CURRENT RESULTS WITH POTATO VINE KILLERS IN PRINCE EDWARD ISLAND

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Killing the potato vines prior to harvesting the crop is a practice in modern potato culture that is annually being adopted by increasing numbers of Prince Edward Island growers. This practice has become so firmly established in this province that the majority of growers are now using vine-killing chemicals for one or more of the several purposes (1, 3, 5) for which they have been developed. The growers have readily accepted the local recommendation to treat all fields in which the vines are green not later than the 1st of October. This recommendation was designed to advance the date of digging and thereby reduce the number of oversized tubers in a year with an extended growing season, to permit harvesting of the crop before the advent of inclement weather or freezing temperatures, and to reduce the incidence of late blight tuber rot. In connection with it, growers are advised to delay harvesting until at least ten days after the death of the vines. During this period the tubers loosen from the stolons and the skin matures or toughens, rendering the potatoes less susceptible to mechanical injury during digging and subsequent handling. The Sebago, in particular, is easily bruised. It is recommended that this variety be left in the ground three or four days longer than the other varieties grown in the province.

A great deal of rot, especially in Sebagos, developed in the 1946 crop while in storage and in transit. An extensive survey revealed that the heavy losses were caused by Fusarium sambucinum f.6, which gained entrance into the tubers through cuts, wounds, and abrasions inflicted during harvesting operations. The autumn of 1946 was unusually mild and open, and chemicals for destroying the vines were in short supply. Consequently, many fields were dug while the plants were still green. The tubers harvested under these conditions were very easily bruised, even by light blows, as the skin was still immature.

Experiments with a number of chemicals and commercial herbicides (1) have been conducted at the Dominion Laboratory of Plant Pathology at Charlottetown and in growers' fields since 1941. The laboratory plots...
for the 1947 tests were planted on the 11th of June and treated on the 8th of September—the variety used being Green Mountain. The plants, at time of treatment, were disease-free and exceptionally luxuriant and vigorous. Although the sprays were applied at a pressure of 300 pounds, and the machine was equipped with four nozzles per row and driven both ways of the rows, it was difficult to cover the heavy mass of growth completely. The weather on the 8th of September and for the ensuing week was probably ideal for the killing tests. Weather data are presented in table 1.

A summary of the effectiveness of the materials tested is given in table 2. The very marked increase in the toxicity of sodium arsenite sprays, represented in table 2 by Handy Killer, that the addition of an oil made, was the most outstanding feature of the experiment. Preliminary tests, conducted in the greenhouse during the winter, clearly indicated that potato vines were more readily destroyed by a solution of sodium arsenite when an oil was included in the spray. Tests conducted in field plots early in August substantiated the results obtained in the greenhouse, and waste crank case oil was found to be just as effective as miscible oil. Tests were made with three sodium arsenite vine killers—Handy Killer, Green Cross Top Killer, and Geigy's Potato Vine Killer—and it was noted that equal amounts of waste crank case oil increased the toxicity of each to the same extent. Various procedures for mixing the components were studied and it was found that the most effective spray was obtained by stirring the commercial concentrated solution of sodium arsenite and oil together, adding the resulting mixture to the sprayer tank, and finally adding the water while the agitators were turning. This method of preparation emulsified most of the oil. Excellent kill was obtained when the vines were sprayed with a mixture containing one quart of a sodium arsenite vine killer and two gallons of waste crank case oil in forty gallons of water. Several farmers were asked to compare a sodium arsenite solution with a sodium arsenite-oil mixture, and all reported better results with the latter preparation.

The plots were harvested on the 22nd of September, tubers were examined for discoloration at the stem-end and in the vascular ring, and a bushel sample from each plot was put in storage for later examination. No discoloration was found in the tubers of the check plots, but the samples from the treated plots showed varying degrees of browning as shown in table 3. The incidence of browning under the point of stolon attachment was apparently correlated with the rapidity of the kill: the chemicals that caused the most rapid kill in-