Powdery Mildew on Roses

Natalie Goldberg
Extension Plant Pathologist

New Mexico State University
Cooperative Extension Service

Photo: www.mastergardeners.org
Powdery Mildew

- Very common and damaging disease on roses worldwide
- Caused by the fungus, *Podosphaera pannosa*
- Also infects stone fruits (peach, apricot, cherry, almond…)
- Obligate parasite – needs living tissue to grow
- Reduces leaf growth and photosynthetic efficiency, weakens plants, reduces flowering and decreases aesthetic beauty
Powdery Mildew

- Early symptoms – raised blisters on the top side of the leaf
- Most noticeable symptom – white, powdery growth on the plant surface (both leaf surfaces, stems, flowers…)
- Eventually, infected leaves may become distorted or curled, and new leaves are dwarfed

Photo: N. P. Goldberg, NMSU

Photo: Jari Poutanen
Powdery Mildew

- Only the above ground plant parts are affected
- Vast majority of the pathogen is on the outside of the plant
- Massive amounts of conidia survive as “repeating spore” and spread disease in season
Powdery Mildew

• Overwintering structures, cleistothecia, may be produced late in the season
  – Spores produced from cleistothecia start new infections the following spring

• In “mild” winters, the fungus can overwinter as mycelium on canes and in rudimentary leaves or bud scales

Photo: agf.gov.bc.ca

Photo: Magnus Gammelgaard, Plante-doktor.dk

Photo: University of Kentucky

Photo: University of Kentucky
Powdery Mildew

• Spores germinate when humidity is very high (97-99%)
• Infection develops under conditions of high humidity at night (>90%), moderate humidity during the day (>40%) and warm temperatures (60-80 F)
• Germination to new spore development can occur in as little as 72 hours
• Other factors that influence disease development include:
  – poor air circulation (over-crowding, planting location)
  – cloudy conditions
  – heavy shade
  – Overall condition of plant at the time of infection
  – Cultivar
Management of Powdery Mildew

- PREVENTION!!
- Plant tolerant cultivars
  - Many cultivars have good resistance, but...
  - Fungus has the ability to change to be virulent on tolerant cultivars so new ones are constantly being developed and released

Photo: texassuperstar.com
Management of Powdery Mildew

• **PREVENTION**

• Reduce humidity/increase air circulation – reduce canopy, reduce over-crowding, increase light

• Good sanitation practices: prune out infected canes, remove fallen leaves, and destroy all infected plant material

• Good cultural practices – proper watering (avoid water on leaves at night) and fertilizer (especially avoid excessive nitrogen)

• Rinse plants with water*
Management of Powdery Mildew

• PREVENTION
• Use of protective (contact) and systemic fungicides* – timing is critical for good control and repeat applications may be necessary depending on environmental conditions

<table>
<thead>
<tr>
<th>Organic</th>
<th>Inorganic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfur</td>
<td>Myclobutanil (Immunox®)</td>
</tr>
<tr>
<td>Oils: Horticultural oils (dormant season); neem oil, jojoba oil</td>
<td>Propiconazole (Systemic Fungicide®)</td>
</tr>
<tr>
<td>Beneficial microorganisms (Serenade® - a bacterium)</td>
<td>Tebuconazole (Disease Control of Roses, Flowers and Shrubs®)</td>
</tr>
<tr>
<td>Baking soda (sodium or potassium bicarbonate) (GreenCure®) or homemade</td>
<td>Triforine (Rose &amp; Shrub Disease Control®, Funginex)</td>
</tr>
<tr>
<td></td>
<td>Thiophanate-methyl (3336®, Halt®)</td>
</tr>
</tbody>
</table>

*Fungicide list is provided only to give an idea of registered products. It is not all inclusive. No endorsement of products is given nor are recommendations being made. Always read and follow all label instructions when using any pesticide.