

## Diseases of Specific Florist Crops

### Bedding Plants (Annuals and Perennials from Seed)

- **Bacterial leaf spots:** Bacteria (*Pseudomonas* sp.) can cause irregular water-soaked areas on leaves of impatiens and New Guinea impatiens under wet conditions. *Pseudomonas* leaf spots on impatiens are variable in size and may blight the entire leaf; spots often start at the leaf edge. Zinnias are susceptible to a different bacterium causing angular tan spots with yellow haloes (*Xanthomonas zinniae*).
- **Damping-off (pre-emergence):** Seedlings fail to emerge because seeds are attacked after imbibition (usually caused by *Pythium* or another water mold fungus).
- **Damping-off (post-emergence):** Seedlings collapse because of attack at the soil line (often caused by *Rhizoctonia*) or root rot (often caused by *Pythium*).
- **Root rot:** Plants are small in size, foliage has grayish or purplish cast, and roots are soft and brown. Caused by fungi that cause damping-off.
- **Botrytis gray mold:** Damping-off (seedling collapse) or tan to brown leaf spots, often irregular in outline and often zonate.
- **Alternaria leaf spot:** Common on dusty miller, marigold, impatiens, zinnia, and geranium. Small purple to brown leaf lesions develop under conditions of warmth and high moisture. On impatiens, spots have a purple to black rim and a light center and are only a few millimeters in diameter. They are easily confused with bacterial leaf spot, or impatiens necrotic spot virus (INSV), but their uniformly small size and the tendency of the leaf to turn yellow help distinguish them.
- **Impatiens necrotic spot virus (INSV):** This tospovirus disease, spread by the western flower thrips, has caused devastating losses to some bedding plant crops in cases where the grower was unaware that the thrips population had skyrocketed. Young seedlings are more susceptible than older plants. Almost all crops are susceptible, but losses have been most dramatic in impatiens, particularly double-flowered varieties. Impatiens show black leaf spots as well as blackening of sections of the stem. INSV-infected plants may also show ringspots, mottling, or browning along the veins. Many species of infected seedlings are stunted by INSV infection. Vegetatively propagated flower crops in hanging baskets have often provided inoculum (and thrips vectors) for a seed crop grown below them. Flowering pot plant crops or weeds in the same greenhouse may also provide inoculum of INSV that may injure bedding plants. Begonias are often a source of the virus. Tomato spotted with tospovirus (TSWV) may also affect bedding plants, but it is far less common.
- **Tomato spotted wilt tospovirus (TSWV):** Tomato and pepper transplants are especially vulnerable to this INSV relative. Keep vegetable transplants separate from flower crops, and grow plants from cuttings well separated from plants from seed. Not all infected plants show symptoms; symptomless plants may be the source of virus for other crops that are highly susceptible. Discard symptomatic plants immediately and guard constantly against thrips population buildup to avoid INSV or TSWV losses. Monitor the thrips population with yellow or blue sticky cards, and initiate treatment if more than 10 thrips are caught per card per week, assuming three cards per 1,000 sq. ft. greenhouse. Maintain a strict weed control program. Beware of carrying over virus-infected stock plants from one production season to the next.