VIRGINIA

PLANT PATHOLOGY ANNUAL REPORT 1934

Index

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ANNUAL REPORT

FOR

PLANT PATHOLOGY

PROJECT NO. 19

FROM

DECEMBER 1, 1933

TO

NOVEMBER 30, 1934

Blacksburg, Virginia
December 20, 1935

Mr. John R. Hutcheson
Director of Extension Division
Virginia Polytechnic Institute
Blacksburg, Virginia

Dear Sir:

I hereby submit a report of the work in extension plant pathology for the year starting December 1, 1935, and ending November 30, 1936.

Respectfully yours,

James Godkin

James Godkin
Extension Plant Pathologist

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PERSONNEL

The Extension Plant Pathologist was the only person employed full time and doing plant pathological project work during the year. However, Dr. S. A. Wingard, Dr. C. M. Shear and Mr. R. C. Henderson, all of the Department of Botany and Plant Pathology, made some trips about the State in the study and observation of tobacco diseases, fruit diseases, diseases of field crops, and the diseases of ornamentals. Dr. R. J. Haskell, Dr. H. B. Humphrey, Mr. F. C. Meier, and Mr. P. R. Miller, all of the U. S. Department of Agriculture, cooperated with us in carrying on disease surveys, and in establishing a cereal rust nursery in Grayson County; and barberry eradication work.

INTRODUCTION

As in past years the Department of Botany and Plant Pathology has outlined and carried out subprojects which meet particular economic needs of counties and sections for which they were planned. Advisory work has increased during 1934 over 1933. The following phases were undertaken during the past year.

(1) The control of root, stalk and ear rot diseases of corn.

(2) The control of wildfire, blackfire, mosaic and blue mold diseases of tobacco.

(3) The control of cereal smuts.

(4) Eradication of the native barberry bush (Berberis canadensis).

(5) The use of wilt-resistant strains of cabbage seed.

(6) Radio broadcasting one or more times a month on diseases, insects and other horticultural topics.

THE SITUATION AND RESULTS OF PHASES OR SUBPROJECTS

Subproject or Phase No. 1.- The control of root, stalk and ear rot diseases of corn has now been conducted in Virginia for the past ten years according to methods of procedure mentioned below.

(1) Emphasis on individual and community germinators.

(2) Correct practices for crop rotations and seed selection.

(3) Correct methods for curing and storing.

(4) Chemical dust treatment of seed.

(5) Field observations and yield data.

Demonstrations with the use of disease-free seed corn grown from certified crops have shown that about 65 per cent of our growers lose annually around 6 per cent of their corn crop, resulting from root, stalk and ear rot diseases, or a total of more than 2,000,000 bushels for each of the years of 1933 and 1934. Testing seed corn for germination and the presence of diseases gives valuable returns in reducing these disease losses. Yields have in many cases been increased as much as 10 bushels to the acre. Quality has also been improved. Seed treatment of selected seed corn has in many cases increased the yield as much as 5 bushels to the acre during 1934. Recommended practices are sound.

This project was begun in 1933 with the Utility Corn Show of the State Corn and Grain Show which was held in Lynchburg, January 25 and 26, 1934. In this Utility Class we are after the performance of the the corn on the germinator in regard to the presence of diseases and germination.

SUMMARY OF WORK DONE ON CORN ROT DISEASES
IN VIRGINIA FOR 1934

Cooperative work was done on this subproject in the following counties: Lee, Surry, James City, Campbell, Giles, Patrick, Gloucester, Fairfax, Page, Franklin, Lancaster, Grayson, Mecklenburg, Botetourt, Halifax, Orange, Loudoun, Scott, Smyth, Prince Edward; totalling 20 counties in all. Twenty thousand ears of corn were tested and of this amount 4,800 ears were discarded as unfit for planting. More and more growers in these counties who have learned the value of seed testing are testing their own corn, an increase of 10 per cent in number during 1934 over 1933. There has been a gradual improvement in the quality of the State's corn crop of growers who

are following recommended practices put out from this department. Five hundred pounds of Semesan and 100 pounds of Purbak chemical dusts used in addition to other recommended practices were distributed by this department in Caroline, Prince William and Loudoun counties as a further aid in the control of these corn rot diseases. These dusts when used on tested and selected seed corn gave an additional average added increase in yield of 8 bushels to the acre. As the grower who knows and he will tell you that there is no question of the dividends received from field selection, proper curing and storing, bin selection, germinator selection and treating the corn seed with chemical dusts (Purbak and Semesan) before planting. These practices insure a quality crop. There must be no let-up in such an improvement program. Even in off-seasons recommended practices for the production of seed corn will accomplish much good.

In connection with this phase of our work 12 press articles were written for County newspapers of the State; also articles for the Southern Planter, Richmond, Virginia, and the Progressive Farmer of Raleigh, North Carolina. Seven talks were given; one in Smyth County, one in Bristol, Virginia, one in Prince William County, one in Fairfax County, one in Loudoun County, one in Scott County, and one in Pulaski County. A total of 680 attended these meetings. Splendid cooperation was accorded us during 1934 in this work by county agents, Smith-Hughes teachers, members of the Future Farmers of America and 4-H Club members. Three hundred and ten circulars on corn diseases were sent out.

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TREATING SEED CORN FOR THE CONTROL OF FUNGOUS DISEASES

By James Godkin, Extension Plant Pathologist, V. P. I.

Several dust compounds now on the market have given promising results in the control of root, stalk and ear rot diseases of corn. After following such recommended practices as field selection, proper curing and storing, and germinator testing, the grower can at best only separate his corn into some such classes as:

(1) Nearly disease-free seed

(2) Seed that germinates well, but carries some infection from diseases

(3) Badly diseased seed

The grower will find it advantageous to treat seed falling into the first two classes. The dust treatments offer many advantages to the corn grower, compared to the liquid treatments. Chemical dusts are much more easily applied and there is less dangor of injury to the seed before it is planted than with the liquid treatments. With wet treatments, care must be taken to dry the seed properly before planting. Dust fungicides probably offer more protection to the seed from molds in the soil than the liquid treatments.

Three companies offer seed corn dust fungicides for sale on the market. The active ingredient in all of these is mercury, ranging from 3 to 7 per cent, mixed with some inert filler. In each case, only 2 ounces are required per bushel, which makes the cost per acre for seed

treatment material about 3 cents. The labor cost involved in treating is also low, especially since the treating can be done any time during the slack season of the year. The following products have given satisfactory results:

Barbak - American Cyanamid Company, 535 Fifth Ave., New York, N. Y.

Morko - Pittsburgh Plate Glass Company, Corona Chemical Division, Milwaukee, Wisconsin

Semesan Jr. - Bayer-Semesan Company, Inc., Du Pont Building, Wilmington, Delaware

The above products may be purchased from your local druggist or seedsman.

It must be remembered that corn seed treatments cannot be expected to take the place of good seed, seed selection, proper storage or constructive breeding. Neither can they replace an accurately conducted germination test in selecting seed of high quality. Seed treatments will not always be followed by an increase in yield, nor will they bring dead seed to life or take the place of proper soil management. The greatest actual increases in yield following seed treatments usually have occurred on the more productive soils, with the better strains of corn and on the earlier planted crops.

These dust disinfectants are poisonous, and a mask should be worn over the nose and mouth while making the treatments, or else the work should be done in the open, keeping on the windward side of the machine. Treated seed should not be fed to livestock or milled for feed of any kind.

Phase or Subproject No. 2.- The control of blackfire, wildfire, mosaic, nutritional and blue mold diseases of tobacco. Heavy losses have resulted to Virginia's tobacco crop in years past as a result of blackfire, wildfire, mosaic disease, nutritional troubles, frenching, ring spot, and within the last three years the blue mold disease. Losses from these diseases have run from 20 to 90 per cent of the crop in 1933. We place the losses for the State in 1933 conservatively at 5,000,000 pounds and with the average price of tobacco at 12 cents a pound, this would amount to more than $600,000 (probably greater for 1934). Yields have in many cases been increased as much as 20 per cent, and the quality improved by seed selection, seed disinfection with bichloride of mercury, sound cultural practices in the care of the plant bed, and field, and by dusting in the plant bed with a 4-4-50 Bordeaux spray or dust, and more recently with calcium sulphide (Cal-Mo-Cal).

In fact we have been recommending the most up-to-date practices in the control of tobacco diseases, and the results of our work in this regard were plainly evident in counties where intensive work was done by us. The blue mold disease was more prevalent in Virginia in 1933 than in 1932, and not serious in 1934, having spread to the Burley section for the first time during the 1933 season.

Sixty-five spray demonstration meetings using 5-5-50 and 4-4-50 Bordeaux mixture and Cal-Mo-Cal were put on in Franklin, Brunswick, Pittsylvania, Mecklenburg, Halifax, Campbell, Bedford, Scott and Russell counties for the control of the blue mold disease and flea beetle of tobacco. Timely information printed on circulars was furnished county agents and

many growers in all tobacco-producing counties. About 9,260 of these circulars were mailed out from this office and indeed the supply was almost exhausted. (See exhibits and photographs at end of this subproject.) Twelve hundred growers attended the 65 spray demonstrations. One hundred plant beds were examined in the above nine counties for the presence of disease, and totalling 88,000 square yards. Blue mold was our most serious plant bed disease in 1933, but blackfire and frenching were the most serious in 1934. Blackfire did considerable damage in parts of Washington, Scott and Russell counties.

Fifty-five fields totalling about 110 acres were inspected for the presence of diseases in Pittsylvania, Scott, Smyth, Halifax, Brunswick, Lunenburg, Campbell and Washington counties. Again as was the case in 1933, less blackfire was found in fields planted from treated seed in 1934, than in those planted from untreated seed. This was true also for the plantbeds observed. With the increased prices in tobacco and the improved quality growers in tobacco-producing counties, should profit to the extent of at least $50,000 for the 1934 season. In Scott County growers have profited by at least $85,000during the 1933 and 1934 seasons. During the 1934 season, 155 lots of seed were treated for growers located in every section of Scott County (See list of growers and amounts of seed treated for them following). Seed for these growers is tested for germination before and after seed treatment. According to Mr. J. E. Delp. County Agent of Scott County - "Growers who follow our recommendations are sold on the value of this work." There is still much to be done in Scott and other Southwest Virginia counties in the way of tobacco disease control.

Eight tons of calcium sulphide (Cal-Mo-Cal) were sold to tobacco growers of the State for use in the control of tobacco blue mold disease. Experiments conducted at our Station for one year have indicated that this material has merit when sprayed on the plant beds for blue mold disease control.

TOBACCO SEED TREATED IN 1934 - SCOTT COUNTY
VIRGINIA

Name	Address	Amount	Variety	Date Treated	Date Returned
1. S S Fugate	Snowflake, Va	6 oz.	Kelley	Feb. 28/34	Mar. 2/34
2. G V Quigley	" "	4 oz.	"	"	" 6/34
3. Gordon Dean	" "	4 oz.	Judy's	"	" 5/34
4. S E Welch	Dungannon, Va.	4 oz.	Kelley	"	" 6/34
5. R L Skeen	Hill, Va	4 oz.	"	"	" 6/34
6. A T Henderson	Hilton, Va	3 oz.	"	"	" 5/34
7. H K Addington	Nickelsville, Va	1 oz.	"	"	" 6/34
8. C T Lart	Gate City, Va	3 oz.	"	"	" 6/34
9. Rufus Mullins	Clinchport, Va	1 oz.	"	"	" 5/34
10. Ollie Gilmer	" "	3 oz.	Judy's	"	" 5/34
11. J J Wolfe	Gate City, Va	16 oz.	Nic.White B.	"	" 6/34
12. Henry Dean	" "	4 oz.	Judy's	"	" 5/34
13. Taylor Gilreath	Clinchport, Va.	3 oz.	Kelley	"	" 6/34
14. K F Elliott	Gate City, Va	1 oz.	Judy's	"	" 6/34
15. R H Burke	Nickelsville, Va	3 oz.	"	"	" 6/34
16. F J Gillian	" "	2 oz.	Kelley	"	" 5/34
17. C C Fraysier	Ft.Blackmore, Va	5 oz.	Judy's	"	" 5/34
18. Roy Pendleton	Gate City, Va	2 oz.	"	"	" 6/34
19. R K Pendleton	" " " "	2 oz.	"	"	" 6/34
20. A G Gillenwater	" " "	4 oz.	"	"	" 1/34
21. Noah Dean	Snowflake, Va	3 oz.	"	"	" 6/34
22. W H Williams	" "	6 oz.	"	"	" 6/34
23. Chas.F.Nichols	Nickelsville, Va	(Judy's (W.Burley (2 oz. (4 oz.		"	" 6/34
24. J C Wise	Snowflake, Va	6 oz.	Kelley	"	" 6/34
25. W K Wilhelm	" "	10 oz.	"	"	" 5/34
26. W V Stapleton	" "	10 oz.	Judy's	"	" 5/34
27. A B Brewbaker	Nickelsville, Va	5 oz.	Kelley	"	" 6/34
28. Jim Eaton	Hilton, Va	4 oz.	(W. Burley	"	" 5/34
29. V H Boston	Clinchport, Va	1 oz.	(2 oz.)Kelley	"	" 6/34
30. Rufus Mullins	Clinchport, Va	½ oz.	"	"	" 5/34
31. H W Eaton	Kingsport, Tenn.	1 oz.	"	"	" 6/34
32. P M Lane	Ft.Blackmore, Va	(Judy's (1 oz. (Kelley (½ oz. & (Ky.W.B. (½ oz.	(W.Burley	"	" 5/34
33. S S Faust	Hilton, Va	4 oz.	Ky. W. B.	"	" 6/34
34. K A Elliott	Gate City, Va	16 oz.	Kelley	"	" 5/34
35. H P Bishop	Gate City, Va	(Judy's (2 oz.	Kelley	"	" 1/34
36. W P Wisley	Gate City, Va	4 oz.	Judy's	"	" 6/34
37. E L Beverley	Hilton, Va	1oz.	Kelley	"	" 5/34
38. H W Gray	Spears Ferry, Va	1 oz.	"	"	" 6/34
39. H C Irvin	Gate City, Va	3 oz.	Judy's	"	" 6/34
40. W H Williams	Snowflake, Va	8 oz.	"	"	" 6/34
41. R L Skeen	Hill, Va	8 oz.	Kelley	"	" 6/34
42. J W Peters	Gate City, Va.	4 oz.	"	"	" 6/34
43. E H Chapman	Gate City, Va	4 oz.	"	"	" 5/34

Name	Address	Amount	Variety	Date Treated	Date Returned
44. T P Williams	Cato City, Va	2 oz.	Judy's	Feb. 28/34	Mar.6/34
45. Glenn Fuller	Snowflake, Va	6 oz.	"	"	" 6/34
46. S G Cleek	Cato City, Va #2	2 oz.	Kelley & W. Burley	"	" 3/34
47. A L Godsey	Snowflake, Va	4 oz.	W. Burley & Judy's	"	" 3/34
48. A L Godsey	Snowflake, Va.	4 oz.	W. Burley & Judy's	"	" 3/34
49. J D Hennessey	Clinchport, Va	2 oz.	W. Burley & Judy's	"	" 3/34
50. S A Music	Cato City, Va	2 oz.	Kelley	"	" 6/34
51. E F Giles	Blackwater, Va (Lee County)	6 oz.	Kelley	"	" 6/34
52. E F Jayne	Hiltons, Va #2	2 oz.	W. Kelley	"	" 6/34
53. L N Peters	Cato City, Va #1	6 oz.	Vic. White Burley	"	" 3/34
54. L N Peters	Cato City, Va #1	16 oz.	Taylor type	"	" 3/34
55. C.I Jennings	Nickelsville, Va	6 oz.	Judy's	"	" 6/34

Radio Talks on Tobacco Rise Held - 1934

May 14 - WRVA, Richmond - 6:40 to 6:45 PM
May 16 - WPHR, Petersburg - 1:15 to 1:20 PM
May 17 - WRVA, Richmond - 8:51 to 9:00 PM
May 19 - WLVA, Lynchburg - 2:45 to 2:50 PM
May 21 - WDVM, Danville - 8:00 to 8:05 PM
May 25 - WDBJ, Roanoke - 6:00 to 6:07 PM

News Stories Written on Rise Held - 1934

May 15 - Richmond Times Dispatch, Richmond
May 17 - Progress Index, Petersburg
May 20 - Lynchburg News, Lynchburg
May 21 - Danville Bee, Danville
May 21 - Danville Register, Danville

Tobacco Disease Control Meetings with Special
Reference to the Blue Mold Disease
February and March, 1934

Date	Place	County Agent	Attendance	Remarks and questions asked at meetings.
Feb.1	Chatham	J.E.Stone	25	Meeting 1:30 PM - 3:00 PM *40 questions asked
" 2	So.Boston	C.L.Hall	40	Meeting 2:30 PM - 3:00 PM 40 questions asked
" 3	So.Hill	N.H.Williams	5	Meeting 8:15 - 10:15 PM 50 questions asked
" 6	Dinwiddie	B.F.Bedwell	72	Meeting 7:30 PM - 9:30 PM 60 questions asked Radio talk WPHR,Petersburg, 12:15 - 12:25 Noon hour.
" 7	Blackstone	G.R.Mathews	20	Meeting 8:15 PM - 10:00 PM 20 questions asked
" 8	Kenbridge	E.G.Stokes	55	Meeting 8:00 PM - 9:30 PM 35 questions asked
" 9	Farmville	Z.F.Striplin	6	Meeting 2:40 PM -4:00 PM 20 questions asked H.S.Ellis,Co.Agt.,Buckingham, present; 2 inches snow cut attendance down.
" 10	Appomattox	R.B.Hudgins	83	Meeting 2:30 PM -4:00 PM 42 questions asked
" 12	Rustburg	S.F.Grubbs	6	Meeting 8:15 PM-4:00 PM 20 questions asked; Radio talk WLVA,Lynchburg 2:45 PM -2:55 PM.
" 13	Naruna	S.F.Grubbs	11	Meeting 7:40 PM-9:00 PM 20 questions asked
" 14	Charlotte	H.E.McSwain	26	Meeting 8:15 PM-9:45 PM 37 questions asked;attended Father & Son banquet 6:30 PM-8:00 PM. 40 present.
" 15	Bedford	S.S.Hylton	40	Meeting 10:30 AM-11:30 AM Meeting in charge S.S.Hylton
" 16	Rocky Mt.	W.A.Alexander	200	Meeting 2:15 PM -3:30 PM 50 questions asked; Radio talk WDBJ,Roanoke,1:00 - 1:10 PM.
" 17	Bedford	S.S.Hylton	26	Meeting 10:00 AM-11:45 AM 30 questions asked
" 19	Chilhowie	P.E.Bird	75	Meeting 1:00 PM -3:30 PM 25 questions asked
" 19	Damascus	Pat Arrington	26	Meeting 7:45 PM - 9:30 PM 35 questions asked

Date	Place	County Agent	Attendance	Remarks and questions asked at meetings
Feb. 20	Mt. City, Tenn.	W.P. Davidson	225	Meeting 10: AM - 12:15 AM 50 questions asked
" 20	Abingdon	Pat Arrington	100	Meeting 3:00 PM -4:30 PM 35 questions asked
" 20	Wallace	" " P.R. Fisher, Ag. Teacher	47	Meeting 7:30 PM - 9:10 PM 38 questions asked
" 21	Lebanon	L.B. Connelly	9	Meeting 8:00 PM - 9:30 PM 32 questions asked
" 22	Glade Spgs.	Pat Arrington	71	Meeting 2:15 PM - 3:45 PM 40 questions asked
" 23	Bristol, Va.-Tenn.	Baker	8	Meeting 2:15 PM - 3:30 PM 11 questions asked
" 24	Jonesville	R.C. Carter	400	Meeting 1:30 PM - 3:30 PM 50 questions asked
" 26	Cedar Bluff	G.W. Litton	3	Meeting 7:30 PM - 9:00 PM 3 questions asked; Radio talk WCPI, Bristol, 12:45-12:55 Noon. Snow, cold weather and bad roads cut attendence.
" 27	Gate City	J.E. Delp		Treating tobacco seed; 50 lots ½ oz. to several lbs. in size.
" 28	Gate City	J.E. Delp	14	Meeting 7:30 PM - 9:15 PM 20 questions asked
Mar. 1	Gate City	J.E. Delp	45	Meeting 1:00 PM - 1:40 PM 35 questions asked
" 2	Gate City	J.E. Delp	50	Meeting 1:00 PM - 2:15 PM 30 questions asked
" 3	Gate City	J.E. Delp	30	Meeting 1:00 PM - 2:15 PM 20 questions asked
		Total Attendance -	1718	885 - Total questions asked

Total No. Meetings - 29

*Colored lantern slides were used at all of the meetings illustrating the major tobacco diseases. At these meetings questions were asked pertaining to the important tobacco diseases and cultural practices. A total of 1655.5 miles were covered by auto and 267 miles by railroad. Newspaper articles were written for all the local newspapers in tobacco producing counties, also The Tobacco Grower published at Farmville.

The following tobacco markets were visited: Kenbridge, Blackstone, South Boston, Petersburg, South Hill, Lynchburg, Danville, and Abingdon. The quality of tobacco seen on these markets was average in most cases, and in many cases above average. Considering the bad weather experienced in February and March, also the fact that County Agents were busy with their corn and hog programs, attendance at these meetings was good. Thanks are due to J. J. Baker of the Norfolk & Western Railway Company and to G. A. Hall and Kent Apperson of the Calcium Sulphide Corporation for their cooperation.

results obtained in these experiments with calcium sulfide, the suggestion as to its use is warranted.

Calcium sulfide may be used either as a dust or as a spray. If applied as a dust, a good dust-gun should be used so the plants will be thoroughly covered with the minimum amount of material. Some burning of the leaves may result if the dust is "piled up" on the plants. If spraying is preferred, use calcium sulfide at the rate of 2 ounces per gallon of water (6½ lbs. to 50 gals.). Mix thoroughly and keep the mixture agitated while the spray is being applied. Apply just enough of the spray to wet the plants thoroughly without drenching the soil. Use a good sprayer and apply the spray to the under side of the leaves as much as possible.

If control of downy mildew is to be expected, the fungicide must be applied in advance of the disease. Therefore, it is suggested that the first application be made early; that is, when the largest leaves are about a quarter of an inch in diameter. This should be followed by applications at weekly intervals. As soon as mildew is reported as occurring in the vicinity, applications should be made every 4 to 5 days.

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Virginia Agricultural and Mechanical College and Polytechnic Institute and the United States Department of Agriculture, Cooperating, Extension Service, Fred S. Hutcheson, Director, Blacksburg, Virginia

Suggestions for the Control of Downy Mildew (Blue Mold) in Tobacco Plantbeds

(Prepared by the Departments of Plant Pathology and Agronomy, V. P. I., Blacksburg, Virginia.)

In 1933 the blue mold disease of tobacco spread to every tobacco growing section of the State. It is now evident that this disease is a permanent problem and growers should take every possible precaution to keep this destructive disease under control. Experimental work is being pushed as fast as possible to find an effective and economical method of controlling blue mold.

From the information available at present these suggestions are made for controlling blue mold in tobacco plantbeds.

9000 of these circulars were distributed among county agents and tobacco growers.

1. Select site for plantbed, preferably a new one and, if possible, in an open location to secure maximum sunlight. Select a soil that is well drained and on a southern exposure to protect the bed from cold winds. If the site selected is in the woods, trees that shade the bed should be cut down.

2. Give more attention than in the past in obtaining a bed that is free of weeds. If possible burn or steam the soil to destroy weed seed.

3. Have seed cleaned and treated. Your county agent will assist you in this work.

4. Avoid too heavy seeding of the plantbed in order to prevent overcrowding of the plants; one slightly heaping tablespoonful of clean seed to 100 square yards of bed will be sufficient. If the plants are too crowded in the bed, they will remain in a moist condition after dews and rains, and thus make conditions more favorable for the development of the blue mold disease.

5. Sow seed early so the plants will be as large as possible before the attack of the blue mold disease.

6. Use a 5-8-5 commercial fertilizer on the plantbed at the rate of 200 pounds to 100 square yards, or 2 pounds to one square yard. Since this is an unusual formula, it is suggested that a 5-8-5 formula may be prepared by adding 20 pounds of nitrate of soda to 200 pounds of a 3-8-5 mixture.

7. Where growth is normal, nitrate applications, in addition to the regular fertilization, are not advised. In cases where plants have been seriously injured by blue mold, watering at four-day intervals with two or three pounds of nitrate of soda in 50 gallons of water to the 100 square yards is advocated as a means of facilitating recovery. These applications should be made early in the morning so the water will dry quickly from the leaves.

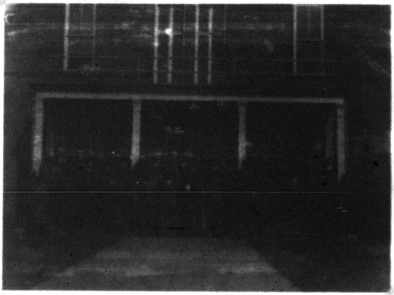
8. Do not plant badly diseased plants; wait for them to recover in the bed. The addition of nitrates may speed up recovery in the plantbed.

9. Get plants into the field as early as possible from beds where disease is not present.

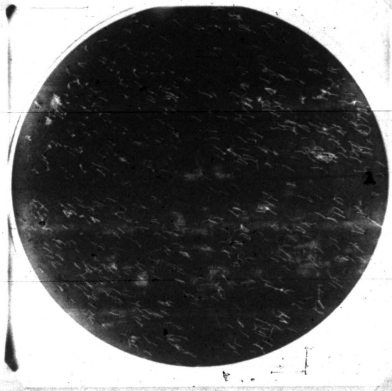
10. Last year effective control of blue mold was obtained by spraying or dusting with calcium sulfide. Since calcium sulfide has only been tested one year, it is not possible to say that this material will control the disease. However, in view of the promising

9000 of these circulars were distributed among county agents and tobacco growers.

Group of growers attending Appomattox meeting.



Group of growers attending Mountain City, Tenn., meeting.



Germination of treated seed at left of vertical line and untreated at right of vertical line. No injury to germination. Scott County, Virginia. Tobacco seed treatment with corrosive sublimate is cheap insurance.

Phase or Subproject No. 5.- The control of cereal smuts and other controllable or partially controllable cereal diseases. Smuts of wheat, oats and barley are the most serious diseases attacking these crops in Virginia. The two smuts of wheat caused a loss of 3 per cent of the crop in 1933, the two smuts of oats a loss of 4 per cent of the crop in 1933, and the two smuts of barley a loss of 3 per cent of the crop in 1933. There were some cases in 1932 and 1933 where wheat fields ran as high as 40 to 45 per cent stinking smut. Estimates based on the U. S. Department of Agriculture Crop Report for November, 1931, placed these losses for the three crops (wheat, oats and barley) at 3,040,418 bushels. Cleaning and treating wheat with copper carbonate has eliminated stinking smut in over a thousand demonstrations. The hot water treatment has completely controlled loose smut of wheat in 15 demonstrations during 1929, 1930 and 1931. Over 100 demonstrations using Semtox, Improved Ceresan and other manufactured chemical dusts have controlled smuts of oats and barley. In 1934 we emphasized more than ever before planting treated small grain seed and having seed houses treat seed where for one reason or another the grower could not treat his own seed. (See exhibit at end of this subproject.)

The following is a brief summary report of cooperative work done with seedsmen and county agents in cereal smut control.

Firm name and address	Bushels of wheat treated	Bushels of oats treated	Bushels of barley treated
Southern States Cooperative Richmond, Virginia	9,000	9,000	18,000
Smith Seed & Feed Company Danville, Virginia	10,000		
T. V. Wood & Sons Richmond, Virginia	25,000	18,000	5,708
Shenandoah County	15,000		

The Southern States Cooperative, Richmond, also sold 2000 pounds of copper carbonate and 1500 pounds of Ansul formaldehyde, the latter used by growers in the control of smuts of oats.

Machinery for the above seed treatment work done cooperatively with these firms was installed under the supervision of the Extension Plant Pathologist of V. P. I. (See Annual Report of this Department for 1931, pages 44-52, and exhibit following.) In supervising this work the Extension Plant Pathologist made six trips to Richmond and three to Danville during the period (September-December 15) when small grains were being treated.

In addition to the above, County Agents and Smith-Hughes teachers sold and distributed an additional 15,000 pounds of copper carbonate among small grain growers of their counties. Probably in no previous year was seed treatment of cereals so general as in the 1934 season. Millers of the State sold and distributed an additional 5,000 pounds of copper carbonate among the growers served by them. County Agents and Smith-Hughes teachers cooperating with the Extension Plant Pathologist sold and distributed an additional 4,000 pounds of Ceresan and 2,000 pounds of Formaldehyde dusts

for use in the control of smuts of barley and oats in their counties. Splendid cooperation has been given, especially by County Agents and millers, in carrying out this work during 1934. Circulars treating on cereal smut control were again brought up to date during August (See 1933 Report, pages 66-69). One thousand, four hundred and seventy-five of these were mailed to County Agents, Smith-Hughes teachers and millers of the State.

One newspaper article was prepared for all of the County newspapers of the State.

Two demonstrations for the control of loose smut of wheat were held, one at the college and one at Harrisonburg.

Photograph No. 1 (Following page) Treating seed and treating outfit in the control of smuts of small grains at the firm of T. W. Wood & Sons, Seedsmen, Richmond, Virginia.

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Photograph No. 2 - Hot-water treatment of wheat for the control of loose smut in Rockingham County.

Subproject or Phase No. 4.- Eradication of the native barberry bush (Berberis canadensis). The native barberry bush has been the chief means of spreading and propagating the black stem rust of small grains in southwest Virginia counties (Pulaski, Smyth, Wythe, Washington, Montgomery and Grayson). In years past (1922-1924) severe losses have occurred, and in at least 20 instances have destroyed entire wheat fields. Wheat is essential in the agricultural progress of the above counties, since it is one of the chief cash crops. Five demonstrations in Wythe County in eradicating barberry bushes near to wheat fields with the use of commercial salt increased the yield on an average of 6 bushels to the acre.

As in 1932 and 1933, Dr. H. B. Humphrey, in Charge of Cereal Rust Investigations and with the cereal office, U. S. D. A., has cooperated with us in helping to continue a rust nursery at Elk Creek, Grayson County. These varieties, or 100 in all of wheat, oats and barley, were examined for resistance by Doctor Humphrey and the Extension Plant Pathologist of V. P. I. in July. County Agent D. T. Painter assisted in this work. Again the Tennarq variety of wheat showed promise of resistance in 1934 as it did in 1932 and 1933. For harvesting we had about one-half of an acre of this variety last July. It stood up against the black stem rust while the local varieties planted alongside were badly rusted, and in some cases were a total loss. The winter varieties this fall were planted October 1, and are surrounded by barberries on all sides. This fall we have two acres of the Tennarq variety planted at Elk Creek, and hope to have more of the seed for distribution in the community next fall, or 1936. A plot of Tennarq is also planted on the College farm.

In connection with this subproject three newspaper stories were written. This work promises to save southwest Virginia growers thousands of dollars, if we can carry it on to completion. Mr. F. C. Meier in Charge of Barberry Eradication for the U. S. D. A. is vitally interested in the black stem rust situation in southwest Virginia. See brief report following. In all about 2500 dollars have been spent in the Elk Creek Valley, Grayson County, for barberry eradication.

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UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Plant Industry
Cooperating with
STATE AGRICULTURAL AND OTHER AGENCIES
in the Eradication of the Common Barberry

Barberry Eradication

Reply to:

Box 108
Independence, Virginia
November 1, 1934

Mr. James Godkin
Extension Division, V. P. I.
Blacksburg, Virginia

Dear Mr. Godkin:

I am enclosing copies of Survey Forms E and F which are to replace copies of these forms for June which you now have. There is one correction on these revised forms. On the forms you now have which are in longhand, I showed 99,100 bushes destroyed on resurvey properties on Form F although they were not sprouting bushes. On these revised forms they are shown on Survey Form E where they more nearly belong.

Am getting squared away, cutting red-tape, etc. so I can put some men to work beginning tomorrow. The closest National Re-employment Office for FERA work is at Christiansburg. Must have my men registered there. We hope to do that by mail. I'm starting tomorrow, anyway. I already have the money. This red tape is ridiculous.

Hope to see you down this way as soon as you can manage it.

Very truly yours,

/s/ G. E. Matheny
Agent

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UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Plant Industry
Cooperating with
State Agricultural and Other Agencies
in the Eradication of the Common Barberry

Barberry Eradication

Reply to:

325 N. Main Street
Stockton, Ill.
Sept. 26, 1934

Mr. James Godkin

Blacksburg, Virginia

Dear Mr. Godkin:

I am enclosing copies of Survey Forms E and F. These forms show that 512,975 native barberry bushes were destroyed in Grayson County on 48 different properties. A total of 504½ man days local labor was employed. The following chemicals were used: 9.25 tons salt, 1000 pounds "Atlacide", 500 pounds sodium chlorate, and 50 gallons kerosene.

More work needs to be done at Elk Creek either this fall or early next spring to make the job there worth anything as a test. Two to 4 more weeks work there would clean it up in good shape. Hope that can be done, preferably early next spring before the bushes become infected. The first aecial infection appeared on May 10 this last spring, and rust was observed on grain on May 23, so the remaining bushes should be removed the latter part of April. All old locations should be checked, sprouting bushes destroyed, and new bushes eradicated for considerable distance.

/s/ C. E. Mathany
Agents U. S. D. A.

Subproject or Phase No. 2.- The use of wilt-resistant varieties of cabbage seed. The yellows or wilt disease is the worst trouble cabbage growers of Southwest Virginia counties (Pulaski, Smyth, Wythe and Washington) have to cope with. Losses have run from 15 to 90 per cent of the crop in individual fields over the period extending from 1923 to 1933. The use of seed from such wilt-resistant varieties as Wisconsin All Seasons, Hollander, All Head Early and Marion Market has resulted in the production of cabbage crops which have not become infected with the yellows disease.

In the past, difficulty has often been experienced by the grower in obtaining seed of these varieties, so, for the past three seasons the Extension Plant Pathologist has been cooperating with County Agent P. E. Bird of Smyth County in the hope of producing seed of these varieties in Smyth County. We have made some progress with the varieties Marion Market, Jersey Queen and Wisconsin All Seasons, and produced a goodly quantity of seed from these varieties at Atkins, Virginia, in 1933 and 1934. We have already demonstrated that we can produce cabbage seed in southwest Virginia. Unfavorable winter conditions in 1933 partially retarded us the following spring, or 1933. If we can save this section of Virginia from $30,000 to $60,000 annually spent for cabbage seed, we will have accomplished a worthwhile piece of work.

RADIO TALKS - 1934

Tobacco Blue Mold Disease, May, 1934.

Joe Apple Prepares for a New Deal in His Orchard and Garden Production Program, September, 1934. (Dialogue by A. H. Tuska of the Horticulture Department, and James Godkin of the Botany & Plant Pathology Department).

Joe Apple Discusses Some Fall Orchard Problems with Professor Hurt, October 19, 1934. (Dialogue by A. H. Tuska and James Godkin.)

STATISTICS OF TRAVEL

During the year 1934, or from December 1, 1933, to November 30, 1934, the Extension Plant Pathologist spent 219 days in the field and 146 days in the office. A total of 8,585 miles have been covered by rail and 7,199½ miles by auto and 300 miles by other means of conveyance (chiefly walking). Plant pathological work has been carried on with 69 County Agents and 20 Smith-Hughes agricultural high school teachers as well as in 4 counties having no agents. Fifty field meetings have been held with a total attendance of 4090, and 91 demonstrations have been put on. Three hundred and seventy-eight letters were dictated; 84 circular letters sent out, 72 bulletins, and 11,134 circulars mailed out at different times during the year. In addition to this 50 evenings (after supper), or a total of 90 hours have been spent in the office on work pertaining to our project. On ten occasions train connections have been made earlier than 5:00 A.M., and connections for midnight trains have been made on 11 occasions. A total of 70 hours after supper or in the evenings have been given to extension work while in the field.