



This bulletin from the Cooperative Extension Plant Health Clinic (Plant Disease Clinic) is an electronic update about diseases and other problems observed in our lab each month. Input from everybody interested in plants is welcome and appreciated.

## Citrus

Citrus canker, caused by the bacterium *Xanthomonas axonopodis* pv. *Citri* (*Xac*) has NOT been found in Arkansas. It has, however, been identified in nearby states. The disease was first found in Florida in 1910. By 1933, the disease was eradicated. Fifty-three years later in 1986, Citrus canker was once more identified in Florida. In 1994 eradication was declared. In 1995 Citrus canker was detected for the third time in Florida. A Florida wide mandatory eradication with the 1,900 foot rule was implemented in 2000. All citrus within 1900 feet of an infected tree had to be removed. Since then, the disease has spread throughout the Gulf States and up the Atlantic coast to South Carolina. Realizing the disease had become too widespread for eradication to be effective; USDA stopped funding the eradication program in 2006. A statewide quarantine remains in effect. The purpose of this article is to inform readers of the signs and symptoms of this serious disease. Although Arkansas is not a citrus producing state, citrus species are kept in homes and greenhouses across the state. Citrus canker causes stem, leaves, and fruit lesions, resulting in defoliation, shoot dieback, and fruit drop. Fruit that doesn't drop prematurely is disfigured and rendered unmarketable. Many species, cultivars, and hybrids of citrus and citrus relatives including orange, grapefruit, pummelo, mandarin, lemon, lime, tangerine, tangelo, sour orange, rough lemon, calamondin, trifoliolate orange, and kumquat are susceptible. Grapefruit and Mexican lime are very susceptible. Early oranges such as Navel, Pineapple, and Hamlin, as well as lemons and limes are moderately susceptible. Mid-season oranges such as Valencias, tangors, and tangelo, as well as other tangerine hybrids are less susceptible. Tangerines are tolerant. Symptoms are lesions or pustules on leaves, twigs, and stems that begin as raised areas. The pustules become corky with age, and crater-like with sunken centers surrounded by a yellow halo. Lesions on the leaves are found on both sides of the leaf. New growth is most susceptible to infection. Leaves are rendered much more susceptible for longer periods when infested with

leafminers Fruit cankers appear scab-like and corky without the yellow halo. The fruit of oranges and tangerines are susceptible during the first 60-90 days after petal fall, and grapefruit for 120 days. Wind driven rain is the primary means of spread. The bacteria enter through stomates or wounds made by thorns, insects, or storm damage. Citrus canker can also be spread from tree to tree or to a different location on hands, clothes and equipment. Once the disease is firmly entrenched in a production area, control consists of good sanitation, windbreaks to limit windblown inoculum, leafminer control, and frequent application of copper sprays for 90 days after petal fall.

### (Copied from USDA)

- **Florida is currently under a statewide quarantine by the USDA and no citrus may leave the state unless the USDA has issued a limited permit. No Florida grown citrus may enter any citrus producing states or territories. No citrus plants or parts may enter or exit Florida.**
- **Citrus producing states and territories include: American Samoa, Arizona, California, Guam, Hawaii, Louisiana, the Northern Mariana Islands, Puerto Rico, Texas, and the U.S. Virgin Islands**
- **This restriction includes dooryard citrus. No citrus grown in residential areas may be shipped out of state without a limited permit; at this time there is no mechanism in place for certifying dooryard citrus.**
- **There are no restrictions on the movement of citrus within Florida, commercial or dooryard.**



**Citrus canker-*Xanthomonas axonopodis* pv. *Citri* (Xac)**



Sherrie Smith University of Arkansas Cooperative Extension

**Citrus canker-*Xanthomonas axonopodis* pv. *Citri* (Xac)**



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Leafminer damage on Meyer's lemon leaf infected with *Xanthomonas axonopodis* pv. *Citri* (Xac)



## Swiss chard

Swiss chard, (*Beta vulgaris* subsp. *Cicla*), is a member of the beet family. It is one of the healthiest vegetables available, and a valuable addition to a healthy diet. The leaves can be eaten raw in salads or as a cooked green. The stalks are also eatable. However the white stalked varieties are tenderer than the red stalked varieties. Since chard is a member of the beet family, it is susceptible to the same diseases as beet crops. Bacterial leaf spot, caused by *Pseudomonas* spp can be seed borne, or enter the leaves through hydathodes, or wounds. Symptoms may begin as tiny water-soaked spots that later enlarge to circular to ellipsoid, tan spots that are 3—8mm in diameter with distinct brown to black borders. There are currently no chemical controls for Bacterial leaf spot of Swiss chard. Growers should avoid working in the field or garden when the foliage is wet, and avoid overhead irrigation. The use of clean seed is thought to help limit losses.

### Swiss card Bacterial leaf spot- *Pseudomonas* spp.



Sherrie Smith University of Arkansas Cooperative Extension

## Forsythia

With its bright yellow blooms, Forsythia is a cheerful reminder that spring is here. Forsythia has few disease problems, but they are susceptible to Phomopsis gall. Species of the fungus *Phomopsis* can also cause galls on maple, hickory, fig, gardenia, jasmine, privet, oak, rhododendron, elm, viburnum, and others. On forsythia, tight globular clusters, ¼ inch to more than an inch in diameter may be found singly, or in clusters along stems and twigs. Twig dieback may occur when galls are numerous. Chemicals are largely ineffective against established *Phomopsis* gall. Control consists of pruning out the galls and removing them from the planting. In severe cases the entire shrub may be pruned to the ground.

### Forsythia Phomopsis gall- *Phomopsis* spp.



Sherrie Smith University of Arkansas Cooperative Extension



## Basil

Basil is the most popular herb grown in America. Downy mildew of basil, caused by *Peronospora belbahrii*, is a serious disease of basil that can move rapidly through a crop. Basil Downy mildew was first detected in the United States in Florida in 2007, and has since spread to other parts of the country. Symptoms are yellowing between the veins on the upper side of the leaves. The yellowing is sometimes mistaken for nutritional issues or insect damage. Grayish dark sporulation occurs on the underside of the leaves. As the disease progresses, leaf margins may become blackened with leaves eventually dying. This disease is favored by environmental conditions such as prolonged leaf wetness, high relative humidity, overhead irrigation, and close spacing. Spores are easily spread by splashing water, wind, or through handling. Downy mildew can survive in plant debris, seeds, or weed hosts. Fungicides labeled for control of downy mildew on herbs are Actinovate AG, Trilogy, OxiDate, ProPhyt, Fosphite, and K-Phite.

### **Basil Downy mildew - *Peronospora belbahrii***



Sandra Jensen, Cornell University, Bugwood.org