty or angular effect and to make the house and the fence seem to connect agreeably with the ground. Corner plantings do not need to be em-

phatic and should not be more so than the entrances. Boundary plantings are to define and protect the yard. As a rule, they should not obscure the front view of the house.

6. All foundation planting, whether at entrances and corners or between them, is for the purpose of tying the house to the ground, thus avoiding the hard "bump" of the artificial against the natural. It is not necessary to hide all the foundation. Ground covers and vines may play a part in the tying as well as shrubs. A foundation planting should not be too showy. Flowers alone are too light for foundation planting. They may be used with shrubbery. It is not wise to use young evergreen trees against the house.

7. The number and varieties of trees and shrubs, vines and flowers to be used should be carefully calculated in your plan. They may be bought or collected according to your appreciation of native plants and your skill in transplanting them; also according to the time, labor and money you have to spend. Nursery plants take less time and labor and sometimes in the end less money, but collecting is more interesting and may be cheaper to one living in the country. A large assortment of native plants can be purchased well rooted.

8. A good lawn not only makes a smooth, soft trend, a better drained yard, and a more sanitary yard; it also provides a harmonising green, makes the best foreground for a house and for flower plantings, softens the glare of sunshine and the sharp contrast of light and shade, absorbs heat and gives off moisture, and bears the rolling and clipping that creates a sense of order and beauty in the floor of the yard. A lawn should be well made, well kept, and as open as possible.

9. Many back yards are undeveloped ways to health and happiness. Caked, bare earth that requires sweeping and that may become slimy in damp weather brings neither beauty nor sanitation to the back yard. Good grass, neat walks and paving where needed, trees or arbors for shade, and a few well placed shrubs and flowers, can add much to its beauty. Remove all trash and useless articles. Make it a place fit to work in or to rest in and a pleasant place for the children to play in. Have a comfortable place to sit. Have a table.

10. An arbor may provide a secluded passageway, may serve to divide one area from another, and may provide shade when trees are wanting. It will support vines for fruit or flowers, it may be a good resting place, and may be an interesting feature.

Seats are essential to real out door living. Tables are also desirable. Courts for games keep the children at home and bring their friends. A pool may hold fish or flowers or may be a tiny place for birds to frequent.

11. Children like to help and like to have things of their own. Their youthful energies may be made constructive instead of destructive by permitting them a share in building, planting and cultivating in the landscape development. A picnic place, large or small, a special nook to read or play, a flower border, a bird house or a small pool, would prove a good homekeeper for children.

12. Permanent plantings have an immense advantage over temporary ones. They save time, trouble and money in the long run. Their season of bloom and growth is longer. They provide something to see in winter besides frostbitten beds. They increase and multiply. They require less care and cultivation than others. They increase the value of the place; grass, trees, shrubs, vines, and established perennial flowers along with good views do more to command a good price for a home than anything else, because they are permanent and cannot be had in a hurry. Annuals are useful for quick results and to fill in seasonal gaps, but they cannot be considered as constructive planting. Cut flower gardens are different from permanent perennial gardens. A flower garden is too personal a matter to be fully exposed to public gaze and comment.

13. A yard that is not lived in after it is planned and developed fails of its purpose. It should be easily entered from the house; should attract one from windows and porches; and should be enough the work of one's hands, head and heart to appeal strongly to the desire to enjoy it. It should be a living place, convenient and orderly as well as beautiful, not a show place that is a care to one for the sake of appearances.

14. It is easy to propagate much desirable material for shrub and flower planting. Such work takes time but saves money and is in many ways a good thing to do. A community interest in propagating would lead to greater wealth of plant material, opportunity for exchange, and surpluses for civic use; a greater knowledge of plants would result.

15. Lives and individuals differ. Some lives are filled with leisure; others with work. One person may need the absorbing responsibilities of a large gardening scheme; another may need only a lovely restful spot in which to recuperate tired mind and muscles. One may find pleasure in attracting and observing birds and other creatures. Some love flowers as they grow and design gardens to make them effective; others care more to cut and arrange them, and grow them solely for that purpose. Busy housewives could enjoy doing much of their work out of doors if they had a convenient, attractive place just a step from the door. It is well to know what we can enjoy most in our yards and to make them serve our ends and needs.

Fuller directions and information under each of the foregoing headings can be had by applying to the Extension Landscape Specialist, Virginia Polytechnic Institute, Horticultural Department, Blacksburg, Va.

11,858 COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
State of Virginia, Va. A. & M. College & Poly. Inst. & U. S. D. A. Cooperating
EXTENSION SERVICE

BEST SMALL NEEDLE-LEAVED EVERGREENS FOR PLANTING GROUNDS

I. Junipers (These are all good green - endure sun. Can be combined with sun-loving plants like shrub roses, spireas, deutzias, barberry, ext. Not too formal)

1. Savin 2 to 4 ft.
2. Dwarf Savin 2 ft. to 4 ft.
3. Tamarish leaved 2 ft.
4. Prostrate or horizontal
5. Sargent's 2 ft.
6. Pfitzer's 4 to 6 ft.

The purple, yellow and varigated varieties are hard to use

II. Pines (Yellowish green, need sun, can be combined with juniper and sunloving shrubs, not too formal.)

1. Mughe or Cushion 1 to 2 ft. easily kept low.
2. Japanese table pine (Tanyosho) up to 10 ft. Slow growth - expensive

III. Yews (These are all fine dark green, prefer shade, can be combined with box and other shade-loving evergreens like box, tarberry, etc., that are fine in quality and somewhat formal.)

1. Broom yew 2 to 4 feet
2. Japanese yew 5 to 7 ft.
3. Dwarf Japanese yew 2 to 3 ft.
4. Spreading dwarf Jap.yew 2 to 3 ft.
5. Canadian yew 1 to 2 ft. shade only

Note: English yew, a tree, is sometimes used as a shrub becuase it grows very slowly. Best to plant such a shrub where it may become a tree without being moved.

IV. Arborvitaes (Will endure sun, but like part shade) Sometimes browning in winter, rather coarse in texture, do not combine with boxwood and fine textured or formal plants.

1. Parson's (one of the best greens) 2 to 3 ft.
2. Globe 3 to 6 ft., bronzes in winter sun needs shearing yearly
3. Tom Thumb 2 to 3 ft.
4. Conica densa 3 to 5 ft. May grow talled

V. Japanese Cypress or Retinospora (Good green, good soil, part shade, a little coarser than yews. Usually expensive.)

1. Dwarf hinoki cypress (Obtusa nana) 1 to 2 ft.
2. Japanese cypress (Obtusa) 5 to 7 ft.
3. Other forms of Obtusa nana

VI. Spruce

Gregory spruce 1 to 3 ft. (Good green, neat, semi-formal effect, transplants easily.)

Caution: Do not buy a collection for your plantings, rather combine one or two harmonious kinds, or several of one kind. Be sure the kind you select are really dwarf if you desire that type. Do not buy evergreens just becuase they are offered cheap. Consider your actual needs first. There are other shrubby needle evergreens, usually too expensive for average use.

(over)

Some needle-leaved evergreen trees all reaching ultimate growth of 20 to 60 ft. suitable for planting grounds. Do not plant any of these for shrubs except in plantings suitable for trees, or unless they can be moved when mature growth begins.

I. Arborvitaes

1. Chinese
2. Siberian (Warren's)
3. Fern-leaf
4. American
5. Standish
6. Pyramidal (Douglasi

II. Junipers (Cedars)

1. Virginia red
2. Virginia blue
3. Irish (use very seldom, too unusual in shape
4. Greek
5. Swedish

III Pines

1. Swiss stone (endures shade, very slow growing, bushy)
2. Austrual (large)
3. Mountain (small)
4. Densiflora (small)
5. Loblolly (large
6. White (large)

Many others

IV. Japanese Cypress or Retinospora

1. Plumosa
2. Squarrosa
3. Nootka Sound
4. Lawson's
5. Filifera (thread)
6. Pisifera (pea-bearing)

Some others all grow to trees

V. Hemlock

1. Canadian
2. Carolina

VI. Spruce

1. Norway (50 ft.)
2. Colorado blue (50 ft.)

some others

VII. Firs

Use any that are suited to locality, all are large trees.

VIII. Yews

1. English
2. Irish (Shaped like Irish Juniper but more beautiful

Som others

All yews are choice, slow growing, and need good soil and shade and part shade. They do not belong in very ordinary informal surroundings, Irish yews are usually planted in groups. They have beautiful fruits and foliage.

There are many other needle-leaved evergreen trees, but these are the varieties generally offered at moderate prices. All evergreens that grow slowly are comparatively expensive because of the time and care needed to propagate them.

DOGWOOD PLANTING

I. Selecting and Preparing Trees for Transplanting.

1. Size: Use seedlings or young trees; it is difficult to transplant large trees.
Type and Vigor: The best type of seedling is one that has had a good start in life, has grown rapidly and formed a good root system; the best type of young tree has a straight sturdy trunk, clean smooth bark, and a well shaped branching top. Vigor of tree or seedling is shown by appearance of normal growth and absence of defect or injury in root, trunk and branch.

2. Proper Handling: Dig the tree so as to save the feeding roots; these are the small roots growing from the large ones. If possible, retain a ball of earth around the roots. If feeding roots are exposed in lifting the tree, protect them from being bruised or broken. Cover them with moist paper or bagging to keep them from drying. If a tree is moved to a distance avoid injury or rough handling.

3. Removing Injured Parts and Pruning Top: Bruised or broken roots and branches need to be removed with a sharp knife. Roots serve to absorb moisture into the tree and leaves serve to evaporate excess moisture from the tree. A transplanted tree may be temporarily reduced in its absorbing capacity in which case a wise amount of pruning which reduces its evaporating capacity proportionately helps to keep a proper moisture balance while the tree is getting established. Do not "top" or mutilate the tree; branches may be thinned in a way to keep the natural shape of the tree; less than half of the top growth is to be removed unless there has been severe loss of roots, in which case pruning is increased in proportion to the loss.
Cut branches close enough to a crotch to allow the bark to draw and heal over the cut. Cut twigs just above a joint or bud to allow healing where new growth will begin. Joints cut in two, or twigs cut beneath a bud joint will have dead stumps because pruning is not close to growing points.

4. Comparison of Collected and Nursery Grown Trees: Trees that grow wild, are not as easily transplanted as nursery stock because they do not always grow in ideal conditions and because their roots are rambling and hard to dig without loss or injury. They frequently grow in shade and are consequently susceptible to sun-burn.
Nursery grown trees are developed in ideal conditions; they are root pruned to develop an extra supply of feeding roots and the roots are not rambling and hard to dig. The seedlings have more abundant roots and the growing trees have been transplanted and cultivated in a way to prepare them for safe moving. They are easy to handle, easy to get, and they are almost sure to grow; they are very cheap especially in lots of 100 or more.
Reliable nurseries offer nursery grown stock at slightly higher prices than collected stock. Some unreliable nurseries sell collected stock as nursery grown stock to persons who do not know the difference. Best buy through the State Nursery Association. Address: V. E. Boyer, Petersburg, Virginia.

5. Reasons Why Collecting Trees is not Advised
1. The Dogwood Planting Campaign is for the purpose of increasing the number of trees in the state. As collected stock frequently dies, and as the planting is to be on a large scale, collecting trees for transplanting would result in decreasing not in increasing the number in the state. What is needed is stock in quantity that will grow. For this as a rule, collected stock is unsatisfactory.
2. Pink Dogwood is preferred by some to white dogwood. It is slightly more expensive than the white variety, but nurseries offer it for the campaign at low prices.

II. Favorable and Unfavorable Conditions for Transplanting.

1. Soil and Site: Dogwood thrives in any soil that is moderately fertile, has average moisture and is fairly well drained. Dogwood will endure both sun and shade.

2. Moisture and Temperature: Transplanted trees suffer from lack of moisture and extremes of heat or cold. Mulching in summer prevents the soil from drying; in winter it prevents too sudden thawing. Hot sun in summer evaporates moisture from the leaves, in winter may burn and crack the bark. Drying winds at all times reduce the moisture.

3. Time of Transplanting Governed by Local Conditions of Moisture and Temperature: In sections where the ground never freezes to the depth of the roots, transplanting can be done at any time of the year. In sections where ground freezes, transplanting is best done in spring, but can be done in summer or early fall.

At whatever time transplanting is done, unfavorable moisture and temperature conditions must be avoided while the tree is being established. Do not transplant on a windy day, or during a dry spell, or if this must be done, shield the tree from wind and sun and water it properly.

C. Setting Out Trees.

1. Avoid delay in getting trees into the ground: If delay is unavoidable, open a trench, lay the roots in and cover them with soil to protect them. Keep the roots covered while preparing for planting.

2. Bring the Roots into Close Contact with the Soil: Loose soil settles and leaves air pockets around the roots; this causes roots to dry and also prevents their absorbing moisture. Pack soil firm around roots and under the trunk where roots begin. Do not plant the tree deeper than it grew.

3. Prevent Danger of Trees Becoming Loosened in the Grounds: A newly set tree is easily loosened. Staking holds it firm against wind and compacts.

4. Prevent Danger of Injury to Bark: It is well to wrap the trunks of transplanted trees to prevent sun injury to the bark. This is especially true of collected trees exposed to sun when not in leaf.

5. Remove Injured Parts and Prune Top if Necessary: Injured parts need removing; nursery grown trees need little if any pruning; collected trees often need pruning to compensate loss of roots reduce evaporation and shape them better.

D. Care of Transplanted Trees.

1. Conserve the Moisture in the Soil: Mulch in the soil, tight packing around the roots, a slight depression around the base of the trunk to hold rain fall, and stirring the surface of the soil after rains and frequently will help to hold soil moisture.

2. In Dry Weather: Protect the tree by mulching and shading it. Water it once a week thoroughly to soak the ground as deep as the roots. A daily shallow watering in dry weather is harmful.

3. In Winter: Wrapping the trunk in muslin prevents injury to bark; mulching prevents freeze-and-thaw injury; staking anchors against winds.

4. Never Allow a Tree to be Broken: Breaking leaves ragged edges and peeled bark that do not heal; cutting (as directed for pruning) allows the tree to heal.

E. Why Dogwood Planting is Advocated.

1. Conservation: This word means "keeping on hand enough of a needed something" either by saving it or by increasing the supply of it.

2. Conserving Natural Beauty: Natural beauty is a "needed something" as necessary to the good of the human mind as natural materials are to the human body. It needs conserving because it is being destroyed.

3. Disappearing Nature Plants: Useful plants are generally preserved and cultivated; ornamental plants are destroyed by collecting and by clearing land for uses. Holly, laurel and dogwood are among the many disappearing nature plants.

4. The Only Hope of Preserving Nature Ornamentals: People must be taught the actual value of these plants that belong to the Natural Beauty of the Landscape; that they are vanishing; that once gone they can never be recalled; that conservation of the wilderness is essential to the recreation of humanity.

Prepared for Woman's Home Companion
by Grace Tabor, Editor Garden Dept.

VINES AND CLIMBERS:

This group includes (1) plants that raise themselves by mean of tendrils; or disks at the tips of aerial rootlets; or by twining their entire bran around a supporting object; and (2) plants that have no method of attaching themselves to a support, although they make such length of growth that they cannot support themselves. Always choose a climber for a particular place therefore, according to the division in which it falls. Against wooden structures it is usually better to place trellises or other support, and to use the twining, the tendril climbing, or those requiring to be trained and helped, rather than any of those that cling with disks to a flat surface. These latter are the better choice for walls of masonry. Trellises should be hinged at the bottom to 4 by 4 inch posts set firmly in the ground and fastened to the building at their tops by hooks, fixed to hold them rigid. Then when it is necessary to paint or for any purpose to remove a vine, the whole mass of trellis and vine is unhooked and folded outward onto the ground, without injury to anything.

Annual Climbers - Practically all of these will do well in SANDY as well as AVERAGE SOIL. All are of quick growth, and need full sun unless otherwise specified.
(N.B. The figure after each plant name indicates height in feet at maturity).

Dolichos lablab, 20. Humulus japonicus, 20. Ipomoea varieties, 20. (includes the Japanese and Brazilian Morning-Glories and Moonflowers). Lathyrus odoratus, 6-8. (Sweet Peas). Maurandia Barclayana,10. Momordica balsamina & charantia, 10. Tropaeolum majus, 6-8,(Nasturtium). Phaseolus multiflorus,10,(Scarlet Runner Bean of the vegetable lists). Thunbergia alata,4,(excellent window or porch box trailer). Linaria cymbalaria,3-4,(Kenilworth Ivy,also for boxes). Echinocystis lobata,15-20. Ornamental Gourds in all varieties, 15-20.

Hardy Climbers - Self-fixing to support as indicated
SANDY POOR SOIL. Full sun: (twining) Jasminum nudiflorum, 20. Pueraria thunbergiana, 60. Convolvulus japonica,20. Shade or sun: (twining) Lathyrus latifolius and varieties, 6. Lonicera japonica and varieties, 20. Shade: (disks) Ampelopsis tricuspidata, 100.

SANDY RICH SOIL. Full sun: (twining) Akebia quinata, 25. Periploca graeca, 40. Clematis paniculata and large flowered varieties also, 8-15. Shade or sun; (disks) Hydrangea petiolaris, 80.

HEAVY SOIL. Full sun; (disks) Tecoma grandiflora, 30. Shade or sun; (twining) Celastrus scandens, 20.

HEAVY AND WET SOIL. Full sun; (twining) Actinidia arguta,30. Aristolochia macrophylla, 40. Shade or sun; (twining) Wisteria chinensis and all varieties, 100. Menispeanum canadense, 12.

WET-ALMOST BOG SOIL. Full sun (twining) Lathyrus palustris, 3-4. Shade; (disks) Hedera helix; 100.

Hardy Plants Trained as Climbers
SANDY OR LIGHT SOIL. All the climbing roses, 8-15.
SANDY AND STERILE SOIL. Lycium chinense, 10-15.
AVERAGE SOIL. Forsythia suspensa, 8-15; good for top of banks, etc. Euonymus in all varieties, height of which varies greatly. (This will usually develop disks eventually, but must be fastened to its support in beginning).

Special Climbers
Adlumia cirrhosa, 10. Hardy biennial which self-sows and so persists.
Apios tuberosa, 8. Good in low damp places; grows from tubers which must be stored over winter as potatoes are stored.
Ipomoea batatas (divaricata), 10. Tuber; tubers will survive winter in the ground up to 42-45 latitude.

Prepared by Woman's Home Companion

PHLOX--MIDSUMMER'S STAND-BY

In the salmon-pinks, which are the palest members of the scarlet-red Phlox group, Elizabeth Campbell is still generally accepted as the best. This is penciled with lighter pink, but has a decided dark red eye which gives it especial character and brilliance. It grows to a height of about two feet and blooms during the midseason, between the middle of July to September and even later. A deeper color combining well with this is Firebrand, called a vermillion scarlet. This is a strong grower and has large panicles, with an eye of deep self-tone. Deep cherry-red is Debe, held by many to be the finest and most effective of reds, especially as it has no tendency to bleach or change color after opening. This is darker and differs in color from the new Karl Foerster and yet does not clash with it--the latter being similar (though weak growing) to the old marvel Coquelicot, which nothing that I have ever seen has rivaled; an orange-scarlet of such lively character that it fairly dances under the eyes, like heat-waves. And finally there is Thor, back into the salmon-pinks, but late blooming and so mentioned last. This shows a deep shade suffused with vibrant scarlet, which produces a more unusual effect, especially as the eye is deep purple with a halo little deeper than a blush-white.

In the pure pinks which work into wonderful masses with the silvery pinks and mauves and so on down into magentas and purples, there is Mrs Milly van Hoboken delicate and soft and lovely; and Jules Sandeau, deeper a little in color with a purple eye set apart by a halo of paler pink than the flower itself. Next to these will come L'Esperance, pale lavender pink with a white eye; Riverton Jewel of distinctly mauve-rose color with a vivid crimson or carmine eye, a particularly brilliant variety; Rosedin and Eugene Danvilliers, mauve and late flowering Champs Elysee, which is getting into the rosy magenta but loses none of brilliance thereby; and so down to the deeper tones of Eclaireur, an early bloomer which gives an effect of purple owing largely to the eye of rose color surrounded by a purple halo. The color of the flower itself is red-purple suffused with dark scarlet red and though its panicles are small comparatively, they are dense and the height is about three feet. Then there is B. Comte, a variety of such unusual color that it must be planted with white flowers or flowers of palest yellow in order to provide the foil it needs. This is a late season variety showing a range from deep purple to a lighter aster-purple with an astonishing brilliance or luster, an altogether sumptuous flower, especially in mass. It grows from three feet to three and a half feet in height and is strong and virile in character.

Between these two kinds of pinks and reds come of course the white phloxes--some purest white, others tinged with suggestions of mauve or blushing warmth. The variety Miss Lingard, earliest to bloom-three weeks earlier than any other kind, coming into flower in June usually and going on to the season's end if the old flower heads are removed constantly, is probably justly the favorite. It is of good height for backgrounds, being three feet; and it has exceptionally good foliage. The eye of the flower is barely tinged with lavender or purple usually, but it may be creamy or pure white. Another fine white is Mrs. Jenkins, low growing, a food and a half, but also early flowering. (this is exceptionally good for shade) though not as early as Miss Lingard. Especially lovely among whites, to my taste, is Europe which has a crimson eye that tends to warm the mass effect delightfully. And fine late blooming white is Jeanne d'Arc, tall and beautiful! Finally, never forget that nearly every phlox, regardless of color is exceptionally fragrant, with a pungent odor as refreshing as it is distinctive. This in addition to their midsummer and late summer season of bloom seems to be almost a work of supererogation. How can any garden be without them?

Crown Rot

Delphinium - Some causes: Water standing over the crowns in winter; slugs and snails.

Remedies: For winter wetness after cold weather has set in, put a shovelful of coal ashes over the crowns which will prevent decay. For slugs and snails, mix with the coal ashes a poison bait made of a thick mash of wheat bran and molasses with arsenic added as a poison or dig dry Bordeaux mixture and sifted ashes into the earth around the ground of established plants. If foliage blackens and plants fail to bloom, use this remedy in the fall or early spring and substitute bone meal for manure as fertilizer.

Columbine - If soil is heavy clay lighten it with leafmold instead of manure. If borers are found in the crown the only remedy is to pull up infested plants and burn them.

Japanese Anemone - These seem to do best when planted on the south side of shrubbery, evergreens or walls and so protected from northern winds. They require rich, moist soil, plenty of water all summer, but need well drained dry soil in winter. They need a good covering of leaves in winter. They endure partial shade, but care must be taken to drain and dry the shaded soil in winter.

Suggestions for Boxwood

Try using some neat lathe screening for protection from sun either in winter after severe cold or in summer when hot sun can strike foliage while it is wet. This screen can be built with legs like a table and ordinarily are protection enough to the plant but in severe weather burlap can be placed over them for extra protection. Lathe screens are not unsightly if stained green and are conveniently moved. They can be made of cross lattice or of ready made plant fencing strung together with wires. (See Sears & Roebuck catalog).

Wash the boxwoods occasionally to clean and freshen the leaves with a good hard spray after the sun is down. Water them copiously once a week allowing the water to run in a stream on the ground not touching the leaves. In hot, dry weather, use inverted sods for a mulch around the roots. Feed plants with well rotted manure or liquid manure in the spring (see circular enclosed).

The question of whether there is a prevailing boxwood disease is not entirely settled but it seems clear that proper feeding, watering and protecting from injury, especially that of burning cold or wet leaves in the sun tend to overcome such attacks as boxwoods appear to be suffering from.

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By Grace Tabor, Editor Garden Dept.

NOTABLY SWEET OR FRAGRANT PLANTS

Perennials

Sweet Woodruff (asperula odorata), white flowers in May; use in shade places anywhere, also as a ground cover. Height 6 inches.
Wallflower (cheiranthus cheri). A biennial; raise annually; give winter protection.
Cheddar pink (dianthus caesius). Rose pink flowers in May and June; cushion-like growth; blue-gray foliage; can be used in rock garden.
Scotch pinks (dianthus plumarius). Many colors in May and June; hardy but must have good drainage and warm soil. Height about 24 inches.
Day Lily (hemerocallis). Shades of yellow, from May to July; some varieties not fragrant. Height 24 to 36 inches. Fragrant are: H.aurantiaca; H.citrina; H.flava and H.Dr. Regel.
Heliotrope. Actually a shrub, this is grown over winter indoors in the north as it cannot endure frost; easily started from seed. Height 18 inches.
Iris (iris florentina). Nearly all have some fragrance byt outstanding is this particular white-flowered species.
Lilies. Some of these root along the stem as well as below the bulk. For this reason they must be planted four times the bulb's diameter under the surface.
Plant the others twice the bulbs diameter underground. Put a handful of sharp sand under every lily bulb and keep manure away from them. Those preferring acid soil are indicated, likewise those preferring alkaline soil.
Lilium hansoni; pale yellow flowers in early June; indifferent as to lime but likes shade and moist soil; plant deep. Height 48 inches or more.
Lilium candidum (madonna lily) pure white in June. Plant shallow in good well limed soil in full sun. Height 36 inches.
Lilium carolinianum; orange-crimson in July; plant deep in mois acid soil but give perfect drainage. Height 24 to 48 inches.
Lilium auratum; very large flowers, white with gold band, in July and August. Plant deep in very well drained soil that is not too rich. Provide some low-growing plant to shade ground or set bulbs in clusters where there own foliage will furnish shade. Sometimes reaches height of 5 to 6 feet.
Peony. Nearly all have some fragrance. Notably fragrant are Paeonia edulis superba, tall, silver-pink, blooming late in May; Duchesse de Nemours, sulphur white, blooming early June; and Baroness Schroeder, tall, flesh-white in bloom at mid-season. Medium height.
Phlox. All varieties of phlox decussata are fragrant and provide the garden with scent from June on through summer. All colors in red, pink and mauve-magenta shades and white.

Annuals

Carnations. Marguerite type bloom in a few weeks from time of sowing the seed and may be used in mixed colors or in the separate packets. Height 18 inches.
Chinese Forget-me-not (cynoglossum amabile) a true blue, delicately fragrant of easy culture. Height 24 inches.
Evening scented Stock (matthiola bicornis). Flowers are not attractive but fragrance is entrancing in the evening; no special culture. Height about 18 inches. Plant where its evening scent may be enjoyed.
Mignonette (reseda odorata). Easily grown from seed; sow early and again about July first; for all-summer bloom; can be grown indoors in pots.
Tuberose-tobacco (nicotiana affinis). No annual is more fragrant this this white flowered form; affinis hubrids provide many colors also. Height 24 to 36 inches.

Nasturtium Golden Gleam. The double-flowering nasturtium which forms a bush. Flowers rather rule yellow and not altogether satisfactory but fragrance is exceptional, especially after cutting.
Petunias. All are exceptionally fragrant whether grown in the ground in window or porch boxes, or in pots indoors. Separate or mixed colors. Easy culture, requiring only average soil and full sun. Prostrate growing.
Stocks. The cut- and-come-again group provide fragrance as well as almost endless flowers for cutting throughout the summer. The Brompton strain is a giant form used indoors in winter but also useful in the garden if large forms are admired. Be sure to cut freely. Of easiest culture. Height about 24 inches.

Shrubs

Spice-bush (benzoin aestivale). Blooms very early; moist soil, part shade, large size.
Sweet shrub (calycanthus floridus) May blooming; good soil, part shade, large size.
Sweet-pepper bush (clethra alnofilia). Midsummer blooming; damp soil and shade. Medium size.
Garland flower (daphne cneorum). Low-growing, spreading evergreen; peaty soil with stones in it, full exposure to sun but shelter in winter from winds.

Trees

Linden (tilia americana). One of the finest native shade trees.
(tilia platyphyllos) European Linden adapted to poor soil.
Locust (rovinia pseudeacacia). Adapted to dry sandy soils.

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AROMATIC PLANTS - The Uses of the Principle Culinary Herbs

ANGELICA: Use stems and leafstalks as salad, or roasted like potato; for garnish; candied; use leaves as greens; seeds for flavoring. Propagate by seeds in late summer or early fall; treat as biennial.
ANISE: Use leaves as greens, garnish or flavoring; seeds for flavoring. Propagate by seeds down annually in early spring.
BALM: Use leaves for flavoring and salad. Perennial. Divide roots.
BASIL: Use leaves for flavoring. Propagate by seeds annually, in spring.
BORAGE: Use leaves as salad and greens; as garnish; as flavoring in drinks. Propagate by seeds annually in spring.
CARAWAY: Use leaves as greens or salad; roots as root vegetable; seeds for flavoring Propagate by seeds sown in May or early June.
CLARY (Salvia Solarea): Use leaves for flavoring cooked foods; a wine is made from the flowers. Perennial; propagate from seeds in spring.
CORIANDER: Use seeds in confections and sauces and as flavoring for beverages. Propagate annually by seeds sown in spring or autumn.
CUMIN: Use powdered seeds as curry powder ingredient; also as flavoring (not necessarily powdered) in soups, pickles and pastry. Propagate by seeds sown annually in spring.
DILL: Use young leaves as seasoning and salads; immerse in vinegar for flavoring. Propagate by seeds sown annually in spring.
LAVENDER: Use flowers dried for scent bags; use leaves and flowers in salads and as condiment. Propagate by divisions or cuttings.
MARIGOLD: Use flowerheads in soups and stews for flavoring. Seeds sown annually. (This is Calendula officinalis, the pot-Marigold.)
MARJORAM: Use leaves fresh or dried as seasoning for meats, cheeses, dressings, etc. Propagate b y cuttings, division, layers, or seeds in spring. Treat as annual.
MINT: Use leaves for flavoring jellies, drinks, sauces, etc. Propagate by division, cuttings, or offsets (layers) in spring.
PENNYROYAL: Use leaves as seasoning. Propagate by division.
ROSEMARY: Use herbage as seasoning, fresh or dried, in salads, pickles, etc. Use also in scent bags and in bags for the bath. Propagate by cuttings, division, cuttings layers or seed in early spring. Tender perennial.
RUE: Use leaves as seasoning and beverage flavor. Propagate by division or seeds.
SOUTHERNWOOD: Use young shoots for flavoring cakes. Propagate by seeds.
TANSY: Use leaves as general seasoning - to taste. Propagate by seeds, or division.
TARRAGON: Use leaves with salads and meats; as seasoning; as vinegar decoction. Propagate by cuttings or division.
THYME: Use herbage as seasoning. Propagate by seeds in spring, or division, cuttings or layers.

Cut all aromatic plants for drying for winter use on a clear day, in the earliest stage of the flower buds opening, and early in the morning before the dew is off. Tie up in bunches and hang to dry indoors immediately where there will be no wind. An attic makes an excellent drying room owing to the dry heat generated under the roof. As soon as thoroughly dry it is well to strip from the stems and close up in glass sealed jars, or other tight receptacles that will retain the aroma. If the glass sweats inside, uncover and dry further until all moisture is gone.

Listed by -

Alfred C. Hottes

GARDEN FLOWERS FOR SHADY PLACES

Anemone, Japanese (Anemone japonica). White, pink.
Aster, Hardy (Aster, various). Purple, white
Balloonflower, Chinese (Platycodon grandiflorum). Blue, white
Beebalm (Monarda, various). Scarlet, purple.
Black-Eyed-Susan (Rudbeckia, several). Yellow, dark center.
Bleedingheart (Dicentra eximia and spectabilis). Carmine.
Bugle (Ajuga, various). Purple, pink.
Bugloss (Anchusa italica). Deep blue.
Candytuft (Iberis sempervirens). White
Cardinalflower (Lobelia cardinalis). Cardinal.
Columbine (Aquilegia, various). Various.
Cranesbill (Geranium sanguineum). Rosy purple.
Coralbells (Heuchera sanguinea). Coral, white
Cowslip, English (Primula, various). Various
Daylily, Lemon (Hemerocallis flava). Lemon.
Evening-Primrose, Missouri (Oenothera missouriensis). Yellow
Forget-Me-Not (Myosotis palustris). Light blue.
Foxglove (Digitalis purpurea). Lavender rose.
Gasplant (Dictamnus albus). Rosy purple, white.
Gayfeather, Cattail (Liatris pycnostachya). Rosy purple.
Globeflower (Trollius europaeus). Golden yellow.
Goldenrod (Solidago caesia and others). Yellow
Goutweed (Aegopodium). Variegated leaves.
Harebell (Campanula rotundifolia). Blue
Joe-Pye-Weed (Eupatorium purpureum). Rosy purple.
Lily-of-the-Valley (Convallaria majalis.) White.
Loosestrife, Purple (Lythrum salicaria). Purple
Maltese Cross (Lychnis chalcedonica). Scarlet
Meadowrue (Thalictrum, various). Purplish white.
Monkshood (Aconitum, various). Violet, yellow, white.
Moss, Phlox (Phlox subulata). Rosy lavender.
Pansy (Viola tricolor). Various.
Pea, Perennial (Lathyrus latifolius). Rose, white
Pheasants-Eye (Adonis, various). Yellow.
Plantainlily (Hosta or Funkia subcordata and others). Purple, white.
Rose Campion (Lychnis coronaria). Bright rose.
Rosemallow (Hibiscus moscheutos), various.
St. Johnswort (Hypericum, various). Yellow
Speedwell (Veronica rupestris). Violet
Spirea (Spiraea aruncus). White
Spirea (Spiraea palmata). Crimson.
Spurge, Mountain (Pachysandra terminalis). White
Stonecrop (Sedum, various)/ Yellow, pink, white.
Sweet-William, Wild (Phlox divaricata). Lavender.
Torchlily (Kniphofia aloides). Bright orange scarlet.
Trillium (Trillium, various). White, red.
Violet (Viola, various). Purple, yellow, white.
Virginia Bluebells (Mertensia virginica). Blue.
Woodruff, Sweet (Asperula odorata). White.

SPRING WILD FLOWERS

Anemone, Wood	Anemone quinquefolia
Baneberry	Actaea rubra and alba
Bellwort, Merrybells	Uvularia grandiflora
Bishopscap, Common	Mitella diphylla
Bloodroot	Sanguinaria canadensis
Bluebead	Clintonia borealis
Blue-Eyed-Grass	Sisyrinchium angustifolium
Bluet	Houstonia coerulea
Bunchberry	Cornus canadensis
Cohosh, Blue	Caulophyllum thalictroides
Coltsfoot, Common	Tussilago farfara
Crinkleroot	Dentaria diphylla
Crowberry	Empetrum nigrum
Dalibarda	Dalibarda repens
Dutchmans-Breeches	Dicentra cucullaria
False Solomonseal	Smilacina racemosa

Ferns:

Christmas Fern	Aspidium acrostichoides
Cinnamon Fern	Osmunda cinnamomea
Hartford Fern	Lygodium palmatum
Interrupted Fern	Osmunda claytoniana
Lady Fern	Asplenium filixfemina
Maidenhair Fern, American	Adiantum pedatum
Polypody, Common	Polypodium vulgare
Royal Fern	Osmunda regalis
Sensitive Fern	Onoclea sensibilis
Spleenwort, Ebony	Asplenium platyneuron
Walking Fern	Camptosorus rhizophyllus
Foamflower, Alleghany	Tiarella cordifolia
Galax	Galax aphylla
Geranium, Wild	Geranium maculatum
Golden-Grass (Stargrass)	Hypoxis hirsuta
Goldthread	Coptis trifolia
Grass-of-parnassus	Parnassia caroliniana
Groundivy	Nepeta glechoma
Hepatica, Roundlobe	Hepatica triloba
Iris, Vernal	Iris verna
Jack-in-the-Pulpit	Arisaema triphyllum
Jacobs-Ladder	Polemonium reptans
Lily-of-the-Valley, Wild	Mianthemum canadense
Lupine, Sundial	Lupinus perennis
Marshmarigold	Caltha palustris
Mayapple, Common	Podophyllum peltatum
Moneywort	Lysimachia nummularia
Oconee-Bells	Shortia galacifolia

Orchards:

Arethusa	Arethusa bulbosa
Grass-Pink Orchid	Calopogon pulchellus
Ladies-Tresses, Nodding	Spiranthes cernua
Ladyslipper, Pink	Cypripedium acaule
Ladyslipper, Small Yellow	Cypripedium parviflorum
Ladyslipper, Common Yellow	Cypripedium pubescens
Ladyslipper, White	Cypripedium candidum

SPRING WILD FLOWERS - continued

Orchis, Showy	Orchis spectabilis
Partridgeberry	Mitchella repens
Pearlpink	Silene pennsylvanica
Periwinkle, Common	Vinca minor
Pipsissewa, Common	Chimaphila umbellata
Polygala, Fringed	Polygala paucifolia
Rattlesnake-Plantain	Goodyera pubescens
Rue-Anemone	Anemonella thalictroides
Sandmyrtle, Box	Leiphyllum buxifolium
Saxifrage, Virginia	Saxifrage virginiensis
Shinleaf	Pyrola, various
Shinleaf, Oneflower	Moneses uniflora
Shootingstar, Common	Dodecatheon meadia
Solomonseal, Small	Polygonatum biflorum
Spiderwort, Virginia	Tradescantia virginiana
Springbeauty, Virginia	Claytonia virginica
Squirrelcorn	Discentra canadensis
Starflower, American	Trientalis americana
Trillium	Trillium, Various
Troutlily, Common	Erythronium americanum
Turtlehead, White	Chelone glabra
Twinflower, American	Linnaea borealis, americana
Twinleaf	Jeffersonia diphylla
Violet	Viola, various
Waterleaf	Hydrophyllum, various
Wildginger, Canada	Asarum canadense
Windflower	Anemone, various
Wintergreen	Gaultheria procumbens
Woodbetony, Early	Pedicularis canadensis

HARDY FERNS

Almost everybody has a spot in the garden around the home which is so shady that very few plants will grow there and consequently these pots are bare eyesores. Have you ever taken a walk through dense, cool green woods and admired the wealth of ferns growing there so luxuriantly, and wished that you could have them around your own home to lend their quiet and cool atmosphere? Most of these ferns can be grown easily if one is willing to give a little attention to their care.

Uses. Since most of these ferns require a shady and moist situation, they can be massed along shady, woodland paths, at the edges of ponds or along the sides of streams. Many are good for planting on the north side of houses and as edges for borders. The small ones are almost invaluable for the rock garden or near small artificial waterfalls. In the ordinary garden very pretty effects are gained by planting the early flowering bulbous plants among them, because the fronds of the ferns begin to unfurl very early in Spring. Collections of hardy ferns are extremely interesting. Many of the sorts are good for cutting during the Summer.

IV. Narrative

A. County Narrative
B. Narrative Summary and Plan of Work