



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.

Squash by Alma Laney

Watermelon mosaic virus (WMV; *Potyvirus*; *Potyviridae*) is an aphid-transmitted virus infecting cucurbits and legumes worldwide. WMV has a broad host range which includes some legumes and most cucurbits, namely watermelon, summer squash, cucumber, and pumpkin. WMV is easily mechanically transmitted, as well as being aphid transmitted. Over 35 different aphid species including the green peach, cowpea, spirea, and potato aphids have been known to vector WMV. Symptoms may range from mosaic on the leaves to asymptomatic leaves later in the growing season. However, various forms of fruit malformation (mottling, mosaic, skin bumps, distorted shape, etc.) may be seen even if the leaves are asymptomatic. As this is a virus, there is no treatment for infected plants. Control measures prior to infection are the best method which includes removal of plant debris, alternative hosts, and volunteer seedlings combined with using virus-tested plants. Sanitation of tools used in the field and removal of infected plants can help limit the spread in the field. WMV is not seed transmitted in any of the identified hosts.

Watermelon Mosaic Virus (WMV)-fruit symptoms on yellow squash



Alma Laney, University of Arkansas Plant Pathology graduate student

Watermelon Mosaic Virus (WMV)



R. Prowidenti, APS Image Library

Potato by Kevin Lee

The wire worm is the underground larval stage of the click beetle (Coleoptera:Elateridae) and is found in most soils. It is a pest on many crops including corn, sorghum, small grains and vegetables. However, it is particularly damaging to potatoes since the crop is in the soil. Only the larvae feed on potatoes. They have a hard slender body, are yellow to orange in color, and are about .75 in long when fully grown. They can live in the soil for several years until they become adults. Feeding can occur on seed pieces resulting in a poor stand, the roots resulting in poor vigor and lower yield, and the potato directly. Early tuber feeding results in deformities, later feeding leaves small holes or tunnels in the tuber. This allows bacteria, fungi, especially fusarium, and other insects to enter the tuber. To prevent wire worm damage it is best not to plant potatoes where the soil was overgrown with grass and weeds. Also avoid areas where damage has occurred in the past, as soils with high populations usually remain high. Keeping an area free from weeds and overgrowth before planting and during potato growth helps the soil stay dry and can help control wire worm populations. Insecticides are also available for control, however population sampling is recommended to determine which method, if any are needed. Commercial growers may apply Capture or Thimet next season at just before planting. Follow label.



Homeowners have few options. Composted gardens seem to have fewer problems with wireworms.

Click beetles-Coleoptera: Elateridae



Steve L. Brown, University of Georgia, Bugwood.org

Click beetle larva (wireworm)- Coleoptera: Elateridae



Sherrie Smith University of Arkansas Cooperative Extension

Indian Hawthorne by Michelle Martin

Indian hawthorn is an evergreen shrub used in many landscapes because they are low maintenance and drought tolerant. These shrubs do not have problems very often; however root rot is one of the most damaging problems that can occur. Root rot diseases of Indian hawthorn are usually caused by the oomycete *Phytophthora* spp.; a soil-borne pathogen. Symptoms include plant wilt, leaves becoming discolored, stunted and dropping prematurely, and a brown or dark gray discoloration beneath the bark. Eventually the plant will die. Sporangia of the pathogen may be viewed on the roots using a microscope. Root rot is almost impossible to control once the plant is infected. It is recommended that the Indian hawthorn be removed and replaced by a plant that is resistant to *Phytophthora*. Planting in well-drained soil is the best way to prevent *Phytophthora* root rot.

Indian Hawthorn-root rot symptoms



Michelle Martin, University of Arkansas Plant Pathology graduate student



Crabapple by Andrew Jecmen

Apple scab is among the most significant diseases of apples in Arkansas. It is caused by *Venturia inequalis*, an ascomycete member of the Pleosporales. *Venturia* is capable of parasitizing ornamental crabapple as well as other rosaceous relatives of *Malus*. *Venturia* is widely distributed and most common on the leaves and fruit of its host. Conditions favorable for this disease are cool, wet springs. The fungus overwinters in leaf detritus and infected fruits. In early spring when surfaces are continually wet, ascospores germinate on flower petals and new leaves of host plants. The epidermal tissue becomes raised with a scabby appearance as the infected tissues dry up and crack. The lesions become larger and coalesce over time, causing the fruit and leaves to fall prematurely. Apple scab is difficult to manage. One can forecast this disease much like the weatherman forecasts rain. Ascospores are reliably discharged within 1-2 hours of available moisture from ripe pseudothecia. Infection of the leaf requires surface wetness for a period of time to be successful. There are computer-aided models that can help with the timing of protective fungicide applications. A number of fungicides are available to the homeowner or commercial grower that have been proven to be effective long-term if rotated. Applications of Fruit tree sprays every 7-10 days should be made from the tight cluster stage until terminal shoot growth ends in midsummer. Protective agents available for use are in some cases considered organic, such as copper based formulations. Captan is available for homeowner use and is effective if timed properly. Curative fungicides include strobilurins that are respiration inhibitors, myclobutanil, and imidazoles that block ergosterol biosynthesis in fungi. Two other control measures exist for the reduction of initial inoculum, and these include sanitation and the use of resistant cultivars. Fallen leaves are encouraged to decompose by mowing the accumulated debris in the fall. Application of urea to the leaf duff material will accelerate this decomposition. Scab-resistant apple and crabapple cultivars are widely available to the homeowner. A few edible apples listed are, 'Enterprise', 'Freedom', 'Gold Rush', 'Jonafree', 'Liberty', 'Pristine', 'Redfree', and a few crabapples, 'David', 'Harvest Gold', 'Mary Potter', and 'Prariefire'. Crabapples resistant to scab have a proliferation of blossoms year after year, partially due to the lack of defoliation caused by apple

scab. An added bonus to resistant selections is the reduced need to apply fungicides.

Apple scab-*Venturia inequalis*



Andrew Jecmen, University of Arkansas Plant Pathology graduate student



Apple scab-*Venturia inequalis*



Sherrie Smith University of Arkansas Cooperative Extension

Apple scab-*Venturia inequalis*



Sherrie Smith University of Arkansas Cooperative Extension

Yew by Jing Zhou

Yews (*Taxus*) are ever-green shrubs growing in temperate areas of the northern hemisphere. Their attractive appearance makes them very popular in both landscape and home gardens. Yews are tolerant of a

range of growing conditions, but prefer a semi-shaded location with moderate soil moisture. Excessive amounts of water invariably create conditions that promote root rot, which may manifest itself in the upper part of the plant. One of the common diseases resulting from boggy, heavy soil is root rot, caused by the oomycete *Phytophthora*. Typical symptoms include rotted roots, browning of leaves and stems which spread to the entire plant followed by plant death. Seedlings need particular care since they are more vulnerable than adult plants. The most effective control is to keep proper moisture in the soils, make sure no water is used over the top and change the poorly drained soils. The application of fungicides, e.g. Monterey Aliette and Subdue Maxx, are helpful if the drainage problem is solved.

Yew *Phytophthora* root rot symptoms-*Phytophthora* spp.



Jing Zhou, University of Arkansas Plant Pathology graduate student