Recorded attempts to control the spread of potato leafroll virus by insecticidal control of the vectors show varied and erratic results. Older materials such as rotenone and nicotine sometimes depressed the amount of early season virus spread but these insecticides have not appeared to be very effective (2) (6) (11). In some of the trials with DDT and parathion, authors have reported unsatisfactory control or even an increased amount of leafroll where these insecticides were used (3) (4) (7), but use of DDT and phosphate compounds is suggested as helpful by others (5) (8) (9) (12). Some of the reported tests have been inconclusive, however, because there was insufficient leafroll to show significant differences (1) (10).

The following tests emphasized the use of the effective phosphate insecticides. To obviate the danger of inconclusive results where no significant disease control data are obtained in either direction the experimental design included: (1) two varieties, one very susceptible to leafroll spread, the other resistant; (2) an abundant source of inoculum placed in a known arrangement so that all treatments would be equally subjected to its influence and so that these diseased source plants could be completely discarded later in order not to complicate the interpretation of results; (3) virus free seed of each variety so that all disease encountered would be the result of dissemination. Consideration also was given to the possibility of insuring the presence of vectors by artificial infestation.

In such experiments it is well to bear in mind that infection in rows adjacent to the leafroll inoculum may be so high that the difference between an effective insecticide and an ineffective one may not be apparent, and conversely, in rows distant from inoculum, infection may be so low that such differences can not be demonstrated. It was for this reason that the two varieties were selected and that the identity of tubers from each row in each treatment was maintained as a sub-plot.

1951 Tests

Materials and Methods

In 1951 each plot consisted of 9 rows 48 feet long with all the inoculum in rows 1 and 9. Row 1 showed 80 per cent leafroll and row 9, 99 per cent spindle tuber with a small undetermined amount of leafroll. The plots were arranged in four parallel strips with eight plots per strip. The first and third strips were planted with Katahdin, known to be resistant to leafroll spread, and the other two strips were planted with Chippewa, known to be very susceptible to leafroll spread. The thirty-two plots were divided into four blocks with four treatments randomized in each block of each variety. The potatoes were planted May 24 and 25.

The four treatments were as follows:
1. 50 per cent DDT wettable powder 4 pounds, plus 50 per cent technical Systox, 12 ounces per 100 gallons per acre.

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2. 50 per cent wettable powder 4 pounds, plus 1.5 per cent parathion wettable powder, 1½ pounds, per 100 gallons per acre.
3. 50 per cent wettable powder, 4 pounds per 100 gallons per acre.
4. Check. Fungicide only.

All treatments had a fixed copper fungicide in the spray at each application. The materials were applied at a pressure of 300 pounds per square inch from a three row, hand-carried boom. Six applications were made starting July 10 and continuing every ten days as weather permitted, with the final spray on August 31.

Early 1951 was a poor season for the development of aphids and it was decided that artificial infestation of the plots would be attempted. On July 7 several thousand greenhouse-raised green peach aphids (*Myzus persicae* (Sulzer)) were placed in the field. Each plot had two plants infested, one in an outer row and one in an inner row. Each such plant received 100 to 200 aphids. A similar artificial infestation was made again on August 14 with the outer row which was infested being opposite to the one infested July 7. There is some doubt as to whether this artificial infestation accomplished a substantial increase in the number of aphids when conditions did not favor natural development. Later in the season when conditions were more favorable for aphid development, potato aphids (* Macrosiphum solani folii* (Kalt.) were in evidence in considerable numbers as well as *M. persicae*. The aphid counts were taken just prior to the spray applications and were made by counting the aphids on seven terminal leaflets per plot, or fifty-six per treatment, with upper, middle and lower leaves being counted in rotation on the inner rows.

At the end of the season, tuber samples consisting of twenty-eight small tubers were taken from each row of all plots, each such group of twenty-eight tubers constituting a sub-plot. These were indexed in Florida during the winter. Conditions for identification of leafroll and spindle tuber were very good.

**Results**

Aphid counts are given in table 1. No aphids were found June 24 or July 19.

Most of the leafroll spread was to row 2, next to the leafroll-infected row. There was also a considerable amount of spread on row 3 and row 8 but very little on rows 4 to 7. In presenting the results, rows 2, 3 and 8 have been combined and designated as exposure 1 and rows 4 to 7 are designated as exposure 2.

The actual percentages of leafroll for each exposure in each treatment are given in table 2. The percentages in each sub-plot were converted to angles following the method of Snedecor (13), and an analysis of variance was made. The analysis showed a high degree of significance for treatments, exposures, and the interactions of exposures with treatments and of exposures with varieties. The decreases in leafroll following insecticide application are presented in table 3. It is believed that the most important figures in table 3 are those for exposure 1 since it was only here that percentages were high enough to demonstrate control.

In table 3 it will be noted that none of the differences in exposure 2 was significant. In exposure 1, in the Chippewa variety each of the three insecticides was better than no insecticide. Each of the two phosphate insecticides, parathion and Systox, gave better results than DDT alone in