

TIMELY INFORMATION

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OVER-VIEW OF THE 2006 ALABAMA PLANT DISEASES AS SEEN AT THE AUBURN & BIRMINGHAM PLANT DIAGNOSTIC LABS

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The Plant Diagnostic Lab at Auburn University receives plant problem/disease samples for diagnosis and soil samples for nematode analysis from all sections of the state. The Plant Diagnostic Lab at Birmingham receives predominantly horticultural samples for disease/problem diagnosis from Jefferson County and the five adjoining counties. Records from both labs are often used to document plant disease occurrences in Alabama. The following summaries were prepared from records of the ACES Plant Diagnostic Labs at Auburn and Birmingham with supplement field and survey information from Extension Plant Pathologists (W. Gazaway, A. Hagan, & E. Sikora).

Copies of the 2006 Annual Reports of the Auburn and Birmingham labs are available upon request. You may request reports by phone, email, or mail. (Contact information for the Auburn Lab: phone 334-844-5508; email jmullen@aces.edu; mailing address - Auburn Plant Diagnostic Lab, ALFA Agricultural Services Bldg., 961 S. Donahue Drive, Auburn University, AL 36849-5624. Contact information for the Birmingham Lab: phone 205-879-6964; email jjacobi@aces.edu; mailing address - C. Beaty Hanna Horticulture and Environmental Center, 2612 Lane Park Road, Birmingham, AL 35223-1802. The www address for the Auburn and Birmingham labs are as follows: Auburn lab - <http://www.aces.edu/dept/plantdiagnosticlab>; Birmingham Lab - <http://www.aces.edu/plantlabbbham/>).

If you wish to submit a plant, soil, or insect sample to the Plant Diagnostic Lab at Auburn, or Birmingham, consult the web sites for information and for downloading the appropriate questionnaire.

Service Charges At The ACES Plant Diagnostic Labs	
Soil Nematode Analysis	\$10
Homeowner Plant Disease Diagnosis	\$10 or \$15
Commercial Plant Disease Diagnosis	\$20 or \$25
Samples Requiring Specific Advanced Molecular Analysis	\$30
Routine Insect Identification	\$5
Insect Identification With Microscopic Study of Slide Mounts	\$10
Commercial/Industrial Insect Samples	\$20

SOME NOTEWORTHY DISEASES REPORTED FROM THE AUBURN
LAB IN 2006

Field Crops. The drought and high temperatures of June-August caused damage to many field crops in the state. And, while drought existed in the state June-August, March-May were relatively dry months, especially in the southern half of the state. As a result of the over-all dry conditions March-August, crop yields were lower than normal and fungal & bacterial diseases were reduced. Small grains, being a winter-spring crop, escaped much of the damage from severe drought. Small grains in the northern half of the state experienced a fairly normal growing season. Corn and soybeans were especially damaged from drought. Diseases seen on field crops last year included the following: severe powdery mildew on wheat, Helminthosporium-type leaf spots on oats & bermuda, Asian soybean rust on soybean, *Fusarium oxysporum* vascular wilt on cotton, tomato spotted wilt virus on peanuts, ergot on Argentine bahia grass, and reniform nematode damage on cotton.

K. Burch rated the small grain trials mid season and documented incidence and severity of the common diseases including powdery mildew, rust diseases and Septoria leaf blotch. For more information, see <http://www.ag.auburn.edu/aaes/communications/agronomy/ay277smgrvar06.pdf>.

Corn yield was about 60% of the average yield of 2004-2005 harvested acres yield. The only disease problems we saw on corn last year were a sample of corn smut and a situation with corn damage from stunt nematodes.

The average soybean yield (in bushels per acre in harvested acres) was about 60% of the normal average during the past three years. Asian soybean rust was detected on soybean in a sentinel plot June 27 in Baldwin County. This plot was destroyed. Soybean fields and sentinel plots were monitored all summer and fall. The disease did not develop on soybeans again until the end of September and the first week of October. By the end of the year, soybean rust had been found in 24 counties. The disease was found in kudzu in January, February, March, and May in Montgomery, Mobile, Baldwin, Henry, and Houston counties. The disease was found on kudzu in October in 9 counties (Clarke, Covington, Pike, Bullock, Russell, Houston, Dale, Coffee, and Barbour). By the end of 2006, rust had been found in kudzu in 33 counties. The survey and identification work was done predominantly by Ed Sikora, Mary Delaney, Dennis Delaney, and the ASBR team. Every county in the state was surveyed. PCR was used to confirm the rust as Asian soybean rust. For a list of positive ASBR counties in Alabama in 2006, see www.SBRUSA.net.

Other diseases seen on soybean in August included bacterial pustule (*Xanthomonas*), charcoal rot (*Macrophomina*), and target spot (*Corynespora cassiicola*).

Cotton yields for 2006 were about 80% (yield measured in bushels per acre in harvested acres; abandoned acres are not counted) of the average yield for 2004-2005. We did not see many disease in cotton. In July and August, we saw Fusarium wilt on cotton which was also damaged by reniform nematode. Fusarium wilt on cotton was diagnosed again in September.

Peanut yields in 2006 were about 10% lower than normal, when comparing to harvested acres in 2004-2005. Few diseases were seen on peanuts. Tomato spotted wilt virus was noted in July and August.

The most unusual disease in July was ergot on Argentine bahia grass. The typical black, hard, elongated ergot sclerotia were covered up by a black superficial mold called *Cerebella andropogonis* (identified by J. Kimbrough and Ann Blount in Florida). This mold may develop on the sweet 'honeydew' material that is produced by the plant infected with the ergot (*Claviceps paspali*). The ergot infected bahia should not be fed to cattle due to the ergot toxins. Removal of the seed heads will remove the problem.

Fruits, Nuts, and Vegetables. Due to the dry conditions, diseases were not common. In May-July, tomato spotted wilt virus on tomato was noted as a widespread problem in the southern half of the state. Bacterial wilt and Fusarium wilt were seen on tomato and pepper. The bacterial leaf spot *Pseudomonas syringae* pv. *syringae* was diagnosed on wild rocket, a salad green. Phytophthora stem rot of okra and pepper were seen in June. Cucumber mosaic virus was diagnosed on tomato in late August. In October, a collard sample was diagnosed with Rhizoctonia and Fusarium stem decay. White spot (*Cercospora brassicae*) was seen on turnips in November and December. This is a common fall disease of turnips and related plants.

Ornamentals. In 2006, our lab received 109 ornamental samples. The types of samples were diverse except for the 129 samples received from the State Department of Agriculture for *Phytophthora ramorum* (SOD) testing. The samples received for *P. ramorum* testing were mostly camellias, pieris, and viburnum.

Some of the ornamental diseases seen included Botryosphaeria cankers on aucuba, azalea, chinquapin, English holly, shore juniper, flowering pear; *Fusarium oxysporum* crown rot & wilt of chrysanthemum; daylily rust and Kabatiella leaf streak on daylily; bacterial leaf spot on Dracaena; Cylindrocladium root rot on hairy indigo; anthracnose on a variety of plants including helleborus, heuchera, maple, red oak, mahonia, ivy, hosta, liriopse, salvia, turmeric, zebra grass, boxwood, camellia, English cherry laurel and Chinese hibiscus; Heterosporium leaf spot on iris; bacterial leaf spot (*Xanthomonas*) on lantana; Botrytis blight on a variety of plants including begonia, marigold, petunia, verbena and Chinese holly; *Sclerotium rolfsii* crown rot on peony; Cercospora leaf spot on viburnum, rhododendron, holly, azalea, astible; powdery mildew on dogwood, rose, torenia, scutellaria, crape myrtle; Alternaria leaf spot on photinia, maple, Japanese magnolia, zinnia, angel's trumpet (*Datura*) and impatiens; Rhizoctonia crown, stem, and/or root rot on thunbergia, liriopse, euonymus, 'Fortunei', verbena; bacterial canker (*Pseudomonas cichorii* and *P. syringae* pv. *syringae* identified) on sunflower; bacterial leaf spot on oakleaf hydrangea; *Phytophthora ramorum* leaf spot on camellia; *Phytophthora* sp. (not *ramorum*) foliage blight on azalea, camellia, Japanese magnolia, water oak, pieris, rhododendron, viburnum; *Phytophthora* sp. root and/or crown rot on chrysanthemum, daylily, liriopse, petunia, salvia, arborvitae, boxwood, Chinese witch hazel, cotoneaster, dogwood, Eleagnus, gardenia, holly, Indian hawthorn, ivy, juniper, Japanese maple, pittosporum, rosemary; Rhizoctonia aerial blight on cotoneaster; *Pythium* sp. root rot/crown rot on chrysanthemum, daffodil, daylily, liriopse, boxwood, jasmine, ligustrum,

rosemary; *Pythium spinosum* and *P. irregulare* root rot of azalea; *Xylella fastidiosa* bacterial scorch on red oak; fireblight (*Erwinia amylovora*) on pear; tomato spotted wilt virus on zinnia.

In May we received notification from the AL State Department of Agriculture that another shipment of nursery plants from a California nursery was suspected to contain *Phytophthora ramorum* infected plants. As has happened previously, the California nursery stock had been shipped to many locations in the U.S. We tested samples brought to us by State Inspectors. Some were ELISA positive for *Phytophthora*. All ELISA positive samples had DNA preparations made, and the DNA was mailed overnight to the University of Florida Plant Diagnostic Lab which was approved by USDA as a USDA Provisional Lab for doing regular & real-time PCR testing for *Phytophthora ramorum*. Most of the samples tested PCR negative for *P. ramorum*. PCR positive samples had to be sent on to the Beltsville USDA Lab for PCR confirmation. One sample was confirmed positive for *P. ramorum*. During early July a second incidence of a contaminated nursery stock shipment was noted from a California nursery. Samples tested in July were all negative for *P. ramorum*. The sampling protocol of last year is still in effect. If you suspect *P. ramorum* is possible on a landscape planting (See Sudden Oak Death, *P. ramorum* blight information distributed to each county in May 2005), contact the State Department of Agriculture at tjohnson@agi.state.al.us. A state inspector will be sent to take the sample and bring it to our lab for testing.

Another disease of note received in June was Hosta Virus X. This is a relatively new virus disease. Symptoms are variable on each cultivar of Hosta. The most common symptom is the blue/dark green spots or other mottled-type markings on the light green colored leaf. Leaves appear mottled in coloration. A recent study showed that the incubation period for Hosta Virus X may be as long as one year after infection and before symptom development. Transmission appears to be mechanical by leaves rubbing each other or by other cultivation practices. The best control is not to purchase infected (blotchy-looking) plants or plants near-by. The variety 'Gold Standard' has been found to be infected on several occasions so it appears that this variety is very susceptible. See <http://www.oznet.KSU.edu/path-ext/factSheets/Ornamentals/HostaVirus.asp> for more information.

In Baldwin County, laurel oaks and water oaks were infected with the canker fungus *Hypoxylon atropunctatum* (species identification by S. Enebak). This fungus will infect trees (especially oak trees) that have been previously weakened. The trees had been weakened and injured by two hurricanes last year and drought this year. The fungus becomes established just under the bark where it produces a brown, thick, flat, hard stroma. The bark is pushed up and eventually will fall off. When *Hypoxylon* development girdles the trunk, tree dieback soon follows. Insect (mostly borers) were also associated with these trees. The insects were considered to be secondary events, developing in previously weakened trees.

Choanephora was associated with a zinnia blossom petal scorch and spotting. This disease is not typically seen, but it is reported to occur on zinnia.

Daylily rust, caused by the fungus *Puccinia hemerocallidis*, was first identified in Alabama and some other states in the Southeast in 2000. It is now widespread in Alabama and many other states. The disease develops as yellow leaf spots that may merge and cause a leaf blight. When rust spores are present, the spots may appear orange or yellow-orange. Disease control involves sanitation (cutting back foliage) and application of protective fungicides. See the AL Pest Management Handbook.

Melampsora rust was identified on weeping willow. This rust is not systemic. The willow may be a host to several subspecies (called form species or *formae specialis*) of *Melampsora epitea*. The subspecies all produce identical spores on the willow, but each one has a different alternate host where other rust types are produced. Some of the subspecies produce spores that can over-winter on willow

buds and twigs. If the rust subspecies on this willow is one that over-winters on the tree buds, the disease will occur next year. All rust subspecies will spend the winter on dead fallen leaves. The fungus will develop in the spring on the dead leaves. If the winter is mild, spores may develop on the dead leaves and infect new willow leaves. If the winter is cold, spores may be produced that will only infect the alternate host which might be fir, saxifrage, hemlock, larch, currant, and gooseberry. Since our winters are often mild and since we do not have most of the alternate hosts in this area, I suspect the spores produced on the dead leaves will directly infect the new willow leaves next spring. All fallen leaves should be removed from the area. If spots begin to develop in the spring, protective sprays of Kocide may be applied.

We have seen a number of crown rot problems on Liriope this past year. *Pythium* sp., *Phytophthora* sp., *Rhizoctonia solani*, and *Fusarium oxysporum* and *F. semitectum* have been detected in the damaged tissues. The above fungi have been detected as the sole fungal agent associated with the rotted tissues, or two or more fungi have been isolated together from the damaged crown tissues. John Olive is conducting some pathogenicity studies with the *Fusarium* spp. identified. The isolates were sent to Jean Juba at Pennsylvania State University (with David Geiser's Program) for species identification. Results of morphological and molecular work show isolates to be *F. oxysporum* and *F. semitectum*.

Turf Grasses. A variety of problems were detected on turf grass samples submitted. We saw fewer incidences of disease problems last year due to the dry conditions. Centipede was the most commonly seen grass last year. We received 127 centipede samples, 93 St. Augustine samples, 76 bermuda grass samples, and 65 zoysia samples. Brown patch was present in some locations. Almost half of our St. Augustine grass samples were diagnosed with take-all patch, caused by *Gaeumannomyces graminis* var. *graminis*.

SOME NOTEWORTHY DISEASES REPORTED FROM THE BIRMINGHAM LAB IN 2006

The following is a brief overview of the major crop groups and problems seen during 2006.

Weather. The biggest problem for 2006 was the warm, dry conditions that persisted for much of the spring, summer and fall. Rainfall was below normal for many of the central and north Alabama cities resulting in moderate to severe drought conditions. Birmingham recorded temperatures of 100 F for three days during the summer. This was the first year we recorded temperatures above 100 F in the last several years. Tuscaloosa reached the 100 degree mark 10 times last summer (NOAA, 2006). Because of the hot, dry conditions we saw a sharp increase in the number of abiotic and stress related problems on both turfgrass and landscape plants.

Fruit Diseases.

Tree and small fruit samples were reduced in number compared to previous years. No new or unusual disease or insect pests were observed in 2006.

Vegetable Diseases.

Tomatoes.

In addition to the above, the gemini virus diseases tomato yellow leaf curl virus (TYLCV) and tomato mottle virus (ToMoV) were found this year on tomato in greenhouse plants. These viruses were previously identified in 2005 in transplant tomatoes recently brought into the state from Florida. These two viruses are white fly transmitted. We also saw Pepino

mosaic virus (PepMV) for the first time on greenhouse tomato. Pepino mosaic virus is in the potex group of viruses and is easily spread mechanically on contaminated clothing, shoes, tools, hands and also by plant-to-plant contact.

Backyard garden tomatoes were the most common vegetable brought to the Birmingham lab. Overall, foliar diseases like early blight on tomato were uncommon due to the hot, dry conditions. Tomato spotted wilt (TSWV) was the most common problem. The number of samples with TSWV was more prevalent in 2006 (8 samples) compared with 2005 (4 samples), but was still not as much as we recorded in 2004 (15 samples). TSWV was seen at an unusually high incidence (25%) in large pepper planting last summer. Bacterial wilt (*Ralstonia solanacearum*) and Cucumber mosaic virus were also observed on tomato last summer.

Landscape Plant Diseases.

A total of 587 woody and herbaceous ornamental plants (76 % of total samples) were submitted for problem identification. Boxwoods were the most common plant brought to the lab; accounting for 7% of our ornamental plant samples. Azaleas were a close second with 6% of the samples. Canker and dieback diseases were very common last year. Especially hard hit were Leyland cypress.

We saw downy mildew (*Peronospora* sp.) on coleus again in 2006. We first saw this disease in June 2005. Downy mildew on coleus was first reported in New York and Louisiana in May of 2005.

We detected tomato spotted wilt on melampodium or butter daisy for the first time last summer. Symptoms on melampodium included leaf mosaic, leaf distortion and plant stunting. It was first reported in Louisiana in 2000.

Bacterial leaf spot and blight of rosemary (suspect *Pseudomonas*) was seen for the first time last year.

Turfgrass Diseases.

A total 118 turf samples (15% of total samples) were received at the Birmingham lab, which was about the same as 2005. Anthracnose, dollar spot, fairy ring, and Pythium root rot were the most common disease problems seen on bentgrass. On Bermudagrass, smut (*Ustilago cynodonis*) and bermudagrass scale were two unusual problems we observed. Chinch bugs were by far the most common problem on St. Augustinegrass. Cultural and environmental stresses were the most frequently observed problems on zoysiagrass last year.

NEW INSECT RECORDS FOR ALABAMA IN 2006 AS SEEN AT THE AUBURN PLANT DIAGNOSTIC LAB

The five new Alabama insect records included: a woolly whitefly, *Paraleyrodes minei*; the cactus eriococcin, *Acanthococcus coccineus*; the soybean aphid, *Aphis glycines*; a leaf beetle, *Demotina modesta*; dead Mediterranean fruit fly larvae, *Ceratitis capitata*. Other insect detections highlights included two identifications of the pyriform scale, *Protopulvinaria*

pyriformis. Both samples (Covington and Houston Counties) were landscape plants that spent the winter out-of-doors. There is no previous record of the pyriform scale overwintering in AL. There was an unusual outbreak of the wrinkled grasshopper, *Hippiscus ocelote*, in Autauga County. Thousands of the grasshoppers were feeding on forage and lawn plantings. Finally, larvae of the Mediterranean fruit fly, *Ceratitis capitata*, were identified (verified by SEL) in citrus (imported clementines) sold in AL supermarket. No live larvae were noted.