PROGRESS REPORT: "Effect of Fungicidal and Nematicidal Activity of Certain Systemic Insecticides on the Incidence of Verticillium Wilt and the Yield of Russet Burbank"

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In 1963, Russet Burbank potatoes planted with 30 lbs./A of 10% granular Di-Syston®[2/] in bands, yielded an equivalent of 9 tons/A more than the nontreated. In 1964 there was a difference of 12 tons from a similar application. These highly significant differences were due to factors other than foliar insect control. The plots were located in a field where the soil was infested with Verticillium albo atrum Reinke and Berthold and Meloidogyne hapla Chitwood. In neither year did plants that received Di-Syston show symptoms of Verticillium wilt as soon as the nontreated plants.

Rate, method and time of applying Di-Syston were included in the 1965 potato experiment planted on April 8. Some plots received 30 lbs./A in bands at planting plus an additional 30 lbs./A as a single sidedress application on May 3, 17, 31 or June 14. Other plots received only a single 30 lb./A sidedress treatment on each of these dates. Verticillium wilt symptoms appeared first on July 6 in the nontreated plot, in the plots that received only a single sidedress application on May 3 or 17, and in the one treated with 20 lbs./A in bands at planting. Wilt symptoms were delayed the longest where Di-Syston was both banded and sidedressed except where the sidedressing was not applied until June 14.

In all instances where Di-Syston was applied, the total yields were significantly higher than the yield from the nontreated plot. The highest yields were obtained from plots where Di-Syston was banded at planting and sidedressed on May 17 or 31.

During each of the 3 years that Di-Syston has been applied to Russet Burbank potatoes, a delay in the appearance of Verticillium wilt symptoms has been positively correlated with total yield.

Time and rate of Di-Syston applications were factors determining the percentages of tubers having root-knot nematode galls. Symptoms

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2/The use of trade names of propriatory products is for identification and does not imply their endorsement by the U. S. Department of Agriculture over similar products not named. None of these systemic insecticides are cleared for use as fungicides in the control of soil-borne fungi.

were present on 50.93, 24.15, 3.94 and 5.73% of the tubers harvested from plots that received a single sidedress application on May 3, 17, 31 or June 14, respectively. Sixty-four percent of the tubers from the nontreated plot showed symptoms. All plots that received 30 lbs./A in bands at planting and an additional 30 lbs./A as a single sidedress application on May 3, 17, 31 or June 14 had a low incidence of galls. The percentages were 6.42, 2.96, 1.35 and 3.53 respectively.

The systemic insecticides GC 6506, NIA 10242, Temik®(UC21149) and Thimet were banded on Russet Burbank potatoes on April 8, 1965, to determine their effect on the incidence of Verticillium wilt and yield. With the exception of Temik, the 10% granular formulations were applied at 30 lbs./A. In the case of Temik, 15 lbs./A of 10% granules were applied in bands at planting followed by 15 additional pounds as a sidedress application on May 17.

Immediately following the appearance of green peach aphids (Myzus persicae Sulzer) on some plots the early part of July, Thiodan spray was applied on all the plots. Three subsequent Thiodan applications were made on all the plots at 2-week intervals. Verticillium wilt symptoms appeared the early part of July in the nontreated plot and in those receiving GC 6506, NIA 10242 and Thimet, but not until the early part of August where Temik was applied. By August 30, all the vines were dead except those that received Temik. Symptoms on the latter were moderate at this time and severe on September 16, the date of the last reading before the frost the following night.

As in the case of Di-Syston, the total yields from each of these 4 treatments were positively correlated with the appearance of vine symptoms. Plants that received Temik yielded an equivalent of 15 tons/A, or 121% more than those receiving no treatment. The difference between the total yields from the Temik plot and the second highest yielding treatment (GC 6506) was significant at the 1% level.

All 4 of the systemic insecticides manifested nematocidal activity. Only 0.29% of the tubers harvested from the Temik-treated plot had galls, as compared to 64% for the nontreated. The incidence of galls on tubers from plots treated with GC 6506, NIA 10242 and Thimet was 7.12, 8.90 and 7.05% respectively.

Di-Syston has not been registered for use as a fungicide. The maximum amount that can be recommended for potatoes is 30 pounds for the 10 percent active formulation.