# 1980-81 INSECT CONTROL FOR SUGAR BEETS

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These suggestions for the control of the principal insect pests of sugar beets are in substantial conformity with current state and federal regulations affecting the use and application of pesticides.

The College of Agriculture offers these suggestions to assist you in safe and effective insect control. The user, however, must assume responsibility for proper application of the insecticides and for residues as well as for damage or injury (whether to crop, person or property) caused by insecticides referred here. To avoid excessive residue, follow label directions carefully for dosage levels, method and number of applications, and minimum intervals between applications and harvest.

For safe, effective and economical insect control, these materials must be applied carefully with appropriate equipment and skills. The precautions discussed in this article are an essential part of these suggestions.

Field Reentry Safety Intervals. The Environmental Protection Agency now requires safety waiting intervals between application of certain pesticides and worker reentry into treated fields to prevent unnecessary exposure. These waiting intervals are 48 hours for Ethyl parathion, Methyl parathion, Demeton, Azodrin, Carbofenothion, Metasystox-R, Bidrin, Endrin, and 24 hours for Guthion, Phosalone, EPN, and Ethion. For all other pesticides included in this article it is necessary only that workers wait until sprays have dried or dusts have settled before reentering treated fields. These worker safety intervals are not to be confused with the familiar harvest intervals listed under "Minimum Days from Last Treatment to Harvest".

If it is necessary to enter fields earlier than the required waiting intervals, workers must wear protective clothing: a long-sleeved shirt, long-legged trousers or coveralls, hat, socks and shoes.

Explanation of abbreviations used in tables:

| | | | |
|---|---|---|---|
| B | Bait | WP | Wettable Powder |
| D | Dust | W | Wettable |
| EC | Emusifiable Concentrate | G | Granular |
| F | Flowable | L | Liquid |
| SP | Soluble Powder | | |

| Insect | Insecticide | Formulation | Dosage Per Acre (Lbs. Active Ingredient) | Min. Days From Last Treatment To Harvest | Safety Restrictions and Remarks |
|---|---|---|---|---|---|
| Armyworms | 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. |
| Beet Leafhopper | Observing the beet-free period during the summer is important in controlling this insect and the curly top virus it transmits. It is important to provide a period of time when there are no sugar beets available to serve as a reservoir for either the virus or insect. Beets which escape cultivation or those growing along the roadside or ditch banks should be eliminated, as well as volunteer beets in following crops. | | | | |
| | aldicarb* (Temik) | G | 2.0-3.0 | 90 | At planting: drill granules 1 - 3 inches below seed line. In-furrow application can be made with 1.0 lb./acre rate only. Post emergence: drill granules to one side of row to moisture depth. Do not make more than two applications or exceed 6.0 lb./acre for each crop. Do not harvest within 120 days of last application if tops are to be fed to livestock. Do not use tops as food |

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|---|---|---|---|---|---|
| Beet Leafhopper (Con't.) | | | | | for humans. Do not allow livestock to graze in treated areas before harvest. Do not plant any crop except sugar beets in soil treated with aldicarb within 100 days of last application. |
| | disulfoton* (Di-Syston) | EC | 1.0 | 30 | Foliage application. Soil application; apply water emulsion in seed furrow two inches under seed or inject on each side of seed furrow at planting, or as a side dress after plant establishment. Do not apply in direct contact with seed. Do not apply more than 3 times per season. Allow a minimum of 21 days between application. |
| | | G | 1.0 | 30 | Soil application. Apply granules two inches under seed or in bands on each side of the seed furrow. Foliage application. Apply granules to foliage and crowns. Do not apply more than 3 times per season nor within 30 days of harvest. Allow a minimum of 21 days between applications. |
| | oxydemeton-methyl (Meta-systox-R)* | EC | 0.375-0.75 | 30 | Foliage application. Do not apply more than 3 times per season. Do not use beet tops for feed or forage within 30 days of treatment. |
| | parathion* | EC | 0.3-0.8 | 15 | Foliage application. |
| | phorate* (Thimet) | G | 1.0 | 30 | Apply by drilling or broadcast at seeding. Do not place in direct contact with seed. Do not apply more than twice per season. Do not feed tops or silage to dairy animals. |
| Crickets | carbaryl (Sevin) | B | 2.0 | 14 | Broadcast application. |
| Cutworms | carbaryl (Sevin) | B | 2.0 | 14 | Broadcast application. |
| Flea Beetles | carbaryl (Sevin) | WP | 1.0-2.0 | 14 | Foliage application. |
| | 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. |

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|---|---|---|---|---|---|
| Grasshoppers | carbaryl (Sevin) | WP or B | 0.5-1.5 | 14 | Foliage application. |
| | | | 2.0 | 14 | Broadcast application. |
| | methyl parathion* | EC | 0.25-0.375 | 20 | Foliage application. 60 days to harvest if tops are to be fed to livestock. |
| | parathion* | EC | 0.5 | 15 | Foliage application. |
| Green Peach Aphid | aldicarb* (Temik) | G | 1.0-2.0 | 90 | Refer to remarks under Beet Leafhopper. |
| | disulfoton* (Di-Syston) | EC | 1.0 | 30 | Refer to remarks under Beet Leafhopper. |
| | | G | 1.0 | 30 | Refer to remarks under Beet Leafhopper. |
| | oxydemeton-methyl (Meta-Systox-R)* | EC | 0.375-0.75 | 30 | Foliage application. Do not apply more than 3 times per season. Do not harvest beets or use tops for feed or forage within 30 days of treatment. |
| | parathion* | EC | 0.25-0.5 | 15 | Foliage application. |
| | 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. |
| | demeton* (Systox) | EC | 0.5 | 30 | Foliage application. Apply specified dosage by air or ground in sufficient water for complete coverage but no less than one gallon per acre. Repeat as necessary but not more than 3 times per season nor within 30 days of harvest. |
| | phorate* (Thimet) | G | 1.0 | 30 | Apply by drilling or broadcast at seeding. Do not place in direct contact with seed. Do not apply more than twice per season. Do not feed tops or silage to dairy animals. |
| | | G | 1.0-1.5 | 30 | Foliage application. Apply when plants are dry. Same precautions as above. |
| Leafhoppers | See Beet Leafhoppers. | | | | |
| Root Aphid | No chemical control developed. | | | | |
| Salt Marsh Caterpillar | No chemical control suggested. Use aluminum foil barrier when caterpillars are likely to migrate into field. | | | | |

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| 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.