POTATO FUNGICIDE EXPERIMENTS IN 1949[1]

Wm G. Hoyman[2]

The 1949 potato fungicide experiment was conducted at Northwood, N. D. on land donated by Mr. Arthur Nelson. Most of the dusts and sprays shown in Table 1 had been tested at some time during the previous three years when early blight had not been present in sufficient amount for satisfactory evaluation of the materials. In 1949 a trace of early blight infection was observed on the lower leaves July 21, and by August 23 blight had become very severe on the check plot. The materials Nu-Z, Esminel, and EM25-3 were included to determine their effect on yield in case early blight had been absent.

The final early blight readings were taken August 23. In estimating the amount of early blight infection, each of the 96 plots was scored by using the following scale: 1—trace, 2—very slight, 3—slight, 4—moderate, 5—severe, and 6—very severe. The average reading for each treatment was obtained, and the rank on this basis is shown in Table 1.

Experimental Procedure:

Planting date: May 7.

Soil: Bearden very fine sandy loam.

Fertilizer: 3-12-12 applied in bands at 407 pounds per acre.

Insecticides: DDT used on all plots except 14S, 15S, and 16S where EM25-3 was applied. The latter is a hydrocarbon solvent containing 25% DDT and 3% Parathion.

Plot design: Triple lattice.

Replications: Each treatment six times.

Plot size: Two rows wide and 90 feet long, with two untreated rows on each side.

Row width: 38 inches.

Sprayer: Two-row, tractor-drawn Bean Sprayer, with 350 pounds pressure.

Rate of spray application: 100 gallons per acre the first treatment, with three nozzles per row; and 120 gallons per acre the last four applications, with five nozzles per row.

Duster: Two-row, tractor-mounted Niagara duster with three nozzles per row.

Rate of dust application: 20 pounds per acre the first application, 36 pounds the second application, and 44 pounds for each of the last three applications.

[1]Financial assistance aiding this research was received from the Agricultural Supply Company, Grand Forks, N. Dak.; the Tennessee Corporation, College Park, Ga.; the General Chemical Division of Allied Chemical and Dye Corporation, New York, N. Y.; and the Crop Protection Institute, Washington, D. C.

[2]Associate Plant Pathologist, North Dakota Agricultural Experiment Station and North Dakota State Seed Department, and Agent Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural Engineering, Agricultural Research Administration, U. S. Department of Agriculture.

Dates of spray and dust applications: July 6 and 20, August 4, 11, and 17.

First killing frost: September 26.

Dates harvested: September 29 and 30.

Experimental Results

Although the application of fungicides three times after the appearance of early blight did not check the disease, there was a considerable difference in the effectiveness of the various materials. The Parzate-DDT dust plus a sticker on plot 7D gave the best control of early blight. This was followed by plot 2D which received five per cent DDT the first application and the Parzate-DDT dust plus a sticker the remaining four applications. The next two materials in order of effectiveness were Parzate spray (12S) and Cop-O-Zink spray (10S). Dithane dust (8D) and No. 1189 (16S) each ranked fifth. No. 1189 is designated at present as a cyclic diene derivative. The copper-containing fungicides Tri-Basic Copper Sulfate and Robertson gave poor control of early blight.

The highest yields were obtained on plots receiving the most effective fungicides. Plot 7D, for example, had the highest yield, followed by plot 2D. Other high-yielding plots were Parzate spray (12S), Cop-O-Zink spray (10S), Dithane dust (8D), and No. 1189 (16S).

Table 1. The effectiveness of various dusts and sprays in controlling early blight of potatoes, and the yields in bushels per acre.

Plots[1]	Materials	Rank, blight control	Yields
	CHECK		
1D	DDT 5%	13	260.2
	DUST TREATMENTS		
2D	DDT 5% the first application. Parzate 8% and DDT 5% plus a sticker the last 4 applications.	2	283.6
3D	Tri-Basic Copper Sulfate (7% copper) and DDT 5%.	12	267.9
4D	Robertson fungicide (6% copper) and DDT 5%.	10	267.3
5D	Cop-O-Zink (7% copper and 2% zinc) and DDT 5%.	7	273.6
6D	Nu-Z (55% zinc) and DDT 5%.	9	266.1
7D	Parzate 8% and DDT 5% plus a sticker.	1	299.0
8D	Dithane 8% and DDT 5%.	5	275.8
	SPRAY TREATMENTS[2]		
9S	Tri-Basic Copper Sulfate and DDT. 4-1-100.	10	270.8
10S	Cop-O-Zink and DDT. 5-1-100.	4	279.0
11S	Nu-Z and DDT. 1-1-100.	8	263.0
12S	Parzate, Nu-Z and DDT. 2 qts.-1-1-100.	3	277.3
13S	Esminel and DDT. 5-1-100.	11	270.3
14S	Zinc Nitrodithioacetate and EM25-3. 4-⅛ pt.-100.	6	261.0
15S	EM25-3. ¼ pt.-100.	13	254.3
16S	1189 and EM25-3. 6-⅛ pt.-100.	5	282.6

Least significant difference at the 5 per cent point equals 11.5 bushels; and at the 1 per cent point, 15.4 bushels.

[1]D refers to dust and S to spray.

[2]All spray materials are expressed in standard units of weight or liquid measure sufficient to make 100 gallons of spray mixture. For example, Tri-Basic Copper Sulfate and DDT 4-1-100 means four pounds of Tri-Basic Copper Sulfate and one pound of actual DDT, with sufficient water to make 100 gallons of spray mixture.

Summary

1. Parzate DDT dust plus a sticker was the most effective material for controlling early blight and it produced the highest yield.
2. High yields and some control of early blight were obtained from plots sprayed with Parzate, Cop-O-Zink, and No. 1189, and the plot dusted with Dithane.
3. The copper-containing materials Tri-Basic Copper Sulfate dust and spray, and the Robertson dust fungicide gave poor control of early blight and the yields were not significantly greater than the check plot.

NEW SOURCES OF CORTISONE

Cortisone, the most recent preparation for relief of arthritis, can be made from *Strophantus*, an African plant related to oleander. The material previously has been prepared from ox bile, and only very small amounts could be secured in that manner. Right now the U. S. Public Health Service and U. S. Department of Agriculture are working co-operatively under direct request of President Truman to find out (1) What species of *Strophantus* yield the highest amount of sarmentogenin, from which cortisone is extracted; (2) Whether this substance can be extracted from parts of the plant other than just the seed; (3) Techniques for quickly propagating plants selected for cultivation, and (4) The climate, soil, fertilization, cultivation and harvesting practices which will be most advantageous. Explorations for *Strophantus* are now under way in Liberia, the Ivory Coast, Gold Coast, Togo, Dahomey, Nigeria and the Cameroons. Meanwhile, a recent research may show that cortisone can be obtained from *Dioscorea*, a genus of many species of tropical climbing vines. Enlarged roots of these plants are used for food in tropical countries and are known as yams (but entirely different from sweet potatoes, which we sometimes call yams.) Some species of *Dioscorea* produce aerial tubers, which really are enlarged stem tissue at the leaf bases.

FOR LIVESTOCK AND POULTRY RAISERS

Several papers published in the Bimonthly Bulletin, Vol. IX No. 6 (July-August 1947) are of lasting interest, especially to those who have livestock or poultry enterprises. Among titles of papers submitted by veterinary staff members, and contained in that issue, are: "Swine Erysipelas," "Brucellosis," "Lungworm Disease of Sheep," "'Mushy' Chick or Poult Disease," "Studies on Navel Infection of Chicks and Poults," and "Treatment of Pullorum Disease and Paratyphoid Infections With Sulfamerazine."

LIMBER PINE

The most interesting new plant record for the state is Limber Pine, *Pinus flexilis*, found in Slope county by R. P. Williams, now in the soil conservation office at Steele. This is an extension from the Rocky Mountain area, like that of the western yellow pine, which is quite common in that part of North Dakota. A small colony of Limber Pine is known in the Black Hills. It has five needles in a cluster and the cones are more slender than those of the western yellow pine.—NDAC Botany News Letter.