VIRGINIA

AGRONOMY Annual Report 1941

Index

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REPORT FILES
EXTENSION WORK

COOPERATIVE EXTENSION WORK
IN
AGRICULTURE AND HOME ECONOMICS
STATE OF VIRGINIA

VIRGINIA AGRICULTURAL AND MECHANICAL COLLEGE AND POLYTECHNIC INSTITUTE AND UNITED STATES DEPARTMENT OF AGRICULTURE, COOPERATING

EXTENSION SERVICE

December 11, 1941

Director John R. Hutcheson
Blacksburg, Virginia

Dear Mr. Hutcheson:

I submit herewith the annual report for the Extension Agronomy Department (Project 16) for the period from December 1, 1940 to November 30, 1941, inclusive.

Very truly yours,

W. H. Byrne
Agronomist

WHB:hw

ANNUAL REPORT

VIRGINIA

EXTENSION AGRONOMY DEPARTMENT

December 1, 1940
to
November 30, 1941

Personnel

Name	Title	Division of Time
W. H. Byrne	Agronomist	Full time
S. F. Grubbs	Ass't. Agronomist	One fourth Extension; three fourths Va. Crop Improvement Association
J. D. Guthrie	Ass't. Agronomist	Three fifths Extension; two fifths Va. Crop Improvement Association

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1941

Plan of Work

Agronomy Department

Project No. 16

Projects	Name of Leader	Assisted by
Farm Units	W. H. Byrne	
Lime and Fertilizer	W. H. Byrne	J. D. Guthrie
Good Seed	S. F. Grubbs	J. D. Guthrie
4 H Club	J. D. Guthrie	S. F. Grubbs
Soil Conservation	H. L. Dunton*	W. H. Byrne

Date Approved_____,1941 Signed_____
Project Leader

Date Approved_____,1941 Signed_____
State Director of Extension

Date Approved_____,1941 Signed_____
Director of Extension
U. S. Dept. of Agriculture

*After the plan of work was made and approved, H. L. Dunton was transferred. He is now full time conservationist and administrative officer of the State Soil Conservation Committee, therefore, he will submit a separate report.

I. Personnel: The personnel of this department consists of W. H. Byrne, agronomist, full time; H. L. Dunton, assistant agronomist and conservationist, full time; S. F. Grubbs, one fourth time assistant agronomist and three fourths time secretary of the Virginia Crop Improvement Association; and J. D. Guthrie, three fifths time assistant agronomist and two fifths time field agent of the Virginia Crop Improvement Association.

II. Situation and Trends: A fertile soil is the foundation of successful agriculture. Virginia's average crop yields indicate that her average soils are not fertile. This is illustrated by an average yield of less than 30 bushels of corn per acre, less than 13 bushels of wheat, and other crops in proportion. With such yields the average Virginia farmer can make little more than the cost of production.

It is a recognized fact that one of the best methods of maintaining and improving the fertility of the soil is to establish a rotation or cropping system, including a legume like red clover, and other crops which will make possible a crop with a green root system in the ground throughout the year, to prevent leaching. It has been proven that the judicious use of fertilizer in a good rotation of crops will increase the yield of corn 11 bushels per acre, wheat 6.5 bushels, and hay 1600 pounds. Furthermore, it is known that the reaction of most Virginia soils is not favorable to the successful growth of such legumes as red clover and alfalfa, nor for the most efficient use of the fertilizers applied. Only one acre in fifteen of the nearly five million cultivated acres in the state is planted to a legume, while experimental data show that to properly keep up the nitrogen and organic matter supply of the soil, legumes should be growing on at least one out of every three or four acres. Investigation shows further that while lime properly used in a rotation will give an average annual profit of ten dollars per acre, we know through a survey that not one third as much lime is being used by Virginia farmers as could be economically used.

The only thing a farmer has to sell, regardless of his type of farming, is plant food, therefore, a good farm manager is one who can market the greatest amount of plant food at the most profit. This is as true with a farmer who markets his crops through livestock as with the farmer who markets his crops directly. Since this is true, the agronomy department feels that it is essential for its program to be built around soil fertility, the basis of which is plant food.

While the soil probably exerts the greatest influence on the economy of crop production, yet the kind of seed used often determines the quality, and, in many instances, the yield of the crop produced, regardless of the fertility of the soil. Even though livestock enterprises comprise about 37 percent of the state's gross income, the state is dependent upon successful crop production because the animals must be economically fed, and the soil economically maintained, both of which depend upon the kind of crops grown. The importance of seed in economical production is illustrated by the comparative yields on a large number of demonstrations conducted by farmers during the past eight years. Good seed corn furnished farmers has

given an average increased yield of 12 bushels per acre over their own seed, while good seed wheat has given an average increased yield of 5 bushels per acre. Even though this be true, most Virginia farmers continue to use ordinary or poor seed.

Over 40 percent of the farm land of this state is devoted to pastures, yet until recently, comparatively little attention has been given to the maintenance or improvement of pastures. Even in the best grazing sections much of the acreage will not support more than one steer to five or six acres. This condition exists in spite of the fact that experimental data and the experiences of many farmers show that by the use of lime and phosphate three steers can be grazed on five acres, and the grazing season increased thirty to sixty days.

There are 134 different grades or analyses of fertilizer registered with the State Department of Agriculture, many of which carry only the required minimum of 14 units of plant food. This is costly not only to the manufacturers, but to Virginia farmers. We are of the opinion that one half the number of analyses now being registered would be ample. As a matter of fact "Virginia's Field and Truck Crop Recommendations" contains only 10 different grades for farm crops and 8 different grades for truck crops, few of which contain less than 20 units of plant nutrients. The fertilizer industry is interested in reducing the number of grades and increasing the units and are cooperating to this end.

Until recently, our recommendations to farmers and county agents concerning liming and fertilizing have been based on soil type, and the cropping and fertilization system of the soil in question. The results obtained have no doubt been successful because we have known that practically all the soils are deficient in phosphoric acid and lime, and the soil type and cropping system used would give an idea of the nitrogen and potash in the soil.

With the introduction of quick tests for available phosphoric acid and potash, farmers in increasing numbers are asking for tests of their soil. While we have known the different tests are indicative, we have not and will not push soil testing until the experiments now being conducted in the state to coordinate the results of the tests with soil type, cropping and fertilization system, season samples are taken, etc. show more clearly to what extent the test may be relied upon.

Club work is one of the most valued programs of the Virginia Extension Division, and in enrollment ranks well in the United States. The outlines for and information on agronomic projects being conducted by Club members need to be not only revised and improved, but many members should be encouraged to follow these more closely in order that their projects will be constructive demonstrations.

While the success of most extension work has been based upon individual crop and other demonstrations, and still has a valued place among extension methods of teaching, we are convinced that the entire farming unit is a much more forceful way of demonstrating farm efficiency. For instance, many farmers have been taught the value of good seed, proper fertilization, and cultural methods by a corn demonstration. These same farmers however, in many instances, use poor clover seed, do not lime or fertilize other crops properly, and often have the poorest kind of livestock imaginable. Farm unit demonstrations will help teach the importance of efficiency with all enterprises onthe farm.

III. Adjustments, Remedies, or Changes Recommended:

a. While the success of extension work in the past may be traced to individual demonstrations, there is a need now for more extension workers to contribute to the successful operation of farm unit demonstrations, when the entire farm and home is conducted as a demonstration. This is extremely important because the controlling of no one factor will make it possible for a farmer to operate his farm successfully. Good crop yields are, of course, important, but so are a number of other factors, such as proper land use, labor efficiency, productive days work, efficient use of pasture, receipts per animal unit, etc. These and other factors can be demonstrated not by a corn or fertilizer demonstration, but only with the farm as a unit.

b. Since there are 134 different fertilizer grades registered in the state, and since we know by results of experiments that a maximum of 10 grades are all that are needed for general farm crops, and since we know that this multiplicity of grades adds to the cost of all fertilizer sold in the state, it is important that the representatives of all agencies working with farmers, and farmers themselves, be acquainted with this fact in order to reduce the number of grades. Furthermore, it is important that these same representatives and farmers become acquainted with the fact that while the state law requires all fertilizer sold to contain 14 units of plant food, the unit cost is 10 to 25 cents cheaper in fertilizer containing 20 to 24 units of plant food.

c. Even though Virginia farmers used over 300,000 tons of ground limestone equivalent in 1940 and over 1,800,000 tons from 1936 through 1940, there is a tremendous number of acres of land in the state that still needs liming. This is indicated in many ways, but particularly by the results of our test of over 10,000 samples of soil from 81 counties during the past two years, 67 percent of which showed a pH of 6.0 or less.

d. Even though Virginia farmers used over 42,000 tons of 20 percent superphosphate equivalent in 1940, and over 150,000 tons from 1936 through 1940 on pastures and meadows, a start only has been made in fertilizing and liming pastures.

e. While the members of the Seed Improvement Association produced and distributed over 76,000 bushels of quality seed in 1940, and over 376,000 bushels during the years 1934 to 1940 inclusive, many farmers continue to use inferior seed.

IV. Objectives: The objectives of the agronomy projects are to improve the fertility of Virginia soils, raise the average crop yields, including pastures, reduce the unit cost of production, and thereby contribute to the raising of the standard of living in rural Virginia.

V. Goals for 1941:

a. Discuss agronomy projects with county agents at five district county agents' conferences.

b. Cover the state with 10 area agronomy and livestock schools to which will be invited representatives of the following organizations: Extension Service, Farm Security Administration, Soil Conservation Service, Federal Land Bank, Production Credit and Seed Loan.

c. Assist county agents when called upon to help county agricultural boards to study county, state and national situations and develop an agronomy program for their county.

d. Encourage and help county agents to set up at least one farm unit demonstration in each magisterial district or community of their counties. Help with field meetings and tours to farm unit demonstrations already set up.

1. Use these farm unit demonstrations to teach the value of proper land use, correctly limed and fertilized rotations and pastures in preventing leaching and erosion, and improving the fertility of the soil, as well as other good farm management practices.

2. Continue to test soils for soil reaction, available phosphoric acid, potash, calcium and magnesium, and make lime and fertilizer recommendations based on the results of the test, the type of soil and the past cropping and fertilization history.

(1) Continue to teach and recommend the use of high analysis fertilizer, and urge the reduction of the number of grades being sold, through meetings of professional workers, fertilizer agents, dealers and salesmen, and farmers.

(2) Hold fertilizer and lime schools in counties on request from county agents.

(3) Assist county agents in conducting pasture demonstrations in 32 counties.

e. Offer agronomic courses during county agents' two weeks short course, and one-half day program during Institute of Rural Affairs.

f. 4-H Clubs:

1. Furnish outlines for projects.

2. Teach weed and crop seed identification at state, district and county short courses and camps.

3. Sponsor judging contests at State Fair and State Seed Show, and help with county contests.

4. Assist in training out of state judging teams.

g. Good Seed:

1. Supervise the production of registered and certified seed by members of the Crop Improvement Association.

(a) Instruct a few growers in the production of hybrid seed corn, and hold educational meetings on the use of hybrids.

2. Encourage a larger production of red clover, rye grass, crimson clover and vetch seed for sale by farmers.

3. Help with good seed meetings over the state.

4. Sponsor the annual state seed show.

VI. Methods and Procedure:

a. Methods: Proven extension methods, as farm units, individual demonstrations, farmers' tours and field meetings, circular letters, radio talks, news articles, correspondence, bulletins, etc. will be used.

Farm unit demonstrations will be used whenever possible to extend the agronomy program, since a large percentage of the best improved agronomic practices may be used on one demonstration farm. This farmer will then act as a demonstrator of many practices for the community. Individual demonstrations must still be used, but will be reduced as much as practicable.

District agents, county agents, marketing organizations, county soil conserving associations, farm organizations, and other agencies interested in extending the agronomy program will be used. The work will be done principally through the county agents and leading farmers. Projects will be carried on especially in those counties where the county agent feels the need and demand for them.

b. Procedure:

1. County agent's duties -

(a) Select demonstrators and plan demonstrations with the assistance of specialists.
(b) Arrange for meetings and tours.
(c) Prepare program for meetings and tours with the assistance of specialists.
(d) Assume responsibility for getting subject matter to demonstrators and others.
(e) Keep up publicity work in county with the aid of specialists.
(f) Supervise all projects closely by personal visits, as well as by other means.

2. Specialist's duties -

(a) Be responsible for subject matter relative to projects.
(b) Assist agents and farmers in outlining demonstrations.
(c) Assist agents with publicity, furnishing news articles, etc.
(d) Attend and address meetings concerning projects.

VII. Cooperation:

a. This department will cooperate with the following departments and agencies: animal and dairy husbandry, plant pathology and club, and the AAA, SCS, BAE, FSA, Farm Credit and Federal Land Bank.

(1) Cooperation with the animal husbandry and dairy husbandry departments will consist of working together in holding livestock and agronomy schools and meetings of professional workers and of farmers. The schools for professional workers will consist of representatives from each of the agencies mentioned.

(2) Cooperation with the AAA will consist of educational meetings and publicity in an attempt to get farmers to use all of their soil building allowance in lime and phosphate.

(3) Will cooperate with the SCS in helping their agronomists and soils men in working out agronomy programs for the different soil conservation districts; also in conducting pasture demonstrations.

(4) Will cooperate with BAE in helping to organize county boards of agriculture, and helping these boards plan their county, community and neighborhood programs.

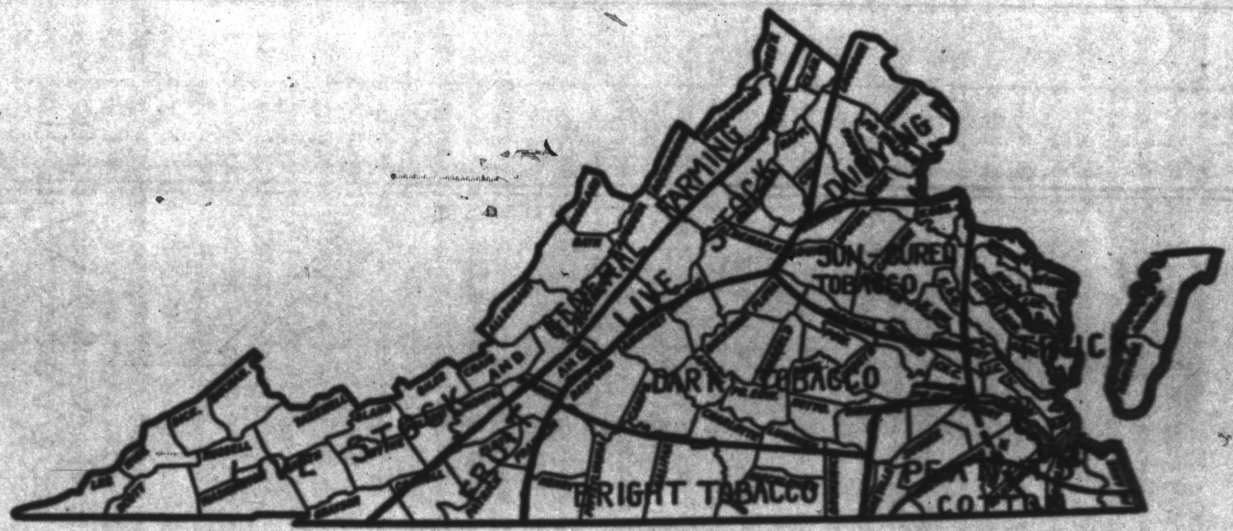
VIII. Extension Literature and Illustrative Materials

a. Will prepare monthly news articles for Extension Division News, and bi-monthly radio talks.

b. Will prepare charts to be used in educational meetings by specialists, county agents and local leaders.

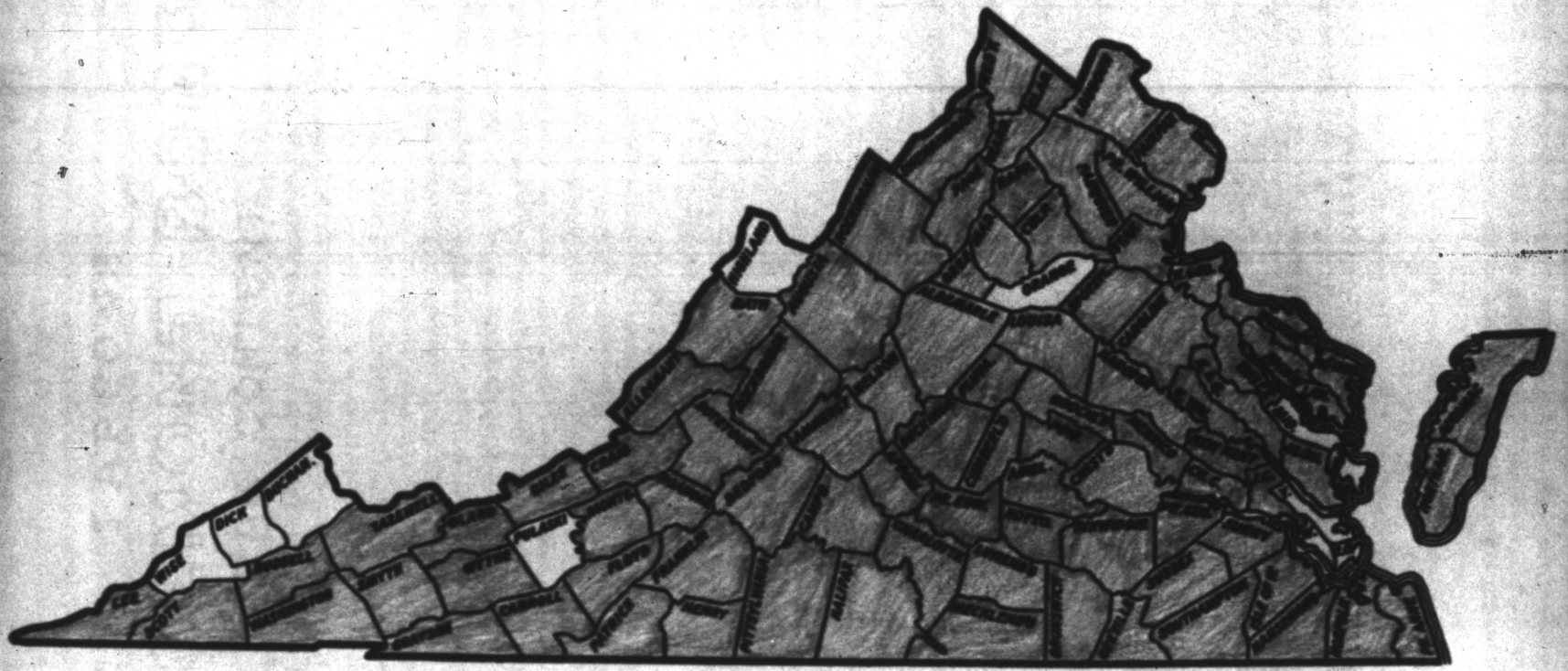
IX. Calendar of Work:

Project	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Farm units				x	x	x	x	x	x	x		
Fertilizer and lime	x	x	x	x				x	x	x		
Good seed	x	x	x	x	x	x			x	x	x	x
Club work			x	x	x	x		x	x	x		
Miscellaneous	x	x	x	x	x	x	x	x	x	x	x	x



I. Outline Map: Showing major activities by type-of-farming areas.

XI. The first half of the year will be devoted to forwarding as much of the outlined program as possible.



Counties in which some form of agronomy extension work was done during 1941.

Personnel

The personnel of the department, the time devoted to extension by each and the part of our program for which each is responsible is set forth under I of our 1941 plan of work, a copy of which is inserted at the beginning of this report. It should be stated however, that even though it is recorded that Mr. Grubbs and Mr. Guthrie are part time employees, they actually do full time extension work. The crop improvement association, to which they devote most of their time, is simply the organization through which most of our good seed work is sponsored.

The factors which determined the inclusion of a project in this year's program, the ultimate objectives, and the goals for the year are also given in our plan of work under II, III, IV and V.

Discussion of Activities and Results

District county agents' meetings: A representative of the department attended the five district county agents' conferences held during February, when the agronomy program for 1941 was discussed. At each conference the agents visited each specialist's room and made tentative dates with him for help needed during the year. Similar conferences were attended in October and November when plans were made for 1942.

In addition to the plans just mentioned, County Agent L. J. Turner and his agricultural board in Rappahannock county were assisted in working out a program for his county.

Farm unit demonstrations: County agents in Montgomery, Floyd, Cumberland, Essex, Alleghany, Shenandoah, Craig, Roanoke, Fairfax, Powhatan, Frederick and Nottoway counties were assisted in setting up farm unit demonstrations. Twenty-five visits were made to already established farm unit demonstrations with the county agents in Bland, Montgomery, Tazewell, Smyth, Frederick, Prince Edward, Rockbridge, Alleghany, Albemarle, Bedford, Patrick, Shenandoah and Essex counties for the purpose of modifying recommendations already made. Eleven field meetings at or tours to farm unit demonstrations, with a total of 463 farmers present, were assisted with. In each instance the demonstrator was asked to compare the operation of his farm before and since he had become a demonstrator. A picture of the group who took part in the tour in Prince Edward county, and a discussion of the tour by the editor of the county paper, will be found as exhibit A. A picture of a few of the group taking part in a tour in Smyth county will be found as exhibit B. This group is studying the effect of borax on alfalfa on John W. Duncan's farm near Chilhowie.

Soil testing: As for the past two or three years, this department has been testing soil samples and making lime and fertilizer recommendations, based on the results of the tests and the past cropping and fertilization systems used. During the past year we tested 4359 samples from 87 counties, with the average results set forth below.

Results of Quick Tests of Soil Samples in 1941

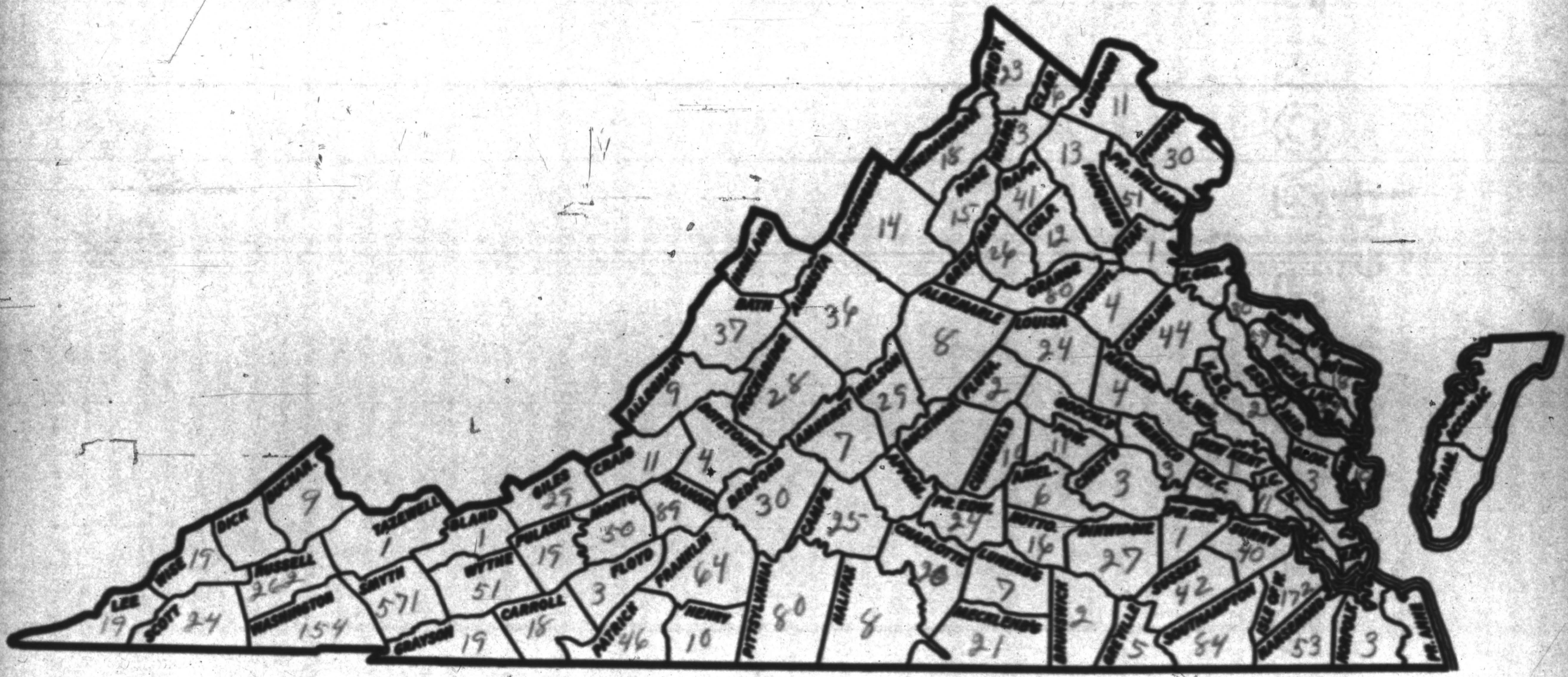
Percentage soil samples with pH below	4.5	1 sample
" " " " " between	4.5 - 5.0	1
" " " " " "	5.1 - 5.7	27
" " " " " "	5.8 - 6.0	23
" " " " " "	6.1 - 6.5	28
" " " " " "	6.6 - 7.0	14
" " " " " "	7.1 - 7.5	3
" " " " " "	7.6 - 8.0	2
" " " " " above	8.0	12 samples

Percentage soil samples with P_2O_5 very good	2
" " " " " good	6
" " " " " fair plus	8
" " " " " fair	17
" " " " " fair minus	15
" " " " " poor	30
" " " " " very poor	22

Percentage soil samples with K_2O extra good	1
" " " " " very good	7
" " " " " good	7
" " " " " fair plus	10
" " " " " fair	19
" " " " " fair minus	18
" " " " " poor	38

Percentage soil samples with C_aO very good	20
" " " " " good	15
" " " " " fair plus	11
" " " " " fair	14
" " " " " fair minus	16
" " " " " poor	13
" " " " " very poor	11

Percentage soil samples with Mg. very good	5
" " " " " good	6
" " " " " fair plus	9
" " " " " fair	18
" " " " " fair minus	23
" " " " " poor	24
" " " " " very poor	15



Counties from which soil samples were received. The number received from each county is set forth in the county on the map.

Exhibit C illustrates the soil record sheet and type of information required if recommendations are desired in addition to the results of the test. The type of recommendations made are found at the bottom of the record sheet. With few exceptions the results and recommendations are furnished to county agents, who give them to farmers and others sending the samples. This work is done in cooperation with the Soil Conservation Service. The Soil Conservation Service furnishes the chemist to do the testing and the Extension Service furnishes the laboratory, equipment and supplies, and the agronomist makes the recommendations.

Lime and fertilizer: In interest of increasing the use and amount of high analysis fertilizer and reducing the number of grades sold in Virginia, county meetings of farmers, professional workers, fertilizer agents, dealers and salesmen were held in Pittsylvania, Halifax, Brunswick, Mecklenburg, Russell and Tazewell counties, with each group well represented.

County agents were assisted with county and community lime and fertilizer schools or meetings in Alleghany, Grayson, King George, Spotsylvania, New Kent, Charles City, James City, Fluvanna, Clarke, Rockingham, Wythe, Tazewell, Fauquier, Shenandoah and Montgomery counties.

In addition to the meetings just mentioned, a representative of the department discussed the importance of increasing the units of plant food in fertilizer and decreasing the number of grades sold in Virginia, at the annual meeting of salesmen of the Smith Douglas Fertilizer Company. This same representative attended a meeting of representatives of fertilizer manufacturers, the North Carolina Department of Agriculture and the North Carolina State College, where the new North Carolina fertilizer law was interpreted and discussed.

The type of information disseminated in an attempt to reduce the number of grades and increase the units of plant food in fertilizer used in Virginia is illustrated in a radio talk made March 3, which will be found as exhibit D.

Exhibit E is a picture of a corn fertilizer demonstration in Patrick county. The corn on the reader's right received 250 pounds of 4-12-4 fertilizer per acre, while that on his left received no fertilizer.

The importance of phosphate in growing clover on some soils is shown in exhibit F, which is a picture of a demonstration in Powhatan county. The entire field was limed. No fertilizer was applied to the right of County Agent Wilson, while on his left 400 pounds of 20% superphosphate was used.

Ten of the 12 soil type alfalfa fertilizer placement demonstrations which were started in 1938 were carried through 1941 and will be continued for several years to come but, due to the drouth, no yields were taken during the past year. From observation however, the indications are that the yields are not only higher onthe areas receiving heavy applications of fertilizer, but the stands are holding up better and contain less weeds and grass. Exhibit G is a picture of Mr. Reilly's alfalfa demonstration in Bedford county. The difference in the height of the alfalfa with the usual fertilizer treatment on Mr. Reilly's left and that on his right, which received 1000 pounds of 20% superphosphate and 200 pounds of muriate of potash when it was seeded in 1940, cannot be clearly seen in the picture unless the position of his hands are closely observed. Exhibit G-1 illustrates the type of reports received this year.

One new alfalfa fertilizer placement demonstration was started in Roanoke county this year, but to date we have been unable to secure a report on it. The county agent told us sometime ago that the stand was fair, but that the crop had done nothing due to the drouth.

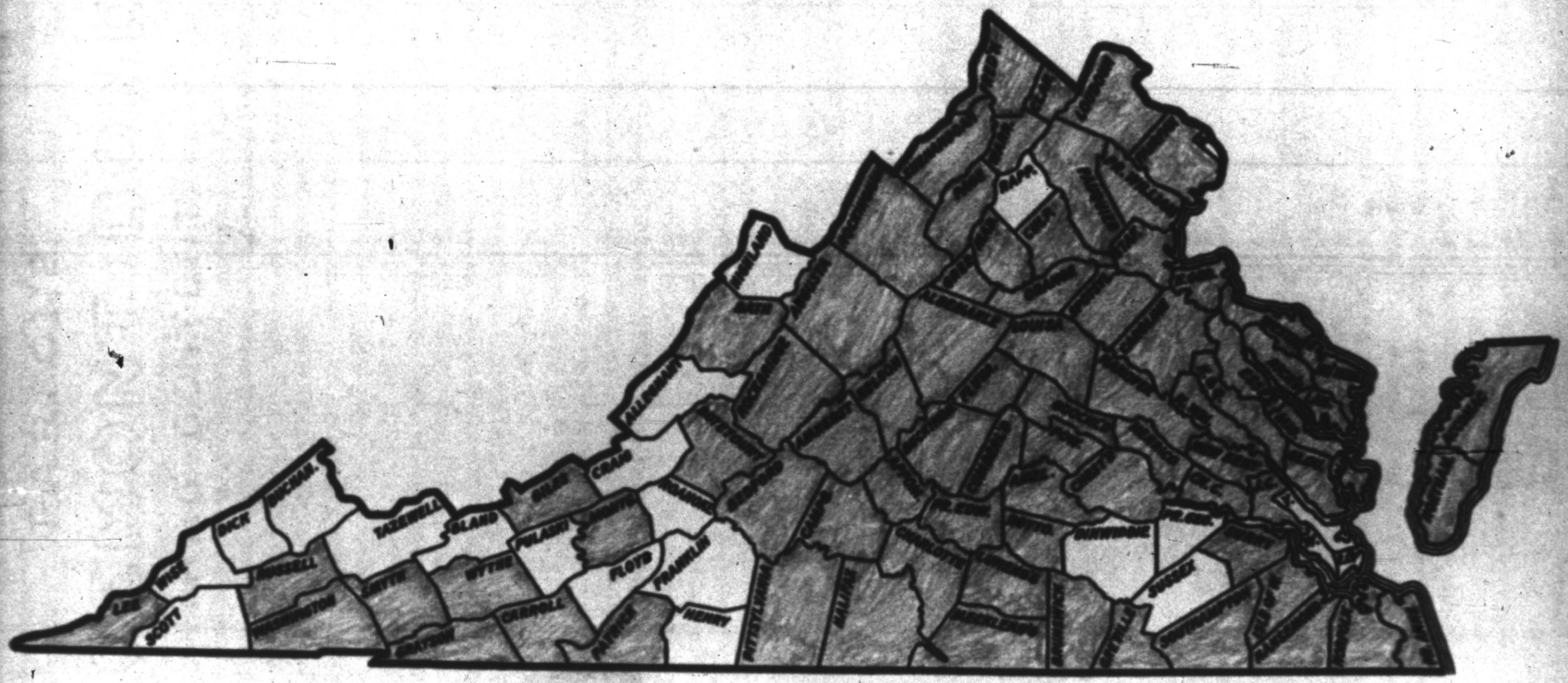
Pastures: Pasture demonstrations were started in cooperation with the American Potash Institute, and county agents in Frederick, Clarke, Fairfax, Prince William, Stafford, Culpeper, Orange, Spotsylvania, Albemarle, Shenandoah, Rockingham, Augusta, Rockbridge, Botetourt, Bedford, Charlotte, Prince Edward, Cumberland, Nottoway, Amelia, Powhatan, Caroline, Westmoreland, Richmond, Essex, King and Queen and King William counties. The demonstrations in the first 22 named counties are designed to teach the value of different amounts of potash when applied as a top dressing on pastures on different types of soils, which have already received an ample supply of phosphoric acid. The layout of the demonstration is shown as exhibit H. The demonstrations in the other named counties consisted of the use of nitrogen, phosphoric acid and potash. Visual rather than measured results were to be obtained of both types of demonstrations. Due to the extended drouth no appreciable differences were noticeable. Exhibit H-1.

Field meetings were attended and pastures discussed at demonstrations in Patrick, Spotsylvania, Caroline, Bland, Tazewell and Smyth counties. Visits were also made to demonstrations with county agents in Bedford, Westmoreland, Essex, Appomattox and Caroline counties.

News articles and radio talks were prepared on both permanent and supplemental pastures. One of the news articles prepared will be found as exhibit I.

Borax demonstrations on Alfalfa: Borax was furnished the county agents in Powhatan, Patrick, Alleghany, King George, Madison and Roanoke counties for the purpose of conducting borax alfalfa demonstrations. There was one demonstration in each of the first four named counties, two in Madison and three in Roanoke. Twenty pounds per acre was applied on each 1/4 acre plot. Yields were not taken as in 1940. County Agent Jessee's report, which is given below, is typical of the reports from other counties.

> "I am sorry I cannot give you the exact weights on the alfalfa borax demonstrations. However, I have recently talked to O. F. Carpenter, R. S. Graves and L. S. Blankenbaker, the three men conducting the demonstrations in this county and they advised that they would not attempt to grow alfalfa without the boron treatment. In fact, two of these men tried to grow alfalfa before and were unsuccessful due to the yellowing that took place after the first cutting.
>
> "These demonstrations were conducted on Cecil soil type. They were very outstanding, and a number of people have commented on the difference the boron made." — A. J. Jessee, County Agent. Madison county.



Counties in which some form of good seed work was done during 1941.

County agents' agronomy short course: The agronomy short course set forth in our plan of work was not given, since the county agents short course which was planned had to be called off because so many of the agents who were going to attend were called to the army.

4 H Club work: An agronomy class was taught at the State 4 H Club short course. Instruction included training in judging corn, oats, wheat, potatoes, sweet potatoes and alfalfa hay; crop and weed seed identification and certification of crops. The class was taken on a tour of the experimental plots the first day. Thirty-three boys enrolled for the course.

One of the more constructive steps in teaching crop and weed seed identification was the preparation and distribution of sets of seed samples. These sets are being sent out in order to county agents and agriculture teachers. The cost of a complete set is 69 cents. To date 59 orders have been received. See exhibit I-1 for list of seeds.

The State 4 H crops judging contest was held at the State Fair September 23. The classes judged included yellow corn, white corn, oats, wheat, alfalfa hay, potatoes and sweet potatoes. In addition to placings, it was required that each contestant give oral reasons for two placings in three of these classes. Each county was permitted to enter a team of not more than 3 members, and 55 boys from 19 counties registered for the contest. See exhibits I-2 and I-3.

The three highest scoring individuals, with the fourth as alternate comprised the state team representing Virginia at the International Livestock and Grain Show in Chicago, December 1. With the assistance of L. C. Measer of the vegetable department, the boys were given two days training before leaving for Chicago.

The 1940 4 H crops judging team asindividuals won a blue award, a red award and a white award in the 1940 national contest. The blue award score was the 5th highest score of the contest. See 1940 team, exhibit I-4.

The junior judging contest at the State Seed Show in Abingdon, January 31, was gratifying in many respects. Twenty-one 4 H and F.F.A. teams from 16 counties competed. The boys applied themselves in commendable fashion. Both the State 4 H Club department and the state F.F.A. department awarded a silver loving cup to the winning related team. Yellow corn, white corn and wheat were judged and in addition a seed identification class was introduced. See report of contestants and scores, exhibit I-5.

Crops judging training was carried on during the year by means of district and county meetings called especially for the purpose. Fourteen county and 2 district meetings were held. See exhibit I-6, group at district meeting.

To forward the use of good seed by 4 H Club members, at least in a limited area, a plan was worked out through the generosity of one of the large mail order houses. The mail order concern agreed to donate a stated amount with which to purchase seed corn and provide premium money for these entries at two fairs. The plan had two main objectives:

1. To place high grade certified seed corn of superior yielding ability in the hands of worthy 4 H Club boys.

2. To teach these boys something about judging and selecting seed corn by having them exhibit the 10 best ears from their crops.

One hundred sixty seven boys in 10 counties were awarded this seed corn. Exhibit I-7 shows 50 of these exhibits at the Danville Fair.

A full report cannot be made as yet but it is gratifying to note that for the first 10 counties reporting; 31 boys won a total of $103.50 in prize money at the state and local fairs. Only three boys in this group did not exhibit from their crops. This is a splendid record in view of the continued drouth of this season. This achievement reflects credit not only on the 4 H Club boys but also onthe tireless efforts of the Club Agent.

The vocational agriculture department was assisted with their F.F.A. grain judging contest during their rally of about 1500 boys here at the college in June.

Good Seed

The first event of major importance in the work of the year is the state seed show and annual convention of the crop improvement association. At this meeting, the directors of the association consider all such measures necessary for their action that have not been handled at special meetings called throughout the year.

The show also provides an opportunity for those who produce certified and other good seed to present exhibits of their year's work to the general public. 4 H Club members and vocational agriculture students are not only allowed to exhibit in any of these adult classes, but a number of classes are made possible for these two groups alone.

At this convention, the secretary gives a review and financial statement covering the year's work to the directors, and presents for discussion plans for the new year. Also, at this time, requests relative to rules of the association from seedsmen and growers are received and considered, and requests for the admission of new crops for certification are either accepted or rejected.

The Va. crop improvement association is an organization of seedsmen and farmers, their object being the production and maintenance of good seed--seed of known lines of acceptable ancestry and free from seed borne diseases, having a high varietal purity and carrying an inherent ability to make good yields.

The organization also seeks, by means of educational efforts, to improve the technique of its growers and to develop new ones. Those charged with carrying out the work are always on the alert for potential talent, meeting new conditions by developing old members and training new ones in fields where a need is found. It should not be understood that this group is solely interested in the production of good seed. It is realized that a widespread use of such seed is the primary objective. Attention is not given to certified seed alone, but also to any seed project that will encourage the use of good seed and lower the cost of production to farmersthroughoutthe state. It is the object of the crop improvement association to confine the production of certified seed to men of ability and integrity, whose farms are suited to the production of good seed. It is conceded that good seed are a necessity in every successful agricultural enterprise, and it is the object of good seed work to convince every farmer of the value of the use of good seed. It is believed that no phase of farming can escape the penalty imposed by the use of poor seed. Even livestock growing is closely inter-related to the use of good seed, since the economical production of forage and grain crops determines the success of this venture. Serious losses of hay often occur when poor seed are used for forage crops and the lack of good grazing at the proper time is a death blow to economical livestock production.

In the latter illustration, grains are to be considered, as well as grasses, since rye, wheat and, to some extent barley, provide much spring and autumn grazing in many parts of the state. It goes without saying that a shortage of pasture necessitates the feeding of increased quantities of grain and forage.

Perhaps Abruzzi rye is our best illustration of a grain crop used as pasturage, since it provides rapid growth in spring and fall and livestock are capable of making good grains on it. Unfortunately, many other strains of rye are not satisfactory for this purpose and since their seed may not be distinguished from that of the Abruzzi, many of our growers have in times past suffered losses from the purchase of misbranded seed. This rarely happens any more in Virginia, since nearly all the rye grown in the state is or has been of certified origin.

In carrying out all the many phases of good seed work, it is realized that no one organization is able to cope with every situation that may arise. Because of this, the association works in cooperation with county agents, agriculture teachers, agronomy extension workers, the experiment stations and the state department of agriculture.

Since the object of the crop improvement association is so clearly defined, it is not necessary to give a detailed explanation of its procedure. Changes are made as situations indicate they are necessary. They usually rise from the invasion of a new disease or insect pest, or the introduction of new crops. The basic principles of certification remain the same. Certified seed are produced under inspections in the field and in the bin; after having satisfactorily met both tests, the grower is eligible to receive a certification tag, issued by the association, setting forth the varietal and mechanical purity, degree of freedom from disease and the germination. Each tag carries a schedule number by which the grower of the seed may be traced. This is beneficial in cases where any question arises as to the heredity of the seed.

For a number of years the production of certified seed has shown a marked increase each year. From this, it is natural to conclude that the use of such seed has correspondingly increased. It will be seen from the tables that 1941 shows a recession rather than an increase, due to the severe drouth that has held the state in its grasp throughout the year.

Reports through channels of the U. S. Department of Agriculture still indicate that quite a bit of trouble is being experienced with misbranded rye in the southern states. This has been reflected in recent years in an increased interest on the part of some southern states in Virginia grown rye. This interest has not been confined to certified seed, which indicates that the widespread use of certified seed in foundation stock has so well established dependable varieties in the state that even unidentified seed of this crop have won a good name away from home.

In the past year, the small grain crops of the state have been much troubled with outbreaks of loose smut and scab. Probably this fact as much as any other has given rise to a greater interest; not only in certified seed, but in treated and well cleaned seed in many sections of the state. It is also noticed that in sections of the state where farmers are not using certified seed to any great extent, the losses from nematodes persist and all diseases are taking a heavier toll.

Nematode infestation may sometimes be blamed on the system of farming where wheat follows wheat, but is safe to assert that in most cases, the infestation comes as a result of the use of poor seed. Many thousands of dollars may be saved the farmers in Virginia on the wheat crop alone by the use of uncontaminated seed. In any event, it is a fact that the recognition of their losses from disease and misbranded seed has caused many thoughtful farmers to turn to seed that carry some identification as to variety and have had some disinterested inspection as to disease. This can be read between the lines in the gradual increase in the amount of certified seed produced and used in the state during the last seven-year period. The following tables confirm this statement.

All crops inspected

Year	Acres	Bushels
1935	5325	52,936
1936	6579	58,084
1937	8423	59,220
1938	8870	47,617
1939	8017	65,370
1940	9213	76,157
1941	8031 3/4	73,743

It will be observed that there is some fluctuation from year to year in the amount of crops inspected, but one fact stands out clearly—the production and use of certified seed is being markedly increased.

In 1941, all crops were reduced as the result of the drouth, not only in yields from fields inspected, but in actual acreage, since in many instances only a limited portion of crops that ordinarily have been suitable for certification have been inspected. In addition to this, a loss of 18 sweet potato growers was incurred in Caroline county, where maneuver grounds were established for the U. S. army.

Efforts were made to recoup losses incurred in the spring seeding of red clover by autumn seeding of this crop. However, in nearly all instances the latter effort resulted in more complete failure than did the first. Also, such crops as crimson clover, Italian rye grass show very little promise, and many complete failures of both are noted throughout the state.

At this time, inspection service is given in wheat, rye, barley, oats, tobacco, corn, (open pollinated and hybrid) cotton, soybeans, red clover, two varieties of lespedeza and sweet potatoes. In the following tables the amount of seed inspected and certified in 1941 is given.

Of the 100 counties making up the state, 77 had some form of good seed work in 1941. A map of the state showing counties in which seed work was done may be found at the beginning of the discussion of good seed. From this map it will be seen that nearly all of the farming counties of the state are interested in some form of good seed work.

While it is the ambition of those who carry on this work to see the entire state represented, it is unlikely that this will ever be accomplished, since a few counties here and there, due to their nature of soil and topography, are unable to do much general farming and cannot be assisted with good seed except in a very limited way.

Small grain: Our work with small grain this year presents an evenly divided picture of success and failure. Perhaps it would be well to mention the reverses first and pass on to the brighter phases of the year's work. At the very beginning of the field inspections it was noticed that we were again facing trouble with loose smut. This was followed by an unusually heavy outbreak of scab and sooty mold. The latter, however, is a secondary infection and, aside from intensifying the bad appearance of the fields and alarming growers, did no appreciable damage.

The smut and scab outbreaks took a heavier toll than any year since 1936, causing large acreages to fail in the field. Such rainfall as we have had took place between harvest and threshing and damaged much more grain. As a result, the seed growers took the heaviest loss in recent years from low germination. It is thought that factors other than the weather also contributed to the poor germination but, so far, no one has been able to determine exactly what they were. Scab, loose smut, extremely dry weather when the grain was forming may all have contributed to the loss.

On the other side of the picture, yields were better than might have been expected and the quality of some crops was as good as usual. Seven varieties of small grain were raised and were of sufficiently good qualities to be accepted on field inspection. Perhaps it would be well to give more details concerning these varieties.

Hardired, an early smooth wheat, was developed by the Coker Pedigreed Seed Company, of Hartsville, S. C. This wheat is a hybrid, being a cross between Red May, known as Little Red in Virginia, and Hope, by Russar. This wheat, partaking of the good qualities of its ancestors, may steal the show from the immensely popular Redhart that has grown so rapidly in favor through the Piedmont and Tidewater for the past seven years.

Hardired seems to offer the abundant yield of Red May, plus the tendency to resist disease of its Hope ancestor. This was so strikingly true that at inspection time scarcely a single head carrying disease of any kind was found in the three fields inspected for registration. In addition to its apparent ability to resist disease, all of this wheat was of exceptionally high varietal purity. No bearded heads were recorded at inspection time and no other off-type factors were found to break the beautiful uniformity of the picture.

While no test has been made of this wheat in the valley, or the southwest, growers in both sections were urged to try it on a limited scale this fall. It is thought that it may possess greater winter hardiness than the popular Redhart, plus its resistance to disease and its capacity to yield.

Sanford, another hybrid smooth wheat, from the Georgia experiment station, gave a good account of itself in the tidewater. This wheat is a cross of a bearded Kansas strain and Alabama Bluestem, and backcrossed twice to Bluestem. The bearded ancestor is not definitely known, since the name was lost in the breeding plots, and it is referred to merely as a bearded Kansas wheat. It is thought by many to have been Kanred. Whatever its parents may have been, it is certainly a persistent and dominant ancestor, in that it still throws an occasional bearded head in spite of the fact that there are three Bluestem crosses against the one bearded one. This wheat, though not as striking to the eye as Hardired, appears to be a good, consistent yielder and so far, has not shown susceptibility to disease.

The third new wheat comes from the North Carolina station and was named Carala. It is a selection from Alabama Bluestem, though it shows none of the morphological traits of its supposed ancestor. The theory most generally accepted is that it is the result of a stray grain of some other variety. The name "Carala" is indicative of its origin, insofar as its history is known.

A beginning was made with a strain of Forward wheat just released by the U. S. Department of Agriculture. It is called the Smut Resistant Forward, and is supposed to be highly resistant to loose smut. Whether this is going to prove to be true in large scale production remains to be seen. At any rate, loose smut was found at inspection time, and a close watch will be kept on the larger acreage of 1942. Insofar as appearance is concerned, this would normally be a rather striking wheat. It reaches a good height, carries a stiff straw and has a large long head. This year it came into head just as a few abnormally hot, dry days struck the state. The result was that the life of the heads appeared to be blighted by the intense heat about a half inch down on the rachis.

Another strain of Forward wheat, Cornell 5-7, was obtained from Cornell, as the name indicates. With one year's experience, no complaint can be registered against this wheat. It made a nice show in the field and yielded well. No evidence of disease was found at inspection time.

One new strain of barbless bearded barley, No. 86, was furnished the association by the USDA. This barley was grown and observed on a breeding plot and seems worthy of future trial.

A new oat, Coker's Fulgrain No. 3, was grown with marked success in Essex county. Thirty-three acres of these oats yielded an average of 74 bushels per acre. This field presented a very pleasing picture at harvest time. No disease was seen and the panicles filled with plump, large grains, borne on stiff, strong straw gave evidence of the bumper crop they made. This field really made more oats than the yield shows, since rice birds came into the field in large flocks when the oats were nearing the milk stage and continued to feed on them by the hundreds until the oats were threshed. This strain of oats will be grown on a larger scale next year, but will be confined mostly to the tidewater region, until limited trial is made further inland.

The Fulwin oat, a new Fulghum selection from Tennessee has been brought into southwest Virginia this fall for trial. Since this variety has given a good account of itself in eastern Tennessee, its introduction is regarded as more than an experiment. In the tidewater and piedmont regions, the Lelina oat, a cross between the Lee and the Victoria, is being tested. This oat came to us from the North Carolina station where it had acquitted itself well. Another variety of oats, the Stanton, is being grown for the first time in the same section.

The above will serve as an indication of the type of work carried on by the crop improvement association in all its many phases to maintain and improve seed supplies available each year in the state. While the public is generally inarticulate in expressing appreciation of beneficial agricultural work, once in a while we are heartened by an unexpected tribute. A copy of such a letter received in midsummer this year, shown as exhibit I-9, is evidence of one man's appreciation of seed improvement work.

Red clover: The production of certified red clover seed showed an increase this year over 1940. This would seem a paradox in the face of the poor showing made by the first cutting hay crops. It was possible because this strain of red clover is resistant to anthracnose and consequently did not die out where stands were obtained last year. Most red clover may make a fair showing in spite of disease as long as weather conditions remain normal but, when severe dry or cold weather occurs, they cannot combat both the disease and the drouth or cold. Such failures are generally attributed to the weather alone, but a fair comparison of Virginia adapted anthracnose resistant seed with the so-called good commercial seed will disapprove this theory. After a drouth dwarfed hay crop was removed this year, the seed crop was aided by the only period of general humidity during the growing season, a period of general showers throughout the state. As a result, fair seed sets were obtained in the Culpeper area and the northern neck where all the certified red clover is produced. The seed so far tested have shown good germination and the high purity necessary for certification is being maintained by the excellent seed cleaners located in these sections.

The picture is not so bright for 1942, since most of the seedings made in the spring of 1941 resulted in imperfect stands, due to the abnormally dry winter and spring. Growers who attempted to recoup their losses by August and September seedings met with no better success. In fact, most autumn seedings are complete failures.

Our clover, when once established, can combat drouth and cold, but in its first stages of growth requires at least some moisture to survive. Considerable interest has been aroused among some of the growers over the possibility of increasing clover seed yields by light applications of borax. This was suggested by seed increases obtained in alfalfa at the Williamsburg and Chatham experiment stations. Several farm tests will be made next year if suitable locations can be found.

Corn: Since corn hybrids are occupying the public's mind so completely at this time, no new developments have been made in the open pollinated varieties. Every effort is being made to maintain good foundation seed stock of our old adapted strains since we believe there will always be a place for them in Virginia agriculture. In spite of this, many of our old growers are following the hybrid test in the state with thinly concealed impatience and are ready to break over into the new field at the first opportunity. This year, we lost the best grower of open pollinated corn in the state to hybrids, when the president of the association quit growing Reid's Yellow Dent on his farm and grew seven hybrids, the first to be raised under certification in the state.

In addition to cooperating with the experiment stations inthe testing of hybrids, a limited number of carefully picked growers are taught the technique of hybrid seed production. This work was carried on in Lunenburg, Lee, Westmoreland, Northampton, Loudoun and Wythe counties this year. The procedure is as follows:

Foundation seed of inbred lines, or single crosses, are obtained either from the USDA, or from seed associations or experiment stations now carrying on hybrid breeding. The grower is furnished with this material and given an outline containing a planting plan and a course of seasonal procedure. He is assisted in carrying out the project by timely visits from a representative of the crop improvement association. By this means, he learns how to self-pollinate to produce inbreds, to cross inbreds, to form single crosses and to cross breed single crosses to produce first generation double crossed hybrid seed. The grower not only learns the technique of the different operations, but what is of equal importance, he learns the vital lesson of scrupulous attention, at the proper time, to each phase of the operation. Without this lesson firmly imbedded in his mind, no farmer can become a satisfactory producer of hybrid seed.

Other educational measures taken in instructing seed growers in the making of hybrids consist of talks and lectures given at farmers' meetings throughout the state. These efforts are of necessity elementary, and serve only to awaken a desire for more information on the part of the more thoughtful farmers. It is sufficient today that when the practice of certifying hybrids becomes general in the state the work of the association will be doubled.

Twenty-six educational meetings were held in 23 of the principal corn growing counties of the state. These meetings averaged 27 each in attendance. In addition, six field meetings were held at experiment stations and on farms for the purpose of observing the different hybrids under test. These meetings averaged 30 each. One such meeting was held at John S. Hard's during the detasseling period. In addition to farmers a large number of county agents, agriculture instructors and seedsmen attended this meeting. A picture of the group will be found as exhibit I-10.

The educational meetings consisted of a discussion of hybrids including suggested hybrids for trial by farmers on a limited acreage, since the experiment station is not yet ready to recommend that an entire crop be planted to a single hybrid.

The testing of hybrids to determine their adaptability in the state was carried on cooperatively by the crop improvement association and the 11 branch experiment stations. See exhibits I-11 and I-12 giving the hybrids under test at each station. This testing of hybrids entailed considerable work of a research nature. The group of 33 hybrids were selected through conferences with Dr. T. B. Hutcheson, department head and Dr. M. T. Jenkins, corn investigations office USDA. Seed of these hybrids were then ordered and distributed to the 11 branch stations along with a randomized planting arrangement comprising three series.

When the yield data is received from the stations, there will be adjusted to a common moisture percentage. This necessitates making moisture determinations of a shelled sample from each plot, a total of 1155 determinations. This work is about two-thirds completed at the present writing. After these data and determinations are all completed a composite report will be compiled. From this report, in conference with Dr. T. B. Hutcheson, department head, hybrids will be selected for subsequent recommendations.

Other work done with hybrids would include suggesting groups of hybrids to county agents for field testing demonstrations and also procuring seed of same in many instances. Further, three corn growers in two counties were trained in making double cross hybrid seed. A small plot, about 25 yards square in each instance, was selected and planted in a 3:1 planting of two single crosses. These growers were taught by means of these learner's plots not only what to do but the importance of doing it at the right time. They will in all probability become certified growers of hybrid seed corn in the future.

It might be added that a two day corn hybrid school was attended in Purdue, Indiana, March 6 and 7, by two members of the department.

Watermelons: Certification work with watermelons came to a halt this year. This will result only in a temporary delay. Several years ago, a wilt resistant melon was released to the association for certification by Dr. Cook, of the Va. truck experiment station. This melon satisfactorily demonstrated its ability to withstand melon wilt and also appeared to have good shipping qualities. However, after being grown for two years, it became apparent that it did not maintain its sugar content as well as some other melons. For this reason, it was deemed prudent to withdraw it from certification, pending further breeding work in an effort to produce a sweeter melon, retaining its other good qualities. It has not been discarded, merely "closed for repairs."

Sweet potatoes: Work with sweet potatoes goes on much as it has for some years, a constant battle with diseases--all the old diseases that cut the yields, lower the quality and contaminate the soil. All the old diseases are present and thriving, with an additional newcomer, the nematode disease, beginning to give trouble, although no alarming spread of the disease has been noted this year. This disease was first discovered by the secretary of the association two years ago inthe southern part of Caroline county, where it was affecting tobacco, sweet potatoes, soybeans and lespedeza. It is hoped it may be held in control at those points as no very great hope is entertained for its eradication.

It may seem a far cry fromthe World war to certified sweet potatoes in Virginia, nevertheless as a result of the conflict, the heaviest concentration of certified sweet potato growers in the state was wiped out last spring when a reservation for army manouvers was established in Caroline county. These men were scattered far and wide and it will be difficult for many of them to produce seed in the immediate future, due to the fact that the large central storage plant of 25,000 bushel capacity was lost. It has therefore, become the task of the association to establish new production areas in other parts of the state where the soil is suitable for the raising of high quality seed.

On the eastern shore, in Accomac county, a new and apparently worthwhile sweet potato has appeared. Three years ago, F. H. Lord of Belle Haven, a director in the association, and a prominent grower of seed potatoes, noticed a potato of unusual appearance on a Big Stem Jersey vine. He then set to work with the association to determine if the freak had any merit. At first, progress was slow, and on one occasion the seed was nearly all lost. However, by 1941, enough plants were obtained for a fair size planting. Enough potatoes were produced this year to test the markets. Very limited quantities have been offered on the Baltimore and Philadelphia markets, where they seem to have met a very good reception for a newcomer.

This potato resembles a Nancy Hall insofar as the root is concerned, while the vine may not be distinguished from the Big Stem Jersey of which it is thought to be a sprout. This potato has been named the "Bloxsweet" and may appear on Virginia tables in another year or so, since it is of good flavor and has an exceptionally smooth skin, giving it a very attractive market appearance.

Like nearly all crops, both the acreage and the yields of sweet potatoes have been reduced by the drouth.

Irish potatoes: Little work has been done in recent years with the certification of Irish potatoes, since it was discovered that they do not give as good results as northern grown seed. This year, a small crop of Sequoias, a North Carolina potato, was certified in the hope that this potato, since it is of southern origin, may be able to produce good seed under our climatic conditions.

Some attention has also been given to the possibility of growing potatoes in the high altitudes of Highland county. One grower has been found who has been successful in growing his own seed for a number of years, at an elevation of over 3000 feet. An effort to test out his experience in 1942 will be made, but as yet no great feeling of optimism is being entertained by the organization over the possibility of producing satisfactory seed potatoes in the state.

Tobacco: No great changes have been noted in the production of certified tobacco seed this year. In the old belts of the state, where dark-fired and flue-cured types are grown, it is difficult to arouse any great interest in certified seed. This may be for two reasons: first, it is always hard to uproot an old established practice. The tobacco growers in the old territories have saved their own seed so long that the buying of seed would seem almost a revolutionary process to the rank and file of them. Second, certified seed of these varieties do not meet, in a spectacular way, any of the diseases with which these growers are primarily concerned.

On the other hand, the burley growers, not being so long established, had no deep seated customs to change. Many of them have and still do buy their seed from sources in Kentucky and Tennessee, so that the practice of buying seed produced in Virginia was not such a difficult transition. On the second count, certified seed of burley tobacco did offer a relief from disease, a situation that carried with it highly visual factors. The organism of root rot was rapidly gaining a foothold in the burley soils. Its nature was so destructive that even the most ignorant grower could readily see it. Missing hills and dwarfed plants cannot be ignored. Comparison of the plants from the resistant certified seed with those from the old strain commonly in use was striking. On the one hand plants shoulder high to a tall man; on the other little plants measuring 18 inches to 2 feet, or hills on which the plants were totally dead. This is therefore, a situation that will take care of itself. It seems now that the principal care of the association so far as the production of burley tobacco seed is concerned is to produce seed for the growers each year in sufficient quantities and of the proper quality to meet their needs.

Lespedeza: Yields of this crop have been severely cut by weather conditions, but the nationwide outlook is for a seed production in excess of last year. Since no superiority of strain is claimed for certified seed of this crop, and since no disease has so far caused any trouble, the only outstanding feature of certified lespedeza seed is its freedom from noxious weeds. Many growers have insisted that since dodder was already present in most fields and since this past was the main danger encountered in uncertified seed, they were not justified in using the certified seed that were slightly higher in price.

The crop improvement association has always considered this false logic, and now another and very disconcerning factor has entered the controversy. The crop improvement association suggests that the rapid increase in Johnson grass in the state the last few years is due to the widespread use of cheap and unknown lespedeza seed. It is only necessary to take an automobile trip in piedmont and tidewater Virginia in late summer to establish the accuracy of this statement. Only the uninitiated can regard this situation unmoved.

Soybeans: There has been a slow increase in the acreage of the soybeans certified for the last several years. This year a gain of slightly over 100 acres more than 1940 is shown. This is probably due to some increase in the interest in soybeans as a money crop for the last few years. It seems that this interest is likely to increase and that the demand for seed beans of good quality is destined to keep pace with the development.

A few pictures of certified seed crops being grown are shown as exhibit I-13.

Additional Meetings

In addition to work in the field with individual seed growers which now takes up the lion's share of the time of the secretary, meetings were attended in 20 counties in the state inthe interest of seed improvement work. Judging was done and general assistance given at the Lynchburg Farm Show. This show has become a yearly institution and has become the largest event of its kind in the state. It is conducted by county agents and agriculture teachers in the Lynchburg trade area. It has shown a steady and consistent growth since its beginning seven years ago. Quality improvements have been particularly encouraging each year insofar as the fortunes of the season permitted. The Lynchburg Chamber of Commerce is the most active sponsor of the movement and one to be heartily commended for the assistance they have given the agents and teachers.

Fairs

The farm products were judged at the State Fair, and the following county fairs: Loudoun, Madison, Shenandoah, Chesterfield, Accomac, Amherst, Caroline, Patrick, Halifax and Prince Edward.

Seed Cleaning Plants

Work with small grains and field seeds loses much of its effectiveness without the aid of seed cleaning plants. The cost of such equipment is too great to be borne by an individual grower and the work must be done in sufficient volume to permit a reasonable income on the investment. For this reason, the crop improvement association has sponsored the establishment of such plants at a number of points throughout the state. At the present ten major cleaning establishments are in operation in territories throughout the state. These plants are so located that no overlapping of trade areas occurs. This does not take into account a number of smaller ventures that have sprung up because of the attention attracted by the larger ones. These smaller plants are not very helpful since they are not able to maintain the kind of machinery necessary to meet the needs of all kinds of farm seeds and also the changes in cleaning requirements caused by seasonal variations.

To illustrate this point, at this time the cleaners are having a very difficult time in removing buckhorn from clover seed, because clover seed are running smaller than usual this year. It will also be difficult to separate lespedeza and ragweed seed this year because the lespedeza seed are smaller than usual. When such emergencies arise only a trained, resourceful man with good equipment is capable of meeting them.

One of the more recently established plants is at Mt. Holly in the northern neck. The following figures giving their volume of increase in their second year of operation shows the rapidity with which farmers accept this service:

	1940	1941
Bushels cleaned:		
All small grain	4211	8741
Beans and peas	985	4775
Lespedeza	2299	2235*
Red clover	1067	2181*
Crimson clover	114	---
Corn graded and tested	21	45
Total bushels	8697	17977
Bushels treated:		
All small grains	3335	6777

*It should be borne in mind that these figures do not cover all the 1941 work since much lespedeza and red clover remain to be cleaned.

State Seed Show

The annual state seed show and convention of the Va. Crop Improvement Association was held at Abingdon, January 30-31, 1941. Over 500 exhibits were on display in the ballroom of the Martha Washington Inn, making this the largest show in point of exhibits held by the present secretary. It is only fair to point out that these exhibits were not noteworthy for numbers alone. The general quality level was very high. So much so that many beautiful exhibits that would no doubt have scored high at other shows were forced to be returned without a ribbon. A copy of the program will be found as exhibit I-14.

A junior judging contest was held and participated in by a large number of boys, and is discussed under 4 H Club Work.

The next seed show will be held at Staunton, January 23-24, 1942. Advance preparations have been made and publicity given to the date. This will be increased as the season advances.

Other Good Seed Work

In addition to the ever growing volume of work with certified seeds, promotional work was done in 15 counties to encourage the production of vetch, crimson clover and Italian rye grass seed. It is doubtful if any concrete results will be shown insofar as 1941 savings are concerned because of the season. However, it is thought that some of this effort will be reflected in 1942, if the season permits.

The association also works closely with the state department of agriculture and 6 leading seed houses. Most of the larger seedsmen are handling an increased volume of certified seed each year and these large firms are having large acreages of certified seed grown under contract for them. Information as to sources of good seed is furnished seedsmen, county agents, agriculture teachers and farmers.

Goal for Distribution of Certified Seed

It is believed that the perfect distribution of good seed is as necessary to the farmer's welfare as the production of them. Three years ago, the secretary offered the following plan to extension agents throughout the state. It has not yet been adopted but because he believes it is right in principle, the secretary means to continue to offer it as long as he is connected with good seed work in the state.

1. County seed production units should be formed by the county agricultural board and the county agent. At present seed is often shipped long distances about the state. Local production could eliminate carrying charges.

2. A seed committee should be appointed who would select the growers and designate the kind of seed needed in the county.

3. The growers should be selected on a basis of personal fitness.

4. Suitable farms should be selected on a basis of their fitness to produce good seed.

5. The committee should aid the growers and the county agent in seeing that as much of the seed is used locally as is possible.

6. A system of barter or equitable exchange would probably give impetus to the use of the seed.

7. Each county producing red clover should have at least one producer of adapted red clover seed.

1940 Fall Crops Inspected in the Bin in 1941

Crop	Bushels inspected	Bushels certified	Bushels rejected	Percent cert.	Percent rejec.	Bus.handled by seedsmen	Percent handled by seedsmen
Cotton	1620	1620		100		1215	75
Corn	8120	7227	893	89	11	6171	76
Soybeans	1260	731	529	58	42	1174	91
Sweet potatoes vine cuttings	7426	7352	74	99	1	371	5
Sweet potatoes slip seed	2285 (Pounds)	1970 (Pounds)	243 (Pounds)	89	11	368 (Pounds)	12
Korean lespedeza	74,628	58,210	16,418	78	22	49,254	66
Red clover	13,680	12,662	1,018	93	7		
Tobacco	532	532					

Field Inspection Small Grains 1941

Crop	Acres inspected	Acres passed	Acres rejected	Percent passed	Percent rejected
Wheat	3017	2057	960	68	32
Barley	1133	626	487	59	41
Oats	719	596	120	83	17
Rye	890	885	5	99	-1

Bin Inspection Small Grains 1941

Crop	Bushels inspected	Bushels passed	Bushels rejected	Percent passed	Percent rejected	Bus.handled by seedsmen	Percent handled by seedsmen
Wheat	21,627	13,409	8218	62	38	18,670	91*
Barley	10,690	6,093	4597	57	43	9,086	85
Oats	12,812	5,894	6918	46	54	11,018	86
Rye	5,995	3,827	2168	64	36	5,505	92

*Percent handled by seedsmen is calculated on total amount since most of the wheat handled by the seedsmen is grown for them under contract. Therefore, they suffer such failures as may occur in the bin inspection.

Field Inspection Fall Crops 1941

Crop	Acres inspected	Acres passed	Acres rejected	Percent passed	Percent rejected
Corn	1225	997	228	82	18
Red clover	305	305			
Korean lespedeza	111	105	6	95	5
Tobacco	6	6			
Cotton	91	91			
Soybeans	447	430	17	96	4
Sweet potatoes vine cuttings	55	50	5	90	10
Sweet potatoes slip seed	32	32			

Bed Inspection Sweet Potatoes 1941

No. beds inspected	No. beds passed	No. beds rejected	Bushels bedded	Plants sold	Returns from plants	Returns from seed
93	92	5	2347	1,450,000	$2675.	$11,760.

Irish Potatoes Inspected 1941

Acres inspected	Acres passed	Acres rejected	Bushels inspected	Bushels passed
3/4	3/4		70	70

Cooperation with other departments and agencies: We cooperated with the animal husbandry department in holding livestock-agronomy schools in Halifax, Augusta and Rockingham counties, and with the dairy department in holding agronomy-dairy schools in Tazewell, Washington and Albemarle counties. In all instances good pastures and quality hay were the main features stressed by our representatives.

Cooperated with the state soil conservation committee and the animal husbandry department in arranging all day schools for the professional workers in the following soil conservation districts: R.E. Lee, Piedmont, Southside and Blue Ridge. The county agents in the districts called the meetings and had present representatives of all agencies working in the district, including vocational agriculture, soil conservation service, production credit, seed loan, federal land bank, farm security administration, agricultural adjustment administration and extension. The subjects discussed were soils, fertilizers, crops and the fundamentals of livestock production. From 50 to 75 were present at each of the schools, which were held at Appomattox, Amelia, Clarksville and Rocky Mount.

County professional meetings were attended, where fertilizers and lime were discussed in Washington and Grayson counties.

A conference at the Glade Spring experiment station was arranged for the professional workers in Southwest Virginia, which was well attended; as was a similar conference arranged for the professional workers in the valley of Virginia at the Staunton experiment station. Exhibit J is a picture of the group listening to Dr. T. B. Hutcheson discuss one of the fertilizer experiments on the station.

A tour of the principle soil types in Nansemond, Isle of Wight and Southampton counties, and a visit to the Holland experiment station, were arranged for the professional workers of that section of the state. A soils man from the extension service and one from the soil conservation service identified the soils and discussed their adaptability.

Our cooperation with the agricultural adjustment administration consisted of attending one state and one district meeting to learn about the 1942 program, and then urging farmers in every meeting attended thereafter to take advantage of the soil building program. Also helped a representative of the state AAA office to work out the seeding rates for their soil building program. In addition, on each farm unit demonstration set up care was taken to fit the farm program in with the AAA program, so that quotas would not be exceeded, and all of the soil building units would be met.

Cooperated with representatives of the soil conservation service in developing a program for the New River soil conservation districts, in working out productivity ratings and fertilizer treatments for the soils in the different soil conservation districts. Exhibits K and K-1 illustrate the kind of classification made. It is realized that these ratings and fertilizer recommendations are far from perfect, but they are being used to good advantage and seem to be a step in the right direction.

We are cooperating with Southern Dairies and the county agents in Floyd, Montgomery and Roanoke counties in developing farm unit demonstrations on some of the farms supplying milk to Southern Dairies. During the past year a representative of the Dairies and the county agents were assisted in working out five cropping, fertilization, liming and pasture improving systems in the counties named.

Cooperated with the forestry service and the county agent in Cumberland county in working cropping systems on a group of farms in the watershed of a lake on a reservation which is handled by the forest service. If systems suggested are followed much silting of the lake will be prevented, and the farmers concerned will also be doing a better job of farming.

Cooperated with the state defense board by attending several state and one district meeting of the board. Assisted the board in setting up county goals, and in organizing county defense boards in seven counties to wit: Powhatan, Cumberland, Prince Edward, Appomattox, Buckingham and Campbell.

Extension literature and illustrated material: An article was prepared each month for the Extension Division News, and a radio talk prepared and given twice each month. The types of articles written will be found as exhibits I, L, L-1 and L-2, while the type of radio talks given will be found as exhibits D, M-1, M-2 and M-3. These radio talks were not only given over our local station but copies of most of them were furnished to several other radio stations in the state by our publicity department, which has charge of the radio programs here at the college.

County agents were furnished articles for their county papers. One of the articles was revised and used as a radio talk. A copy will be found as exhibit M.

An article was prepared for distribution to county agents and others at the request of the state defense board on "meeting defense from an agronomic standpoint."

A few subject matter articles were prepared for such publications as the Southern Agriculturist, Southern Planter and the Progressive Farmer.

No charts were prepared for distribution to county agents however, a set of hay charts and hay samples was secured from the USDA and not only used in meetings and schools, but loaned to county agents for the same purpose.

Miscellaneous activities: Under this heading many activities were taken part in, a few of which were: visited the Glade Spring, Staunton, Chatham and Holland experiment stations to keep abreast of the experimental work being done, and thereby be better qualified to help county agents and others; prepared and initiated a program for those interested in agronomy during the Institute of Rural Affairs, a copy of which will be found as exhibit N; discussed lawn management at a meeting of the Flint Hill Garden Club in Rappahannock county; spoke at county farmers' picnics in Alleghany, Essex and Page counties, and also at the county Puritan picnic in King and Queen county; and spoke to the Lion's Club in Harrisonburg and the Puritan Club at Marshall.

Outlook

Similar projects will be continued during 1942, unless we are needed and it is decided that our efforts are worth more in some other capacity in helping forward the agricultural defense program.

Statistical Summary

	W. H. Byrne	S. F. Grubbs	J. D. Guthrie
Days in field	194	179	128
Days in office	110	115	167
Days leave -			
annual	5	15	10
sick	0	0	4
National holidays	4	4	4
Number agents visited	111	60	73
Extension committee meetings	47	1	6
Meetings at result demonstrations	20	0	7
Attendance	602	0	229
Leader training meetings (adult)	0	0	4
Attendance	0	0	194
4 H Club meetings	0	0	27
Attendance	0	0	695
Method demonstrations given	1	0	35
Attendance	14	0	2884
Other meetings	90	17	17
Attendance	5959	540	2991
Result demonstrations visited	88	0	10
Other farm visits	39	198	197
Leaders interviewed	69	53	23
Letters written	1484	1163	870
Circular letters prepared	4	10	8
No. copies distributed	180	1900	721
Bulletins distributed	361	275	80
News articles prepared	16	17	4
Radio talks given	8	6	9
Miles traveled	16,549	25,788	31,337

Division of Time in Percent

	W.H. Byrne	S. F. Grubbs	J. D. Guthrie
Farm unit demonstrations	16	0	0
Lime and fertilizer	36	1	1
Soil testing	10	0	0
Alfalfa	3.5	1	0.5
Tobacco	1	2	0
Pastures	4	1.8	0.5
Good seed	8	80.5	68
Farmers' Institute, short courses, etc.	3	2	1
Staff conferences	3	3.5	2.4
Club work	.4	0	18.5
AAA	2	0	0
Soil Conservation Districts	4	0	0
Work with negroes	0.5	0	0.5
Miscellaneous	6	2.2	3.1
Annual leave	1.3	4.97	3.2
National holidays	1.3	1.3	1.3

Exhibit A.

Productive Farms Are Inspected

SOME OF THE 125 MEN ON THE FARM TOUR LAST THURSDAY, Sept. 4, are here shown on a pasture at the R. S. Harris farm beyond Five Forks, listening to County Agent E. P. Striplin telling how Mr. Harris developed his land by soil-conservation practices.

How to Grow "Food And Feed" Shown On Tour

Four Prince Edward county farms where "food and feed" are raised, where proper land use and soil conservtion are practiced, and where diversification includes other money crops besides tobacco, were visited by 125 county farmers and business men on the Farm Tour conducted by County Agent E. P. Striplin Thursday afternoon Sept. 4.

The farms visited were Mrs. W. O. Dunnington's R. S. Harris', T. D. Dillon's, and J. L. Metcalf's.

The tour ended at suppertime at Darlington Heights, where, in a field behind Metcalf's Store, Brunswick stew was served by the Darlington Heights Ruritans, presided over by R. A. Watson, past president of the Darlington Heights Ruritan Club.

After the Brunswick stew, all went into the Darlington Heights school auditorium and heard talks by Dr. H. N. Young and H. Byrne of the Virginia Polytechnic Institute, Blacksburg.

Affects of War

Dr. Young said that the war is affecting the average farmer by causing higher prices and a good market for his crops. The principal demand now, he said, is for food—beef cattle, hogs, poultry and dairy products. He said farmers should go in heavily for such products now as part of the defense program and to benefit by the higher prices.

But, he said, there was another more important reason for farmers to diversify and raise more "food and feed". The "war boom" of higher prices, he said, was bound to be over some day. Then, he said, it would be a "rainy day" indeed for farmers who did not raise food products who didn't go in for beef cattle, hogs, poultry and dairy products.

In other words, he said, now is the time for farmers to improve and diversify, to put in soil conservation practices, and to make their farms more self-supporting. With self-supporting farms, he said, when the "rainy days" come after the war boom, the farmers of Prince Edward county will be able to maintain themselves and their families from their own land, regardless of low prices for farm products.

Continued on Page 7

Con[illegible] Page 4

Mr. Byrne offered suggestions for pasture improvement, soil conservation, and farm arrangement.

At Dunnington's

The first stop shortly after 3 o'clock in the afternoon was at Mrs. W. O. Dunnington's farm on the Farmville Lake road. Here S. J. Dowler, the farm's manager, showed the visitors the fine herd of pure-bred white-faced red Hereford beef cattle and breeders, and a new hay barn in which there is not a post nor a brace except on the walls and roof.

Then the group went to a big field on a sloping hillside, a field which is now a fine pasture. Twelve years ago, E. P. Striplin told the group, this field, known as "Turkey Hill", was under cultivation. But, he said, it sloped so that the ploughed soil was washing away, and crops did very poorly. Twelve years ago, Mr. Striplin said, he laid this field off in terraces, and Mr. Dowler terraced it, and then planted it to grass as pasture. With the terracing and the grass roots hol-

Exhibit B.

24069

Exhibit C

INSTRUCTIONS FOR TAKING SAMPLES ON BACK OF SHEET

SOIL RECORD SHEET

(Owner of sample)Name W. A. Brown Address Jewell Ridge

Soil type loam, or parent rock(linestone, granite, etc.) limestone

Acres in field(4). Crop, fertilizer and lime history of field:

Year:	Crop	Yield per A.	Fertilizer: analysis.	Lbs.fert.: per A.	Kind of lime.	Tons lime per A.	Tons manure per A.
1938:	corn	25	4-12-4	300 lbs	crushed	2	4
1939:	oats	25					4
1940:	clover						
1941:	clover						

Any other information about cropping and fertilizer system Would like to seed in alfalfa

Simply testing the soil is of little value. The test must be combined with all other known facts about the field before recommendations can be made; therefore, the above blank must be filled in completely and accompany the soil sample if recommendations are desired. Put the record sheet inside the container of the soil sample. Be sure the sheet in each sample is the record of the field from which the sample was taken.

County agent, S. C. S. Technician, Vocational Agricultural Instructor, or other person sending the sample:

Name S. D. Woods Address Grundy, Va.

Results of Test:

pH 6.4

Phosphoric acid P

Potash P

Calcium f

Magnesium

Suggested Recommendations:

Doubt if this field is fertile enough to grow alfalfa successfully, but if seeded, use 2 to 2½ tons ground lime equivalent, 800 lbs. 0-12-12 fertilizer and 15 lbs. borax per acre. Also cover with manure before plowing land.

V.G.= very good; G.= good; F+= fair plus; F-= fair minus; P.=poor; V.P.= very poor.

VA. A. & M. COLLEGE AND POLYTECHNIC INSTITUTE AND U.S.DEPARTMENT OF AGRICULTURE COOPERATING; EXTENSION DIVISION, John R. Hutcheson, Director, Blacksburg, Va.

SAMPLING SOIL

Soil samples must be carefully and properly taken if the results of the test are to be of any value, since a sample represents many million pounds of soil. For a sample to be representative of a field a large number of samples must be taken, thoroughly mixed, and a composite sample of these furnished for testing. Depending upon the size of the field, samples should be taken from 10 to 30 places in the field for making a composite sample.

Samples may be taken with a trowel, shovel or spade. A vertical cut is made to the desired depth and the soil pushed out. A thin slice of the face is then removed and carefully collected for the sample. Samples should be taken to a depth of 6 to 8 inches on crop land, but on pasture land at a depth of 2 inches. Do not take samples from under manure, decaying organic matter, corn shocks, small grain shocks or litter, because such soils will have an accumulation of plant food from the leaching of this material.

If there are distinct types of soil in the field, or differences in the past treatment of the crops, these differences should be represented by composite samples. A sample should consist of not less than one-half pint of soil.

Do not send samples in paper bags, and remember that clean containers are essential. Ice cream cartons are ideal shipping containers. Write the name and address of the owner, and sender on each sample. If there is more than one sample being sent for an individual be sure to number or letter each sample.

Address samples to W. H. Byrne, Agronomy Department, Blacksburg, Va.

SEND ALL LIME SAMPLES FOR ANALYSIS AND SCREEN TEST TO THE STATE DEPARTMENT OF AGRICULTURE, RICHMOND, VA. WE ARE NOT IN POSITION TO RENDER THIS SERVICE.

Exhibit D.

Radio Talk
March 3, 1941
W. H. Byrne

Virginia's Fertilizer Program

Virginia's fertilizer program has as its goal the intelligent use of a larger amount of plant food by Virginia farmers, and the lowering of the cost of plant food per unit. The latter goal is the one I want to discuss with you this morning.

Can the unit cost of plant food in fertilizer be reduced and, if so, what influence can farmers have in bringing this about? It can be done, and farmers can and should play the leading role.

In the first place, too many grades and too much low analysis fertilizer are being purchased by Virginia farmers, both of which add to the unit cost of plant food in fertilizer.

You will realize at once the importance of reducing the number of grades or analyses when I tell you that 134 different grades are registered with the State Department of Agriculture, and that last year 19 grades composed 87½ percent of the total tonnage sold in the state, while the remaining 115 grades composed only 12½ percent of the total tonnage. It is pertinent to note further that 25 grades composed 92½ percent of the total tonnage. This multiplicity of grades is costly to manufacturers and naturally the increased cost is passed on to farmers.

It is even more important to increase the number of units of plant food per ton, because in low analysis fertilizer plant food is more costly per unit. With the available high grade material from which fertilizer is now manufactured it is essential that low analysis fertilizers contain a large amount of filler, which is of little or no value to the farmer. This filler is costly to manufacturers and must be passed on to farmers as long as low analysis fertilizers are demanded by farmers.

According to a survey by the National Fertilizer Association and the U. S. Department of Agriculture, Virginia farmers used 230,535 tons of fertilizer in 1934. In this fertilizer there was 35,697 tons of filler for which Virginia farmers paid $426,579. Why did they pass so much for filler? Was it because fertilizer manufacturers wanted to sell filler? Not at all. The reason is that Virginia farmers demanded low analysis fertilizer.

To illustrate that plant food is cheaper in high analysis than in low analysis fertilizer, let us consider that a farmer has $100. to invest in fertilizer. At last year's prices his $100. would purchase 1250 pounds of plant food in a 14 unit fertilizer, or 1300 pounds in a 16 unit fertilizer. However, the same $100. invested in a 20 unit fertilizer will buy 1460 pounds of plant food, and if invested in a 24 unit fertilizer it will buy 1550 pounds of plant food. Therefore, is it not logical that we are recommending reasonably high analysis fertilizer?

In speaking of high analysis fertilizer I mean an analysis that can be made economically with the available present day materials. This is important to manufacturers and in turn to farmers, because fertilizer can be made so high in analysis that it cannot be manufactured economically. Another thing, most present day machinery is not equipped to distribute extremely high analysis fertilizer without danger of injury to row crops.

While there are 134 different registered fertilizer grades, many of which contain only 14 units of plant food, Virginia's recommended grades consist of only 17 grades, only two of which contain less than 20 units of plant food. If Virginia farmers would use these grades exclusively, as set forth in circular R-341, they would contribute much to reducing the number of grades and increasing the units of plant food per ton in fertilizer sold in Virginia. This would mean cheaper plant food per unit.

Exhibit E.

Exhibit 7

Farm of W. H. Gills, Powhatan. County Agent I. B. Wilson. On his right no clover and no phosphate; on his left good clover, 400 lbs. 20% superphosphate per acre. Entire field limed.

Exhibit C.

Exhibit G-1

Montross, Va.
November 17, 1941

Mr. W. H. Byrne, Agronomist
Blacksburg, Va.

Dear Mr. Byrne:

In checking on the J. T. Sanford alfalfa plot I find that the number of plants per square yard to be more numerous and present a greater vigor on the first three plots on which 1000 pounds of superphosphate and 500 pounds of muriate of potash was applied, as compared to the last three plots on which 500 pounds of superphosphate and 250 pounds of muriate of potash was applied. There was no apparent difference where part or all of the fertilizer was turned or applied at seeding time.

On the three plots on which the 500 pounds of superphosphate and 250 pounds of muriate of potash were applied, wire grass and other weeds were by far more numerous than in the three plots receiving double the amount of the above materials. Mr. Sanford told me this morning that he could not tell whether or not there was a greater tonnage of alfalfa on the first three plots as compared to the last three but that the amount of grass in the alfalfa on the last three plots was by far greater, this being very noticeable.

These plots will be left next year for any treatment that we may suggest.

Borax was applied through the center of all six plots last year. Last year there was a very noticeable difference in favor of the borax. The difference was in a green color, more growth and a larger number of plants in bloom. No borax was applied this year. There were no visable results this year of the borax applied last year.

Yours very truly,

S. J. Dawson
County Agent

Exhibit H.

AMERICAN POTASH INSTITUTE, INC.

PASTURE PROJECT

Object:

To demonstrate the value of potash on pasture where the lime and phosphoric acid requirements have been supplied.

Plan:

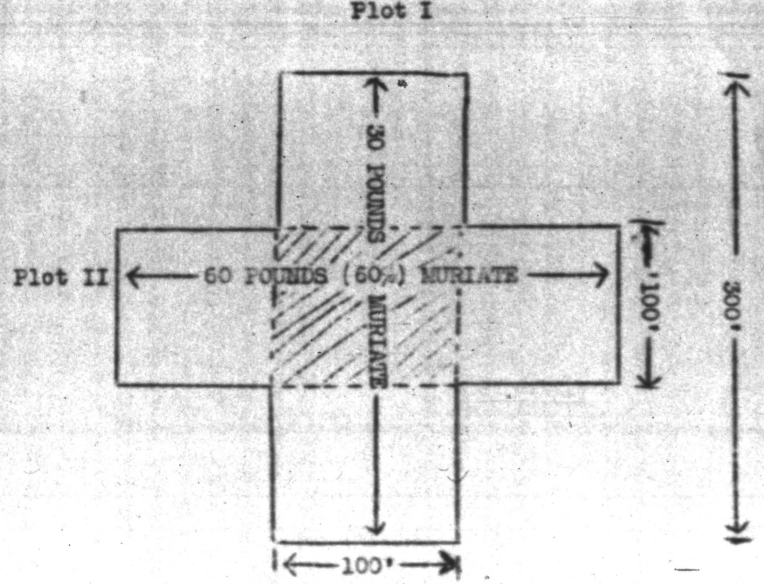
Number of plots---------- 2

Size of plots---------- 0.69 acres (100' x 300')

Source of Potash---------- Muriate of Potash, 60% K_2O

Amount per plot ---------- Plot I - 30 pounds muriate
Plot II - 60 pounds muriate

Diagram of Plots:



Note: The above arrangement of plots provides three rates of application: 25 lbs. K_2O per acre in Plot I; 50 lbs. K_2O per acre in Plot II; 75 lbs. K_2O per acre in the shaded area where the two treatments overlap.

Exhibit H-1

Warsaw, Va.
Nov. 17, 1941

Mr. W. H. Byrne
Blacksburg, Va.

Dear Mr. Byrne:

Due to the extreme dry weather the past spring and summer, the pasture demonstrations did not show very much. However, in early spring we noticed that the plots which were nitrated produced more abundant than the others. We also noticed that the cattle grazed these plots the most.

Everything is dried to a crisp now and no difference can be noticed.

I am sorry not to be able to give you more information, but it is the best I can do under the circumstances.

Very truly yours,

R. A. Farmar
County Agent

Exhibit I.

Extension Division News
March 20, 1941

SUPPLEMENTAL PASTURES

Among crops that are used for supplementary pastures, sweet clover, orchard grass, lespedeza, sudan grass, Italian rye grass and crimson clover are not surpassed.

Sweet Clover, Orchard Grass and Korean Lespedeza

Ten pounds of sweet clover, 10 pounds of orchard grass and 8 pounds of Korean lespedeza, seeded on small grain in February will afford a lot of late fall pasture the year it is sown. It should not be grazed the year it is seeded until mid-September in order to give the crop ample time to develop a good root system, which is necessary for the production of a heavy crop the second year. By April 1 to 15 of the second year, the plants will be 6 to 8 inches high, when grazing should begin. The plants should not be allowed to become more than 12 inches high. During a normal season it will require 3 or 4 cows per acre to keep the crop in good grazing condition. The plants must be continually bitten off, which will cause them to branch.

By grazing the sweet clover, etc. early the spring of the second year, permanent pasture will have an opportunity to develop before the cattle are taken from the supplementary to the permanent pasture. In July and August, when permanent pastures are in their lowest state of production, the cattle can be returned to the supplemental pasture. The lespedeza and orchard grass will then furnish an abundance of high quality pasturage.

Sweet clover, orchard grass and lespedeza fit well into a three-year rotation with small grains preferably barley and corn. If the land is too steep to cultivate in a row crop, it will fit well into a two-year rotation with small grain.

It is, of course, necessary to use lime on most of the land in the state to grow sweet clover successfully. If the mixture is seeded alone, the equivalent of 400 pounds of 0-14-6 fertilizer should be used at seeding. If grown in a three-year rotation, as suggested above, 300 pounds of 2-12-6 or 0-14-6 fertilizer should be applied on the corn, and an equal amount of the same fertilizer on the small grain.

Sudan Grass

Sudan grass probably leads the list of non-legumes suitable for supplementary summer pasture. It should be seeded at the rate of 30 to 40 pounds per acre in early May, but may be seeded up until July 1. A drill set to sow 2 to 3 pecks of wheat will usually sow about the right quantity of seed. Sudan grass is ready to graze within from 4 to 6 weeks. It will carry from 2 to 3 animals per acre, depending upon the stand and season. Grazing should begin when the plants are from 6 to 12 inches high. When sowing the seed the equivalent of 300 pounds per acre of something like a 4-12-4 fertilizer should be used.

In a test conducted at V.P.I. by the dairy department a few years ago, sudan grass furnished as many cow days pasture in 14 days as did well fertilized blue grass pasture in 80 days.

If the summer pasture season is good and the sudan grass is not needed as a supplementary pasture, it may be harvested as hay, which has about the same feeding value as other grass hay.

Crimson Clover and Italian Rye Grass

In sections of the state where crimson clover can be grown successfully a mixture of 15 pounds of Italian rye grass and 15 pounds of crimson clover, seeded in August or early September, will furnish a lot of late fall pasture and an immense amount of early spring pasture. A good stand of this mixture will carry from 4 to 5 cows per acre for from 4 to 6 weeks, depending upon the season. It is usually ready to turn on between April 1 and 15, depending upon the section of the state in which it is sown.

The soil reaction should be pH 6.0 or above for the successful growth of crimson clover, and when the crop is seeded, the equivalent of 400 pounds per acre of 4-12-4 or 0-14-6 fertilizer should be used.

This mixture may be used to good advantage in connection with sudan grass, as the land on which the sudan grass is produced may be prepared and seeded to crimson clover and rye grass for pasturing the following spring. After pasturing the crimson clover and rye grass the land may be seeded to sudan grass for midsummer pasture. By using this combination there will be a supplemental pasture for late fall, early spring and midsummer. By following this system very little, if any, leaching or erosion will take place, as the land will have green roots in it practically throughout the entire year.

When starting cattle on sweet clover, or any other leguminous pasture, it is well to give them some dry hay or straw after the morning milking, to help prevent bloating and loose bowels.

Exhibit I-1

25133

Crop and Weed Seed Identification

1. Morning Glory
2. Dodder
3. Wild Onion
4. Cockle
5. Ragweed
6. Buckhorn
7. Jimson Weed
8. Cockle Bur
9. Narrow Leaf Dock
10. Wild Carrot
11. Johnson Grass
12. Cheat
13. Burdock
14. Sheep Sorrel
15. Cowpeas
16. Soybeans
17. Austrian Winter Pea
18. Italian Rye Grass
19. Timothy
20. Orchard Grass
21. Herds Grass
22. Kentucky Bluegrass
23. Alfalfa
24. Lespedeza
25. Sericea Lespedeza
26. Sorghum
27. Millet
28. Rape
29. Vetch
30. Crimson Clover
31. Alsike Clover
32. White Clover
33. Red Clover
34. Cotton
35. Buckwheat
36. Tobacco
37. Rye
38. Wheat
39. Barley
40. Oats

Exhibit I-2 - 1941 State 4 H Crops Judging Contest,
State Fair

Exhibit I-3 - 1941 State 4 H Crops Judging Contest,
State Fair

Exhibit I-4

1940 4 H Crops Judging Team,
National Contest, Chicago

24972

Exhibit I-5

JUNIOR JUDGING CONTEST - STATE SEED SHOW 1941

Scores of Contestants

County	Name	4-H FFA	Yellow Corn	White Corn	Wheat	Seed Identification	Total	
Amherst	Lewis Patterson	FFA	100	100	90	60	350	
	Page Stinnett	FFA	100	90	95	70	355	
	Warren Campbell	FFA	90	100	75	80	345	1050
	Maynard Bailey	4-H	100	100	100	65	365	
	Swanson Jones	4-H	100	100	90	75	365	730
Augusta	Marshall Shifflett	FFA	90	95	100	80	365	
	Harold Bosserman	FFA	100	95	70	90	355	
	Bill Shirey	FFA	100	40	85	90	315	1035
Bland	Harry Wilson	FFA	100	90	100	90	380	
	Harry Durham	FFA	65	85	40	90	280	
	Garnett Strack	FFA	60	90	100	90	340	1000
Botetourt	Tommy Trevy	FFA	65	85	55	50	255	
	Shirley McFarland	FFA	90	80	55	25	250	
	John Hemmitt	FFA	100	100	95	55	350	1030
Carroll	Elmer Dalton	FFA	100	100	90	100	390	
	Carlos Aderman	FFA	100	100	90	100	390	
	Bill Iroler	FFA	95	70	60	100	325	1105
	Ray Hollandsworth	4-H	90	60	100	100	350	
	Dexter Hall	4-H	75	100	100	95	370	
	Claude Dalton	4-H	100	100	100	100	400	1120
Dickenson	Charles Baker	FFA	100	90	70	84	345	
	Noel Fleming	FFA	100	90	70	70	330	
	Burt Willis	FFA	100	90	50	55	295	970
Floyd	Frederick Harmon	FFA	85	90	60	80	314	
	Robert Sumpter	FFA	85	50	90	75	300	
	Bryon Poage	FFA	85	90	60	75	310	925
Grayson	Ray Hale	FFA	40	85	90	95	310	
	Joe Phipps	FFA	85	90	100	80	355	
	Letcher Phipps	FFA	100	90	90	85	365	1000
	Creed Thomas	4-H	100	12	90	70	273	
	Dean Martin	4-H	100	35	100	70	305	
	Beal Todd	4-H	100	100	50	55	305	883
Lee	Clarence Slemp	FFA	85	55	90	70	300	
	Ralph Shuler	FFA	95	100	12	75	282	
	John D. Reasor	FFA	85	75	65	70	295	877
Montgomery	Marvin Lawrence	FFA	100	85	90	70	345	
	Kenneth McCauley	FFA	65	15	85	40	205	
	Bruce Scaggs	FFA	65	100	55	90	310	850
Russell	Leonard Jackson	FFA	80	95	65	90	330	
	Douglas Morrison	FFA	95	95	90	95	375	
	James Tignor	FFA	65	90	100	90	345	1050

County	Name	4-H FFA	Yellow Corn	White Corn	Wheat	Seed Identification	Total	
Scott	Jack Davidson	FFA	80	90	70	70	310	
	Ernest Lucas	FFA	100	90	90	65	345	
	Glen Mann	FFA	100	90	90	65	345	1000
Smyth	Dwight Earnest	4-H	90	60	25	65	240	
	Pete Slemp	4-H	100	55	55	55	265	
	James Richardson	4-H	85	100	70	85	340	845
	Dan Vaught	FFA	100	70	90	80	340	
	Rudolph Earnest	FFA	100	90	90	80	360	
	Junior Odhan	FFA	100	40	95	75	310	1010
Tazewell	R. W. Johnson	FFA	100	40	40	85	265	
	Jennings Lockhart	FFA	90	100	70	85	345	
	Claude Hawkins	FFA	90	60	40	85	275	885
Washington	Jack Atwell	FFA	100	100	90	100	390	
	Curtis Tillson	FFA	90	90	85	95	360	
	Robert Lester	FFA	100	90	90	100	380	1130
	John Copenhaver Jr.	4-H	90	90	100	90	370	
	Sam Copenhaver Jr.	4-H	100	60	90	90	340	
	John Mack Grey	4-H	85	90	100	85	360	1070
Wythe	Quinton Cregger	FFA	100	80	90	80	350	
	Roy Rose	FFA	60	60	60	45	225	
	Ray Arnold	FFA	100	100	60	70	330	905

High Individuals

1st - Claude Dalton - 4-H
Carroll County - gold medal

2nd - Elmer Dalton - FFA
Carroll County - silver medal

3rd - Carlos Aderman - FFA
Carroll County - bronze medal

High Teams

Washington County - FFA
Carroll County - 4-H

Each of these teams is awarded a handsome cup from the respective departments.

Exhibit I-6

District 4 H Club Crops Judging
Meeting, Rustburg

Exhibit I-7 - 4 H Club Corn Exhibit, Danville Fair 1941
4 H Seed Corn Project

Exhibit I-8

Department of Vocational Education
Blacksburg, Virginia
July 1, 1941

Mr. J. D. Guthrie
Campus

Dear Mr. Guthrie:

When a man works hour after hour during hot summer days to help someone with a program merely to have "thank you" said the reward seems very inadequate. I am not sure just how we could have conducted the crops judging contest without your valuable assistance.

May I express to you not only my own appreciation of your help but that of every member of our staff and others who had the responsibility of conducting the Rally. You certainly made an invaluable contribution to its success.

Sincerely yours,

H. W. Sanders, Professor
Agricultural Education

Exhibit L-9

Woodlawn, Va.
August 1941

Mr. S. F. Grubbs
Blacksburg, Va.

Dear Sir:

As I have been in the milling business for nearly 20 years I am writing you to mention the improvement in the quality of milling wheat during the past few years. The farmers have become more interested in clean seed and certified seed. There were some all along that graded their seed but the bulk used the general run of wheat, so the yield was lower and poorer quality, mixed with rye and cockle. A large part of the wheat now grown in this section originated from certified seed. Mr. J. L. Harmon has gotten a number of farmers interested in good seed and has furnished them with certified seed.

About two years ago some 10 or 12 lots of wheat came to the mill to be graded from a section that had not graded their wheat at all. Then is when I fully realized what had been done in this section.

Yours respectfully,

E. C. Kyle

Exhibit I-10

Hybrid corn meeting, John S. Ward,
Loudoun county

Exhibit I-11

Uniform Tests of Hybrids at the Holland, Williamsburg, Bowling Green and Petersburg experiment stations 1941

Tennessee 16
Wood's Hyb. Red Sweepstakes
Experiment #2
Eureka
Funk G 135
Kentucky 69
U. S. 360
Kentucky 201
Tennessee 15
U. S. 361
Wood's Hyb. Golden Prolific
Kentucky 72
Experiment #1
Hoosier Crost 829
U. S. 99
Check Clarage
Illinois 200
Hoosier Crost 818
Kentucky 78 B
U. S. 262
U. S. 265
Pioneer 300
Kentucky 69 B
Wood's Hyb. Yellow Dent XX
Richbred 1002
Check O.P.
National 134 D
Funk G 94
U. S. 102
U. S. 359
Funk G 125
Pioneer 332
Illinois 448
U. S. 13
Wood's Hyb. White Dent

Exhibit I-12

Uniform Tests of Hybrids at the Appomattox, Charlotte, Chatham, Orange, Staunton, Blacksburg and Glade Spring experiment stations 1943

Tennessee 16
Funk G 46
Pioneer 337
Experiment #1
Funk G 135
Kentucky 69
U. S. 360
Indiana 844 D
Tennessee 15
U. S. 361
Wood's Hyb. Golden Prolific
Kentucky 72
Experiment #2
Hoosier Crost 818
Kentucky 201
U. S. 262
U. S. 265
Pioneer 300
Kentucky 69 B
Wood's Hyb. Yellow Dent YK
Richbred 1002
Check
National 134 D
Funk G 94
U. S. 102
U. S. 359
Funk G 125
Pioneer 332
Illinois 448
Check
Illinois 200
U. S. 13
Wood's Hyb. White Dent

Exhibit I-13

Ky. #16 Burley Tobacco, J. O. Woodward
Jonesville, Lee county

Porto Rico Sweet Potatoes, S. E. Pope,
Dreamyville, Va.

Coker's Hardired wheat, M. G. Broaddus
Sparta, Caroline county

Fulgrain oats #3, R. C. Hutchinson
Tappahannock, Essex county

Exhibit I-14

PROGRAM

Wednesday, January 29, 1941

8:00 P. M.—Meeting of Board of Directors.

Thursday, January 30, 1941

FORENOON

10:00—Welcome Address—Mayor T. C. Phillips.
10:05—Response—John S. Ward, President of the Virginia Crop Improvement Association.
10:10—"The Impact of the Defense Program on Virginia Agriculture"—Dr. John R. Hutcheson, Director of Extension, Blacksburg, Va.
11:00—"Why Some Farmers are More Successful than Others"—Kenneth E. Loope, Assistant Farm Management Specialist.
11:45—Review of Exhibits.
12:15—Lunch.

AFTERNOON

1:30—"Hybrid Corn"—Dr. Merle T. Jenkins, Principal Agronomist in charge of Corn Investigation, Bureau of Plant Industry, Washington, D. C.
2:15—"Current Problems and Future Prospects for Dairymen in in Southwest Virginia"—R. G. Connelly, Extension Dairyman, Blacksburg, Va.

Banquet — 6:30-9:00 P. M.

The annual banquet of the Virginia Crop Improvement Association is always looked forward to with pleasure by those who have attended this event in the past.

Everyone attending the show and convention is invited to attend. Tickets will be on sale the morning of January 30.

A feature of the banquet will be the awarding of the Sweepstakes trophy given by T. W. Wood & Sons, of Richmond

Friday, January 31, 1941

FORENOON

9:45—"The Crop Improvement Association's Contribution to Virginia Agriculture"—Dr. T. B. Hutcheson, Agronomist, V. I. P., Blacksburg, Va.

10:30—"Home Gardens"—Dr. H. H. Zimmerley, Director, Virginia Truck Experiment Station, Norfolk, Va.

11:15—"Our part in Virginia Seed Improvement"—L. M. Walker, Commissioner of Agriculture, Richmond, Va.

1:30—Meeting of Board of Directors.

Exhibit J. Professional workers' conference, Glade experiment Station.

A GUIDE FOR THE IDENTIFICATION

OF

SOIL TYPES IN THE TIDEWATER OF VIRGINIA

AND

SUGGESTIONS AS TO CROP ADAPTATION AND MANAGEMENT

Blacksburg, Virginia

October 1, 1941

Exhibit K

FOREWORD

Information on soils and fertilizers now available applies to the state as a whole and has therefore been general in its application. Agricultural Workers have from time to time expressed a desire to have this information on soils and fertilizers available in such a form that it will be applicable to certain sections of the state and can therefore be used more intelligently on individual farms.

The enclosed tables and recommendations represent an attempt to better interpret the information now available on soils and fertilizers.

It is realized that this is only a beginning and from time to time as more information becomes available this material may be revised and improved.

These tables and recommendations have been prepared by representatives of the Agronomy Department of V. P. I. and the Soil Conservation Service for the use of Agricultural Field Workers in the state.

TIDEWATER SOILS OF VIRGINIA

WELL DRAINED
(Generally No Mottling of Subsoil)

Soil Type	Surface	Subsoil
Atlee	Gray	Pale yellow (heavy)
Beltsville	Gray	Yellowish Brown (friable) (Semi-hardpan 16")
Bray	Gray to dark gray	Dark gray (very heavy)
Caroline	Gray	Reddish brown to yellowish brown (heavy)
Craven	Gray	Yellow brown (very heavy)
Evesboro	Grayish brown to brown	Brown sand
Hyattsville	Brown	Yellowish brown (friable) (Colluvial)
Jamison	Gray	Yellow (friable) (Colluvial)
Kempsville	Grayish brown	Yellowish brown (friable)
Kent	Gray to brown	Yellow to brown (variable)
Marlboro	Gray	Yellow (heavy friable)
Norfolk	Grayish yellow	Yellow friable sandy clay
Rumford	Light gray	Reddish brown (friable)
Ruston	Gray	Reddish yellow (friable)
Sassafras	Brown	Yellowish brown to reddish brown (friable)

INTERMEDIATELY DRAINED
(Lower half of subsoil mottled)

Keyport	Grayish brown	Brownish yellow (heavy but friable) - Mottling begins
Lenoir	Gray	Pale yellow mottled with gray plastic clay (18 to 20 in.
Loyock	Gray	Grayish yellow (friable sandy clay)
Onslow	Gray to dark gray	Yellow mottled with gray (heavy but friable)
Woodstown	Brown	Yellow brown (friable sandy clay)

POORLY DRAINED
(All of Subsoil Mottled and Sometimes Surface)

Bayboro	Dark gray	Gray mottled with brown (very heavy)
Bladen	Light gray to gray	Very heavy gray mottled brown
Elkton	Light gray	Heavy gray mottled with brown
Plummer	Light gray	Wet and sandy
Portsmouth	Dark gray to black	Mottled yellow and gray (friable)

FIRST BOTTOM (COASTAL PLAIN)

(Subject to floods)

Soil Type	
Alluvial undifferentiated soils	Variable wet land
Ochlockenee	Well drained

RIVER TERRACE (COASTAL PLAIN SECOND BOTTOM)

Soil Type	Surface	Subsoil
Almia	Gray	Yellow friable (well drained)
Lyatt	Gray	Gray mottled (poorly drained)

FIRST BOTTOM (PIEDMONT)

(Material transported from Piedmont) (Subject to floods)

Soil type	
Congaree	Well drained
State	Well drained - seldom overflows
Wehadkee	Poorly drained

RIVER TERRACE (PIEDMONT)

(Material transported from Piedmont)

Soil types	Surface	Subsoil
Altavista	Gray	Yellow mottled subsoil (Intermediately drained)
Hiwassee	Drak brown	Brownish red silty clay (well drained)
Wickham	Grayish brown	Reddish brown sand clay (well drained)
Roanoke	Gray to dark gray	Heavy gray mottled subsoil (poorly drained)

Productivity Rating[1]

	Alfalfa	Berries (Blue and black)	Corn	Cotton	Cowpeas	Crimson Clover	Grapes	Grasses	Irish Potatoes (early)	Lespedeza	Melons	Peaches	Peanuts	Red and other Clovers	Small Grains	Soybeans	Strawberries	Sweet Potatoes	Vegetables
Altavista F. S. L.	5	7	7		7	7	6	8	6	8	6	5	7	6	7	8	7	5	6
Atlee V. F. S. L.	5	7	6½		7	7	6	8	6	8	6	5	(6)	5	7	7	6		6
*Bayboro F. S. L.			5		4	5		8	8	8					5	7	7		7
*Bayboro loam			4		4	4		7½	6	7					5	7	7		5
*Bayboro silty clay loam						4		7	4	7					5	6	6		
2 Beltsville F. S. L.	7	7	8		8	8	8	8	8	8	7		(7)	8	8	8	7	7	7
*Bladen F. S. L.			5		4	5		7½	6	7½					5	7	9		7
*Bladen loam			4		4	4		7½		7½					4	6	7		4
*Bladen silty clay loam								6½		6½						5	5		
2 Bray F. S. L.	5		5		5	6	5	7		7		6		6	6	6	6		
2 Bray silt loam			4		4	5	5	7		7				5	5	5	6		
2 Caroline very fine sandy loam	6	7	7		7	7	7	8	6	8	5	6		7	7½	7	6	5	5
Congaree loam (subject to floods)			10		9	9		10	7	10	8				7	9		5	7
Craven fine S. L.	6	7	7	7	7	8	6	8	7	8	5		6	7½	8	7½	6	5	7
*Elkton silt loam			4		4	6		7½		7½					5	7	5		4

	Alfalfa	Berries (Blue and black)	Corn	Cotton	Cowpeas	Crimson Clover	Grapes	Grasses	Irish Potatoes (early)	Lespedeza	Melons	Peaches	Peanuts	Red and other Clovers	Small Grains	Soybeans	Strawberries	Sweet Potatoes	Vegetables
*Elkton F. S. L.			5		5	7		7½	6	7½					6	7	6		5
Evesboro sand	Primarily forest																		
Evesboro loamy sand		7	4		4	4	5	4	4	5	7	4	(4)					7	6
Hiawassee Loam	10	9	9	9	9	10	8	10	7	10	6	7	7	10	10	10	8	7	7
2 Hyattsville F. S. L.	7½	7	9		9	9	8	9	8	9	8		(8)	8	9	9	8	6	9
2 Hyattsville loam	8½	7	10		10	10	8	10	7	10	6		(7)	9	10	10	9	5	7
Jamison loam	5	7	8		8	8	7	9	8	9	8		(8)	6	8	8	8	7	8
Kalmia fine sandy loam		8	7	8	7	7		6	7	6	8		7	6	6	8	7	8	7
Kalmia loamy fine sand		8	7	8	7	7		5	7	5	8		(7)	6	6	8	7	7	7
2 Kempsville F. S. L.	7	9	8		8	8	8	8	8	8	8	8	(8)	8	8	8	8	7	9
2 Kempsville F. S. L. D. P.		9	6		7	6	6	6	6	6	8	7	(7)	6	5	5	5	7	8
2 Kempsville loam	7½	9	9	8	8	8	9	8	6	8	7	8	(7)	8	8	8	8	6	7
Kent fine sandy loam	Primarily forestry and pasture																		
*Keyport F. S. L.		6	8		7	8	5	8½	9	8½	6			7	8	9	8	6	8
*Keyport loam		6	8		6½	8	4	9	7	9	5			7	8	8	8	4	7

	Alfalfa	Berries (Blue and black)	Corn	Cotton	Cowpeas	Crimson Clover	Grapes	Grasses	Irish Potatoes (early)	Lespedeza	Melons	Peaches	Peanuts	Red and other Clovers	Small Grains	Soybeans	Strawberries	Sweet Potatoes	Vegetables
*Lenoir F. S. L.			6½	6	6	7		8	6	8			6	5	7	8	7	5	5
*Lenoir loam			6	5	5	6		7½	5	8				5	6	7	7		5
*Lenoir silt loam			6	4	5	6		7	5	7				5	6	7	7		
Marlboro F. S. L.	7	8	8	8	8	8	8	7	7	7	7	8	7	8	8	8	8	7	8
*Loyock F. S. L.		6	7	6	7	7	5	7	9	7	8		6	5	7	8	8	7	9
*Loyock S. L.		6	6	6	6	6	5	6	9	6	9		6	5	6	7	8	8	9
*Loyock loamy sand			5	6	5	5	4	5	6	5	8		6		4	6	7	7	7
*Lyatt F. S. L.			4		4			7	4	6						6			4
Norfolk F. S. L.	5	9	7	9	7	7	7	5	9	5½	9	8	10	6	6	7	7	8	9
Norfolk S. L.	4	9	6½	8	7	6½	7	4	8	5	9	9	10	5	5½	6	7	10	9
Norfolk sand	primarily suited for forestry																		
Norfolk loamy fine sand		7	4	5	5	4	5			4	7	6	7		4	4	4	7	7
Norfolk F. S. L. D. P.		8	5	7	6	5	6	4	4	5	8	7	8	4	5	5	5	8	7
Ochlockenee (subject to floods)			8		8	8		8		8	8				7	9			6
*Onslow F. S. L.		6	8	8	7	8	7	7½	8	7½	7	7	7	7	7	8	8	7	8

	Alfalfa	Berries (Blue and black)	Corn	Cotton	Cowpeas	Crimson Clover	Grapes	Grasses	Irish Potatoes (early)	Lespedeza	Melons	Peaches	Peanuts	Red and other Clovers	Small Grains	Soybeans	Strawberries	Sweet Potatoes	Vegetables
Plummer F. S. L.	Primarily suited to forestry																		
*Portsmouth F. S. L.			5		5	6		7	8	7					6	7	8		7
Roanoke Silt loam			4		5	4		7		7					5	6			
2 Rumford F. S. L.	5	8	7		8	7	7	6	7	7	8	8	(8)	6	6	6	6	9	8
2 Rumford F. S. L. D. P.		8	5		6	5	5	4	5	5	8	7	(7)	4	4	4	4	9	7
Ruston F. S. L.	6	6	7	7	7½	7	7	6	7	6	7	8	7	8½	7	7	7	7	7
Sassafras F. S. L.	9	10	8½		10	10	10	9	10	9	8	10	9	9	9	10	10	8	10
Sassafras Sandy loam	8	9	8		9	9	9	8	10	8	9	9	9	8	8	8	10	10	10
Sassafras loam	10	10	9		10	10	10	10	7	10	5	10	7	10	10	10	10	6	9
State F. S. L.	7	8	9		8	9	7	9	8	9	9	6	(8)	7	8	9	9	8	8
Wehadkee	Primarily suited to pasture																		
Wickham loam	10	9	10	7	10	10	10		7	10	7	9	(7)	10	10	10	8	5	8
Wickham F. S. L.	9	9	9	9	9	9	10	9	10	10	8	10	8	9	9	9	8	7	9
Wickham loamy fine sand		7	5	5	6	6	7	4	5	6	9	7	(7)	4	4	5	4	8	

	Alfalfa	Berries (Blue and Black)	Corn	Cotton	Cowpeas	Crimson Clover	Grapes	Grasses*	Irish Potatoes (early)	Lespedeza	Melons	Peaches	Peanuts	Red and other Clovers	Small Grains	Soybeans	Strawberries	Sweet Potatoes	Vegetables
Woodstown F. S. L.	6	8	8		8	8	7	9	9	9	7			7	8	8	8	7	8
Undifferientiated (poorly drained)			4				6			6						5			

F. Fine
L. Loam
V. Very
S. Sandy

D. P. Deep Phase
D.S.P. Pale Surface Phase

[1]Rating based on 10 as most productive in Tidewater; 9 includes those only 9/10 as productive

2 Soils not correlated (name may be changed)

*Productivity rating based on average farm management practices which includes adequate drainage.

Soil Groups	General Crop Adaptations	INHERENT POTENTIAL CAPACITY: Drainage	Organic Matter	Acidity	Lime Requirement	Leachability	GENERAL fertilizer and lime practices recommended under normal conditions for corn, small grain and hay rotations: Based on a present fertility level of 40 bu. of corn or less	Based on a fertility level of 40 bu. of corn or more
Group I Caroline Craven Hyattsville Janison Kempsville F.S.L. Kempsville L. Marlboro Ruston F.S.L. Sassafras	General and special Purpose	Good	Low to medium	Medium to strong	Medium	Medium	Lime to test for legume in the rotation or initial application of 1 to 1½ tons, and 3/4 to 1 ton each 3 years thereafter 300 lbs. per acre per year of 2-12-6 in the rotation. Side dress corn and top dress small grain with equivalent of 100 to 150 lbs. of nitrate of soda	300 to 350 lbs. per acre per year of 2-12-6 in the rotation. Side dress corn and top dress small grain with equivalent of 100 to 150 lbs. of nitrate of soda where nitrogen deficiency is evident
Group II Beltsville Kalmia F.S.L. Kempsville F.S.L.D.P. Norfolk F.S.L. Norfolk S. L. Rumford F.S.L.	Special purpose	Good to Excessive	Low	Medium to strong	Medium to low	High	Lime to test for legume in the rotation or initial application of at least 1 ton, and ½ to 3/4 ton each two to three years 300 lbs. per acre per year of 2-12-6 in the rotation. Side dress corn and top dress small grain with equivalent of 150 to 200 lbs. of nitrate of soda. For corn divide into two applications.	300 to 350 lbs. per acre per year of 2-12-6 in the rotation. Use nitrogen as opposite if deficiency is evident, but at rate of 100 to 150 lbs. per acre
Group III Evesboro Kalmia L.F.S. Norfolk L. F. S. Norfolk F.S.L.D.P. Norfolk Sand Rumford F.S.L.D.P.	Special purpose or (Forestry)	Excessive	Very low	Medium to strong	Low	Very high	Lime to test for legume in the rotation or initial application of at least 3/4 ton and ½ ton every 2 years 350 lbs. per acre per year of 2-12-6 in the rotation. Side dress corn and top dress small grain with equivalent of 150 to 200 lbs. of nitrate of soda; for corn divide into two applications. Watch for potash deficiency, particularly on corn and legumes and if such occurs apply the equivalent of 50 to 100 lbs. of muriate of potash per acre, as side dressing with nitrogen	350 to 400 lbs. per acre per year of 2-12-6 in the rotation. Side dress corn and top dress small grain with equivalent of 100 to 150 lbs. of nitrate of soda; for corn divide into two applications. Watch for potash deficiency on corn and legumes.

F. Fine S. Sandy L. Loam D.P. Deep Phase

Soil Groups	General Crop Adaptations	INHERENT POTENTIAL CAPACITY: Drainage	Organic Matter	Acidity	Lime Requirement	Leachability	GENERAL fertilizers and lime practices recommended under normal conditions for corn, small grain and hay rotations. Based on a present fertility level of 40 bu. of corn or less	Based on a present fertility level of 40 bu. or corn or more
Group IV							Lime to test for legume in the rotation, or initial application of 1 to 2 tons, and 1 ton every 4 years thereafter	
Altavista Atlee Craven Keyport Lorock Onslow Woodstown	General purpose	Intermediate	High	Strong to very strong	High	Low	200 lbs per acre per year of 2-12-6 in the rotation. Side dress corn and top dress small grain with equivalent of 100 to 150 lbs. of nitrate of soda	200 lbs. per acre per year of 2-12-6. Use nitrogen if deficiency is evident as opposite
Group V							Lime to test for legume in the rotation or initial application of 2 to 3 tons, and 1 ton every 4 years	
Bayboro Bladen Bray Elkton Lenoir Myatt Plummer Portsmouth Roanoke Tuhadkee	Hay Pasture (forestry)	Poor	High to very high	Medium to strong	High to very high	Low	200 lbs. per acre per year of 4-12-4 in the rotation. For permanent hay and pasture, 400 lbs. per acre at seeding of 4-12-4 and top dress with average of 200 lbs. per acre per year of 0-14-6	200 lbs. per acre per year of 0-14-6 in the rotation. For permanent hay and pasture, 400 lbs. per acre at seeding of 4-12-4 and top dress with average of 200 lbs. per acre per year of 0-14-6
Group VI							Lime to test where legume is grown	
Congaree Ocholockonee State	Corn Grass	Good	Medium	Medium to strong	Medium	Medium to low	Use mixture of phosphate and potash as an 0-14-6 on silt loams and 0-12-12 on sandy loams	Use mixture of phosphate and potash as an 0-14-6 on silt loams and 0-12-12 on sandy loams
Group VII							Lime to test for legume in the rotation or initial application of at least 2 tons, and 1 ton every 4 years thereafter	
Hiawassee Wickham	General purpose	Good	Medium	Medium to strong	Medium	Medium to low	200 lbs. per acre per year of 4-12-4 or 2-12-6 in the rotation. Side dress corn and top dress small grain with equivalent of 100 to 150 lbs. of nitrate of soda, where nitrogen deficiency is evident.	200 lbs. per acre per year of 2-12-6 or 0-14-6 in the rotation. Use nitrogen if deficiency is evident as opposite

Exhibit L.

Extension Division News
Sept. 17, 1941

Taking Stock of my Situation

This is a good season of the year for every farmer to study his farm situation and make some definite plans for the future. Below are some of the questions every farmer might answer for himself.

1. Is every acre on my farm protected from erosion and leaching by a cover crop with a live root system?

2. How soon can my corn be husked and stored and the fodder housed or ricked?

3. Why did I not produce profitable yields in 1941?

4. Did the growth of any of my crops indicate a deficiency in any of the plant nutrients?

5. Did a seed-borne disease show up in any of my crops indicating that I should secure new seed?

6. Am I working land too steep or rough for cultivation that should be in pasture or trees?

7. Should I shorten my rotation and increase my permanent pasture acreage?

8. Do the fields on which I am going to sow clover next spring need lime?

9. Have I secured all of the lime and phosphate possible under the AAA soil-building program?

10. Is all my machinery protected from the weather, or is some of it still in the field where it was last used?

These are only a few of the many questions farmers should answer before planning for the future.

Space will allow only a brief discussion of two or three of these questions. Immediate consideration should be given to seeding that there is a cover on every acre possible. Fortunately, Abruzzi rye may be seeded even at this late date with fair assurance of protection to the land and early spring grazing for livestock.

The importance of small grain as a cover crop is illustrated by the results obtained with an experiment conducted by the V.P.I. agricultural chemistry department. In this experiment the loss of plant food from land with rye as a winter cover was 60 cents, while the loss from land without cover was $3.90 per acre. This saving of $3.30 per acre where the rye was sown, offset much of the cost of seeding the rye. Furthermore, these figures do not take into consideration the amount of soil saved from erosion.

After getting all bare land on the farm covered properly, the next most pressing problem is to complete husking and storing the corn crop, seeing that thefodder is properly shocked, ricked or stored. Much loss of the feed nutrients takes place by leaving the corn in the field over a long period, especially when it is poorly shocked.

Many farmers in Virginia are following long rotations, using the rotated land for pasture one or more years. Long rotations require large acreages of crop land, and force farmers with a small amount of smooth land to cultivate their steep or rough land. For instance, if 20 acres of corn and other cultivated crops are needed, and a five-year rotation of corn, small grain, clover, mixed hay and pasture is followed, 100 acres of crop land is required. If there is only 75 acres of level and rolling land on the farm it perhaps means that 25 acres which is adapted only to pasture is being cultivated. In many such instances farmers have found it profitable and a better system of land use to change to a three-year rotation of corn, small grain and clover, or to a four-year rotation of corn, small grain, clover and mixed hay, putting the balance of the land in permanent pasture.

The use of lime in the state has more than trebled in the past five years, with more than 550,000 tons being used during the past year. Even though the soil building phase of the AAA program is making it possible for every farmer to obtain lime, many farmers continue to throw away money by sowing clover on unlimed land. The sooner the land on which clover is to be seeded next spring is limed, the better are the chances of a successful clover crop. If the land was not limed before seeding small grain this fall, apply it on top of the small grain as soon as possible.

Exhibit L-1

Extension Division News
July 11, 1941

Small Grain Varieties

For the last several years small grain for seed purposes is increasing in importance in the state. This year, at the close of the field inspections, the Crop Improvement Association finds that it has a record of the largest acreage of grain inspected in its history. Since this is being absorbed, it would seem to indicate that grain growers are giving more careful attention to the kind of seed they sow each year. It is not enough however, simply to grow better seed of old varieties. It is becoming necessary to introduce new varieties from time to time. This is true because of the rapid improvement that is being made throughout the United States in crops having a greater capacity for good yields and a tendency to resist the inroads of diseases that seem not only to be with us to stay, but to be becoming more prevalent as the years go by. This year a number of new varieties of wheat, oats and barley were tried out on a field scale, not only with a view to introducing new varieties and new strains of old varieties, but also to lay the foundation for the production of registered grain to be used as foundation stock in certified seed. It will therefore, be the policy of the Crop Improvement Association from now on to attempt the production of registered seed for the use of growers who are just beginning the production of certified seed, and for old growers whose certified seed may fail, due to disease or varietal mixture. As a result of this policy it is hoped that the Association may have available for its growers in the near future good foundation stock of all varieties of seedbeing raised. This will result in higher levels of production and fewer failures of crops intended for seed purposes. This, of course, cannot be accomplished all at once, and as yet no replacements are available for some of the old strains.

Last year a selection of V.P.I. No. 131 wheat from the old strain was released by Prof. T. B. Hutcheson and is now in production. According to growers who have triedthis strain, it is more satisfactory than the old strain of No. 131 which has been grown in the state for many years.

Several new strains of barley were produced, but not in sufficient quantity to be released to the individual grower. It will take another year of multiplication before this can be effected.

A new strain of oats from the Coker Seed firm was produced and will be on the market late this summer. This oat is named Fulgrain No. 3. About 30 acres in all of this crop was produced. A new hybrid wheat known as the Sanford wheat was obtained from the Georgia experiment station. This wheat is a result of a cross between Purple Straw and a bearded Kansas strain, back-crossed twice on Purple Straw. This wheat is partially resistant to leaf rust but, so far as is known, is not resistant to other wheat diseases. It is similar to Purple Straw in appearance and growth habits, and is a smooth-head variety.

North Carolina has also contributed a new wheat known as Carala. This wheat was a selection of the North Carolina experiment station from Purple Straw, but does not resemble the crop from which it was taken. In an eight-year test at the Statesville station this wheat outyielded Fulcaster, Leaps Prolific and Redhart. It gave a very good account of itself on a field scale in Virginia this year and appears to be worth more extensive trial, both in the Piedmont and Tidewater regions.

The Coker Seed firm of Hartsville, South Carolina, who have contributed many valuable crops to southern agriculture, have released a new wheat which they have named Hardired. This is a hybrid wheat and is a result of a cross between Early Red May with Hope, by Hussar. It will be remembered that Redhart wheat, now so popular in eastern Virginia, was obtained from this organization. This year three fields of Hardired wheat were grown in Essex and Caroline counties and gave a good account of themselves. Where grown on the same farm with other wheat the Hardired yielded considerably higher. It is supposed to combine the yield and adaptability of Red May with the rust and mildew resistance of Hope, by Hussar. It is also supposed to carry considerable winter hardiness. No option can be ventured on this last assertion, since last winter was too mild to thoroughly test resistance to cold. All of these wheats, although grown but one year in the state on a field scale, seem to have considerable promise, and a limited trial in the Piedmont and Tidewater regions is recommended. It might also be well for a few farmers in the Valley and the Southwest to grow a small amount of Hardired as a test. In addition to these strains already mentioned, a very good strain of Leaps Prolific was brought in from the Piedmont station in North Carolina; and a nice strain of hybrid Forward known as Cornell 5-7 was also grown with satisfactory results. These two wheats last named are old favorites in the state, and no more need be said about them than that they are clean, healthy strains of these varieties.

Another feature of the field inspections, but not so pleasing, was the wide prevalence of scab and loose smut in the Piedmont and eastern sections of the state, where so much wheat is now grown for seed. While most good growers are familiar with these diseases, it may be well to discuss them some before closing this article. Loose smut, which appears as black or blasted heads, increased to rather alarming proportions and caused the failure of otherwise good seed. It is generally recognized by growers that this disease comes and goes. Its disappearance is closely associated with the lack of humidity at the time wheat is in bloom. While at that time this year we were suffering from drouth, we did have some quiet, drizzly days at the time the wheat was in bloom, which may lead to a further increase in the disease next year, unless measures are taken to control it. Contrary to public opinion, this disease cannot be controlled by the dust treatment. Only the hot-water treatment gives any relief in wheat, or any complete relief in barley. Space will not permit a detailed discussion of this disease, but information as to its control may be obtained from the Extension Plant Pathologist, Blacksburg.

Later in the season, after many of the inspections were completed, widespread outbreaks of wheat scab occurred throughout the state and will result in a reduced yield of many crops. Scab is a fungus which grows in the wheat plant in somewhat the same way that the wheat plant grows in the soil. This parasite destroys the vitality of the plant and sometimes destroys the entire head. (Much wheat this year will contain weak, shriveled, scabby grains which, if allowed to remain in the seed, will cause poor germination and loss of some of the wheat sown, thereby causing irregular stands throughout the crop. Even the weak grains that do not carry the scab organism will likely fall prey to disease in the soil and produce crops of low quality, low-yielding wheat.) This disease is easily recognized by the unhealthy appearance of the grain, that often becomes so aggravated as to give the appearance of large, weather-beaten areas in the field. It is sometimes confused by growers with black rust. However, there is no relationship whatever between the two diseases. Luckily, control measures are known that will give very good relief from this disease. All are practical and require only a little care on the part of the grower. First, land containing large amounts of organic matter, such as dead corn stalks, wheat straw, pea or soybean vines, should be plowed under. This material, if left on the surface, provides an excellent home for the winter spore stage of the disease. Seed wheat should be thoroughly recleaned and, regardless of how severe the shrinkage is, it pays to remove all scab and shriveled grains, leaving only the plump, healthy ones for seed purposes. After the wheat has been thoroughly recleaned and after an examination shows only plump, strong grains, it should be treated with the new improved ceresan. It is also well to keep in mind that the scab organism does not thrive in cool ground, containing a reasonable amount of moisture. So that this year it is recommended that wheat be sown at the latest seeding date that is safe for the section of the state in which it is sown.

Good healthy kernels which have been treated to remove any scab that may be on the surface from contact with unhealthy seed, sown in cool, clean ground will go a long way toward providing a clean crop next year. It is also true that old straw stacks and corn fields with stalks left in them, adjacent to a field of newly sown wheat will provide an excellent scab nursery, and may cause trouble next year. It is therefore, recommended that all wheat growers obtain good strains of clean seed this year, unless their own seed is in good condition. All growers using their own seed should have it thoroughly recleaned and treated with ceresan dust before seeding.

The Crop Improvement Association will be glad to assist growers in locating good seed for their autumn sowing.

Exhibit L-2

Extension Division News
February 24, 1941

Getting Started with Corn Hybrids

The acreage planted to hybrid corn each year has been increasing rapidly for the last few years. In 1938 there were 12 million acres of hybrid corn in the United States, in 1939, 20 million and in 1940, 25 million. When we reflect that in 1940 there were 86,449,000 acres of corn in this country, it can readily be seen that the hybrid acreage is no small share of this total, approximately 29 percent in fact. In Virginia the acreage planted to hybrid corn was a much smaller percent of our total corn acreage, only about 8 percent in 1940. This is not unexpected. Naturally, the corn belt states would be the place where research work and the general use of corn hybrids would advance most rapidly. In a large area comprising parts of northern Illinois and Iowa the corn acreage is greater than 80 percent hybrid. With great acreages, the advantages of the hybrid are much more important to the grower. Further, economical yields are large yields. In a study made a few years ago in the midwest it was found that to produce a 60-bushel yield of corn per acre required an expense of 38 cents per bushel, while to produce a 100-bushel yield the cost was only 26 cents per bushel. The larger yield of the hybrid helps to reduce this cost per bushel.

How much advantage may the rank and file farmer expect from the use of adapted hybrids? The Ohio experiment station reports that an average of eight years comparative tests showsthe hybrids yielded 15 percent above ordinary open pollinated varieties. This test covered good corn years and bad corn years, also included a large group of hybrids and varieties. In still another test where only the topnotch hybrids and varieties were used, the advantage in yield was 20 percent in favor of the hybrids. It appears therefore, that a 15-percent increase in yield is a safe average, provided, of course, the hybrid is adapted to the section in which it is to be grown.

The yielding ability of a particular hybrid is doubtless the main point in which most corn growers are interested. It might be added however, that there are several other characteristics which should also be known beforehand. The ability to stand up, maturity, number of ears, size of fodder, are all important considerations. In fact, it was the "stand up" ability of the hybrids that went a long way towards selling them in the corn belt. Maturity, of course, is important. In general, it has been found in our tests that the higher yielding hybrids are the late ones. Usually, unless a hybrid utilizes the entire growing season, it does not show up so well against the local variety. The size of fodder and number of ears are of less importance than other characteristics perhaps, but essential nevertheless.

Up until the present time the Virginia experiment station has not been in a position to recommend any hybrid as being definitely adapted to a particular section of the state. Now however, from experimental tests, hybrids can be suggested for one-fourth to one-third of the total corn acreage which a farmer intends to plant. It is not recommended that the entire crop be trusted to a particular hybrid as yet, unless,of course, the hybrid has already been tried and found to be superior. Suggested hybrids for trial will be sent upon request.

To those farmers to whom corn growing is a major enterprise, it appears important that the 15 percent increase in yield, and other advantages of the hybrid should be had as soon as possible. They are too vital to be disregarded. Trying up to one-third of the corn acreage in hybrids appears a safe way to find one for use later for the entire crop.

As most of us know by this time, seed corn should not be saved from a hybrid crop. If so, the yield will most probably drop down to about that of the open pollinated variety and it is possible for it to drop appreciably lower. In fact, if one had to choose between using his own local variety and second generation hybrid seed, the local variety would be preferable, since its yielding ability is more dependable.

Exhibit M.

Radio Talk
June 2, 1941
W. H. Byrne

Prevent Hay Shortage Next Winter

The extended drouth has reduced the first cutting of clover and grass to an extent that unless something is done there will be a shortage of hay for cattle next winter. Furthermore, young grass and clover which was seeded in small grain this past spring has been killed and, unless this land is reseeded, there will be a shortage of hay in 1942. The extension agronomy department is therefore, offering the following suggestions to meet this situation:

1. Sow soybeans, cowpeas, sudan grass, German millet, or preferably a combination of one of these grasses and legumes. These crops may be seeded up to July 1 with assurance of a good hay crop before frost, if weather conditions become favorable. Good mixtures are sudan grass, 30 pounds and soybeans, 3 to 4 pecks; or, German millet, 25 pounds and soybeans, 3 to 4 pecks. The sudan grass and soybean mixture will give larger yields and better quality hay than millet and soybeans or cowpeas. Therefore, the former mixture should be used unless sudan grass seed cannot be secured at a reasonable price. Another advantage of the sudan grass mixture is that it will be ready for grazing within about forty days and can be used for this purpose if not needed for hay, and will carry from two to five animals per acre, depending upon the fertility of the soil and the season.

While these seed may be sown until July 1, they should be sown as soon as there is sufficient moisture present to prepare the land. Use at least 300 pounds of a 4-12-4 or 4-16-4 fertilizer per acre.

2. Where good stands of meadow hays are available a second crop may be encouraged by topdressing with nitrogenous fertilizer. One hundred to 150 pounds of nitrate of soda or its equivalent per acre will give good results.

3. Italian rye grass seeded alone or in combination will provide late fall and early spring pasture. The combination should be seeded at the rate of 15 pounds of rye grass and 15 pounds of crimson clover, after the first good rain in August, but may be seeded as late as September 15 in most parts of the state. Rye grass alone should be seeded at the rate of 20 to 25 pounds per acre, and may be sown as late as October 15.

Italian rye grass will do well where lespedeza has been removed, either for hay or pasture. All that is necessary is to sow the seed broadcast and disk them in lightly.

Use 200 to 300 pounds of 4-12-4 or 4-16-4 fertilizer per acre when seeding either the mixture or the rye grass alone.

4. Where spring seeded clovers and grasses have been killed by dry weather these fields may be reseeded in August or early September. In most cases all that is necessary in the way of soil preparation is to disk the land well. The seed should be sown <u>after</u> the first good rain in August, but may be sown up until September 15, if there is not sufficient moisture until then.

On land where the spring seeded clover has been killed but there is still a good stand of grass, and not many weeds present, the land may be disked lightly and clover seeded. A smoothing harrow run over the land after seeding will cover the seed. If the disking and harrowing are carefully done the stand of grass will not be destroyed.

If sown on thin soil, or at the later date, use 200 to 300 pounds per acre of a 4-12-4 or 4-16-4 fertiliser. If the soil is fertile and the seed are sown early, use an equal amount of 0-14-6 or 0-12-12 fertiliser.

Exhibit M-1

Radio Talk
May 5, 1941
S. F. Grubbs

Select your Small Grain Seed Early

It is not too early to make some plans for our seed needs of small grain for this fall. You may expect me to tell you that you should buy certified seed. This is exactly the advice I would give you if you continue to get poor yields on fair to good land where good fertilization and reasonable cultural attention has been given the crop. I would certainly advise you to do this if you have much disease in the strain you are using, but I would not be so narrow as to maintain that there is not any good seed but that which is certified. If you are even a fairly good farmer you should know whether or not you have good seed. If you have been so absorbed in other things that you have not given the matter much thought, now is a good time to begin to pay some attention to it. Sometimes even good farmers do not pay enough attention to the seed they produce for their own use. This is a very costly oversight. If you keep your land in a good state of fertility, cultivate it well and use fertilizer intelligently, but neglect the seed you plant, you are about in the same position as the man who takes a bath, puts on a clean shirt and a nice suit, but puts his dirty underwear back on. To say the least, he is not completely prepared. While it is a long while before time to seed small grain, the time to study your small grain for weaknesses most effectively is the period in which it is headed out but is not mature enough for harvest. Then you can tell how much toll disease is taking of your crop. You can see whether or not you have much wild onion or cockle and you can tell easily if you have heavy mixtures of other crop seed such as rye in wheat, bearded varieties in those that are supposed to be beardless, and can decide whether you want to plant the same seed again next fall.

If your trouble is disease, determine how much injury you are suffering from it. You may be able to completely eliminate it, if it is a disease that will yield to dust treatments. If you do not know the disease, or if you do not know the method by which it is transmitted from crop to succeeding crop, gather some specimens and take them to your county agent for identification. Ask him how the disease may be controlled. If it is one that yields readily, and many of them do, to simple and inexpensive treatments, he can tell you what to do to stamp it out of your seed. It is worth repeating that some diseases that lower yields every year in the state can only be detected between heading and harvest time, with any certainty. A good example of such a disease is loose smut. As the wheat is heading, it appears in smutty masses that completely destroy the grain. It is easy to see it during the early heading stage, later, as the crop matures, it is blown by the wind and whipped off by rains until its damage is apparent only to the close observer. At that time only the bare rachis or stem is left and, since this is usually the color of the rest of the straw, it is not readily seen by any except the close and trained observer. This disease has already entered next year's seed at harvest time and does not appear on the surface of the new grain. Yet it has lowered your yields this year and will likely lower them more another year. Dust treatment will not reach it. It will yield only to the hot water treatment and, since this is laborious and may even damage the seed if improperly done, it is usually advisable to get new clean seed.

Stinking or covered smut, once very common in the state but, due to its easy control with ceresan and other dust treatments, is no longer of major importance. It is easily recognized in the field or the smut balls may be found in the threshed grain. It has a disagreeable fishy odor that will also assist in identifying it. Nematode galls are sometimes mistaken for smut balls, but since the smut balls easily break into a dark powder, and the nematode galls are hard, it is not difficult to distinguish between the two. In the field the two look somewhat alike in that both give the chaff a darker color and the heads are spread at a wider angle than is a healthy head of wheat. In the case of bearded wheat the beards are usually shorter. Again, it is easy to identify the nematode gall by removing them from the chaff. If nematodes are present in your wheat you should obtain clean seed and sow it on ground that was not in wheat the previous year.

Of recent years the Virginia grain crops have suffered severe loss from scab. Many farmers know this disease; others can easily learn to identify it. The spikelets lose their color, die and turn a light yellow, usually part of the head develops a pink or salmon color. The grain becomes shriveled and often it shows a pinkish cast, although the general color of the grain is bleached or whitish. Many grains that do not show the scab organisms are shriveled because the disease has struck the head or stalk below them and cut off their food supply. Since so much wheat is sown following corn, and since the scab spores over-winter on corn stalks and wheat straw, it is difficult to control this disease. However, if diseased grains are sown it will greatly increase the damage. Much of the young grain will die if seeding blight, which is caused by the scab organism. If you have scab in your wheat and must use it for seed, by all means clean it thoroughly with a heavy wind blast to remove the shriveled or light grains. If the plump grains left, after further cleaning, are treated with ceresan it will assist in reducing your chances of scab in your next crop.

Often diseases may be found before the crop is harvested and steps taken to prevent them from reducing your next year's yields.

At the same time, the grower should pull out all other crop mixtures that may occur and that will reduce the purity of the yield. If you will drive around your neighborhood after wheat has headed you will be surprised at the number of fields you will see badly contaminated with rye. It should always be removed by pulling up the entire plant. If the heads are pulled off, new ones will appear in a short time and it will be necessary to go over the fields again.

To make a long story short, if you plan to use your own grain for seed, set aside a portion of the field and go over it carefully to remove noxious weeds, other crop mixture, and even other varieties, if they are not too abundant. At the same time you will have an opportunity to see how much and what kind of disease is in your crop. Before seeding time, clean the grain thoroughly and treat it to control disease. Such time spent will pay you good dividends.

Exhibit No2

Radio Talk
Sept. 15, 1941
W. H. Byrne

Lespedeza a Soil Builder or Destroyer

Perhaps no legume introduced into Virginia in recent years has spread so rapidly as lespedeza. Furthermore, no other crop has possibly done more for Virginia soils and farmers, but the sad side of the story is that it has been, and still is, doing a tremendous amount of harm where it has not been handled properly.

Lespedeza is an annual which has to be seeded in the spring, and dies with the first frost in the fall. When seeded alone, the soil is left bare over the winter. Since lespedeza has a tendency to loosen the soil it is left in an ideal condition to erode, and for the soluble plant nutrients to leach out of the soil. This is why it is so important to sow perennial grasses with lespedeza or to sow small grain or rye grass on land that has been in lespedeza.

Many good farmers who have been seeding orchard grass, Kerds grass or timothy, or a combination of these grasses, with lespedeza in the spring, report that the heavy stands of lespedeza choke out the grasses. This trouble may be avoided by seeding the grasses with small grain in the fall, and sowing the lespedeza on top of the small grain the following spring, or by sowing the grasses on the lespedeza sod in the late summer or early fall. Of course, if the lespedeza is allowed to make seed before sowing the grass seed, it will not be necessary to sow lespedeza the following spring.

The purpose of discussing lespedeza at this time is twofold. First, to urge that small grain or rye grass be seeded this fall on land that has been in lespedeza this summer, in order to conserve not only the soil but the nitrogen which has been put into the soil by the lespedeza and to furnish winter and early spring grazing for livestock. Second, to urge farmers who are planning to sow lespedeza on small grain next spring to sow Kerds grass, orchard grass or timothy, or a combination of these grasses, with their small grain this fall.

Exhibit M-3

VA. A. & M. COLLEGE AND POLYTECHNIC INSTITUTE AND U.S. DEPARTMENT OF AGRICULTURE COOPERATING, EXTENSION DIVISION, John R. Hutcheson, Director, Blacksburg, Va.

Farm Flash — Monday, October 13, 1941

Quality Food Helps Defense

In increasing the production of dairy, pork and poultry products, and certain crops which are used for oils and fats, as requested by the Secretary of Agriculture, Virginia farmers should keep in mind the following 6 points listed by W. H. Byrne, agronomist with the Agricultural Extension Division of V.P.I.

1. Economical livestock production depends, to a large extent, upon economical crop production, and economical production of quality crops depends, in a large measure, upon proper seedbed preparation, cultivation, and the judicious use of good seed, lime and fertilizer.

2. Good pastures and high quality legume hay are the most economical sources of food for cattle, sheep and horses; and reduce materially the amount of concentrates needed.

3. Good pastures also reduce the cost of producing hogs and poultry.

4. Farmers will be serving neither the state nor the nation, nor in the long run helping themselves, by breaking and cultivating land that is not suited to crop production.

5. Much plant food and soil will be lost by leaching and erosion whenever land is left bare through the winter.

6. If the price of soybeans continues favorable, the production of seed for oil should prove profitable in certain sections of the state.

In obtaining the extra food nutrients necessary to increase livestock and livestock products, Mr. Byrne believes that it willbe unwise, and unnecessary in most instances, for farmers to interfere with the regular established rotations, or to plow up land that is not suited to cultivation. Instead, the increase may be secured by using the best seed obtainable, applying lime and fertilizers, and using the best known cultural practices. Of course, lime and fertilizer will not bring back a 1941 clover failure. To take the place of the clover hay that would have been produced in 1942 from this fall's seeding, soybeans or cowpeas may be

seeded next spring. The hay will be more expensive, but will be about equal in value to clover, if properly handled.

Every good farmer knows that one of the best and most economical ways to increase the food supply and reduce the cost of producing livestock is to improve the quality of the hay produced. Quality hay means food value, for it reduces the amount of concentrates needed per animal unit. Of course, this is not the haying season, and it will be some months before hay-cutting-time comes around again. But Byrne suggests that you make plans now to produce quality hay -- by cuting it at the right time and handling it properly -- next year.

Here are some jobs that will need attention most any time:

In improving old established pastures, a topdressing of phosphate, and lime in most instances, is essential, Agronomist Byrne says. Potash in addition to phosphate is important on light-sandy and other potash-deficient soils. Four hundred to 600 pounds of 20 percent superphosphate, or of 0-14-6 fertilizer, and the equivalent of one ton of ground limestone per acre when needed, is a good basic application. With such treatments, many Virginia farmers have doubled the carrying capacity of their pastures in about three years. When milk is bringing a good price, it often pays to apply to dairy pastures the equivalent of 100 pounds of nitrate of soda per acre. When seeding new pastures, it is better to use the equivalent of 400 to 600 pounds of 4-12-4 or 4-16-4 fertilizer.

In addition to permanent pasture, Byrne recommends that dairymen and livestock producers have a supplementary pasture for early spring grazing, and one for midsummer grazing. A good mixture for early spring grazing is 15 pounds of crimson clover and 15 pounds of rye grass. Since this mixture should be seeded in August or early September, it is too late now to seed it. A mixture that can be seeded during October is 15 pounds of rye grass and 3 pecks to one bushel of Abruzzi rye.

After the crop from either of these mixtures has been grazed off, the land may be prepared and seeded to 35 pounds of sudan grass about the middle of May, for grazing in July and August. If desired, a mixture of 20 pounds of sudan grass and

3 pecks to one bushel of soybeans may be used. Both the crimson clover and rye grass, and the sudan grass will carry 3 to 5 cows per acre for 6 to 8 weeks, depending upon the fertility of the land and the season. Six to eight pounds of rape per acre, seeded in August and September, or February and March, makes an excellent pasture for hogs and poultry. Soybeans, or corn and soybeans hogged off, are of value in reducing the cost of pork. Three hundred to 400 pounds of 4-12-4 is the fertilizer Byrne recommends for each of these crops. Many dairymen claim that the land on which their supplementary pasture is located is the most profitable on the farm, and reduces their feed bill materially.

Even though a supplementary pasture has not been seeded, Byrne says it isn't too late, and will be profitable in the long run, to seed small grain of some kind, or small grain and rye grass, or even rye grass alone, on every acre that will otherwise be bare. It will not only prevent leaching and washing of valuable plant food and soil, but will furnish some winter and early spring grazing, and afford a crop for harvesting or turning under.

Byrne suggests that every farmer who has not already done so should take advantage of the soil-building part of the AAA program, to lime as much of his land as need it, and to apply phosphate on his pastures, and seed a cover crop on the land that will otherwise be bare.

Properly limed and fertilized rotated crops, pastures and cover crops, will mean not only cheaper and better quality feed for livestock, but a conserved and more fertile soil for use in the future.

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Exhibit N.

Program
of
Institute of Rural Affairs

VIRGINIA POLYTECHNIC INSTITUTE
BLACKSBURG, VIRGINIA

JULY 29-31, 1941

VIRGINIA AGRICULTURAL AND MECHANICAL COLLEGE AND POLYTECHNIC INSTITUTE
AND THE UNITED STATES DEPARTMENT OF AGRICULTURE, COOPERATING
EXTENSION DIVISION, JNO. R. HUTCHESON, DIRECTOR
BLACKSBURG, VIRGINIA

THE INSTITUTE OF RURAL AFFAIRS

BLACKSBURG, VIRGINIA

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Cornell University

INSTITUTE OF RURAL AFFAIRS

Blacksburg, Virginia

July 29 - 31, 1941

The thirteenth session of the Institute of Rural Affairs will be held at the Virginia Polytechnic Institute July 29-31, inclusive, and will have for its general theme "The Impacts of the Defense Program on Agriculture." This topic was chosen for the current year because there are more defense plants in Virginia than in any other Southern state, and the operation of these plants has already caused radical adjustments in the farm labor and production situations. It is believed that much greater adjustments will be called for when the defense program is discontinued.

This year the program for the Institute has been worked out cooperatively with the Division of Program Study and Discussion of the Bureau of Agricultural Economics. Dr. Carl F. Taeusch and other representatives of this division will serve as discussion leaders.

The Institute of Rural Affairs was organized in 1928 at the suggestion of the American Country Life Association and provides a place in this region for open forum discussions devoted largely to rural problems. The Institute is directed by the agricultural faculty of the Virginia Polytechnic Institute and a board of advisers made up of prominent agricultural leaders from the surrounding states. It receives the wholehearted support of every farm and home organization of rural people in Virginia, and the State Farmers' Institute, the Federation of Home Demonstration Clubs and the Agricultural Conference Board hold meetings concurrently with the sessions of the Institute of Rural Affairs. The sessions of the Institute take place in the mornings and the other groups hold their sessions in the afternoons. Joint sessions are held each evening.

Directions and Accommodations

Immediately on arrival in Blacksburg those attending the Institute are requested to register. Upon registration full information will be given as to quarters and meals.

Arrangements have been made for those attending the Institute to occupy the student dormitories. Those bringing their own bedclothing, towels and toilet articles may secure lodging for the entire period of the Institute for the nominal charge of $1.00. Those who do not bring bedclothing, towels and toilet articles will be charged 50 cents per person per night. However, it is hoped that most of those who attend will bring their own bedclothing and toilet articles as the college supply of these materials is limited. Those who expect to stay at the hotels or at private homes in town should make reservations well ahead of time.

Meals will be served at the college dining hall for 35 cents each or $1.00 per day and at the Faculty Apartment Building at 35 cents for breakfast, 45 cents for luncheon and 65 cents for dinner. Meals may also be secured at restaurants and hotels at reasonable rates.

PROGRAM FOR

Institute of Rural Affairs

BLACKSBURG, VA., JULY 29 - 31, 1941

Tuesday, July 29

MORNING SESSIONS

9:00 Meeting State Federation Home Demonstration Clubs. (Auditorium Administration Building).

10:00 Meeting Agricultural Conference Board. (Auditorium Student Activities Building).

AFTERNOON SESSIONS

2:00 Business Meeting Agricultural Conference Board. (Auditorium Dairy Building).

2:00 Meeting of Older Youth Group. (Auditorium Commerce Hall).

2:00 Exhibits and Demonstrations by Home Economics and Other Departments (See page 12).

4:00-6:00 Tea given by Federation of Home Demonstration Clubs. (Women's Dormitory).

EVENING SESSION

Joint Meeting of All Groups

John R. Hutcheson, presiding.
(Auditorium Administration Building)

7:30 Group Singing. Led by Mrs. Dennett Guthrie.

8:00 Invocation. Rev. A. H. Eubank, Blacksburg Christian Church.

8:15 Presentation Certificates of Merit. Dr. Julian A. Burruss, President Virginia Polytechnic Institute.

8:30 Method of Conducting Institute Meetings. Carl F. Taeusch.

8:40 Address: Pan-American Solidarity. Edvard Hambro, Northwestern University.

9:30 Social Hour. (Memorial Building).

Wednesday, July 30

MORNING SESSIONS

Institute of Rural Affairs

Section I

B. L. Hummel, Discussion Leader
(Lyric Theatre)

9:00 The Navy and Virginia. Lt.-Com. Robt. E. Vining, U. S. N. R.
9:45 Open Forum.
10:15 The Problem of Pan-America from the Standpoint of National Defense. Carl F. Taeusch.
11:00 Open Forum.

Section II

Morris B. Storer, Discussion Leader
(Auditorium)

9:00 The Problem of Importing South American Products. Kathleen W. McArthur, Hollins College, Virginia.
9:45 Open Forum.
10:15 Continuation of discussion. Clarence Roberts, Editor of the Farmer Stockman.
11:00 Open Forum.

Section III

J. R. Hutcheson, Discussion Leader
(Student Activities Building)

9:00 The Outlook for A Foreign Market for American Farm Products. Louis Bean, Bureau of Agricultural Economics.
9:45 Open Forum.
10:15 Discussion continued by Arthur Bunce of Iowa State College.
11:00 Open Forum.

AFTERNOON SESSIONS

Federation of Home Demonstration Clubs

Mrs. H. H. Walton, presiding.
(Auditorium Administration Building)

2:00 Business Meeting and Program of the Federation.

Agronomy Section

W. H. Byrne, presiding
(Sylvan Theater)

2:00 The Value of Some Recently Introduced Crops. T. B. Hutcheson.
2:40 Discussion.
3:00 Visit to Field Experiments.

Animal Husbandry Section

R. E. Hunt, presiding
(Judging Pavilion)

2:00 Experimental Work with Sheep at V. P. I. C. M. Kincaid.

2:30 A Review of Wool Marketing in 1941. K. A. Keithley.

2:40 Sheep Shearing Contest. E. W. Bartlett in Charge.

Fruit Growing Section

A. H. Teske, presiding
(Auditorium Student Activities Building)

2:00 The Army's Fruit Purchasing Program. John Martin, O. P. M.

2:30 The Fruit Marketing Outlook. William Ockey, U. S. D. A.

3:00 The Fruit Grower's Place in the Nutrition Program. Mary Barber.

3:30 Apple Juice as an Outlet for Low Grade Fruit. Lionel Newcomber.

3:45 The Place of Hormones in Fruit Production. H. J. Dietz, duPont Co.

Older Youth Section

G. A. Elcan, presiding
(Auditorium Commerce Hall)

2:00 Living Democratically. Discussion Leaders, C. F. Taeusch M. B. Storer

Wildlife Section

Dr. I. D. Wilson, presiding
(Room 112, Davidson Hall)

2:00 Wildlife as a Farm and Community Asset. Paul S. Blandford, President Virginia Wildlife Federation.

2:30 Increasing Wildlife in a Practical Farm Program. Dr. Wm. R. Van Dersal, U. S. Soil Conservation Service.

3:15 Open Forum: Is Farm Wildlife Conservation Worth the Trouble? Justus H. Cline, Leader.

EVENING SESSION

Joint Meeting of All Groups

Mrs. H. H. Walton, President of State Federation of Home Demonstration Clubs, presiding.
(Auditorium)

7:30 Miss Lyon and The Continental Quartet.

8:30 Feeding, Clothing and Sheltering Our Low Income People. John Temple Graves II, Birmingham, Alabama.

9:30 Recreation Hour. (World War Memorial Building).

Thursday, July 31

MORNING SESSIONS

Institute of Rural Affairs

Section I

Carl F. Taeusch, Discussion Leader
(Lyric Theatre)

9:00 The Business Man's Viewpoint Regarding the Distribution of America's Food Supplies. Hector Lazo, Cooperative Food Industries.
9:45 Open Forum.
10:15 Virginia's Agricultural Defense Program. Jno. R. Hutcheson.
11:00 Open Forum.

Section II

Morris B. Storer, Discussion Leader
(Auditorium Administration Building)

9:00 Are We Well Fed? Esther Phipard, Bureau of Home Economics.
9:45 Open Forum.
10:15 Continuation of Discussion by Kendall Weisiger, Atlanta, Ga.
11:00 Open Forum.

Section III

Maude Wallace, Discussion Leader
(Student Activities Building)

9:00 Our Obligation to the Lower Income Family. Rupert Vance, University of North Carolina.
9:45 Open Forum.
10:15 Continuation of Discussion. Mary Barber, Food Consultant U. S. Army.
11:00 Open Forum.

AFTERNOON SESSIONS

Home Economics Section

Miss Maude E. Wallace, presiding

2:00 Exhibits and Demonstrations (See page 12).
2:00 How to Improve Your Appearance. Doree Smedley. (Clothing Laboratory, Home Economics Building).

Agricultural Engineering Section

C. E. Seitz, presiding
(Agricultural Engineering Building)

2:00 Farm and Home Equipment and Demonstrations.

Dairy Section

Holdaway, presiding
udging Pavilion)

R. G. Connelly.
A. C. Oosterhuis.
W. Dickson.

omemade Ice-cream and Frozen Desserts.
ry Building).

oultry Section

Moore, presiding
ium Dairy Building)

and Chickens for Defense. H. L. Moore.

for Eggs. Cecil Rogers.

eases. E. P. Johnson.

hickens. A. L. Dean and M. E. Coe.

, led by Dr. R. L. Bryant.

Youth Section

e Hughes, presiding
m Commerce Hall)

to Nutrition and Health. Discussion
eusch
er

table Section

trick, presiding
w Agricultural Hall)

ble Situation. Dr. H. H. Zimmerley.

f Vegetables. Janet Cameron.

B. Dietrick.

e Garden. S. B. Fenne.

G SESSION

g of All Groups

ate Farmers' Institute, presiding.
itorium)

rs. Dennett Guthrie.

Defense on American Agriculture.
ed States Department of Agriculture.

Young, Virginia State College for

War Memorial Building).

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CORRECTION

The preceding document has been re-photographed to assure legibility and its image appears immediately hereafter.

NSA-WASH DC-51-0560

Dairy Section

C. W. Holdaway, presiding
(Judging Pavilion)

2:00 Judging Guernseys. R. G. Connelly.
Judging Holsteins. A. C. Oosterhuis.
Judging Jerseys. R. W. Dickson.

2:00 Demonstration of Homemade Ice-cream and Frozen Desserts. (First Floor Dairy Building).

Poultry Section

H. L. Moore, presiding
(Auditorium Dairy Building)

2:00 Producing More Eggs and Chickens for Defense. H. L. Moore.

2:30 Getting More Money for Eggs. Cecil Rogers.

3:00 Common Poultry Diseases. E. P. Johnson.

3:30 Selecting Profitable Chickens. A. L. Dean and M. E. Coe.

4:00 Tour of Poultry Plant, led by Dr. R. L. Bryant.

Older Youth Section

Miss Hallie Hughes, presiding
(Auditorium Commerce Hall)

2:00 Youth's Contribution to Nutrition and Health. Discussion Leaders, Carl F. Taeusch
M. B. Storer

Vegetable Section

L. B. Dietrick, presiding
(Room 107, New Agricultural Hall)

2:00 The Commercial Vegetable Situation. Dr. H. H. Zimmerley.

2:30 The Nutritional Value of Vegetables. Janet Cameron.

3:00 The Home Garden. L. B. Dietrick.

3:30 Pest Control in the Home Garden. S. B. Fenne.

EVENING SESSION

Joint Meeting of All Groups

Col. B. Morgan Shepherd, State Farmers' Institute, presiding.
(Auditorium)

7:30 Group Singing, led by Mrs. Dennett Guthrie.

8:00 The Impact of National Defense on American Agriculture. Dr. Eric Englund, United States Department of Agriculture.

9:00 Special Music. James Young, Virginia State College for Negroes.

9:30 Recreation Hour. (World War Memorial Building).

Special Exhibits and Demonstrations

(By Home Economics and Other Departments)

TUESDAY AND THURSDAY

FROM 2 TO 4 P. M.

FOODS AND NUTRITION (Room 102, New Agricultural Hall)

Janet Cameron — Sally Guy Davis

COTTON CLOTHING (Room 104, New Agricultural Hall)

Byrd Johnson — Sylvia Slocum

CONSUMER PROBLEMS (Room 103, New Agricultural Hall)

Ruth Jamison — Belle Burke

SUCCESS WITH MEAT (Food Laboratory, Home Economics Building)

Janet Cameron — Mary Wien, National Livestock and Meat Board

ROSE GARDEN DEMONSTRATION (Across the Lake)

A. G. Smith — Mary C. McBryde

HOME DAIRYING EQUIPMENT EXHIBIT (Dairy Building)

C. L. Fleshman — C. C. Flora

FARM AND HOME EQUIPMENT EXHIBITS (Agricultural Engineering Building)

Chas. E. Seitz, and other staff members.