

Floral Diseases

Disease, Symptoms	Cultural Control	Fungicide*
<p>Rust</p> <p><u>Symptoms:</u> On geranium, reddish-brown pustules appear in concentric rings on underside of plant. On fuchsia, red leaf spots appear with yellow-orange pustules. On snapdragon, reddish-brown pustules form on underside of leaves.</p>	<p>Discard infected plants. Keep leaves dry.</p>	<p>azoxystrobin, kresoxim methyl, mancozeb, myclobutanil, oxycarboxin, propiconazole, triadimefon, trifloxystrobin</p>
<p>Botrytis Blight (Gray Mold)</p> <p><u>Symptoms:</u> Grayish mold visible on above ground plant parts. Old leaves, injured leaves and stems are particularly susceptible.</p>	<p>To reduce relative humidity: vent greenhouse at dusk to bring in cooler, drier air and heat. Use horizontal air flow fans especially at night and on overcast days. Irrigate by drip or bottom water. Space plants to improve air circulation and reduce senescence of lower leaves. Remove dead and dying leaves daily and place in a garbage can with a lid.</p>	<p>azoxystrobin, chlorothalonil, fenhexamid, fludioxonil, mancozeb, iprodione, thiophanate, trifloxystrobin, vinclozolin</p>
<p>Powdery Mildew</p> <p><u>Symptoms:</u> White, powdery fungal growth on leaves, stems, flower buds and/or petals. New growth may be stunted, distorted.</p>	<p>See control measures listed under Botrytis blight.</p>	<p>azoxystrobin, kresoxim methyl, myclobutanil, piperalin, thiophanate methyl, triadimefon, trifloxystrobin, triflumizole</p>
<p>Pythium Root Rot</p> <p><u>Symptoms:</u> Roots are decayed and discolored. Plants may wilt even though soil moisture is adequate.</p>	<p>Use soil-less growing mixes, that drain well. Do not overwater. Sanitation is important; use clean pots, flats and tools.</p>	<p>etr Diazole, fosetyl AI, mefenoxam, potassium salt of phosphoric acid, propamocarb</p>
<p>Black Root Rot</p> <p><u>Symptoms:</u> Infected plants are often chlorotic and stunted.</p>	<p>Reduce stress during hot weather. Sanitation is important; use clean pots, flats and tools.</p>	<p>fludioxonil, thiophanate methyl, triflumizole</p>

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<p>Rhizoctonia Stem Rot & Damping Off</p> <p><u>Symptoms for Stem Rot:</u> Distinct lesions form on stem at soil line. Young plants may be killed; older plants may be stunted.</p> <p><u>Symptoms for Damping Off:</u> Young seedlings are attacked at soil line and fall over. Circular areas of dead plants develop in flats.</p>	<p>Use a soil-less mix. Use clean pots, flats, and tools.</p>	<p>azoxystrobin, fludioxonil, flutolanil, iprodione, PCNB, thiophanate methyl, triflumizole, trifloxystrobin</p>
<p>Leaf Spot Diseases (Alternaria, anthracnose, black spot, Cercospora, Myrothecium leaf spot and blight) Purple, brown to black leaf spots on foliage. Check plugs closely for signs of disease. Buy only disease free plants. Leaf spot diseases can be difficult to control.</p>	<p>Keep foliage as dry as possible. Irrigate with drip irrigation. Discard heavily infected plants.</p>	<p>azoxystrobin, chlorothalonil, fludioxonil, iprodione, kresoxim-methyl mancozeb, myclobutanil, thiophanate methyl</p>
<p>Downy Mildew May be found on snapdragon, pansy and rose. Damage may appear as leaf spots with fungal growth under infected leaves.</p>	<p>Vent cool, humid air. Use fans to keep air moving and foliage dry. Destroy heavily infected plants.</p>	<p>azoxystrobin, dimethomorph, fosetyl Al, kresoxim methyl, potassium salt of phosphoric acid, trifloxystrobin</p>
<p>Foliar Nematode Water soaked lesions on shade loving perennials such as hosta and anemone; also on African violet and begonia. May cause distorted growth.</p>	<p>Propagate only nematode free plants. Sanitation is important. Prevent splashing water.</p>	<p>chlorfenapyr</p>
<p>Disinfectants Use to disinfect inanimate objects such as pots, flats, benches, walkways etc.</p>	<p>Preclean all surfaces prior to disinfection</p>	<p>Quaternary ammonium chloride disinfectants.</p>
		<p>Hydrogen dioxide (peroxide) disinfectant.</p>

*For each disease, consult the pesticide label for the following information: target disease, target host, cropping system (nursery, greenhouse, commercial or residential landscape), rates, use intervals, compatibility with other pesticides, information on resistance management, mammalian toxicity and phytotoxicity, and other valuable information.

Crop Rotation Guidelines for Bedding Plants/Landscape Beds

One method of managing bedding plant diseases is crop rotation. If you have experienced chronic problems with one of the following diseases in a landscape bed, choose a host that is resistant (**R**) or only slightly susceptible (**SS**).

Host	Phytophthora Crown Rot	Rhizoctonia Stem Rot	Black Root Rot	Botrytis (gray mold)	Pythium Root Rot	Root Knot Nematode	Powdery Mildew
Vinca*	HS	SS	S	R	R	R	R
Impatiens	SS	HS	R	R	S	HS	R
Begonia	SS	S	R	R	R	HS	S
Salvia	HS	R	R	R	R	R	R
Petunia	S	S	S	HS	S	SS	R
Coleus	S	R	R	R	S	HS	R
Pansy	HS	R	HS	S	R	S	R
Marigold	R	R	R	HS	R	R	R
Snapdragon	HS	S	R	S	S	HS	S
Geranium	S	R	R	HS	HS	?	R
Zinnia**	R	S	R	SS	R	R	S

*Vinca (Madagascar periwinkle) is very susceptible to foliar phytophthora blight.

***Zinnia linearis* is resistant to powdery mildew. The 'Profusion' series of zinnia is also resistant to powdery mildew.

HS = Highly susceptible, control measures needed; **S** = Susceptible, some damage when conditions are very favorable for disease, generally little damage; **SS** = slightly susceptible, rarely causes damage; **R** = resistant

***The information in this table was supplied by Dr. R. K. Jones, Professor Emeritus, Plant Pathology, North Carolina State University.