SCREENING OF POTATO FUNGICIDES IN 1960

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In 1960, fourteen fungicides for potato late blight, Phytophthora infestans (Mont.) de Bary were included in the Screening Test conducted at Charlottetown. These fungicides were:

1. Blitane -- A mixture of copper oxychloride (377'0) and zineb (16%).
   Source: Fisons Pest Control Limited, England.
   Concentration: 2.5 pounds per 80 Imperial gallons.

2. Blitox -- Copper oxychloride, 20% copper.
   Source: Fisons Pest Control Limited, England.
   Concentration: 4 pounds-80 gal.

3. Bordeaux, 8-4-80. Included annually as a standard treatment.

4. Colloidox -- A colloidal copper product containing 20% copper.
   Source: Metallurgical Chemists Limited, England,
   Concentration: 4 pounds-80 gal.

5. Cuprosan -- Copper oxychloride (37.57'~)and zineb (15%).
   Source: Pechinery-Progil, France,
   Concentration: 2.5 pounds-80 gal.

6. Delan -" 2,3-dinitrilo-1, 4, dithiaanthraquinone.
   Source: E. Merk, Germany.
   Concentration: 2 pounds-80 gal.

7. Dithane M-22 -- Manganese ethylene bisdithiocarbamate.
   Source: Rohm and Haas Company of Canada, Limited.
   Concentration: 1.5 pounds-80 gal.

8. Gorsatox 70 -- 1-chloro-2, 4-dinitronaphthalene.
   Source: Fisons Pest Control Limited, England,
   Concentration: 1.5 pounds-80 gal,

9. LO-1499 -- Ammonium ethylene bisdithiocarbamate,
   Source: Rohm and Haas Company of Canada, Limited,
   Concentration: 1 quart t 1 pound zinc sulphate-80 gal.

10. Manzate -- Manganese ethylene bisdithiocarbamate,
    Source: DuPont of Canada, Limited,
    Concentration: 1.5 pounds-80 gal.

11. Manzate t Thylate -- Maneb t thiram.
    Source: DuPont of Canada, Limited.
    Concentration: 1 pound + 1 pound-80 gal.

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12. Miller 658 -- Copper-zinc-chromate.
Source: Miller Chemical and Fertilizer Corporation, U. S. A.
Concentration: 1.5 pounds-80 gals.

13. N-2038 -- Confidential.
Source: Rohm and Haas Company of Canada, Limited.
Concentration: 1.5 pounds-80 gal.

14. X-9 + additive -- Confidential.
Source: Rohm and Haas Company of Canada, Limited.
Concentration: 1.5 pounds + 120 cc.-80 gal.

The plots were planted on May 31, the Green Mountain seed pieces being counted to assure the same number in each row. Each plot was 4 rows wide by 50 feet long, and 15 plots (one for each fungicide and an unsprayed control) were set out in each of 5 ranges. Single rows of potatoes were used as borders and buffers. All data were taken from the two center rows.

The sprays were applied by an experimental tractor-sprayer unit on which the nozzles were so arranged that each row received a 4-nozzle application. A constant pressure of 375 pounds per square inch was maintained. All rows were sprayed with DDT on June 22 and with Malathion on August 15. The fungicides were applied on July 15, 26, August 4, 15, 28, September 8. On September 20 the test was completed by spraying all plants with a solution of sodium arsenite.

It was an unusually dry season, the rainfall for the July-September period being only 6.43 inches made up of 2.13 inches on July, 0.91 inches in August, and 3.39 inches in September. Of this amount, only 2.31 inches fell between July 15 and September 8, the dates of the first and last applications of the fungicides.

In an attempt to build up late blight infection, water suspenions of spores were disseminated frequently over the plants in the unsprayed buffer and border rows. The first dissemination was made on July 20, and by July 28 from one to three lesions were found in a few of these rows, Repeated attempts, many of them in evenings, were made through August and into September, and in the latter part of this period the spores were sprinkled over the sprayed plots as well. By September 20, when the test was terminated by the application of top killer, only 15 per cent defoliation had occurred in the unsprayed check plots, Under these conditions it was impossible to evaluate the fungicides with respect to control of disease on the foliage.

Some damage, however, was inflicted by spraying the plants under the hot, dry conditions that prevailed. The blight lesions being generally dry, it was almost impossible to distinguish them from spray injuries, and the percentage defoliation figures given in Table 1 are therefore meant to include all types, whether disease, phytotoxic effects, or mechanical injury. The figures in Table 1 are the approximate mean defoliations for the five plots of each treatment. It will be observed that the defoliations were highest in plots treated with copper fungicides.

Table 1. Percentage of defoliation, September 20.

Treatment		Treatment	
Miller 658	4	Gorsatox	7
LO-1499	5	Cuprosan	7
Manzate t Thylate	5	Blitane	8
X-9 t additive	5	Blitox	9
Delan	6	Bordeaux	10
Dithane M-22	6	Colloidox	10
Manzate	6	Check	15
N-2038	6		

Little late blight tuber rot was found in the crop, the unsprayed plots having only 2.9 per cent loss from this cause, and a mere trace occurring in five of the treatments. The tuber rot was probably induced by rains of 0.06, 0.37, 0.01, 0.36, 0.50 inches that fell on September 9 to 13, and a heavy rain of 1.20 inches on September 20.

Yield data are presented in Table 2 in which the treatments are arranged in descending order of yields of No, 1 tubers, It is noted that all the copper fungicides appear at the bottom of the table.

Table 2. Effect of treatments on yield and rot,

Treatment	Total bu/ac	Smalls bu/ac	Rot bu/ac	No. 1 bu/ac	% Rot
Manzate t Thylate	433.0	36.1		396.9	
Manzate	427.4	33.9	0.1	393.4	trace
Miller 658	420.1	32.1	0.3	387.7	trace
LO-1499	415.8	30.4		385.4	
X-9 t additive	421.1	36.1		385.0	
Dithane M-22	418.0	37.4		380.6	
Delan	407.0	27.7		379.3	
N-2038	406.4	34.8	0.2	371.4	trace
Gorsatox	402.1	33.4		368.7	
Cuprosan	406.6	39.6		367.0	
Blitane	403.0	38.7		364.3	
Blitox	397.9	35.6	0.2	362.1	trace
Bordeaux	391.2	34.8		356.4	
Colloidox	382.1	35.2	0.2	346.7	trace
Check	392.3	38.7	11.7	341.9	2.9

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