

## POTATO SPRAYING IN EASTERN VIRGINIA IN 1937

LAUREN D. ANDERSON AND HARRY G. WALKER

*Virginia Truck Experiment Station, Norfolk, Va.*

Potato spraying experiments were conducted in several widely separated localities (Onley, Norfolk, Back Bay, and Kiptopeke, Virginia) in 1937 in an effort to compare the value of spraying potatoes with calcium arsenate-Bordeaux (2-4-6-50) when potato flea-beetles *Epitrix cucumeris* Harris, and potato leafhoppers *Empoasca fabae* Harris are present, and when absent. Colorado potato beetles *Lepidotarsa decemlineata* Say, were controlled in the check plats by spraying with calcium arsenate (2-50). Previous experiments showed that calcium arsenate partially controls flea-beetles, and has no effect on leafhoppers.

Potato flea-beetles were very abundant at Onley and practically absent at the other three localities. Potato leafhoppers became abundant at Onley and Norfolk about two weeks before harvest. There were also many leafhoppers at Back Bay, but they appeared just a short time before the potatoes were harvested and apparently did not affect the yield.

Potato diseases were not a factor in these experiments as they were practically absent.

Traction and gasoline engine power sprayers that maintained pressures from 150 to 300 pounds were used in these tests. All sprayers covered four rows at a time and all of them had three nozzles to the row with the exception of the sprayer used at Back Bay which had two nozzles. Four applications were made at Norfolk and at Kiptopeke and five applications at Onley and Back Bay. Yield records were taken on two rows 100 feet long, replicated nine times at Kiptopeke and twelve times at Back Bay; at Norfolk on three rows 175 feet long replicated thirteen times; and at Onley four rows 140 feet long replicated fifteen times.

As shown by the results given in table 1, significant increases in yield were obtained at Onley where flea-beetles and leafhoppers were abundant and at Norfolk where leafhoppers were abundant, whereas the differences in yield were not significant at Back Bay and Kiptopeke where flea-beetles and leafhoppers were absent or scarce.

From these data and from field observations it appeared that the increase in yield at Onley was largely caused by potato flea-beetle control. The flea-beetle foliage injury at Onley was determined by counting the number of holes where the beetles had fed on seventy-five leaflets selected at random from the treated plats, and seventy-five from the check plats. These counts revealed an average of 54.9 holes to the square inch of leaf surface in the untreated as compared with 3.8 holes in the treated plats (a difference of 2.8 holes may be considered significant).

The increase at Norfolk may not have been caused entirely by leafhopper control as the Colorado potato beetles were not adequately controlled on the untreated plats early in the season.

TABLE I.—*Results of spraying potatoes in 1937 with a calcium arsenate-Bordeaux (2-4-6-50) mixture, under different intensities of potato flea-beetle and potato leafhopper infestations*

Locality	Infestation		Yield in Bushels of U. S. No. 1 Potatoes to the Acre		Bushels Increase	
	Potato Flea-beetle	Potato Leafhopper	Untreated	Treated	Over Untreated	Necessary to Be Significant
Onley	Heavy*	Medium to Heavy	170	222	52	11
Norfolk	None	Medium	118	143	25	15
Back Bay	None	Light	202	210	8	30
Kiptopeke	None	None	114	107	-7	11

\*Counts of flea-beetle feeding places or holes at Onley showed an average of 54.9 holes to the square inch of leaf surface on the untreated plants, and 3.8 holes on the treated plants (a difference of 2.8 holes may be considered significant).

In experiments conducted at Norfolk in 1936 when potato flea-beetles and potato leafhoppers were absent, calcium arsenate-Bordeaux sprayed plats did not result in significant differences in yield when compared with untreated plats. However, at New Church, Virginia where potato flea-beetles were moderately abundant, an average increase of 32 bushels of U. S. No. 1 potatoes to the acre was obtained (1), (2).

The results in 1936 and 1937 agree with the results of similar

experiments at New Church in 1932, 1933, 1934, and 1935 in that the increases in yield of potatoes caused by the treatments were directly proportional to the potato flea-beetle population (1), (2), (3), (4).

These results agree with those reported by Zimmerley in 1928(5). He states that no benefits were obtained by the use of Bordeaux sprays or copper lime dusts, when diseases and insects are not present to an injurious extent.

#### CONCLUSIONS

As shown by these results spraying potatoes with a calcium arsenate-Bordeaux mixture gave significant increases in yield when potato flea-beetles or potato leafhoppers were present in injurious numbers, and did not give significant differences in yield when these pests were not present to an injurious extent.

#### LITERATURE CITED

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