Insect	Insecticide	Formulation	Dosage Per Acre (Lbs. Active Ingredient)	Min. Days From Last Treatment To Harvest	Safety Restrictions and Remarks
Spider Mites	carbophenothion (Trithion)*	EC	0.5-1.0	14	Foliage application.
	disulfoton* (Di-Syston)	EC	1.0	30	Refer to remarks under Beet Leafhopper.
Webworms	methomyl (Lannate-Nudrin)	L or SP	0.22-0.9	7	Foliage application. Do not feed tops to livestock for 30 days after last application. Make up to 2 - 3 additional applications as needed.
	methyl parathion*	EC	0.25-0.375	20	Foliage application. 60 days to harvest if tops are to be fed to livestock.

*Highly toxic and requires special attention to precautions for safe use. Dust, wettable powder and granular formulations should be handled with special caution to avoid inhalation.

Root Rot of Mature Sugarbeets

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Root rot of mature sugarbeets, caused by the soil-borne fungus *Pythium aphanidermatum*, is one of the limiting factors to production of sugarbeets during the summer months in Central Arizona. Disease prevalence during the summer months varies from field to field (0 to 50% dead) in any given year. Additionally, the onset of root infections during the summer season varies from month to month in any given year.

The ultimate objective of our investigation is to develope a commercially feasible system which can be used to predict the onset of root infection and the disease risk of specific sugarbeet fields. A predictive system would permit the timely rescheduling of a high risk field and/or implementation of cultural procedures which would reduce disease prevalence if rescheduling were not possible. The development of such a system would be based on knowledge of I) the percise environmental factors governing the onset of infection, II) the rate at which new infections are initiated within the sugarbeet population, and III) a method of identifying high risk fields.

Our investigations began in 1978. Results are as follows:

1. Environment factors governing the onset of root infection. Soil temperatures have been monitored for the past three years (1978, 1979, 1980). The onset of root rot occurs when soil temperatures, at the 10 cm soil depth, reach ca. 80°F. These results partially explain the year to year variation in the onset of root infection. For example, root rot did not occur during the 1980 campaign. Soil temperatures, at the 10 cm depth, never exceeded 77°F. In 1978, and 1979, however soil temperatures of 80°F or greater occurred in late June and mid-July, respectively. Root rot was severe in both 1978 and 1979 in some late harvest fields.
2. Death rate. Within one week of the occurrence of the first dead sugarbeet, the death rate is 2% of the healthy sugarbeet population per day. This mortality rate, based on a population of 30,000 plants per acre and a sugar yield of 6,000 lbs. per acre, results in a loss rate of 100 lbs. of sugar per acre per day. Thus, extensive losses can occur if infection occurs within one month before harvest.
3. Identification of high risk fields. A quantitative method, using a selective growth medium, has been developed to estimate the population of the fungus in field soil. In 1980, thirteen fields were assayed. Ten of the fields were infested with fungus populations ranging from 1 to 25 units per gram of soil. The fungus was not found in three of the commercial fields. These results provide an explanation for the field to field variation in disease prevalence in any given year. However, no root rot occurred in 1980 in any field despite the fact that some fields were highly infested. As stated earlier, this was attributed to low soil temperatures in 1980.

Our objectives in 1981 are as follows:

1. To identify high risk fields scheduled for late harvest.
2. To establish the relationship between the level of field infestation, soil temperatures, and disease prevalence. At least 20 commercial fields will be assayed for fungus populations, as previously described, and assigned a risk factor. Soil temperature in both low and high risk fields will be regulated by altering the duration and/or frequency of irrigation. Disease prevalence will be correlated with soil temperatures and soil populations of the fungus.

Effect of Preharvest Applications of 'Pix' on Yield and Sucrose Concentration of Sugarbeets

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Summary

The growth regulator Pix was tested to determine its value as a means of suppressing top growth of sugarbeets prior to and during the early harvest season. Preharvest applications of Pix had no effect on top growth, yield or sucrose percentages of early harvested beets.

Introduction

One of the potential uses for growth regulators in sugarbeet production in Arizona would be to regulate top growth prior to the harvest season. Maximum sucrose concentrations are achieved in most growing areas when top and root growth have been restricted prior to harvest by low night temperatures and nitrogen deficiency.

In central Arizona, temperatures prior to and during the early part of the harvest season are generally favorable for vegetative growth. When excessive soil nitrogen is present during this period, rapid root and top growth can occur. Consequently, although root yields may be relatively high, sucrose concentrations are generally low for early harvested beets. Growth inhibiting chemicals have been tested as a means of suppressing sugarbeet top growth prior to harvest, but so far none have proved effective. Recently, an experimental chemical labeled Pix (1, 1-dimethyl piperidinium chloride) has been shown to be useful for control of vegetative growth in cotton (1). Laboratory studies indicated that Pix can reduce vegetative growth while promoting root growth.

In the 1979-80 season a test was conducted at the Mesa Farm to determine the effect of preharvest foliar sprays of Pix on sugarbeet growth and sucrose concentration. The growth regulator was applied at rates of 0, 15, 30, 60 and 120 g ai/A approximately nine weeks before harvest.

Results

Root yields, sugar yields, sucrose concentration and top yields of beets are shown in Table 1. Preharvest applications of Pix had no significant effect on root yields, sugar yields or sucrose concentration of sugarbeets for early harvest. Excessive nitrogen was available during April and May, resulting in rapid top growth prior to and during early harvest. Pix treatments had no visible or measurable effect on top growth.

Literature Cited

(1) Urwiler, M. J. and J. T. Cothren. 1979. Cotton responses to 'Pix' -- field and laboratory studies. Proc. Plant Growth Regulator Working Group, Aug. 20-24, 1979. p 110-115.