



BEDDING PLANT APPLICATION GUIDELINES

October 2002

The broad-spectrum disease control of Phyton-27® helps take the guesswork out of your pesticide applications. Control the toughest bacterial and fungal diseases on all your annual and perennial bedding plants.

Alternaria *Dusty Miller & Impatiens*

Alternaria causes a leaf spot characterized by tiny, water-soaked areas on the leaves that turn into spots with brown centers, and concentric rings of light and dark brown.

Control - Apply Phyton-27® as a foliar spray. Phyton-27® gave good to excellent control of *Alternaria* leaf spot on impatiens and dusty miller in trials conducted by Dr. Ann Chase, Chase Research Gardens.

Botrytis *All Annuals & Perennials*

Botrytis, commonly referred to as gray mold, is found virtually everywhere plants are grown, causing leaf spot and blight. The spores persist in crop debris and readily attack fading flower and plant parts and damaged plant tissue. Cool, humid conditions are favorable for disease development and spread.

Control - For optimal control of *Botrytis*, combine applications of Phyton-27® with good sanitation and environmental controls to reduce humidity and free moisture on the plant surfaces.

Resistance Management - Control of *Botrytis* has been complicated by the appearance of resistant strains. Phyton-27® is an invaluable tool for control of *Botrytis* without inducing resistance. Use Phyton-27® by itself or in rotation with other fungicides for effective resistance management in a broad-spectrum disease control program.

Cercospora *Pansy*

Cercospora leaf spot is a common disease on pansy. This fungus causes purple lesions that have a weblike or feathery appearance. The first symptoms are typically found on the older, lower leaves. Tiny purple spots or flecks appear on the upper leaves as the disease progresses.

Cercospora likes warm, wet conditions so it most often occurs in the spring and fall on outdoor pansy crops, but can be found anytime on greenhouse-grown pansy crops.

Control - Apply Phyton-27® as a foliar spray at 7 to 14 day intervals. When disease is visibly present, remove severely infected plants and debris to reduce inoculum and spread.

Downy Mildew *All Annuals & Perennials*

Downy mildews primarily cause foliage blights that attack rapidly in young tender green tissues. Infection is favored by cool temperatures, high humidity and leaf wetness. Heavy precipitation, fog and dew tend to increase the disease incidence making fall, winter and early spring prime times for disease development.

The downy fungal growth is only visible on the under surface of the leaves, with a corresponding discolored area on the upper surface of the foliage.

Control - Apply Phyton-27® as a foliar spray. Preventive applications or early detection with therapeutic applications is essential for optimal control.

Powdery Mildew *All Annuals & Perennials*

Powdery mildew is one of the most troubling diseases of annual and perennial bedding plants because the symptoms, patches of frosty white growth on the upper surfaces of the leaves, are so obvious and unsightly. Cool nights and dry, sunny days favors development of powdery mildew, particularly on verbena, begonia, zinnia and snapdragon. Phyton-27® has broad labeling for powdery mildew prevention and control on all annual and perennial bedding plants.

Control - Apply Phyton-27® as a foliar spray. Use of low volume equipment is effective for preventive applications but may not be effective against established powdery mildew infections.

Rust *Geranium, Hollyhock & Snapdragon*

Rust fungi usually appear as pale spots on the upper leaf surface with pustules containing the rusty reddish to brown spores on upper and lower leaf surfaces. Spores are spread by rain, splashing water and wind.

Snapdragons rust, (*Puccinia antirrhini*), tends to be more of a problem on outdoor grown plants than on greenhouse grown plants. Cool conditions foster infection and warmer conditions speedup spore production. Temperatures between 55° and 70° F are ideal for epidemic development.

Geranium rust, (*Puccinia pelargonii-zonalis*), is more often seen on cutting geraniums but seedling geraniums are also susceptible. Scented, regal and ivy geraniums don't get rust. Infection occurs readily when leaves stay wet for 5 to 6 hours and temperatures are 54 to 75F.

Hollyhock rust, (*Puccinia malvacearum*), symptoms start on the lower leaves and progress up the plant. This rust does not need an alternate host to complete its life cycle, but it can survive and spread from other hosts, such as various mallows also in the Malvaceae family, that are present in the growing area.

Control - Apply Phyton-27® as a foliar spray. Preventive applications or early detection with therapeutic applications is essential for optimal control.

Phyton-27® is a great tool for cleaning up incoming cuttings and plugs by inhibiting germination of rust spores that may have escaped detection by the propagator/supplier.

Phytophthora

Pansy & Periwinkle

Phytophthora is a common soilborne fungus which causes root, crown or stem rots. Cool, wet soils with poor drainage favor disease development. In warm weather, *Phytophthora* can cause blight of stems and foliage on some bedding plants. Vincas, marigolds and petunias are most commonly infected.

Control - Apply Phyton-27® as a spray or drench to control *Phytophthora* infections above and below the soil line.

Pythium

Pansy

Pythium is a soilborne fungus that causes root rot or damping off. *Pythium* species are very common and cannot be eliminated from production areas. This fungus survives in soil, on anything containing soil, and in contaminated water supplies. High soluble salt concentrations in the growing medium, overwatering and excessive overhead misting during propagation provide ideal conditions for *Pythium* infection.

Control - Apply Phyton-27® as a drench to control *Pythium* root rot and damping off on pansy.

Xanthomonas

Begonia, Geranium, & Zinnia

Xanthomonas campestris can cause bacterial leaf spot and blights on a variety of bedding plants. The bacteria become systemic in many host species including begonia and geranium. Bacterial blight on begonias affects the leaves and stems and is intensified by high temperatures and high humidity. Wet conditions with high humidity also favor development of leaf spot on zinnia.

Control - Remove systemically infected plants from the growing area. Apply Phyton-27® as a foliar spray. Combine applications with good sanitation, good ventilation and irrigation practices to minimize splashing and foliage wetness. See the Phyton-27® Geraniums Technical Bulletin for detailed information on management of *Xanthomonas* blight on geraniums.

Pseudomonas

Chrysanthemum, Geranium, Impatiens, & Zinnia

Under cool, stress-producing conditions, bedding plant plugs, particularly impatiens, will show signs of *Pseudomonas* bacterial leaf spot. When the weather warms up, the spots usually disappear.

Control - Apply Phyton-27® as a foliar spray. Combine applications with good sanitation, good ventilation and irrigation practices to minimize splashing and foliage wetness.

Erwinia

Daylily & Hosta

The *Erwinia* bacterium causes a soft rot on daylily and hosta. A soft, mushy rot associated with a foul odor is diagnostic of this disease, and can occur on roots, storage organs, crowns and foliage.

Control - Apply Phyton-27® as a spray or drench to prevent and control *Erwinia* soft rot. Remove rotted plants before application and treat the remaining crop to stop and active infection.



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