

# **Insect, Nematode, and Disease Control in Michigan Field Crops**

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\*\*This bulletin contains information on the management of field crops insects, nematodes, and diseases, including recommendations for pesticide use. Every attempt is made to verify product names, formulations, use rates, and other important information, but products and labels may change before the field season begins. Always read the label of a product to reconfirm rates, precautions, PPE, and other important information before use.

## SUGARBEET DISEASES

### Rhizoctonia crown and root rot

**Cause:** *Rhizoctonia solani* (fungus). Anastomosis Group (AG) 2-2.

**Symptoms:** First symptoms appear on the petioles of the lower leaves and within the crown as extensive elongated black lesions. Lesions spread to all the leaves and the upper portion of the crown and spread into the root. As the disease progresses in the root the entire plant becomes blackened and loses adhesion with the soil. The disease often occurs along rows affecting adjacent plants.

**Disease cycle:** The fungus over-winters in Michigan although the sexual stage of the fungus is relatively rare. The pathogen survives as fragments of hyphae (threadlike vegetative cells) in plant debris and also as small sclerotia (melanized, bundles of hyphae) in the soil which can survive extreme environmental conditions.

**Conditions favoring the disease:** Under favorable environmental conditions, sclerotia can germinate in the soil at temperatures from about 50°F. Plants are infected early in the season often after cultivation and also after heavy rain which can both deposit propagules of the pathogen in the crown. The disease is further favored by wet conditions during the growing and tends to spread along rows. Levels of crown and root rot vary drastically among different growing regions of Michigan but seem to be more prevalent in heavier clay soils.

**Management:** Rotations greater than three years tend to reduce the impact of crown and root rot. Also, check with your seed supplier for more resistant cultivars which can be immune to crown and root rot. In susceptible cultivars, applications of the strobilurin fungicide azoxystrobin (Amistar 80WG) either as an in-furrow application at planting or foliar banded applications up to the 4-6 leaf stage has proved effective in suppressing crown and root rot.

Consult the label for additional specific information, including re-entry intervals (REI), PHIs, and plant-back restrictions.

**List of registered fungicides, rate per acre or 1000 row feet:**

Amistar 80WG in-furrow at planting 0.125 – 0.25 oz/1000 row feet

Amistar 80WG foliar 3.0 - 5.0 oz

### Cercospora Leaf Spot

**Cause:** *Cercospora beticola* (fungus)

**Symptoms:** Individual leaf spots are roughly circular and can measure from 1/8 to 1/4 inch diameter. The lesions are tan to light brown with red to purple borders. As the disease progresses the lesions can join to form irregularly shaped lesions. Small black dots are often visible within the lesions. In severe cases the leaves turn become chlorotic, and turn brown.

**Disease cycle:** Survives mainly on crop residue left on the soil surface as conidia (spores) and stromata (fragments of hyphae). Under humid conditions conidia are dispersed by wind and splashing rain to leaves where germination occurs and new lesions are formed. Weed hosts can also serve as sources of inoculum, e.g. Lambsquarters and other Chenopodia.

**Conditions favoring the disease:** High temperature (~75 - 90°F) and protracted periods of high humidity (>90%RH) favor all aspects of disease development including expansion of lesions and production of conidia. Little infection occurs below 60°F.

**Management:** Partial resistance to *Cercospora* leaf spot has been developed. Select sugarbeet varieties with resistance to *Cercospora* leaf spot and use them in combination with good management practices to reduce damage caused by this disease. Avoid continuous planting or short rotations. Use longer rotations with non-host plants like vegetables, corn and small grains and attempt to plant new fields at least 300 feet from previous season's fields. There are several fungicides registered for management of *Cercospora* leaf spot however, because fungicide resistant strains of *Cercospora beticola* are known to occur in Michigan, exclusive use of e.g. Topsin should be avoided and should only be used in tank mixture with a mancozeb-containing compound. Fungicides with different modes of action should be alternated during season where more than one application is necessary.

Consult the label for additional specific information, including re-entry intervals (REI), PHIs, and plant-back restrictions.

**List of registered fungicides, rate per acre:**

Eminent 125SL 13 fl oz

Amistar 80WG 3 - 5 oz

Headline 2.09SC 9 – 12 fl oz

Gem 6 – 7 oz

Super Tin 80WP 2.5 – 5 oz

Agri Tin 80WP 2.5 – 5 oz

Topsin 4.5FL 10 – 20 fl oz

Thiophanate-methyl 70W WSB 6 – 8 oz

Farmsaver Thiophanate-methyl 85WDG 6.4 – 12.8 oz

Manzate Flowable 2.4 – 3.2 pint

Dithane Rainshield DF 1.5 - 2.0 lb

DuPont Manzate Pro-Stick 1.5 - 2.0 lb

Maneb 75DF 1.5 - 2 lb Maneb 80WP 1.5 - 2 lb

Penncozeb 80WP 1.5 - 2 lb

Penncozeb 75DF 1.5 - 2 lb

Penncozeb 4FL 2.4 – 3.2 pint

ManKocide 2.5 – 6.5 lb

Kocide 101 2 - 5 lb

Kocide 4.5LF 1.33 – 3.33 pint

Champion Wettable Powder 2 – 5 lb

Champ Formula 2 Flowable 1.33 – 3.33 pint

Champ Dry Prill 1.33 – 3.33 lb