FIELD TESTS OF FUNGICIDE-INSECTICIDE COMBINATIONS IN MICHIGAN FOR 1948

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Further field trials were made at the Lake City, Michigan, Experiment Station employing 22 spray and 12 dust combinations of fungicides and insecticides in control of early blight and various potato insects. The plots consisted of four rows randomized and replicated three times for the sprays and duplicated for the dusts. For the spray plots two harvestings were made and for the dust plots three harvestings were made for each plot. The spray plots were 150 feet and dust plots 250 feet in length. Both series of plots were planted to the Katahdin variety on the 17th of May and harvested between the 13th and 15th of September. The plots were irrigated five times during the period from the 26th of July to the 24th of August. Spray and dust applications were made at approximately 10-day intervals as follows: July 9, 19, 29, August 9, 19, 31, and September 7. Sprays were applied with a tractor drawn engine-powered sprayer at 300 pounds pressure and the dusts with an engine-powered machine of 50 pounds capacity drawn by tractor. A canvas 25 feet in length and covering four rows, trailed behind the duster to confine the materials to the vines.

No late blight was found in these plots but it was present as a trace amount in the main potato field across the field road. Early blight was first seen in the plots on the 3rd of August, but gained little headway until...

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after the 24th when irrigation was discontinued and the vines were reaching maturity. Readings of early blight infection were made on the 17th and 24th of August and on the 13th of September just previous to harvesting.

Insect counts were made 2, 4, 6 and 8 days after each application of spray or dust from five complete sweeps including approximately 30 feet of row. Counts were made at ten-day intervals during the period from the 11th of July until the 9th of September inclusive.

Results of the spray materials tests are given in table I and show that the highest yield of U. S. number 1 potatoes was obtained from the plots sprayed with Zerlate + DDT (382.1 bu.) followed closely by zinc nitrodithioacetate (356.5 bu.), Dithane D-14 plus 50 W DDT, Parzate plus DDT and micronized cuprous oxide (Calumet and Hecla) plus DDT. The lowest yields were obtained with bordeaux mixture 8-4-100 plus DDT and Tribasic copper sulfate plus 1155, a mixture of 22.5 per cent DDT and 2.5 per cent chlordane used at the rate of 1 quart per 100 gallons. The results from the latter materials were not unexpected since there was some injury to the foliage after the first application of bordeaux mixture and later stunting of the vines and in 1947, chlordane used as a dust caused some wilting of the plants and a reduction in yield.

The table also shows that copper-zinc chromate gave best control of early blight followed closely by Zerlate, Dithane D-14, yellow cuprocide and cuprous oxide (Robertson Co.). Control of this disease seems to fall roughly into two classes, *vis*: Copper-zinc chromate and zinc-organic sulfur materials and (2) the inorganic copper materials with exceptions as mentioned above. The yield and control of early blight are not always closely related as shown by the plots sprayed with Parzate, Copper-zinc chromate and zinc nitrodithioacetate. In general, however, higher yields followed effective early blight control.

All of the insecticides tested gave practically 100 per cent control of flea beetles but there was considerable variation in effectiveness against common potato leafhopper, six-spotted leafhopper, spittle bug and aphids. The addition of chlordane to DDT was ineffective at the strength used in the control of spittle bug as was 25 per cent emulsion DDT and Parathion. This latter material, however, in combination with two fungicides gave perfect control of aphids, by far the best of all the materials used. Since none of these insects was present in great numbers at any time during the growing season, it is difficult to determine the true value of the insecticides employed, and only comparisons can be made.

Tests of dusts were also made with five different combinations of