Preventing Pest Problems During Propagation

Leanne Pundt
Extension Educator

During propagation, growers may suffer losses due to diseases or insects. This article will discuss potential problems on vegetatively propagated material including geraniums, impatiens and bedding plants.

Prevention

Prevention with a thorough sanitation program is the first step in pest management. If possible, the propagation area should be separated from the main growing area. This will help to reduce the emigration of flying insects, windblown spores or weed seeds. A screen may be used to isolate a propagation section of a greenhouse from the main production area.

Walkways, tools, benches and growing containers should be disinfected. Growers should select vigorous disease-free cuttings and use a sterile well-drained growing media. The propagation area should be free of weeds and plant debris.

Pythium and *Botrytis*

Geraniums may become infected with *Pythium*, *botrytis* blight and bacterial blight. Black leg caused by *Pythium* sp. may affect cuttings or young plants. At first, growers may see brown water-soaked lesions that develop at the cutting base. These lesions darken to coal black and progress up the stem from its base. *Pythium* infection may be confused with *botrytis* blight or bacterial blight. Cuttings infected by *Botrytis* blight tend to be dark brown in color. Black leg has more of a water-soaked appearance and develops more rapidly than bacterial blight. Growers should use a well-drained growing media and avoid

overwatering. Maintaining a root zone temperature between 60° to 65°F will help discourage *Pythium.*

Botrytis blight caused by *Botrytis cinerea* is favored by high humidity levels. Fuzzy grayish-brown spores (conidia) form under humid conditions and are easily spread by air currents or splashing water. Wounded tissue is more susceptible to attack by *Botrytis.* Stubs left after cuttings are taken from stock plants, flower petals and injured leaves are the primary sites of infection. On impatiens cuttings, *Botrytis* colonizes weakened scorched leaf tips. Geranium seedlings grown under cool moist conditions are susceptible to *Botrytis* blight.

Recently, researchers monitored the concentrations of *Botrytis* spores in propagation areas. They found that the highest concentrations of spores were present in the air when growers were irrigating and fertilizing stock plants, spraying pesticides, cleaning benches and harvesting cuttings. During the seven- to 12-day period between the planting of geranium cuttings and application of a fungicide, cuttings were exposed to peak levels of *Botrytis* spores. Spore levels increased as the cuttings matured.

The first step in *Botrytis* prevention is to provide adequate ventilation and heating to lower humidity levels. Adequate plant spacing is important to improve air circulation and help prevent leaf and flower petal infections from spreading to adjacent plants. Fungicides are a useful tool to supplement environmental management. However, certain *Botrytis* populations may develop resistance to fungicides that are used repeatedly in a spray program.

Dr. Moorman, from Pennsylvania State, has reported *botrytis* populations resistant to dicarboximide fungicides (Ornalin and Chipco 26019) or benzimidazole fungicides (Benlate, Cleary's 3336 and Domain). Growers should assess treatment effectiveness, especially if a fungicide has initially worked well with declining effectiveness though the season. If resistance is a problem, Dr. Moorman suggests that growers use dicarboximide fungicides when high levels of control are needed, perhaps only once during the bedding plant season.

Bacterial Blight

An occasional wilted leaf may be the first symptom of bacterial blight. Symptoms become more obvious in the

spring as temperatures and plant handling increase. Look for small (less than 1/8 of an inch) round brown leaf spots within a v-shaped wedge. Because there is no control, diseased plants must be rogued. (For more information on preventing bacterial blight, see "Spring Cleanup Advance" in *CGNL* issue #182.)

Damping-off

Damping-off is the most serious problem affecting bedding plant seedlings. Soil-borne fungi such as *Pythium* or *Fusarium* or *Rhizoctonia* may cause damping-off. These soil-borne fungi are difficult to eradicate from the greenhouse environment.

There are two major types of damping-off, pre-emergence damping-off and postemergence damping-off. In pre-emergence damping-off, seed decay occurs before germination. In post-emergence damping-off, seedlings rot just below the soil line. Older plants may develop fungal stem and root rots.

Damping-off is favored by excessive soil moisture and overcrowded seed beds. Before germination, low soil temperatures (below 68°F) favor damping-off. After germination, high soil temperatures (above 77°F) favor damping-off. The use of bottom heat will help to maintain media temperatures between 70° and 75°F to aid in seed germination.

If damping-off is detected early, growers may discard an isolated infested flat or spot treat. Broad spectrum treatment may be needed, but first, growers should consult the label for information on crop sensitivity to fungicides. Fungicide treated seed may be another option for management.

Researchers are investigating the use of beneficial fungi against damping-off. Currently, a beneficial fungus, Glioguard (*Gliocladium virens*) is labeled for use against *Pythium* and Rhizoctonia damping-off. Growers need to allow one day for incubation of *G. virens* before seeding or transplanting. Glioguard should not be used with chemical fungicides.

Recently, researchers evaluated Glioguard against damping-off on celosia, geranium and zinnia. Overall, fungicides were more effective than Glioguard. *G. virens* was more effective against damping-off on the faster

germinating zinnias and celosia than the slower germinating seedling geraniums.

Fungus Gnats and Shoreflies

The moist environment common to propagation areas encourages both fungus gnats and shoreflies. Fungus gnats may cause direct plant injury, especially on thick-stemmed cuttings such as geraniums and sedum. Losses from 20% to 40% have been reported in propagation areas. Fungus gnats help transmit *Pythium sp.* and *Thielaviopsis basicola* (the causal agent of black root rot on pansy).

Thrips

Thrips tend to be less of a problem in propagation areas due to the use of intermittent mist, which makes it difficult for the delicate winged adults to fly. The tolerance level for thrips is zero, due to their role as vectors of impatiens spotted necrotic virus (ISNV). If possible, growers should isolate seedling propagation from vegetatively propagated ornamentals to reduce the possibility of vul-nerable seedlings becoming infected with ISNV.

Thoroughly clean propagation areas and carefully monitor incoming plant material to reduce pest problems this spring.

References

Douglas, S.M. 1993. Update on Diseases of Bedding Plants. *Connecticut Greenhouse Newsletter.* 178:1-9

Hausbeck, M.K. and S.P. Pennypacker. 1991 Influence of grower activity and disease incidence on concentrations of airborne conidia of *Botrytis cineraria* among geranium stock plants. *Plant Disease* 75(8):798-802.

Lumsden, R.D., J.C.Locke, J.A. Lewis, S.A. Johnson, J.L. Peterson and J.B. Ristaino. 1990. Evaluation of *Gliocladium virens* for biocontrol of *Pythium* and *Rhizoctonia* damping-off of bedding plants at four greenhouse locations. 1988-1989. *Biological and Cultural Tests* 5 90.

Moorman, G.W. and R.J. Lwase. 1994. *Biology and Control of Fungicide-Resistant* Botrytis cinerea *(Gray Mold) in the Greenhouse.* Bedding Plants Foundation Research Report F-9402.

Vali, R.J. and G.W. Moorman. 1991. Influence of selected fungicide regimes on frequency of dicarboximide-sensitive strains of Botrytis cinerea. *Plant Disease* 76(9):919-924.