DREGSETH, ROBERT J.^{1*}, A. W. ANDERSON,¹ R. B. CARLSON¹, and LARRY J. SMITH², ¹Entomology Department, North Dakota State University, Fargo, ND 58105, and ²Northwest Experiment Station, University of Minnesota, Crookston, MN 56716. - Sugarbeet Root Maggot Control Under Dry-Land Conditions.

ABSTRACT

Sugarbeet production in the Red River Valley of North Dakota and Minnesota is under dry land conditions. Currently, approximately 80% of the American Crystal acreage is treated for sugarbeet root maggot (SBRM) control. The Minn-Dak production area in the southern Valley currently treats approximately 30% of their acreage for this insect problem. In all areas where the SBRM is a problem, the standard but essential recommendation is application of a planting time granular insecticide.

Efficacy trials are established yearly with registered insecticides. Terbufos (Counter 15G), Fonofos (Dyfonate 20G), Diazinon, Chlorpyrifos (Lorsban 15G), and Aldicarb (Temik 15G) are included in these trials. With the exception of Terbufos, all other insecticides are applied in a 5" band over the row and incorporated with drag chains. Terbufos can be applied as a modified in furrow treatment which is also included in the trials. These trials are established yearly in several areas of the Valley to include different soil types and weather conditions.

All of these insecticides provide good control of the SBRM when properly applied at planting. Band applications (5" band) of Terbufos are superior to modified in furrow applications especially during seasons with low rainfall. Fonofos and Diazinon provide good control under good to plentiful moisture conditions; more SBRM damage can be seen in beets treated with both insecticides when dry conditions prevail.

Chlorpyrifos provides excellent SBRM control, however, some phytotoxicity has been observed when Chlorpyrifos is applied in furrow or modified in furrow. Previous research indicated in furrow applications of Chlorpyrifos would result in stunting at the 2-4 leaf stage. Further development was halted for 7-10 days after which the Consequently, band applications of Chlorpyrifos have been beets develop normally. recommended. In 1992, severe phytotoxicity was noted with in furrow applications of this insecticide in research plots and commercial sugarbeets. The characteristic injury symptom was a severe constriction approximately 0.75-1.0 inches below the crown of the sugarbeet seedling, when the plant was in the 6-10 leaf stage of development. On some plants the constriction became so severe that the crown and leaf tissue would break off in windy conditions or when the field was rotary hoed or On sugarbeets that survived, the constriction was highly visible at harvest. dragged. In all cases, injury was noted in modified in furrow applications at the 2 lb.ai/A rate. No injury was noted when the insecticide was banded. Weather conditions in 1992, which made many of the herbicides and insecticides used in sugarbeet production superactive, may have been a primary factory in the injury observed.

As early as 1986, we observed reduced efficacy with aldicarb in SBRM control plots.. By 1990, this was evident in commercial sugarbeets. The problem has been most evident in areas of the Valley where aldicarb has been in general use in commercial

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beets. Further, this problem became obvious during the drought years of 1988-89; seasons characterized by extremely depleted subsoil moisture levels. Coincidentally, new label restrictions regarding crops which can follow in Aldicarb treated fields were implemented. Because of these problems, Aldicarb has been temporarily removed from the recommended insecticide list. We currently have no evidence for Aldicarb resistance in our SBRM populations. Intensive investigation of this problem is underway.

BSTRAC

Red River Valley sugarbeet growers are provided with efficacy data for all registered insecticides from research plots in several growing regions. The selection is theirs. We strongly encourage sugarbeet growers to use recommended rates of insecticide, calibrate accurately, and to develop windscreen protection on planter units to reduce granule movement during windy periods. Band applications are recommended for all insecticides followed by vigorous incorporation of the granules.

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