TSU NURSERY NEWS TO USE

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CITRUS FLATID PLANT HOPPER, *Metcalfa pruinosa*, can be found on a variety of ornamentals. This planthopper seldom causes economic damage except to plants weakened by some other factor such as freeze damage. The white, flocculent, waxy material made by the nymphs impairs the sales quality of affected plants, partly because buyers sometimes mistake these deposits for mealybugs.


PHOTO CREDIT: AMY DISMUKES

Generally, no control is required. If damage is observed, conventional pesticides for control include insecticidal soaps, acepahte, bifenthrin, carbaryl, chlorpyrifos, cyfluterin, deltamethrin,imidacloprid, permethrin, etc .

WEED OF THE MONTH: Spotted Spurge (*Euphorbia maculata*), also known as prostrate spurge, is commonly found in container-grown nursery stock and persists in gravel container pads, pine bark piles, sidewalks, and landscape areas. Spotted spurge is a warm-season annual that thrives in hot temperatures and full sun conditions. The small leaves are oblong with a purple spot in the center and milky sap oozes when the stem is broken and can be a skin irritant. Plants form a low-growing dense mat up to 3 feet across and each plant produces thousands of tiny seeds that are forcefully dispersed and quickly germinate. When hand weeding (I suggest wearing gloves), the entire plant and root system must be removed or regrowth will occur. Good sanitation practices are key to preventing spotted spurge infestations and include weeding liners prior to transplant, removing small weeds prior to flowering, thoroughly washing re-used containers, and properly storing pine bark and other potting substrates to prevent infestation. Common post-emergent herbicides (glyphosate, glufosinate, etc.) can be used to control established weeds in non-crop areas, while pre-emergent herbicides should be used to prevent seed germination and effective products contain dimethenamid-P, dithiopyr, flumioxazin, indaziflam, oryzalin, and prodiamine.


PHOTO CREDIT: DR. ANTHONY WITCHER

Please contact Dr. Anthony Witcher at awitcher@tnstate.edu for more information on nursery weed control practices.

IRON DEFICIENCY is a type of chlorosis resulting from a lack of iron. Lack of iron in a tree may be due to a high iron need, less effective uptake or insufficient usable iron in the soil. Most often, it is related to a high (alkaline) soil pH. When pH exceeds 6.5 – 7.0, available iron decreases. Even though there may be sufficient iron in your soils, a high soil pH causes a chemical reaction that make the iron solid and unavailable to roots, which will remain tied up in the soil unless conditions change.

Iron is essential for the growth and development of trees because it is used by chlorophyll in photosynthesis and the production of food. When iron is deficient, less food is made and the tree suffers. If a tree starts declining, it will be more susceptible to damage from insects or pathogens. Often, these secondary invaders will kill severely iron deficient trees.

SYMPTOMS AND DIAGNOSIS. Foliage turns uniformly yellowish-green between the veins, but the veins remain green. Yellowing is most common on new growth. The new growth may be stunted. In severe cases, leaves may necrose (brown and die) and drop. Branches and twigs may experience stunting and dieback, and plants may fail to produce flowers or fruit. Fungal leaf spots are more common on leaves with iron deficiency and tend to make the necrosis appear worse. If the leaf veins remain green on the otherwise yellow leaf, and the chlorosis appears first on the younger or terminal leaves, spreading later to the lower parts of the

IRON CHLOROSIS continued …
plant, you can be fairly certain chlorosis is be to lack of iron. Susceptible species include sweet gum, birch, rhododendrons, azaleas, white pine, magnolia, dawn redwood, photinia, holly, hydrangea, arborvitae, boxwood, lilac, maples (red, silver, Amur), oaks (pin, red, swamp white, willow), apple, crabapple and peach.

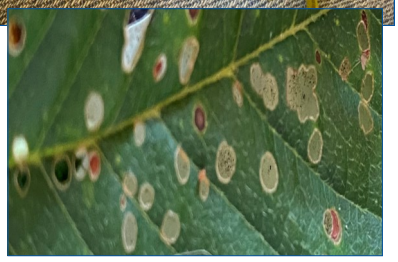


SECONDARY PESTS ON IRON CHLOROSED WILLOW OAK

IPM AND CONTROL. One of the best methods of avoiding iron chlorosis is by planting tolerant trees.

1. Monitor the problem. Weather conditions and extreme changes in soil moisture may cause symptoms of yellowed leaves may disappear as conditions normalize. Persistent chlorosis needs attention.
2. Accurately identify the problem. If nutrient , the issue can be determined with a foliar and soil analysis (pH measurement).
3. Use a foliar feeder**.** Spraying the foliage with iron sulfate, iron chelate or soluble organic iron complexes will correct temporarily. The "fix" will last only one season and won't change the underlying deficiencies in the soil.
4**.** Adjust the soil pH. The best long-range solution for correcting iron chlorosis in soils is to make the soil more acid by lowering the soil pH with the addition of sulfur, aluminum sulfate or iron sulfate. Quicker effects result when the chemical is worked into the soil while being mindful of plant roots. Another method is to use water-soluble materials, which can be injected into the soil with a root feeder. For more information, contact adismuk1@tnstate.edu or awitcher@tnstate.edu

SHOT HOLE. For growers who are seeing "shot hole" disease of ornamental *Prunus species* this year, especially flowering cherry, plan to incorporate spray controls next year. Shot hole disease affects *Prunus species*, including Japanese flowering cherry, 'Otto Luyken' laurel, almond, plum, nectarine, peach and apricot. Disease is most severe following warm, foggy or rainy winters and when it rains in the spring during young leaf growth. Shot hole symptoms first appears in the spring as purplish or reddish spots on new buds, leaves, and shoots. Spots on young leaves often have a light green or yellow margin (or halo). The spots expand and their centers turn brown and drop, leaving "shot" holes. The disease can cause premature leaf drop and small cankers on branches.



Avoid overhead watering, as leaves must be moist for infection to occur. Prune and destroy infected leaves, dead buds and cankered twigs. Spray treatments should begin in the spring at petal fall, shuck fall and 2 weeks later. Rotate or tank-mix materials from different groups with different modes of action to prevent resistance. Below are a few chemical options for control in commercial nurseries.

- Daconil Weather Stik at 1.4 pints/100 gal water. Group M5. 12-hr re-entry.
- Fixed coppers may help but can cause leaf injury and defoliation. Group M1. 48-hr re-entry.
- Heritage at 1 to 4 oz/100 gal water plus a non-silicone-based wetter sticker. Group 11. 4-hr re-entry.
- Junction at 1.5 to 3.5 lb/A. More effective than other copper-based products when copper-resistant bacteria present. Spray solution pH should be above 6.5. Group M1 + M3. 48-hr re-entry.
- Protect DF at 1 to 2 lb/100 gal water plus 2 to 4 oz spreader-sticker. Mancozeb-based products were found useful for both fungal and bacterial causes. Group M3 fungicides. 24-hr re-entry.
- Spectro 90 WDG at 1 to 2 lb/100 gal water. Fo fungal problems. Group 1 + M5 fungicide. 12-hr re-entry.
- Zyban WSB at 24 oz/100 gal water for fungal problems. Group 1 + M3 fungicide. 24-hr re-entry.

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