

Important Landscape and Greenhouse Diseases:
Recognizing Emerging Threats to California Agriculture

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1. Impatiens Downy Mildew-This disease is caused by the fungus-like *Oomycete Plasmopara obduscens*. Affects *Impatiens walleriana* (all varieties and hybrids with *I. walleriana* parentage), and wild impatiens (*I. balsamina*) as well as *Pachysandra* spp. New Guinea Impatiens (*I. hawkeri*) NOT affected. Mainly found in coastal CA: Santa Barbara, San Diego Co., Orange County, Monterey Co. First symptoms are yellowing or mottling of upper surfaces of leaves, followed by stunting of plant growth/malformation of leaves and flower buds, downward curling or leaf distortion, wilting and defoliation. Three spore types: Oospores can survive in soil and plant debris long term (years), other spore types are wind borne and others swim in water (zoospores) and cause most infections. Prefers cool, moist conditions (59-73°F), but can survive down to 5°F, so can overwinter in most CA climates. Not seed transmitted. Impatiens now not recommended as bedding plants and may be hard to find in nurseries. No effective chemical control at this time once disease and sporulation gets started. Preventative applications of Subdue Maxx, Subdue GR, and Adorn are showing promise in trials.

2. Bacterial Leaf Scorch- Caused by the plant pathogenic bacterium *Xylella fastidiosa* and vectored by sharpshooter insects, primarily the Glassy winged sharpshooter (GWSS, *Homalodisca vitripennis*), who made it's way to CA about 20 yrs ago. Four strains of bacterium currently present in CA, Almond leaf scorch (most variable and affecting landscape trees, mutations being found), Mulberry leaf scorch, Oleander leaf scorch, and Pierce's Disease or grape strain. Over 200 plant species are susceptible to the bacterium, both monocots and dicots, and the GWSS can colonize over 200 plant species across over 35 botanical families. Bacterium lives and grows in the xylem where it blocks the vessels and prevents water transport. Decreased water movement causes symptoms that often look like water stress or nutrient deficiency:

- Scorch
- Chlorosis
- Stunting
- Decline

Necrosis (browning, death of tissue) on leaves at tips and margins, with or without a yellow margin next to healthy tissue are first obvious signs of infection. Eventually leaves will die, with entire branches and shoots in the canopy dying back, leading to death. May start in late spring/summer when water demands increase. No cure, although early, selective pruning, with proper water and nutritional support can delay severe symptoms.

3. Impatiens necrotic spot virus- Member of Tomato spotted wilt virus family (*Tospoviruses*), a spherical, membrane enveloped minus-sense RNA virus. Transmitted by Western flower thrips. Juveniles must acquire the virus, then upon maturation into adults, can

transmit the virus for life (30-40 days on average). Adults that acquire the virus cannot transmit it and do not pass the virus to eggs. Thus control of the vector is the most efficient management strategy for the virus. Virus is also transmitted by grafting, mechanical means and vegetative propagation. Has an extremely wide host range and is still expanding. INSV has historically mainly affected greenhouse plants, but infections in field crops, especially lettuce, are routinely being found the last few years. Common symptoms are ringspots and necrosis on leaves, but combinations of the 2 are routinely found and may also affect flowers. Expression varies greatly depending on host.

4. Boxwood Blight- Caused by the fungus *Cylindrocladium pseudonaviculatum* (= *C. buxicola*, *Calonectria pseudonaviculata*). Not yet in CA, but in 7 eastern states, Oregon, and British Columbia, Canada. Common in Europe and New Zealand for 20 yrs. Characterized by brown leaf spots with dark edges, blights, dark brown/black cankers on stems, defoliation and dieback. Disease attacks all boxwood species, with *Buxus sempervirens* (American boxwood) the worst. Rapid defoliation is the first noticeable symptom. The disease cycle can be completed within a week, and thrives best in warm, humid temps., +/- 77 degrees. Sticky spores can attach to any surface; mycelium can dry and survive for years on leaf debris. Cannot be controlled once symptoms start; fungicide trials underway for preventative use.