Diseases of Turnip and Mustard Greens

Introduction

Greens is the common name for the eatable leaves of turnips, mustard, collards and related Brassica spp. (mustard family). Greens have long been a popular addition to the early fall garden. These plants are easy to grow but are susceptible to several fungal and bacterial leaf spot diseases when environmental conditions are favorable for infection.

Common diseases of greens in Arkansas include:

- **Anthracnose**
  (Colletotrichum higanensis)
- **Cercospora leaf spot**
  (Cercospora brassicicola)
- **White spot**
  (Pseudocercosporella capsellae)
- **Downy mildew**
  (Peronospora parasitica)
- **Bacterial leaf spot**
  (Pseudomonas maculicola)

Disease Development and Spread

Foliar diseases of greens are spread by wind or rain and are strongly favored by wet conditions. Anthracnose survives on volunteer plants, dead leaves and related weed hosts and is most severe during wet conditions with warm temperatures between 79º-86ºF (warm, rainy periods during August and September). The pathogens that cause Cercospora leaf spot and white spot survive on volunteer plants, perennial weeds and less commonly on infected seed. Cool temperatures of 55º-64ºF and frequent rain, heavy dew or overhead irrigation increase both diseases. Night temperatures of 46º-61ºF with daytime temperatures below 75ºF favor downy mildew. The downy mildew fungus overwinters on Brassica spp. residue and is also more severe under frequent wet conditions. Bacterial leaf spot is favored by cool weather where
daytime highs only reach 65°-75°F. The bacterial leaf spot pathogen can survive on crop residue for several years and on seed. Weather conditions in late September or during October and November in Arkansas favor all diseases except anthracnose (earlier disease).

**Symptoms**

*Anthracnose attacks turnips, mustard, broccoli, collards and kale. Symptoms are small, gray- to straw-colored circular spots on the leaves and petioles (Figure 1). Lesions on the stalks are sunken, elongated and gray to brown with a black border.*

*Symptoms of white spot include circular spots with gray, brown or nearly white centers on cotyledons, leaves and petioles (Figure 2). Edges of the lesions may become slightly darkened with age. Leaves turn yellow and drop prematurely with this disease. Mustard, collards and turnip greens are all susceptible. Seedlings may be killed outright if the disease is severe at emergence.*

*Cercospora leaf spot lesions are pale green to gray or white and angular in shape (Figure 3).*

*Bacterial leaf spot symptoms begin on leaves as numerous pinpoint-sized and irregular brown spots with yellow halos. This stage is difficult to see on the upper leaf surface, whereas water-soaked brown spots are clearly visible on the leaf underside. As the disease progresses, the many small spots coalesce into large, brown papery areas with yellow borders that tear, giving the plant a ragged appearance (Figure 5).*

**Disease Control**

- Start with a soil test before planting and fertilize according to test results to ensure adequate, balanced fertility.
- Plant in warm, well-drained and tilled soil.
- Plant certified clean seed and healthy transplants. If certified seed is not available, use an approved seed treatment.
- Practice good weed control in and around the field. Remove all volunteer crucifer (*Brassica* spp.) weeds such as wild mustards, shepherd’s purse, pepper-grasses and wild radish.
- Practice crop rotation and do not grow crucifers again for at least three years on the same spot.
- Monitor and use pesticides as necessary for insect and disease control (see Table 1).
- Remove any diseased plants immediately, if possible, to prevent disease buildup and spread.
- Till all old crop debris immediately after harvest to allow time to rot.
- Avoid overhead sprinkler irrigation if possible as this makes disease worse. Work in the fields only when leaves are dry to prevent spreading disease with your hands, tools or clothing.
Figure 4. Visible white fungal mats on the underside of leaves are evidence of downy mildew.

Photo by David B. Langston, University of Georgia, Bugwood.org

Figure 5. Bacterial leaf spot progresses into large, brown papery areas with yellow borders giving the plant a ragged appearance.

Photo by Sherrie Smith, University of Arkansas Division of Agriculture

**Table 1. Fungicides (0 = ineffective, 4 = very effective)**

<table>
<thead>
<tr>
<th>Commercial Production</th>
<th>Preharvest Internal (DAYS)</th>
<th>Downy Mildew</th>
<th>White Spot Cercospora Leaf Spot</th>
<th>Anthracnose</th>
<th>Bacterial Leaf Spot</th>
</tr>
</thead>
<tbody>
<tr>
<td>azoxystrobin (Amistar, Quadris)</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>cyprodinil + fludioxonil (Switch)</td>
<td>7</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>fixed copper (Kocide)</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>maneb (Manex)</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>pyraclostrobin (Cabrio EG)</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

**Home Gardens**

| Copper hydroxide (Kocide) | | | | | |
|--------------------------| | | | | |
| 0 | 2 | 1 | 1 | 3 |

**Disclaimer: THE LABEL IS THE LAW.** The above information should be used as a general guide on effectiveness, but actual use and other factors are strictly governed by the registered and latest label on the product. Always read and follow the label. This information is for educational purposes only and was as accurate as could be determined as of November 2012. The University of Arkansas Division of Agriculture makes no purposeful distinctions between brands or products mentioned, except where scientific research has been published to indicate differences.
References


