

## Sugarbeets XX-7-10

### Beet Leafhoppers

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*Sugarbeet leafhopper adult*

The beet leafhopper, *Circulifer tenellus*, is the vector of curly top virus. In the Big Horn basin area of Wyoming and the Yellowstone Valley of Montana, curly top has caused severe economic losses when sugarbeet were infected in epidemic proportions. Curly top virus may also occur sporadically throughout the High Plains sugarbeet growing region. The virus has an extensive crop and weed host range represented by at least 300 species in 44 families. Permanent breeding grounds for the beet leafhopper are areas with low annual precipitation (less than 10 inches), low humidity and desert type vegetation. Beet leafhoppers require a sequence of succulent hosts that they utilize through the winter and spring to survive on when field crop hosts are not available.

#### Identification (life cycle and seasonal history)

Proper identification of the beet leafhopper is essential to correctly estimate population densities. The beet leafhopper is a small insect (0.12 inch long by less than 0.04 inch wide) that is very active at high temperatures. Its color varies from insect to insect and from season to season.

The beet leafhopper can be tentatively identified by the presence of a slightly roof-shaped face that is absent of clearly defined spots. In addition, when viewed through a microscope, the terminal abdominal segments of the male are square-shaped (not round or triangular) and those of the female have a semi-circular appearance. On reasonably warm days (60°F or warmer) the beet leafhopper is more active than other leafhoppers commonly found in the region.

Beet leafhopper females overwinter on hosts found in rangeland and in disturbed areas, such as sagebrush, salt bush, greasewood, filaree, mustards, and Russian thistle. In the spring, the females will lay eggs for an initial generation on hosts available at this time, primarily mustards, kochia, hoary cress, halogeton, and Russian thistle. Beet leafhoppers prefer sparse vegetation that allows maximum sunlight and heat to penetrate through the plant canopy. After the initial generation has been completed, adult leafhoppers will move to summer hosts, which include sugarbeet. They will complete two generations on these summer hosts before moving back to their overwintering hosts in the fall.

#### Plant Damage and Response

Beet leafhopper does not cause significant direct damage to the sugarbeet, but the transmission of curly top virus can result in loss. Curly top virus infections that begin

during the early growth stages of sugarbeet can cause complete or nearly complete losses. Curly top symptoms include the rolling inward and puckering of the leaves along with the swelling and prominent appearance of the veins. Severe infections will result in stunting and possible death of the plants.

## Management Approaches

In areas where the beet leafhopper and curly top virus are a problem, several cultural practices can reduce the potential for leafhopper buildup and damage potential to the crop. Plant as early as possible to insure the sugarbeet plants are at a later growth stage and have a greater tolerance to the virus prior to infection during the season. Plant tolerant varieties in areas with a history of curly top virus. These varieties will limit the impact and help to avoid major losses to the disease. Areas around fields, machinery yards and roads should be kept free of spring host plants for the beet leafhopper. In the Big Horn Basin the primary infestations initially are from areas near sugarbeet fields. In high risk areas insecticide can be added to herbicide sprays when treating weedy areas around sugarbeet fields.

It is important to monitor the beet leafhopper population to determine if control measures are justified. Sensitive tests have been developed for curly top detection, and it is now possible to identify curly top virus sources. Test results can be used to determine the potential role of virus sources in disease development and crop loss. Standardized collection methods must be used to accurately monitor beet leafhopper populations and determine sources of virus. A Wyoming Cooperative Extension Publication entitled "Sugarbeet Curly Top Virus and the Beet Leafhopper" (Publ. No. B-978) gives sampling methods and information on the proper techniques and procedures for leafhopper and virus host sampling.

Leafhoppers can be collected with a sweep net. Sampling must be done only when air temperatures are 60°F or greater to insure adequate leafhopper activity. Determining the leafhopper density will help to establish the virus risk level in the area. Resistant varieties are damaged less by the virus; however, if plants are smaller than the 12-leaf stage, leafhopper densities in adjacent weedy areas are more than one leafhopper per 10 sweeps, and more than eight percent of the leafhoppers are viruliferous, there is still a significant risk to resistant varieties.

### *Product List for Leafhoppers:*

<b>Insecticide</b>	<b>Product per Acre</b>	<b>Preharvest Interval, remarks</b>
Asana XL <sup>R</sup>	5.8-9.6 oz/A	Do not exceed 0.15 lb ai/A per season; PHI 21 days; REI 12 hrs.
Counter 15G <sup>R</sup> , CR <sup>R</sup>	15G: 4.0-8.0 oz./1000 ft. CR: 3.0-6.0 oz./1000 ft.	May be applied banded (PHI 110 days) or knifed in (PHI 150 days); REI 72 hrs.
Methyl 4EC <sup>R</sup> (methyl parathion)	0.5-0.75 pts./A	PHI 20 days (60 days if tops fed to animals); REI 5 days.
Diazinon 50W <sup>R</sup> , AG500 <sup>R</sup>	50W: 0.75-1.0 lbs./A AG500: 0.75-1.0 pt./A	PHI 14 days; REI 24 hrs.
Metasystox-R <sup>R,1</sup>	1.5-3.0 pts./A	PHI 30 days; REI 48/72 hrs.

Sevin <sup>1</sup> (carbaryl, multiple formulations)	See label for rates	PHI 28 days; REI 12 hrs.
Temik 15G <sup>R</sup>	14-20 lbs./A	Apply at planting or post-emergence. <b>Potential for groundwater contamination. See label for environmental precautions and restrictions.</b> PHI 90 days; REI 48 hrs.
Thimet 20G <sup>R</sup>	3.4-4.5 oz/1000 row ft	Apply to side of seed or in band over seed at planting, not in contact with seed. REI 72 hrs.
<b>Seed Treatment</b>		
Gaucho 480	3.0-6.3 oz / unit	If rates exceed 3.0 oz/unit seed must be pelleted.
<sup>R</sup> Restricted use pesticide <sup>1</sup> Labeled for chemigation.		

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