

brown lesions in the crown area. These become conical areas of black rot, both in the field and in storage.

#### Cultural control

- Maintain proper water and nutrient levels during the growing season.
- Avoid wounding roots.

#### Chemical control Seed treatments.

- Captan 400 at 6 fl oz/100 lb seed plus a dye.
- Thiram 50WP dyed at 8 oz/100 lb seed (not labeled for Oregon) or 42-S Thiram at 8 fl oz/100 lb seed plus a dye. See label for reentry restrictions.

### Sugar Beet (*Beta vulgaris*) — Phytophthora Root Rot and Pythium Root Rot

**Cause** The fungus-like soilborne organisms, *Phytophthora drechsleri* and *Pythium aphanidermatum*, cause root rot primarily in waterlogged soils at high temperatures. Low areas of the field are where these two diseases are most often found.

**Symptoms** A brown-black wet rot begins on the lower taproot and progresses upward.

#### Cultural control

- Maintain good soil drainage.
- Do not over-irrigate.

### Sugar Beet (*Beta vulgaris*) — Powdery Mildew

By John Gallian and C. M. Ocamb

**Cause** The fungus, *Erysiphe polygoni* (*E. betae*), affects plants in the Polygonaceae. The disease has been widespread in several Western States since 1974. Fungal spores may blow in from overwintering sources. Overwintered infected seed beets may also be sources of infections. The fungus tolerates a wide range of environmental conditions.

**Symptoms** Small, discrete, white patches on both leaf surfaces. Patches coalesce until white mycelium and spores cover the entire leaf. Leaves later become yellow, then purplish brown, and finally necrotic.

**Chemical control** Begin applying when mildew is first observed. If necessary, repeat application to maintain 10% or less leaf area diseased throughout the growing season. Sulfur dust provides superior control to liquid applications and is the preferred treatment. Research in south-central Idaho indicates it is economically feasible to apply sulfur to fields developing initial powdery mildew infections up to 5 weeks before harvest (or about September 1 in that area).

- Bicarbonates are registered to control powdery mildew. Thorough coverage is essential.
  - » Kaligreen at 2.5 to 3 lb/A at 7- to 10-day intervals. Might supplement a normal program when powdery mildew is first observed. May be applied up to the day before harvest. 4-hr reentry. ☒
  - » MilStop (85% potassium bicarbonate) at 2 to 5 lb/A. 1-hr reentry.
- Demethylation-inhibiting (DMI) Fungicides (Group 3) are labeled for use. Do not make more than one (1) application before alternating to a labeled fungicide with a different mode of action.
  - » Eminent 125 SL at 13 fl oz/A. Do not apply within 14 days of harvest. 12-hr reentry.
  - » Inspire XT at 7 fl oz/A on 10- to 21-day intervals. Preharvest interval is 7 days. 12-hr reentry.
  - » Proline 480 SC at 4.3 to 5.7 fl oz/A on 14- to 21-day intervals. Preharvest interval is 7 days. 48-hr reentry.

- » Tilt at 4 fl oz/A on 10- to 14-day intervals. Preharvest interval is 21 days. 12-hr reentry.
- Strobilurin fungicides (Group 11) are labeled for use. Do not make more than one (1) application of a Group 11 fungicide before alternating to a labeled fungicide with a different mode of action.
  - » Gem at 6 to 7 oz/A on 10- to 14-day intervals. Do not apply within 21 days of harvest. 12-hr reentry.
  - » Headline at 9 to 12 fl oz/A. Preharvest interval is 7 days. 12-hr reentry.
  - » Quadris Flowable at 9 to 15.5 fl oz/A on 7- to 14-day intervals. May be applied the day of harvest. 4-hr reentry.
- Sulfur dusts give better coverage than liquid formulations. Sulfur is manufactured under many trade names, and a few are listed here.
  - » Kumulus DF at 10 to 20 lb/A. 24-hr reentry. ☒
  - » Sulfur 6L (52% sulfur) at 0.66 gal/A at 18-day intervals. 24-hr reentry.
  - » Dusting Sulfur (98% sulfur) at 35 to 50 lb/A each application.
  - » Thiolut Jet (80% sulfur) at 10 to 20 lb/A on 10- to 30-day intervals. 24-hr reentry.
- Switch at 11 to 14 oz/A on 7- to 10-day intervals. No more than two (2) sequential applications alternating with another fungicide with a different mode of action for two (2) applications. Do not allow cattle or other livestock to feed upon leaves of vegetables. Do not apply within 7 days of harvest. 12-hr reentry
- Topsin M WSB at 0.5 to 1 lb/A. Do not use alone; use another non-benzimidazole fungicide with Topsin M WSB for disease resistance management. Resistant strains can persist for many years. It is preferable to not apply more than once during the season. Make alternating applications with a non-benzimidazole fungicide. Do not apply within 21 days of harvest. 12-hr reentry.
- Trilogy at 0.5 to 2%. Do not use above 90°F or when plants are under heat or moisture stress. Do not use when foliage is wet as good coverage is essential. Poor control as a stand-alone product. 4-hr reentry. ☒

**References** Braun, U. 1995. The Powdery Mildews (Erysiphales) of Europe. Gustav Fischer, New York, 377 pp.

Whitney, ED, and Duffus, JE. 1986. Compendium of Beet Diseases and Insects. St. Paul, MN: APS Press.

### Sugar Beet (*Beta vulgaris*) — Ramularia Leaf Spot

**Cause** *Ramularia beticola*, a fungus. Most likely it is seedborne. It is believed to persist in beet debris at least 1 year. The disease is not considered an economic problem.

**Symptoms** Leaf spots, which occur on older leaves, are light brown and fairly large (4 to 7 mm). As they mature, they develop a gray to white center (sporulation of the fungus) and a dark to reddish brown margin.

#### Cultural control

- At least a 3-year rotation out of beets is helpful.

**Chemical control** Materials labeled for Cercospora leaf spot should help to control Ramularia leaf spot.

- Eminent 125 SL at 13 fl oz/A. Do not make more than one (1) application of Eminent (triazole fungicide) or other Group 3 fungicide before alternating to a labeled fungicide with a different mode of action. Do not apply within 14 days of harvest. 12-hr reentry.