September 1998
Volume 19, Number 3

Plant Diagnostics Quarterly

Feature

Innovative Delivery of IPM Information in Maryland

On the Cover:

Top: Cross-section of a fungal apothecium

Middle: Sclerotia of ergot of rye (*Claviceps purpurea*)

Bottom: Mummies of plum fruit

Cover Art courtesy of Clare Kenaga, retired faculty member, Dept. of Botany and Plant Pathology, Purdue University.

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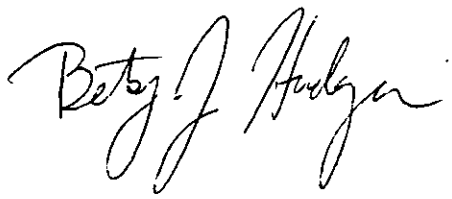
FROM THE EDITOR

Dear Reader:

This PDQ issue is my last as editor. I have accepted a plant disease diagnostic position with the British Columbia Ministry of Agriculture and Food and am leaving in a few days to start work. Happily, Stephan Briere has volunteered to take over the role as editor of the PDQ. I wish him all the best. I look forward to "seeing" all of you on the diagnostician's listserve once I get settled!



Betsy Hudgins, Editor

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REGIONAL REPORTS

NORTHEAST

Cheryl Smith

Before I begin with the northeast report, I would like to take this opportunity to welcome Karen Sirois to the diagnostic ranks. Karen will be replacing Diane Karascevicz as director of the Cornell Plant Disease Diagnostic Clinic (PDDC). Karen sent me the following information to serve as her introduction:
Karen was born and raised in the northern part of New Jersey. She joined the United States Air Force in 1982 shortly after graduating from high school. In the Air Force she was trained as a Aerospace Control and Warning Systems Operator (basically a radar and operations technician). She served in many different locations including Texas, Florida, Alaska, Saudi Arabia, and Korea. Although she loved the Air Force, she missed her family and decided to come home after a four year tour of duty. Most of her family had moved to the central New York area to become dairy farmers and she followed. In 1987 she began a career with Northeast Dairy Herd Improvement as a Field Supervisor. In 1989 she was promoted to Day-One Coordinator, a new position created to transfer all the paperwork performed on the farms to electronic computer files. This position was an incredible experience that enabled Karen to design a program, test it, and train over 200 employees on its use. As the training was nearing completion, she felt a need to go back to school.
With the encouragement of her husband, she enrolled in a local community college in 1993. In 1995 she transferred to Cornell University and studied Floriculture and Ornamental Horticulture. During that time she became fascinated with plant diseases and took as many course as possible in plant pathology. In 1997, she began her Masters of Professional Studies (MPS) in the department of Plant Pathology with Dr. James Lorbeer. Her research involved studies of a fungal pathogen, *Aspergillus niger*, of onion. The position of Director of the PDDC became available while finishing up her MPS. Karen is very excited about the position and hopes it can be a rewarding experience for all involved.

The unusual weather patterns that began in March continued through the summer. Although the last half of May was somewhat 'normal', the month of June was wet, cloudy, and cooler than normal. Needless to say the start of the growing season was slow and filled with disease problems. July brought a relatively sudden jump to 'normal' summer temperatures and near drought-like conditions. It's been an interesting summer, to say the least.

Woody Ornamentals

The sudden shift in temperatures and moisture availability has resulted in early leaf color and premature leaf drop on many trees. Cheryl Smith (NH) and Dan Gillman (MA) have noted widespread symptoms on European birch and linden, and Anne Sindermann (MD) has noted early leaf drop on many tree species. The sudden moisture shift has also caused a condition known as semi-mature needle blight in eastern white pines. The symptoms resemble acute ozone damage. Shade tree anthracnose is still taking its toll, particularly on sugar maples, which have also been hard-hit by pear thrips in New England. Oaks have been diagnosed with anthracnose and oak leaf blister throughout the region, and Anne (MD) and Cheryl (NH) reported anthracnose (*Gnomoniella carpinea*) on hornbeam. Sycamore anthracnose was very severe this year in many areas. John Peplinski (PA) reported that in some cases, the heavily defoliated trees produced a second flush of growth that was hit by severe powdery mildew that stopped leaf expansion. Dogwood anthracnose has been widespread with severe blighting on many trees throughout most of the northeast. Cheryl (NH) had one sample of Kousa dogwood with minor leaf spots caused by *Discula*. Powdery mildew has also been severe on dogwoods. Mary Ann Hansen (VA) reported that cases of Discula anthracnose and spot anthracnose have been outnumbered by cases of powdery mildew in recent years. Of 60 total dogwood samples during this time period, 26 were diagnosed with powdery mildew.

Leaf spots were also common thanks to the prolonged wet weather. Mary Ann (VA) reported Coniothyrium leaf spot on crabapple causing circular, tan leaf spots with dark borders. Bob Mulrooney (DE) reported Herpobasidium leaf spot on *Lonicera tartarica.* He mentioned it is an unusual problem for Delaware and suspects it came in on a nursery grown plant from outside their area (hmmm). Tubakia (Actinoplelte) leaf spot on oak was reported by Bob and Anne (DE) and Mary Ann (VA). John mentioned that tar spot on Norway maples and Entomosporium leaf blight of hawthorn were common in PA. He also reported a Venturia scab on red maple. Scab was common on crabapple in most states.

Bob (DE) reported that bacterial leaf scorch of Oak (positive ID by Agdia) appeared the earliest he's ever seen (7/20). Phytophthora root rot was also a common problem this spring and summer and was reported on boxwood, juniper and azalea (VA), euonymus, holly (VA) and on yew (DE). Ascochyta leaf blight was a the most common problem on lilacs (besides powdery mildew) in NH.
Other diseases reported on woody ornamentals included; fire blight on may hosts (Anne Hazelrigg, VT); Monilinia shoot blight on *Prunus* species (NH & VT); Sphaeropsis tip blight on Umbrella pine and *Sciadopitys verticillata* (DE), and Austrian pine (DE & NH); powdery mildew on crepemyrtle (DE); Xylaria root rot on hawthorn (NH); Phyllosticta leaf spot on wisteria (NH); Volutella blight on pachysandra (NH & NY); Phoma dieback on vinca (NH); black root rot on *Ilex* spp. (DE); Verticillium wilt on *Acer ginnala* (DE) and *Koelreuteria paniculata* (MD); rust (*Solidago*) on *Vinca major* (DE); anthracnose (*Marssoniella juglandii*) on walnut (DE); Mary Ann (VA) reported a couple of interesting diseases; 'anthracnose' on euonymus and Stigmina needlecast on spruce. The

'anthracnose' of euonymus was not the same anthracnose described in Diseases of Woody Ornamental Plants and Their Control in Nurseries. Symptoms included a dieback of individual branches (straw colored leaves) and some circular leaf spots. There was profuse sporulation of a *Gloeosporium* species. This problem seemed to follow a severe temperature drop in March. They have found the fungus *Stigmina* associated with needlecast symptoms on spruce many times in the past two years, but have been unable to find much information on this disease. Symptoms are similar to Rhizosphaera needle cast. Does anyone have information on this disease? If so, e-mail Mary Ann at: - maryannh@vt.edu. While we're on the subject of *Rhizosphaera*, Cheryl (NH) had one case where *Rhizosphaera* killed the new growth on a young blue spruce.

Herbaceous Ornamentals & Greenhouse

Botrytis was still a big problem during June, particularly for bedding plants and herbaceous perennials. Asiatic lilies were devastated by Botrytis blight in NH and PA. A stem canker caused by a *Colletotrichum* sp. was reported on osteospermum (cv 'wildside') by Cheryl (NH). Margery Daughtry (NY) also reported the same problem on the same cultivar. Cheryl also reported another basal canker on phlox, caused by *Fusarium*. Karen (NY) identified foliar nematodes as the causal agent of a major problem on creeping phlox. Bob (DE) reported foliar nematodes in hybrid cranesbill (Geranium x), a new host for him...we do tend to get excited over these things! Anthracnose of lupine, evident as elongate, sunken stem and petiole lesions with profuse salmon pink sporulation, and circular light brown leaf spots with dark borders was reported from (VA & NH). John (PA) received 3 samples of daylily with leaf streak caused by *Collecephalus hemerocalli*.

Mary Ann (VA) mentioned finding Phytophthora root rot in plants she doesn't often see it in, including butterfly bush and hypericum, and Anne (MD) reported *Phytophthora* on Euphorbia in containers. Damping-off and roots rot caused by *Pythium*, *Phytophthora*, and *Rhizoctonia* were common problems in VA on herbaceous ornamentals, such as bluebeard, bergenia, hellebore, impatiens, and veronica.

Virus diseases included INSV on Dipladenia (Mandevilla) from (MD), TMV on Scaveola (MD), a couple of cases of Cymbidium Mosaic Virus on Orchids in NY (Karen), and INSV on impatiens (great symptoms on the new seashell cultivars) and coleus (NH).

Other diseases on ornamentals included southern blight was common on sweet woodruff, germander, and periwinkle (VA); white smut, *Entyloma polysporum*, on Gaillardia (MD); powdery mildew on petunia (NH) and Myrothecium leaf spot on impatiens (NH). Cheryl received a couple of unusual samples, a Plectranthus with chlorotic ringspots and an obedient plant with chlorotic patches on the leaves. Both tested negative for the viruses included in Agdia's ornamental screen. If you have any ideas let her know (cheryl.smith@unh.edu).

Turf

The month of June remained cool and wet through the third week, so spring diseases such as Fusarium patch, anthracnose (mostly in the crown rot stage), and yellow patch (cool-season brown patch) predominated (Gail Schumann, MA). Yellow patch was also common on many lawns. Gail provided the following report: that Fusarium patch continues to confound many superintendents who think it is *Pythium* because of the greasy look and spray the wrong fungicides. This was particularly true in areas that are rarely this cool and wet by mid-June. Fusarium patch just doesn't seem to be on their list of "possible diseases" at that time of year. In early July we moved almost over night into hot, humid, stressful weather with its accompanying golf course diseases including: brown patch, anthracnose, summer patch, take-all patch, and Leptosphaerulina blight. On many golf courses, the excessive rain in June resulted in badly compacted fairways, so the annual bluegrass declined rapidly, in many cases from stress alone or with various secondary fungal contributions. As diseases caused thinning of turf, algae quickly took over, especially in shaded greens following the heavy rainfall of June. In lawns, necrotic ring spot and crown rots resulting from leaf spot fungi appeared quickly and caused considerable damage. There were many phone calls about fairy ring in mid-to-late July but most were about green rings that could be disguised. Towards the end of July, New England entered a drought period that has continued until this time (late August). Fungal disease samples diminished, but problems with drought dormancy were common, especially in lawns where even automated sprinkler systems had trouble getting enough water to the turf. (Thanks Gail!).

The other states reported a similar scenario of diseases. In PA, John reported 'the usual samples' of *Microdochium*, Drechslera leaf spot, basal anthracnose (*Colletotrichum*), Take-all patch and Pythium blight. In NY, Karen reported lots of summer patch and anthracnose, as well as some Leptosphaerulina blight. Bob reported a severe case of anthracnose on fine fescue in DE, and Cheryl reported Fusarium (Microdochium) patch, anthracnose crown rot, Leptosphaerulina leaf blight and Pythium blight, as the major problems in NH with a few cases of brown patch, Ascochyta leaf blight, anthracnose, rust and one case of summer patch.

Vegetables

Mary Ann (VA) saw a lot of damping-off and root rot caused by *Pythium*, *Phytophthora*, and *Rhizoctonia* in crops such as soybeans, cucurbits and tomatoes. She also mentioned that Pythium root rot and Rhizoctonia stem canker, two diseases they rarely see on tomato, were common this year. After the weather warmed up and dried out in July, she mentioned that southern blight was a common problem on beans and peppers in VA. Bob (DE) Saw southern blight (*Sclerotium rolfsii*) on potato for the first time in Delaware, and Anne saw Southern blight on watermelon in Maryland. *Fulvia* and *Botrytis* were causing severe problems in greenhouse tomatoes in NH and VT, and Rob Wick (MA) reported Fulvia leaf mold in outdoor tomatoes.

Bob (DE) found high populations of lesion nematodes in several potato fields, along with *Verticillium dahliae* to be the cause of early dying. Bacterial black leg on potato stems in two different fields in Delaware was traced to the same seed source. Rob (MA) reported a high incidence of bacterial wilt of summer and winter squash. Karen (NY) saw quit a bit of bacterial blight on various vegetables earlier in the summer, and she recently had a sample of aerial black leg on potato.

Late blight (*Phytophthora infestans*) was reported on potato from Pennsylvania (John), Vermont (Ann) and Massachusetts (Rob). The one isolate Rob had typed turned out to be US 7. Late blight was also reported on field and greenhouse tomatoes from Vermont (Ann), western Pennsylvania (John), and from northeastern Massachusetts (Cheryl). Blue mold of tobacco was very significant early in the year in Massachusetts (Rob).

Other diseases reported on vegetables included tomato pith necrosis (NH); bacterial spot in pepper (VA);bacterial wilt in tomatoes and cucurbits (VA); lots of fungal leaf spots and fruit rots in cucurbits (VT); and alfalfa mosaic virus on tomato (NH). Mary Ann reported that sunscald was common on sweet corn in Virginia. Water collecting in the whorls presumably acts as a lens to sunlight, which burns the leaves, often resulting in breakage. Mary Ann also reported a case of ToMV that caused severe leaf strapping resembling 2,4-D injury on the tomato variety Big Boy, while a neighboring variety, Better Boy, was completely unaffected.

Fruits

Mummy berry and anthracnose fruit rot were widespread in New Hampshire (Cheryl). Apple scab was also severe in orchards where growers did not get a spray on before the prolonged rainy period in May. John Peplinski (PA) reported receiving "quite a few strawberry specimens with black root rot (*Pythium*)" and "one angular leaf spot (*Xanthomonas fragariae*) sample on strawberry."

The following report was received from Frank Caruso:
"After being observed for the first time in 50+ years here in a small swath of unsprayed vines on Nantucket, rose bloom (caused by *Exobasidium rostrupii*) occurred in the same cranberry bed as well as eight other beds on Nantucket. The disease reached serious levels in at least three of the beds, requiring that the grower take steps to control the disease and prevent spread of the disease into other beds, eventually having a significant impact on yield. It is certainly an interesting situation when you have to deal with controlling a 'nonexistent' disease."

"Other *Exobasidium* (*E. vaccinii*) diseases on cranberry (red leaf spot) and blueberry (red leaf) were at very high levels in 1998. These infections occurred to a great degree during the 1997 growing season. *Taphrina* diseases were also present at high levels here. I noticed *Taphrina* on cherry for the first time in my yard."..."Because of the first 10 days

of May being very cool and drizzly, *Botrytis* caused significant injury to highbush blueberry, resulting in quite a lot of stem blight in addition to the usual blossom blight. Because of the mild winter, less Phomopsis twig dieback was observed this spring."..."Drought stress has been minimal this season. However, numerous cranberry beds were flooded in June, sometimes for 7 or more days, thus destroying the flowers (we were in bloom at the time of the worst flooding) and the berries."..."There were more than the usual number of cases of odd-looking flowers in cranberry. Some of these have been sent off for determination if viruses or viral-like agents are involved." (Thanks Frank!)

Field Crops

Bob Mulrooney (DE) reported a very severe outbreak of tan spot on wheat but very little *Septoria* this year. Soybean cyst nematode has been seen along with Septoria brown spot on soybeans in Delaware. John (PA) had several oat samples with BYDV delivered to the clinic.

SOUTHEAST

Jackie Mullen

Unusually high temperatures and sparse rainfall in many parts of the Southeast caused varying levels of damage. For some parts of this area, rain and showers have been occurring sporadically in August following a prolonged drought. This scenario has been perfect for the development of certain stress-related diseases. Richard Cullen in Florida reported that June in Florida was the driest month on record for central Florida. And, what drought didn't destroy, the fires finished off. In all, over 500,000 acres of timberlands were destroyed in Florida. In Kentucky, however, Julie Beale reports that wet weather almost all summer - except for dry conditions for the last two-three weeks in August - resulted in a variety and abundance of plant diseases.

Field Crops

Steve Vann in Arkansas reports a high incidence of charcoal rot (*Macrophomina*) and sudden death syndrome (*Fusarium*) on soybeans across the state. Extreme hot and dry conditions during June and July significantly contributed to the appearance of charcoal rot in most areas of the state. Also, AR is currently experiencing a significant problem with aflatoxin on the corn crop. The most severe locations are the SW, SE, and East Central areas. The state plant board is now running corn samples from within the state with

equipment donated by the Extension Service. Problems are associated with non-irrigated fields and with fields improperly irrigated. Steve's office has been flooded with questions concerning this problem. The rice crop looks good, mostly, and it is about two weeks ahead of schedule. Few reports of blast, brown spot, sheath blight and Sarocladium sheath rot have been documented. Bronze wilt (agent unknown) was observed on a sample of Paymaster 1220 cotton from the northeastern portion of the state. This disorder appears limited to only a select few varieties.

In Kentucky, Julie Beale reports Rhizoctonia crown and stem rots on many crops including tobacco and soybeans. An unusual finding in Mid-July with the unusually wet conditions was slime mold on a variety of plants including soybean stems. Tobacco diseases kept the Kentucky lab busy. They started the summer season with blue mold already well-established in the state, since it arrived on transplants in April. Many fields were set in June with plants infected systemically with blue mold. Even as of August 21, they received a sample of such plants which were only about ten inches tall after eleven weeks in the field. Blackleg and Pythium root rot (often expanding into the stem tissues) were also common in tobacco transplants and have resulted in field problems late in the season. Field diseases in tobacco included repeated episodes of blue mold infection, many cases of black shank and soreshin (*Rhizoctonia*), more tomato spotted wilt than usual early in June, Fusarium wilt (often in combination with root knot nematode), and severe angular leaf spot. They also saw the 'normal' mixture of target spot, frog-eye leaf spot, bacterial hollow stalk, and late-season aphid-borne viruses!

The North Carolina clinic (Tom Creswell reporting) received an inordinate number of chemical injury samples from corn and soybeans. Weather related problems developed in a variety of plants. Diseases of interest included corn with maize bushy stunt (phytoplasma), millet with gray leaf spot, and rye with black point.

Tom Stebbins in Tennessee reports that tobacco with severe early blue mold infections in the float beds developed into systemic blue mold in many fields where quality and yield will be affected. Other problems included black shank (stem and foliar), sore shin, frog-eye leaf spot, brown spot, Fusarium root rot, Pythium root and stem rot, black root rot, bacterial soft rot, angular leaf spot, and tomato spotted wilt virus on field tobacco; Rhizoctonia root and stem rot on snap beans; and Alternaria leaf blight on ginseng.

In Alabama, Jackie Mullen reports that bronze wilt on cotton, a disease of unknown etiology, was observed in August on Paymaster 1220 series. Plants develop a red stem coloration on upper sections, plants wilt and eventually die. There is no evidence of vascular or root disease. *Pythium* and *Fusarium* were isolated from some of the roots, but these fungi are very likely to be secondary agents. Other field crop diseases of note were southern corn leaf blight (*Bipolaris turcicum*), and southern rust (*Puccinia polysora*) on corn; *Fusarium moniliforme* rot of pegs and *Rhizoctonia* damage on pods of peanut; and sudden death syndrome (*Fusarium solani* isolated) on soybean.

Fruits and Vegetables

S. Vann in AR reported southern blight (*Sclerotinia*) has been common on bean, pepper and tomato from homeowner gardens. Both bacterial and Fusarium wilts were common on tomato. He saw few bacterial spots on vegetables.

In KY Julie Beale saw a good bit of black rot (*Xanthomons*) of cole crops; *Rhizoctonia* of bean; many incidences of tomato diseases including early blight, late blight, southern stem blight, Fusarium crown and stem rot, buckeye rot, bacterial spot , speck, canker, and bacterial pith necrosis. On fruits, KY saw more black rot of grape than usual and much more brown rot on peaches.

In TN, Microdochium blight on pumpkins was severe. Other problems include zucchini yellow mosaic virus, downy mildew and angular leaf spot on pumpkin; downy mildew and black rot of grape; pecan scab; Phyllosticta leaf spot on gooseberry; Septoria leaf spot on raspberry; rosette (double blossom) on blackberry; Choanephora fruit rot on squash; Phoma leaf and stem rot, Septoria leaf spot, pith necrosis, buckeye rot and water wilt on tomato.

In NC, Tom Creswell reports ozone injury to cucurbits.

In AL, cucumber mosaic virus (confirmed with ELISA) and bacterial wilt were noted on tomato. *Fusarium* and *Pythium* were consistently isolated from tomato and pepper lower stems showing internal vascular decay and rotting roots. In adddition, a US8 strain of *Phytophthora infestans* on tomato was identified using the gel electrophoresis technique.

In FL, Pam Roberts of the Immokalee Plant Disease Clinic (PDC) reported the Asian strain of citrus canker, *Xanthomonas axonopodis* pv. *citri*, was identified in a commercial grove in Southwest Florida near Immokalee. This pathogen is controlled in the U.S. by quarantine and eradication. Approximately 70 acres of grapefruit are currently being destroyed. Citrus triteza virus is also claiming thousands of citrus trees on susceptible rootstocks as growers remove and destroy infected and declining trees in local citrus groves.

Richard Cullen (Gainesville PDC) reported that the summer rains in late summer were sometimes accompanied by strong winds and hail which damaged late season crops such as butternut squash.

Ornamentals

In AR, Stephen Vann reports that many of the problems seen were weather related and unusual problems were not observed.

In KY, landscape diseases were mostly foliar problems, such as anthracnose of shade trees; powdery mildew on star magnolia, mahonia (unusual), euonymus, and dogwood; and other leaf spots (*Cercospora, Cercosporella, Septoria, Phyllosticta*) on many ornamentals.

In NC, heat/drought stress was widespread on many shrubs and trees which had become shallow-rooted during the late winter/early spring rains. Ozone injury to white pine, deodar cedar, and cucurbits was seen several times. Dogwood powdery mildew seemed to be decreased as compared to last year. Other diseases of interest included Alexandrian laurel with Fusarium leaf spot; Japanese Cryptomeria with Botryosphaeria canker and Asperisporium needle blight; Euonymus seen several times with anthracnose, powdery mildew and Phomopsis dieback; Horse-sugar with bud gall (*Exobasidium*); Japanese Kerria with Phyllosticta leaf spot and Phytophthora root rot; several maple samples in June with Venturia leaf blight (*V. acerina*); mulberry with false mildew (*Cercospora aracnoidea*); oleander with bacterial gall (*Pseudomonas syringae* pv. *savastanoi*); tutsan (a *Hypericum* sp.) with Phytophthora root rot; Chinese phlomus with cucumber mosaic virus; yellow gentian and Hellebore with foliar nematodes; Hellebore with bacterial soft rot, Phytophthora root rot, Pythium root rot and Rhizoctonia stem rot; moss phlox and Montebretia with bulb/stem nematode (*Ditylenchus* sp.); greenhouse-grown sea oats with Fusarium damping-off; black-eyed Susan vine with Alternaria leaf spot; globe artichoke with powdery mildew; Jerusalem artichoke with southern blight (*Sclerotium rolfsii*).

In TN, Leyland cypress was hard hit this year by a spring freeze followed by hot, humid weather leading to numerous fungal cankers including Seiridium canker, Botryosphaeria canker and Phomopsis canker. Other interesting problems at the clinic included powdery mildew on phlox, oak, tulip poplar, dogwood, lilac, cherry, and euonymus; leaf spot and twig blight on elm; Tubakia leaf spot and oak leaf blister on oak; Botryosphaeria blight on redbud; fungal leaf and twig blight on willow; dogwood anthracnose (several new county reports); rust on iris; Fusarium canker on weeping mulberry; anthracnose type diseases on chestnut, privet, ash, euonymus, maple and river birch; Verticillium wilt on sugar maple; Pythium root rot on Chrysanthemum; southern blight on ajuga and hosta; Macrophoma leaf spot on boxwood; Phoma stem rot on periwinkle; Phytophthora crown rot on petunia and impatiens; foliar Phytophthora blight on vinca; Rhizoctonia stem rot on impatiens; Corynespora leaf spot on African violet; anthracnose on purple coneflower, oakleaf hydrangea and blue fescue (ornamental grass); powdery mildew on coreopsis; Alternaria leaf spot on gomphrena; bacterial leaf scorch on red maple and pin oak; Septoria leaf spot on maple; Corynespora leaf spot on hemlock; Cercospora leaf spot on rose; Fomes wood decay in hemlock; annosum root and butt rot on arborvitae at a botanical garden; Cylindrosporium leaf spot on English walnut; Verticillium wilt on oakleaf hydrangea; southern blight on daylily; and Phytophthora root rot on potted plants in nurseries irrigated by ponds.

The following diseases of interest were noted in AL: *Phytophthora parsitica* crown rot of coleus and root rot of English ivy; Phomopsis stem blight of Wisteria. Also, Rhizoctonia

aerial blight and Cercospora leaf spot were unusual finds on rose. Heat stress problems on ornamentals
were common.

Bill Graves of the FL Homestead Plant Disease Clinic (PDC) reported that the drought of early summer brought on many problems. Heat damage and sunscald were diagnosed on a diverse group of plants including ferns, palms, avocados, mondograss, carrotwood, spathiphyllum, and bitter melon.

Richard Cullen in FL reports that water was used during the unusually hot summer to irrigate and cool crops. This foliage water treatment created problems with bacterial and *Phytophthora* diseases such as Erwinia soft rot and bacterial leaf streak (*Xanthomonas campestris*) on bird of paradise. *Phytophthora* was diagnosed on a broad range of plants including spathiphyllum, English ivy, peperomia, pothos, ixora, Kentia palm, white bird of paradise, rosemary, papaya and alocasia.

Southern blight continues to be a problem on the "Milky Way" variety of the cast-iron plant. Buttonwood (*Concarpus erectus*) was added as a new host in FL for witches' broom (*Nectriella pironii*).

At the Gainesville PDC, palm diseases and tomato yellow leaf curl virus (TYLCV) continue to be the main concerns. Palm disease diagnoses this quarter included bud rot (*Thielaviopsis paradoxa*), pink rot (*Gliocladium vermoeseni*), rachis blights (*Diplodia* sp. and *Serenomyces* sp.), Cecospora leaf spot, false smut (*Graphiola phoencis*), Ganoderma butt rot, Fusarium wilt (*Fusarium oxysporum* f. sp. *canariensis*), and lethal yellowing (LY). Lethal yellowing represents the first phytoplasma disease to be diagnosed at this clinic. The research protocol developed by Dr. Nigel Harrison of the Ft. Lauderdale Research and Education Center has recently been implemented as a diagnostic procedure in this lab. Successful diagnosis requires 6-8 leaflets from the emerging spear or a just-opened leaf and the use of DNA hybridization and amplification using two nested primers. This new protocol is a break through compared to the earlier method, which required destructive sampling. With over twenty palm genera in FL being susceptible to LY, we expect that palm samples will continue to keep us busy.

Turf

In AR (S. Vann), rust (*Puccinia*) was infrequent on turf during summer due to the hot/dry weather conditions. It was diagnosed on fescue and bermudagrass growing under shady/wet conditions. Recently, we have seen more cases of insect problems, specifically aryworms and mites.

In TN, Tom Stebbins noted the incidence of sting nematodes on bentgrass.

In AL, there was a decided increase in occurrence of take-all patch (*Gaeumannomyces graminis* var. *graminis*) on St. Augustinegrass.

In FL, Richard Cullen reported that heat stress contributed to the increase in the incidence of take-all root rot in St. Augustinegrass and bermudagrass. He reported seeing the usual turf diseases including take-all root rot, Pythium root rot and cottony blight, brown patch, gray leaf spot, etc. In August, summer brown patch (*Rhizoctonia zeae*) was frequently isolated from turf samples.

CENTRAL

Karen Rane

This is summer, and the busiest season of the diagnostic year. This year has been particularly busy for Central Region diagnosticians, with late spring and early summer rains favoring the development of what seems like thousands of diseases. My thanks go to Judy OÆMara (Kansas), Nancy Pataky (Illinois) Paula Flynn (Iowa) and Gail Ruhl (Indiana) for taking time out of their busy schedules to contribute to this report.

Agronomic crops

Cool, wet weather in July during flowering favored the development of Sudden Death Syndrome (SDS) in soybeans in several states. This disease, caused by *Fusarium solani* f. sp. *glycines*, causes interveinal chlorosis and necrosis of the foliage, and tan to brown discoloration of the cortical tissues in the taproot and lower stem. Symptomatic leaflets eventually fall off the plant, leaving petioles attached. SDS is often (but not always) found in conjunction with soybean cyst nematodes, and in Kansas new county records of soybean cyst nematode were documented when samples with SDS were submitted to the clinic. Other common soybean diseases this season include stem canker and Phytophthora blight. Gray leaf spot incidence was moderate in Kansas and Indiana, more severe in Iowa. Stewart's disease was severe this year, due to high populations of the corn flea beetle vector surviving the relatively mild winter. Corn that had been under water for a few days due to river flooding in Indiana developed a bacterial rot of the ears within the husks. The only symptom visible on the exterior of the plant was the caked mud indicating the floodwater level on the stalks and foliage. The ears appeared normal, but when the husks were removed the brownish, foul-smelling decay of the cob was

evident. Sooty stripe has been problematic in Kansas sorghum. Sorghum ergot did overwinter in Kansas, and specialists there are waiting for the development of new infections. In Iowa alfalfa, foliar diseases were common, wh e Sclerotinia blight was commonly found in fall-seeded alfalfa in Indiana.

Ornamentals

Anthracnose was very severe on many woody hosts this summer. Because of wet weather, new anthracnose infections developed into the summer. Tar spot was common on silver maples in Iowa and Indiana. Oak tatters, a noninfectious condition of unknown etiology (some suspect insect injury to leaves while still in bud), was reported from Illinois, Indiana and Iowa. Severely affected foliage appears to be "veins only" û most of the leaf blade tissue is missing. The condition is most common on white oaks, and varies in severity from year to year. Pine wilt is still common on Scots pines in Kansas. Dutch elm disease was frequently observed in Illinois elms, but less so in Indiana. Verticillium wilt was common on maple, ash smoketree and Koelreuteria in Illinois. Leaf scorch due to temperatures greater than 100°F and high winds resulted in leaf scorch of many Kansas tree species. Iron chlorosis was severe on oak, sweetgum, birch and maple in Illinois. Southern blight, caused by *Sclerotium rolfsii*, was common in ajuga, hosta and assorted prairie flowers in Kansas. Aster yellows was very common on echinacea (purple coneflower) in Iowa. Other diseases of note in herbaceous ornamentals included Mycosphaerella leaf spot on iris (Illinois), anthracnose on hosta (Indiana, Illinois), downy mildew of rose (Illinois), and pelargonium flower break, Pelargonium zonate spot and tomato ringspot viruses in geraniums (Iowa).

Other crops

Gray leaf spot was significant this year in ryegrass fairways in Kansas. Brown patch was common in Indiana and Kansas turf. Take-all patch was confirmed in an Indiana bentgrass green (perithecia of *Gaeumannomyces* were present in the crown tissue). There were relatively few reports of severe disease problems in vegetable crops. In Kansas, a crop of sweet corn was ruined when a bacterial soft rot of the husks occurred after a period of wet weather. Although the kernels were not rotted, they developed a bad flavor, apparently from the husk infection.

SOUTHWEST

Tom Isakeit

ARIZONA, Tucson - Mary Olsen
Mary reports a powdery mildew problem on pepper.

ARIZONA, Yuma - Mike Matheron
The summer in western Arizona has been about normal with respect to temperature, which means it's been HOT! This is the time of the year that homeowners find out why many perennial plants are not grown in this area. The high daytime and nighttime temperatures put a tremendous stress on plants. The combination of high temperatures, intense sunlight and salinity lead to a plethora of abiotic diseases during this time of year. Plants and humans alike eagerly look forward to the more moderate climate that will come with autumn.

CALIFORNIA, San Diego - Patricia Nolan
The best news is what we did not find. We haven't seen chrysanthemum white rust since May and hope we have it licked for this year. The best disease has been a spectacular case of downy mildew (*Plasmopora viticola*) on wine grapes. We are seeing powdery mildew on everything that can get it, some gray wall and blossom end rot on tomato, and a lot of mealybug, mite and thrips problems on everything else.

We've been very busy answering phone calls. Within a 2-week period, gypsy moth, Mexican fruit fly, and Mediterranean fruit fly were found in the county. If that wasn't enough, the Africanized honey bee was found a bit closer to the city limits. The resulting publicity kept several people attached to phones for a couple weeks.

NEW MEXICO - Natalie Goldberg
Sampling and testing of New Mexico's Karnal bunt samples for the National Survey is complete with no Karnal bunt detected. Additionally, processing of pre-release samples (from regulated counties) for bunted kernels is nearly complete. So far, no bunted kernels detected.

Diseases identified in the Plant Clinic include: Slime flux on willows and cottonwoods, brown patch (*Rhizoctonia solani*), leaf spot (*Bipolaris* sp.), and root rot (*Pythium* sp.) on bentgrass; brown patch, and leaf spot (*Bipolaris* sp.) on bluegrass; brown patch, and leaf spot (*Bipolaris* sp. and *Curvularia* sp.) on fescue; powdery mildew (*Microsphaera* sp.) on ash; powdery mildew (*Leveillula taurica*) on chile peppers; Verticillium wilt (*Verticillium dahliae*) on chile peppers and catalpa; Phytophthora root rot (*Phytophthora capsici*) on chile peppers; damping-off (*Pythium* sp.) on watermelon; bacterial canker (*Pseudomonas*

syringae) on peach; leaf spot (*Alternaria* sp.) on pecan, jasmine, India hawthorne, privet, peach, and tomato; root knot nematode (*Meloidogyne incognita*) on cantaloupe, beans, tomatoes, chile and bell peppers; pink root (*Phoma terrestris*) on onion; beet curly top virus on tomatoes, chile peppers, squash, pumpkin, and melons; alfalfa mosaic virus on chile peppers; cucumber mosaic virus on chile peppers; and corn smut (*Ustilago maydis*) on field corn.

The following abiotic disorders were identified: herbicide injury on ash, sycamore, lilac, pecan and apricot; drought and heat stress on many plants including, apples, heavenly bamboo; junipers, blue spruce, crabapple, pines, pecan, and peach; zinc deficiency on pecan; blossom-end rot on chile peppers; iron deficiency on maples, willows, photinia, catalpa, lilac, chitalpa, ash, and wisteria; and salt stress on many plants including, pecan, apple, peach, apricot, rose, lilac, wisteria, grape, and vitex.

OKLAHOMA - Betsy Hudgins
A very hot and dry summer caused a sudden flurry of golf course bentgrass samples to arrive in the diagnostic lab during the last half of July. The main problems were complicated combinations of cultural and environmental stresses (improper watering, heat stress, black layer, algae growth, thatch development, etc.), with only a few disease problems. Anthracnose was abundant on some greens or a contributing factor to decline in others. In a few samples, the nematode populations were high enough to cause significant damage; in fact, in one sample the numbers were more than 3 times the threshold levels! The nematode species at very high levels were lance (*Hoplolaimus*), sting (*Belonolaimus*), and stunt (*Tylenchorhynchus*).

On the molecular front, yellow vine detection has been successful this year using PCR. Dr. Fletcher in the Department of Entomology and Plant Pathology at Oklahoma State University and Dr. Bruton with the USDA at the Wes Watkins Agricultural Research and Extension Center in Lane, OK and other researcher have been screening cucurbit plants for the yellow vine disease this summer. Initially, a stain test is performed on crown sections, followed by a PCR test using primers specific for the bacterium believed to be responsible for this disease. Two sample received in the diagnostic laboratory were tested by the research team. Although both samples had a positive reaction in the stain test, only one sample produced a positive result from the PCR analysis. The plant with the negative result is believed to have had bacterial wilt, not yellow vine.

No other type of sample has been submitted to the lab with any regularity. Some of the diagnoses include: southern blight of apple (nursery); Botryosphaeria cankers of birch (nursery), elm, and sweetgum; alfalfa rust; Rhizoctonia stem and root rot of periwinkle; charcoal rot of soybean; Dutch elm disease; and pine wilt.

TEXAS, Plant Disease Diagnostic Clinic, College Station - Larry Barnes
Root rot caused by *Thielaviopsis basicola* has been a problem on pansy. There has also been a problem with a non-infectious pansy disorder distinguished by a blind head and thick leaves.

TEXAS, East, Overton - George Philley
Bacterial stem rot (*Erwinia chrysanthemi*) occurred in a field of sweet potatoes. This is noteworthy because this disease is usually only a storage problem. Southern blight (*Sclerotium rolfsii*) was a problem in commercial fields of tomato and eggplant. In one field, the root knot nematode was a problem in a tomato field previously cropped to cucumber. Charcoal rot occurred on soybean, including the production of the pycnidial stage, *Botryodiplodia phaseoli*.

TEXAS, High Plains, Lubbock - Harold Kaufman
There was a high incidence of common smut in corn (up to 80% in some fields). Aerial Rhizoctonia blight was a problem in commercial facility producing poinsettia. The only ergot (*Claviceps africana*) seen on sorghum was on plants that developed from seed spilled from a bird feeder.

TEXAS, Winter Garden, Uvalde - Mark Black
Aflatoxin, caused by the fungi *Aspergillus parasiticus* and *A. flavus*, was a serious problem in food and feed corn; levels often exceed 200 ppb. Anthracnose (*Colletotrichum trifolii*) was a problem on alfalfa in far-west Texas.

TEXAS, North-central, Stephenville - Thomas ("Chip") Lee, Jr.
In spite of the very dry summer, pecan scab (*Cladosporium caryigenum*) has been a problem on the cultivar, 'Wichita'. Prevalent peanut diseases seen were: Sclerotinia blight (*Sclerotinia minor*), pepper spot (*Leptosphaerulina crassiasca*), Rhizoctonia rot (*Rhizoctonia solani*) and Botrytis blight (*Botrytis cinerea*).

TEXAS, Lower Rio Grande Valley, Weslaco - Tom Isakeit
Aflatoxin was a serious problem on corn in the Lower Rio Grande Valley and especially in the Coastal Bend area because of the drought conditions. Levels ranged up to 800 ppb. (The cut-off for human and dairy consumption is 20 ppb; for feedlot cattle, 300 ppb). A dieback of young leaves was quite noticeable in fields of some varieties of sugarcane. The temperatures that occurred routinely during this summer (100°+) exceeded the optimal range for sugarcane growth. There's only supposed to be one other sugarcane growing area in the world - some remote place in Iran - that has the same problem. Smut (*Ustilago scitaminea*) has become more of a problem on the sugarcane variety CP72-1210, which was previously thought to be resistant to it. Last year, sugarcane smut was the death knell for the variety NCO-310, which used to be the prevalent variety in this area.

TEXAS, Central, College Station - Tom Isakeit
The drought had a major impact on agriculture in central Texas and this was reflected in a serious aflatoxin problem on corn. The drought also took out quite a few trees in the College Station area. Take-all patch on St. Augustinegrass became more noticeable as the summer progressed. In university research plots, there was some recent infection of sorghum with ergot that coincided with some August rain showers.

PACIFIC NORTHWEST, INLAND NORTHWEST, AND UPPER GREAT PLAINS

Ellen Bentley

Throughout the region the lingering effects of el niño have produced a busy season. The word is slowly getting out that the **WSU-Puyallup** Diagnostic Lab (*Lindsey du Toit*) is open again. July was busy until the unusually hot weather - the number of samples dropped off dramatically. It may have been the hot weather *per se*, or the fact that many urbanites go on vacation around now, or that most people attribute their problems to hot, dry conditions. Some of the disease problems we've seen, as well as the usual horde of cultural and environmental plant problems follow.

Turf diseases included Rhizoctonia brown patch and *Pythium* (particularly following the hot and dry weather west of the Cascades); red thread; Fusarium patch (*Microdochium*); a lot of cultural problems such as very dense/tall thatch and herbicide injury; net blotch on fescue forage grass.
Broadleaf trees: *Gymnosporangium* rusts; Dutch elm disease; anthracnose on ash and dogwood; brown rot on weeping cherry; fasciation on ornamental cherry; Taphrina leaf curl on alder.
Tree fruits: scab; sun scald (unusual for western WA); bitter pit of apple; Coryneum blight on cherry; European canker on apple.
Shrubs and vines: *Gymnosporangium libocedri* rust on serviceberry; Exobasidium leaf gall on azalea; powdery mildew on rose; Entomosporium leaf spot on *Photinia*; crown gall on euonymus; Phytophthora root rot on *Ilex*; suspected herbicide injury to ornamental/landscape plants.
Small fruits: Phytophthora root rot on raspberry (quite a few samples); sun scald.
Conifers: Phytophthora root rot on arborvitae and Port Orford cedar; a lot of Botrytis tip blight on Douglas-fir, true firs, and cedars (mostly during June and early July before conditions turned hot and dry).
Vegetables and herbs: *Fusarium* on basil and pumpkin; black rot on cabbage; rust on beans; catfacing on tomato; late blight on tomato and potato; Ascochyta and Ramularia leaf spots on rhubarb; *Rhizoctonia* on pea; Verticillium wilt on tomato. Botrytis neck rot and Stemphylium leaf blight on shallot; white rot (*Sclerotium cepivorum*) on garlic.

Across the Cascades at **WSU-Prosser** (*Ellen Bentley*) the same weather pattern meant an atypical cool, wet followed by a record setting hot, dry July continuing as normal August temperatures. Severe storms battered eastern WA with hail, high winds and "floods", lodging wheat, stripping orchards and ornamentals, as well as flattening vegetables and annuals. Many growers did not have hail insurance. Lightening strikes and wild fires also occurred. An irrigation canal rupture washed out a potato circle. Ornamentals and garden vegetables from higher elevations were attacked by various anthracnose and leaf spotting

fungi (unusual and fun to see!). Fir and spruce were hit by late frost. Off target herbicide injury is common in landscapes contiguous to small grains. Columbia Basin ornamentals have suffered from Verticillium wilt, drought, heat stress and currently are developing root rots due to over compensating irrigation. Summer limb drop has been excessive in large broadleaf trees. Everything everywhere still has powdery mildew. Turf is scalped and drought stressed. Orchards under evaporative cooling exacerbated the fire blight which is proving lethal following the intense heat. Fruit cullage is high due to water spotting (high soluble salts in irrigation water), drought spot and bitter pit. Sprinkler rot of fruit (*Phytophthora cactorum*) is common. An unusual occurrence of black fruit rot (*Botryosphaeria*) has been noted. Pears were damaged by sun scald and premature ripening. Grapes suffered from early season iron chlorosis, powdery mildew, residual 1996 cold injury and reduced pollination during a rainy bloom. However, the harvest looks profitable. Sweet corn yields are down due to common smut (atypical) and poor pollination (heat). High Plains Virus was confirmed in two commercial fields and one home garden planting. It also destroyed the male lines in a dent corn field for seed increase. This is the first documented occurrence of this disease in Washington. Late blight in potato is common. Early varieties suffered from pink rot and leak at harvest. Erwinia stem rot and white mold are more common due to storm injury. Green peas suffered root rots and downy mildew. Small grains were diagnosed with head scab, Septoria leaf blight, WSMV, BYDV, fungal foot rots, rusts, physiological leaf spot and drought. Hops are still besieged by powdery mildew and spider mites. One large grower decided to fight the mildew by leaving his yards bare.

High rainfall during May undoubtedly contributed to another summer of varied but interesting plant disease problems in North Central Oregon (Joy Jaeger & Phil Hamm, OSU-Hermiston). BYDV caused wide spread damage in dryland and irrigated winter wheat. Also, this spring was the first time BYDV was seen in spring wheat. A low incidence of WSMV was also found. Physiologic wheat spot (Ca deficiency) occurred in low frequency. Stripe rust was at a high level, possibly the highest in 30 years. Barley scab was also found, as was false loose smut. Excess rain also contributed to a moderately high level of head scab (*Fusarium*) in some fields. After seeing common smut of both sweet and field corn for the first time in 1997, some was expected in 1998. However, this disease has not been found in most fields throughout the area. Potatoes continue to have their share of problems. Late blight was found in early July, as predicted by our model. All strains thus far have been US8. We have also encountered pink rot, powdery mildew, black leg, and Fusarium dry rot. Other diseases of interest: bacterial fruit blotch and angular leaf spot of watermelon; bacterial canker of cherry; downy mildew on alfalfa; white rot of onion; and bacterial blight on peas.

The wet weather in May was extremely conducive to fungal diseases. Tip blights of conifers were a large concern throughout **Western Oregon** (*Melodie Putnam, OSU-Corvallis*). *Sirococcus* commonly blighted new growth on blue Atlas cedars and Sitka and blue spruces. *Botrytis cinerea* was also prevalent on all kinds of conifers, again attacking the new growth. Affected plants included Douglas-fir, blue spruce and noble fir (I'm not even considering all the *Botrytis* that came in on angiosperms).

There were slim pickings in the curiosity corner this quarter. The fungus *Pleiochaeta setosa* was observed causing numerous leaf and stem lesions on an ornamental Scotch broom cultivar. We wondered if an intentional release might be a good thing! (*Seconded, scotch broom is a noxious weed in W OR and WA -ed*). A *Peronospora* species was found on the native succulent *Lewisia* cotyledon; this appears to be a new disease for this host. Firsts for Oregon were *Oidium* on seed and leaves of ginseng, and *Peronospora* on *Limonium* (statice). Not unheard of, but not common here either, was *Melampsora* aecia on grand fir. A real weirdo was *Entomosporium* on persimmon. Who'd have thought this interesting looking fungus would ever stray so far from Photinia?

After several years of remission, wheat streak mosaic (WSMV) made a comeback in north and south central **Montana** (*Martha Bamford*) . Barley yellow streak mosaic virus was common on barley due to dry conditions that favored the brown wheat mite vector. Wet weather that followed in June caused severe net blotch and scald on barley in some locations. Minor Septoria blotch (*Septoria passerinii*) was confirmed on barley. The cool, dry spring caused severe emergence problems in many sugar beet fields. Aphanomyces root rot, Fusarium wilt, and Cercospora leaf spot also were problematic in some beet fields. Despite many favorable infection periods, seed potatoes remain free of late blight to date. In alfalfa, a leaf blight caused by *Phoma spp.* was present in many irrigated seed fields. Leaves develop a yellow blight speckled with noticeable black pycnidia. Dr. Kenneth Leath, PA, has not seen this disease in the Northeast and confirmed that the symptoms are not typical of spring black stem and leaf spot (*Phoma medicaginis*).
A very wet spring in western Montana encouraged a number of interesting diseases on trees, garden plants, and turf. Among these were brown spot needle blight and Elytroderma needle cast on ponderosa pine, needle rust on Douglas-fir, and Chrysomyxa rust on Engelmann spruce. Peach leaf curl, bacterial blight on lilac, hawthorn leaf spot (*Diplocarpon mespili*), anthracnose on sycamore, and shothole disease on cherry were detected as well as white rot on garlic, Fusarium wilt on pansies, and Sclerotinia stem rot on petunias. I identified ash rust (*Puccinia sparganioides*) on green ash transplants from several locations in southeastern Montana. With as many green ash samples as we see in the Clinic, this was the first time I've found this disease. There also was "epidemic" red thread on turf and slime mold on turf and cucurbits. Pelargonium flower break virus caused severe wilting and drying of commercial geranium leaves. Tomato spotted wilt and bacterial canker were detected on several garden tomato samples. ELISA tests confirmed raspberry bushy dwarf virus on raspberries with small, crumbly fruit. The owners say these symptoms develop about six years after each time they start new beds with the same (infected) source of canes. Time to buy some new, disease-free canes? *Echinacea* from western Montana research plots tested positive for a phytoplasma. Plants were stunted and leaves were thickened, distorted, and yellowish with witches' brooms. Flowers were very small and pale. However, the phyllody that others have reported was not present. Aster yellows symptoms also were present on lilac, plum, delphinium, potato. It must have been a good year for the leafhopper vectors.

The **Utah** plant disease clinic (*Scott Ockey*)is experiencing more small grain foot and root rots this year due to our wet spring. Dutch elm disease is also showing up in some central Utah locations. In 1997 I reported on the Black Walnut Bark Beetle killing some black walnuts on an old homestead. This year it has taken out approximately 10 established trees. We haven't investigated to see if the beetle is vectoring a pathogen but the beetle seems to be able to attack seemingly healthy unstressed trees. Other diseases include: *Rhizoctonia* on poinsettia, curly top virus in annual statice and tomato, and heat and drought stress. To date, late blight hadn't been reported in any Utah potato fields.

Wyoming (*Stephan Briere*) had a two week hot period in early July and it has been somewhat unseasonably cool and wet since then in most of the state. Some diseases seen on trees have been frost damage in spruce (remember this *is* Wyoming!), bacterial blight of lilac, Venturia shoot blight and Marssonina leaf spot in aspen, ash anthracnose, *Cytospora* in narrow-leaf cottonwood, cedar-apple rust in Rocky Mountain juniper, winter injury, iron chlorosis and zinc deficiency in many tree species. We diagnosed the following problems in some home garden plants: 2,4-D herbicide damage of tomatoes and potatoes, early blight on tomato, Fusarium root rot in pea and bean, and nutrient deficiencies. Turf diseases included anthracnose *(Colletotricum graminicola*), grey snow mold (*Typhula sp.*), pink snow mold (*Microdochium nivale*), Bipolaris leaf spot, melting out, and Ascochyta leaf blight. Field crop samples included tan spot (*Pyrenophora triticirepentis*) on wheat, Helminthosporium leaf blight in oat, brown spot (*Pseudomonas syringae* pv. *syringae*) and halo blight (*P. syringae* pv. *phaseolicola*) in navy bean, *Cercospora* in sugar beet, and leaf rust in bean. We also were amazed at a few clandestine herbicide (Roundup, Spike) attacks by some individuals on a 60 ft cottonwood in a trailer park and several lilac bushes in a cemetery!

The summer started out with the famous mixed bag of weather. We have 5 or 6 counties in **South Dakota** (*Marty Draper*) that have been so wet they were declared a Federal disaster area! We also have counties that are below normal precipitation on the year (six inches behind when the annual total is expected to be 19... it a tough situation).

The wheat crop had more Fusarium head blight than last year. Some fields approached 50% disease in fields where a susceptible variety was planted into no-till corn stubble. State-wide the average was probably closer to 5% disease. Winter wheat in western counties have seen significant damage from common root rot.

Soybeans were damaged early by Rhizoctonia root rot. Phytophthora root and stem rot is becoming quite common. Soybean cyst nematode has now been documented in 13 eastern counties from the Nebraska border to the North Dakota border. *Sclerotinia* diseases do not appear to be a severe problem so far this year, but that may change. Some safflower fields in the western part of the state have already been destroyed due to complete losses from *Alternaria carthami.*

Late blight has been severe on tomatoes this year. Appearing in June, suggests (at least to me) that *P. infestans* may have been introduced with the transplants. Genotyping has not yet been successful due to very poor condition of the samples. As of last week late blight

was beginning to occur in commercial potatoes. Only about 6 fields have been identified so far.

Reports were not received from **Idaho** or **South Dakota**.

THE WELL CONNECTED DIAGNOSTICIAN

SLIDING INTO HOME (DATA) BASE

Mike Munster & Tom Creswell
North Carolina State University

At this writing we are keeping one eye on the computer screen and one eye over our shoulders at Hurricane Bonnie, hoping not to see a repeat 1996's hurricanes Bertha and Fran. Any lapses in logic will be blamed on the weather.

Besides email, the computer application most essential to the work of a diagnostic clinic is the database that is used to keep track of samples and write reports. It has been nine years since the clinic here at North Carolina State switched from three-part carbonless cards to a computer database, but the time has come for us to upgrade. The purpose of this column is to give you a window on this sometimes painful process, in the hope is that it will provide insights for others considering the same move.

Let's begin with the *least* important of our motivations: the impending Year 2000 problem. We use separate datasets for each year, so there isn't any explicit subtraction of one year from another, but our understanding is that sometimes computer code makes internal checks with date values. In other words, we might be vulnerable. If you are just now thinking of this for your own system, it may be too late to do anything, so we're sorry we mentioned it. It would be worth getting some local advice on your particular situation.

The main reason we want an upgrade is that our current database is something of a dog. Don't get us wrong, it's a good dog, but it's hard to train and the vet bills are high. Our database was written especially for the clinic, based on a program called Unify[1]. A serious drawback is all the work needed to change over from one year to the next. Also, it is necessary to write a small unix program called an SQL script to do summaries of the data. Add to this the fact that we are the only ones on campus using this package (translation: no local support) and the cost of approximately $2000 per year for the maintenance agreement. There are some hardware issues, too. Our Sun SPARC station 10, though extraordinarily reliable, is getting on in years and we'd like something faster

[1] As usual, mention of a trade name does not imply endorsement by North Carolina State University or the North Carolina Cooperative Extension Service.

and with more storage space. Finally, there are some new tricks that we'd love to see, but that our old dog simply can't do.

One of the current features that is absolutely essential is that multiple individuals can work on the database at the same time. A new feature we want is for extension agents, regional agronomists, and other clients to be able to look up the status of any given sample on the web. Think of the phone calls saved, which always come when you're in the middle of an ELISA! Another good thing about the current setup is that we send out most reports by email. Now we want to simplify that process so that individual specialists looking at a specimen can conveniently input their diagnosis, call up "canned" responses if desired, write their recommendations, and send the report. Currently all this is done by the clinic manager and secretary from the paper form on which the specialist wrote the diagnosis.

We'd also like to have a graphical interface that offers options in pull-down menus, based on information that has already been given. For example, one of the first pieces of information we add about a sample is the county from which it was sent. Given that, the computer could prompt us with the appropriate area code for the grower's telephone number (often omitted on the forms). Likewise, given the name of the plant, the most commonly diagnosed problems could be presented for selection. And wouldn't it be nifty to push a button and send an "inadequate sample" message as soon as a sample is entered? To be really high tech, we also want to incorporate a bar-code system for sample tracking and updating, as well as a way of storing digital images of samples.

Once we had recognized our current problems and future ambitions (o.k. some of those ambitions came later in the process), we had to decide which of three general types of solutions we wanted: another custom-written database, an off-the-shelf product such as PClinic, or an application based on Lotus notes that we could develop ourselves with some technical assistance. Each of these had pros and cons which we discussed at a meeting with some of our Extension Technology Services staff. The consensus was that the PClinic and Lotus notes solutions would not be the best for us, that we ought to have a web front-end to some sort of relational database. Two things quickly became clear: that we needed professional help, and that it would be expensive.

At this we became discouraged (requiring further professional help), and little progress was made for a time. The big break came from Extension Administration, which agreed to fund the project. As a ballpark estimate, it is going to cost $56,000, broken down as follows. Clearly this is nothing to sneeze at, especially the labor cost, but the only extension personnel capable of the programming are already overworked.

Software development tools (PowerBuilder) and Database (probably SYBASE)	$5,000
New Server (Sun-Solaris or NT; min 128K RAM, min 8G hard drive)	$15,000
Commercial programming labor, $75.00/hr for 12 weeks	$36,000

The other thing that broke the logjam was a helpful piece of software called Inspiration (Inspiration Software, Inc.). This is a generic program for organizing one's thoughts into flowcharts and outlines, and Tom got very excited using it on his PC to diagram the database and the features we want to include. This helped us to see the relationships among the different functions of the database, spot redundancies, etc.

The process of formalizing all of our requirements of course means that we have formed a committee with representatives from the different groups of people using the database (clinic staff, plant pathologists, entomologists). Extension agents will be part of the evaluation/development process later on, since they also will be users. The first meeting will be this week, hurricanes permitting. Of course a timetable needs to be decided, too, and the millennium is fast approaching.

Join us again next quarter for an update on this situation. You are invited to contribute your own ideas and experiences. Please send an email to mike_munster@ncsu.edu. That column will also be the wrap-up for this particular author, so stay tuned.

DIFFUSION

Melodie Putnam
Oregon State University

Black spot of globe artichoke: a calcium-deficiency disorder. Researchers in France describe, in a related paper (*J. Phytopathology* 146:73-77), a relatively new and severe disorder characterized by localized black necrosis of the receptacle of the flower bud of globe artichoke. Necrotic lesions in the receptacle are usually spherical with a diameter of a few millimeters to two centimeters. Early in the development, the injury is light brown and wet looking. With age the tissue turns black, the central affected portion is destroyed, and a cavity develops. Surrounding cells turn into sclerified corky tissue. Plants sprayed with an anti-transpirant (which slows movement of calcium in the xylem) showed reduced incidence of black spot. Additionally, calcium measurements of tissue surrounding the necrosis were significantly lower than calcium measurements of healthy receptacle tissues. *J. Phytopathology* 1998, **146**:79-82.

The occurrence and pathogenicity of *Cylindrocarpon*, *Cylindrocladium* and *Fusarium* in *Calluna vulgaris* and *Erica* spp. in England and Scotland. Pathogenicity of fungi commonly isolated from heather and heath was tested by A. M. Litterick and M. P. McQuilken (Scottish Ag. College, Auchincruive, Ayr, Scotland). Symptoms of affected plants included rotting of both fine and woody roots, discoloration and rotting of the stem bases, wilting of shoot tips, and browning and rotting of the lower foliage. Plants with golden foliage were particularly affected. Interestingly, *Cylindrocarpon*, *Cylindrocladium*, and *Fusarium* spp. were more frequently isolated from stem bases and lower foliage than from roots. Species most frequently recovered from 77 *Calluna vulgaris* and 115 *Erica* plants were *Cylindrocarpon destructans* , *Cylindrocladium scoparium* and *C. ili cicola*, and *Fusarium sporotrichioides* (other species of all three genera were also isolated). *Cylindrocladium scoparium*, *C. ilicicola* and *Cylindrocarpon destructans* were most pathogenic in greenhouse assays on rooted cuttings. *Fusarium tricinctum*, *F. sporotrichioides* and *F. avenaceum* were less pathogenic (i.e. fewer inoculated plants became diseased). Specific cultural control measures are suggested. *J. Phytopathology* 1998, **146**:283-289.

Induction of systemic resistance in pea to pea powdery mildew by exogenous application of salicylic acid. Salicylic acid (SA) is known to induce systemic resistance in plants. S. Frey and T. L. W. Carver (Inst. Grassland and Environmental Res., Aberystwyth, Ceredigion, UK) have investigated conidial germination and infection success of pea powdery mildew when inoculated onto leaves distant from those treated with SA. Although phytotoxic at the highest concentration tested (15mM), treatment of leaves with 1.5 mM SA did result in reduced infection in leaves both below and above treated leaves. Resistance was not expressed until three days after SA application, but persisted for at least 13 days after treatment. *J. Phytopathology* 1998, **146**: 239-245.

FEATURE ARTICLE

USING ADVANCED PHONE TECHNOLOGY TO DELIVER IPM INFORMATION

Mary Kay Malinoski, Regional Specialist, Entomology
Jon H. Traunfeld, Regional Specialist, Fruit and Vegetables
David L. Clement, Center Director, Regional Specialist Plant Pathology

Home and Garden Information Center, University of Maryland,
Cooperative Extension Service, 12005 Homewood Rd.,
Ellicott City, MD 21042

Background:

The Center was established in 1989 to provide up to date environmental horticulture information to the general public. As Maryland's urban and suburban population has grown, so has the need to provide these burgeoning audiences with environmental horticulture information they can use I their homes and gardens. The Center provides information on environmental horticulture questions via a toll free phone number to Maryland residents. Access to Extension information is available 24 hours a day through pre-recorded, self-help problem diagnosis tapes. Phone consultants are available to assist the public five days a week. Regional specialist positions in horticulture, plant pathology and entomology were created to serve as resource personnel, develop educational materials, train horticulture consultants and master gardener volunteers and operate the center. Faculty collaborates in development and delivery of interdisciplinary educational materials through demonstration gardens, TV, radio, professional meetings, field days, and applied research projects.

The original automated phone system was in place from December 1989 through early May 1995. Due to the success of the Center, the number of phone calls exceeded the capacity of this out-dated phone system. A new system with greater call handling capacity, reliability, ease of use and technical support was put into operation in the spring of 1995. The newly designed automated phone system is unique and the first of its kind in the United States.

System Components:

Primary concerns when choosing the new phone system hardware were technical support and hardware reliability. The system selected was an AT&T Conversant Phone System. It utilizes the latest speech recognition technology, which allows the utilization of spoken input by callers. The system is composed of a MAP 40 (Multi-Application Platform) which is the call handling computer. It can handle up to 48 channels. There are 12 in our systems. Other features include a 150-MB tape drive for system back-ups, disk drive and hard drive. The MAP 40 is easily upgradeable by replacing circuit packs. Other components of the package included monitor, keyboard, printer, 3KVA UPS, software and Legend Phone system with voice mail and music on hold. The price was approximately $100,000. Customized menu software was sub-contracted by AT&T to AGT International, Inc. of Columbus, OH.

Design:

The menu were designed by Mary Kay Malinoski, Jon H. Traunfeld and David L. Clement. Software engineers at AGT International, Inc. wrote the actual software. The menu structure is logical and subject oriented, and contains self-help diagnostic keys, simplified IPM language and techniques to better help the public diagnose their problems over the phone. The software design utilizes both voice and touch-tone input to optimize the time involved to get to a desired destination. Callers can reach a consultant at any time by pressing "0". They can access information tapes by entering the 4-digit tape number or by navigating menus. Included in the subject menus are subject tip tapes, which are updated every two weeks with current pest and disease problems, and newly available publications. These tips are sent to media contacts and to the Distance Education and Outreach Communications Unit to be used in public service announcements. Other features include a form filler application where callers may leave their name and address to receive a tape list or promotional publication. There is also an automated survey available that callers may participate in. It requires numerical input. Survey questions can be changed, activated or deactivated at any time. This feature can be utilized to survey the public on IPM, pesticide use, nutrient management, etc., and to evaluate service by the center.

Once the system was installed in April of 1995, a month of testing was involved to check the software to make sure that all menu prompts were correct and the hardware was performing properly. The new system was activated in mid May. We have had no major problems. AGT has worked closely with use to work out any software problems. This is the most complex system they have ever worked with. Most conversant applications have been in the business sector.

Administration of the Conversant is fairly straightforward. It involves periodic back-ups of the voice and data systems. Reports are generated through administrative menu

screens. Daily phone activity can be monitored and reports such as survey reports, call detail, tape access, and system error reports can be easily generated. The new system may be accessed within Maryland by dialing 1-800-342-2507 or (410) 531-1757 outside the state.

Program Successes:

The new automated phone system has been in operation since May 1995. It has increased our ability to serve the public more efficiently and effectively. Tape usage by the public is indicative of the popularity of the system. Tape usage for June, 1995 increased 457% over June 1994, and July 1995 increased 310% over 1994.

In order to better serve the public with printed material that truly "Helps People Help Themselves," a series of commodity or subject based IPM publications was developed. This series was conceptualized, designed and co-authored by the Center faculty. The fact sheets take a holistic approach to problem solving instead of the traditional approach of addressing a single disease or insect problem. The purpose of this series is to complement the new phone system and aid the client in self-diagnosis of plant problems. Unique features of these fact sheets include diagnostic tables with symptoms and possible causes, detailed information of culture, insect and disease problems, and sound methods of control stressing IPM and reduced pesticide use.

From 1990 through June 1996, the Center has received 297, 278 phone inquiries. Of these 165,117 were assisted by the trained phone staff. A 1994 survey was conducted to determine how well people followed advice given over the phone. Of the randomly selected 120 people who responded to the survey over the course of the growing season, 51% received cultural advice and 49% received IPM advice. Of those who received IPM advice 58% followed the recommendations to use IPM control strategies for their problems and 42% were convinced not to use pesticides for their problems. Results of an automated phone survey conducted in July 1995 indicated that 34% of callers were able to solve their gardening problems without the use of pesticides as a result of contacting the Center.

Center staff has produced over 100 peer-reviewed fact sheets and over 150 phone tapes. Staff is currently producing a new Maryland Master Gardener Handbook, which focuses on sustainable gardening practices and plant problem diagnosis. The Center has mailed and distributed over 200,000 fact sheets. Media efforts that promote environmental horticulture across the state include over 250 live and taped news broadcasts on TV and radio and articles sent to more than 50 newspapers. The IPM fact sheets are valuable teaching tools. They have been very popular with the public, horticulture consultants and Master Gardener volunteers and have been reprinted several times. Various extension personnel, nationally, have written or called for information about the Center or have visited the operation in hopes of patterning a similar system in their own states.

Home and Garden Information Center Web Site (http://www.agnr.umd.edu/hgic)

The web site extends our service world wide and provides Internet users with timely environmental horticulture information. The site currently offers bi-weekly tips on 23 subject areas, a bay issues page, and an online order form that enables users to electronically order publications available through the Home and Garden Information center. The tips contain timely updates and environmentally sound information on subjects such as pest control, bay issues, ornamentals, turf, fruit and vegetables. Future plans include adding a problem solving keys that will employ color photos to aid users in diagnosing gardening and pest problems.

IN-SERVICE TRAINING PROGRAMS AT MARLYAND'S HOME AND GARDEN INFORMATION CENTER

University of MD, Cooperative Extension Service
Raymond V. Bosmans-Regional Extension Specialist

Introduction:

Maryland's Home and Garden Information was established in 1989 to centralize Extension's horticulture information service via the telephone to homeowners across the state. Home horticulture calls were previously handled at the local county Extension office. There were several advantages of changing to a centralized information facility:

(1) There is greater expertise and efficiency handling the calls via one toll free number with staff hired and trained exclusively for answering home horticulture questions.

(2) Caller and horticulture data can be more easily collected and used by the Extension Service and other State agencies.

(3) Relieving the field faculty of answering routine homeowner calls provided more opportunity for them to expand their Extension programs with the commercial horticulture industry.

The phone staff, called Horticulture Consultants, are supported by four faculty positions called Regional Extension Specialists. The Regional Specialists specialize in four

different areas: ornamental horticulture and turf, entomology, plant pathology and fruits/vegetables.

The phone system is a 'voice activated' system and includes a large collection of audiotapes on various horticultural topics. These tapes may be listened to on a 24-hour basis. Daily phone hours to speak with a consultant are 8:00 a.m. to 1:00 p.m. Monday through Friday.

Staff and Faculty Structure:

The consultant positions are hired under an 'if and as needed' contract with the University. They are paid on an hourly basis. Most individuals work 4 or 5 days each week, some work 3 days. There are eight phone stations occupied from March through the end of November. From December through the end of February only 4 stations are occupied. People laid off for the winter maintain their contract and are asked to attend all the winter in-service training sessions, staff meetings and other professional improvement events. Consultant qualifications include skills working with the public and a sound background in horticulture. All the present staff has their B.S. degrees, some are in horticulture, others in education or related fields. Many have additional course work in horticulture from the Master Gardener volunteer program and from the local community college.

The four Regional Specialists positions are full time. They have Master Degrees in their respective specialty and the Center Director has a PhD. In addition to assisting in staff training and back up support, they are responsible for writing home owner extension publications, promoting the center, developing press releases speaking in the regions to assist field staff with programs and participating in limited field research.

Types of Calls Received:

The consultants answer a wide range of calls and the topics are very seasonal. On the average the consultants answer approximately 45,000 phone calls each season. Many call topics are cultural and 'how to do.' Insect pests, plant diseases and weeds are a major part of the problem type of calls. Problems on indoors insect pests and animal pests outdoors are also addressed. Occasionally plant and insect sample needs to be seen in order to make an accurate diagnosis. Callers are then asked to mail in a sample with a $5.00 plant clinic fee.

Training Classes and Staff Meetings:

All new consultants go through a two-week training session. As part of this they are provided resource materials to take home for study which they are later evaluated on. The first several days on the phone for a new person is spent on a 'buddy system' with experienced people.

The phone staff meets once each month to discuss phone room operation and related business. It is at these times that they contribute to the development of the inservice training program. Training classes are given once each week in the afternoon immediately after the daily phone hours (Thursdays 1:00 p.m. - 4:00 p.m.). The Center's Regional specialists, university specialists, Extension Agents and representatives teach these classes from the horticulture industry. In addition to the tradition technical information emphasis is also put into training staff on dealing with the stressful caller, avoiding phone burnout and other important public relations skills.

Some in-service training is also provided at the monthly staff meetings by the consultants themselves. When a consultant is asked to attend a workshop or industry meeting they are required to present a brief seminar on the program's highlights during the staff meeting. (Consultant time spent attending a program is covered by the HGIC staff budget). In-service training includes occasional field trips to local arboretums, nurseries, Extension Research Center field days, public and private display garden and other places of interest and benefit to the staff.

Evaluation:

In-service training sessions are usually followed up by a discussion at the staff meetings. Often a certain amount of interpretation and sharing of notes is needed. Pre and post testing are also used at the 'Winter school' which is a two week long training program in January. Test results are used as a guideline for each individual to determine how well they are learning a specific topic. Results are discussed as a group.

Phone Call Data 1995-1998

Month/Year	AT&T	Callers Requesting Consultants	Calls Recorded by Consultants	% of Consultant Calls Answered	% Consultant Calls vs. AT&T Calls
Jan-95	1444		861		65.50%
Feb-95	1547		821		53%
Mar-95	5017		2261		45.2%
Apr-95	5214		2857		54.8%
May-95	5872	2792	3493		59.5%
Jun-95	5994	4087	3739	91.5%	62.8%
Jul-95	5229	3642	3258	89.5%	58.9%
Aug-95	5150	3475	3072	88.4%	59.7%
Sep-95	3475	2280	2111	92.6%	60.75%
Oct-95	3340	2182	1977	90.6%	59.2%
Nov-95	1846	1173	1053	89.8%	57%
Dec-95	928	439	403	91.8%	43.4%
Total 1995	45,356		25,906		
Jan-96	1106	578	503	87.02%	45.48%
Feb-96	1733	1037	913	88.04%	53.68%
Mar-96	4016	1955	1781	91.01%	44.35%
Apr-96	5951	3654	3048	83.42%	51.23%
May-96	5615	3427	3030	88.42%	53.96%
Jun-96	4869	3148	2804	89.07%	57.59%
Jul-96	5237	3294	2979	90.44%	56.88%
Aug-96	5582	3479	3167	91.03%	56.74%
Sep-96	4347	2690	2472	91.90%	56.87%
Oct-96	4138	2459	2312	94.02%	55.87%
Nov-96	2184	1269	1180	92.98%	54.03%
Dec-96	1276	576	541	93.92%	42.40%
Total 1996	46,054		24,730		
Jan-97	1535	854	774	90.6%	50.42%
Feb-97	1917	1142	1026	90.7%	54.04%
Mar-97	4379	2165	2006	92.7%	45.81%
Apr-97	5655	3471	3182	91.7%	56.27%
May-97	5333	3498	3263	93.28%	61.19%
Jun-97	5519	3803	3466	91.14%	62.80%
Jul-97	5709	3931	3518	89.49%	61.62%
Aug-97	4182	2839	2401	84.57%	57.41%
Sep-97	3940	2667	2432	91.19%	61.73%
Oct-97	3187	2137	2019	94.48%	63.47%
Nov-97	1540	1057	956	90.44%	62.08%
Dec-97	1342	708	644	90.96%	52.76%
Total 1997	44,238		25,697		

Jan-98	1425	841	753	89.54%	52.84%
Feb-98	1947	1260	1214	96.35%	62.35%
Mar-98	3824	2275	2069	90.95%	54.12%
Apr-98	4614	3079	2927	95.06%	63.44%
May-98	4844	3252	3076	94.59%	63.5%
Jun-98	4605	3172	3034	95.65%	65.88%
Jul-98	4770	3276	2955	90.2%	61.95%
Aug-98		2523	2372	94.02%	
Sep-98					
Oct-98					
Nov-98					
Dec-98					
Total 1998					

OFF THE SHELF

Gary Simone
University of Florida

Crous, Pedro W.
Mycosphaerella spp. and their Anamorphs Associated with Leaf Spot Diseases of *Eucalyptus* - - Mycologia Memoir No. 21.
1998. APS Press, St. Paul, MN 170pp.
ISBN: 0-89054-190-6. $42.00

This highly focused work deals with the Mycosphaerella leaf blotch disease complex that has growing importance worldwide as more than 200+ species of the host genus *Eucalyptus* continue to be introduced into warm temperate and subtropical areas. *Eucalyptus* represents a genus of >500 species endemic to Australia, New Guinea, Malaysia, Tasmania and the Philippines Islands. Today there are> 8 million hectors of *Eucalyptus* in plantations for timber, pulp, poles, firewood, charcoal, oil, honey, tannin and ornamental use in Africa, Brazil, China, India, Spain, Portugal and California. This text reviews the status of the leaf blotch complex worldwide, providing an overview of the latest taxonomy of *Mycosphaerella* and its anamorphs. Dichotomous keys to both *Mycosphaerella* species and the anamorphs are presented along with specific treatment of 57 species that includes a mycological description, holotype information, teleomorph/anamorph status, hosts, distribution, notes and mycological line drawings and/or photomicrographs. Six new *Mycosphaerella* spp are introduced as well as new species in eight anamorphic genera.

This is not a 'must have' for most diagnostic labs since *Eucalyptus* has importance only as a host in coastal areas from North Carolina over to Texas as well as into California and parts of the Southwest. This does represent a concise update on this disease complex with ample diagnostic detail for many clinical situations in subtropical areas of the world where *Eucalyptus* is an increasingly important crop.

Maas, J.L. (Ed.)
Compendium of Strawberry Diseases 2nd.edition.
1998. APS Press, St. Paul MN 98 pp.
ISBN: 0-89053-194-9 $35.00.

After 14 years, the Strawberry Compendium has been revised and expanded and is a real testament to editing! J.L. Maas has taken a 1984 first edition with 138 pages and updated it to a 98 page second edition! Primary page savings was obtained through deletion of the glossary, approximately 25% of the literature citations, some 40% of the black and white figures and tight editing. My only regret here in the downsizing, was the deletion of the strawberry variety chart which summarized disease resistance attributes across cultivars. This was such a handy component to the first edition.

In spite of downsizing this edition, such abiotic disorders as green tip, white shoulder, and white streak were added as was a section on thrips damage to strawberries. The fungal diseases experienced some upgrading in taxonomy of pathogens as Septoria fruit rot is redefined as Stagonospora fruit rot and Sphaeropsis fruit rot is redefined as a rot caused by *Botryosphaeria obtusa*. Some of the older, more vague virus reports were dropped, while all the virus entries were clarified by the addition of family designations. Marginal chlorosis caused by a bacterium-like organism was a new entry as was coverage of needle nematode (*Longidorus elongatus*) injury to strawberries. Color plates were expanded from 148 to 171 plates in the new edition. Approximately 50 + old plates were re-colorized and reused while the rest represented new images.

Lastly, I was glad to see the insect/mite section moved from the front of the first edition to the end of the new edition. After all, it is a 'Compendium of Strawberry Diseases' first!

Thurston, H. David
Tropical Plant Diseases 2nd.edition.
1998. APS Press, St. Paul MN. 200pp.
ISBN: 0-89054-196-5 $35.00

This represents a revision of this text after its original printing in 1984. This revision is still focused on the international community - to complement the abundance of temperate agriculture-oriented plant pathology texts with one that centers upon the summarization of tropical plant pathology - literature resources, identification and management. Chapters treat major tropical crops such as rice, mango, sorghum, millet, root and tuber crops, food legumes bananas and plantains, coffee, cacao, tea, citrus,

sugarcane, coconuts, rubber, cotton and others. Certain host/pathogen systems are emphasized in specific chapters like rice hoja blanca disease and red ring of coconut palm. These chapters detail the history of each disease, describe the pathogen, disease importance, symptomatology, host range, infection biology and current management options, accompanied by ample literature citations. These chapters are perfect for substitution into introductory plant pathology or plant disease control courses where the intent is too broaden the curriculum beyond a region or nation in coverage.

Utility of this text in the diagnostic setting is not high - not even in places like Florida that grow many of these tropical crops. The pathogen text is not technical enough for diagnostic purposes nor are the black and white figures sufficient to illustrate the range of symptomatology. Remember, however, that this is an instructional text for plant pathology, not a diagnostic reference work. I have enjoyed the management components of the specific diseases as they represent truly integrated control strategies. The diversity in physical and cultural management options was useful in redirecting my mind set away from resistant cultivars and pesticides. Many states, like Florida, are experiencing growing interest and production acreage in 'organic' type farming where these options have renewed utility.

CLASSIFIED

BOOKS FOR SALE

1. Darrow, G.M. The Strawberry - History, Breeding and Physiology. 1977. The New England Institute for Medical research. 447 pp. $27.50

2. Graf, Alfred Byrd. Exotic Plant Manual - 4th ed. 1974. Rogers Company. 840 pp. $27.50

3. Hanson, A.A. & F.V. Juska. Turfgrass Science. 1969. American Society of Agronomy, Inc. 715 pp. $22.50

4. Hawksworth, F.G. and D. Wiens. Biology and Classification of Dwarf Mistletoes (*Arceuthobium*) - Ag. Handbook No. 401. 1972. U.S. Department of Agriculture/ Forest Service. Washington DC. 234 pp. $25.00

5. Hepting, George H. 1971. Diseases of Forest and Shade Trees of The United States. Ag. Handbook No. 386. U.S. Department of Agriculture/Forest Service, Washington DC. 658 pp. $17.50

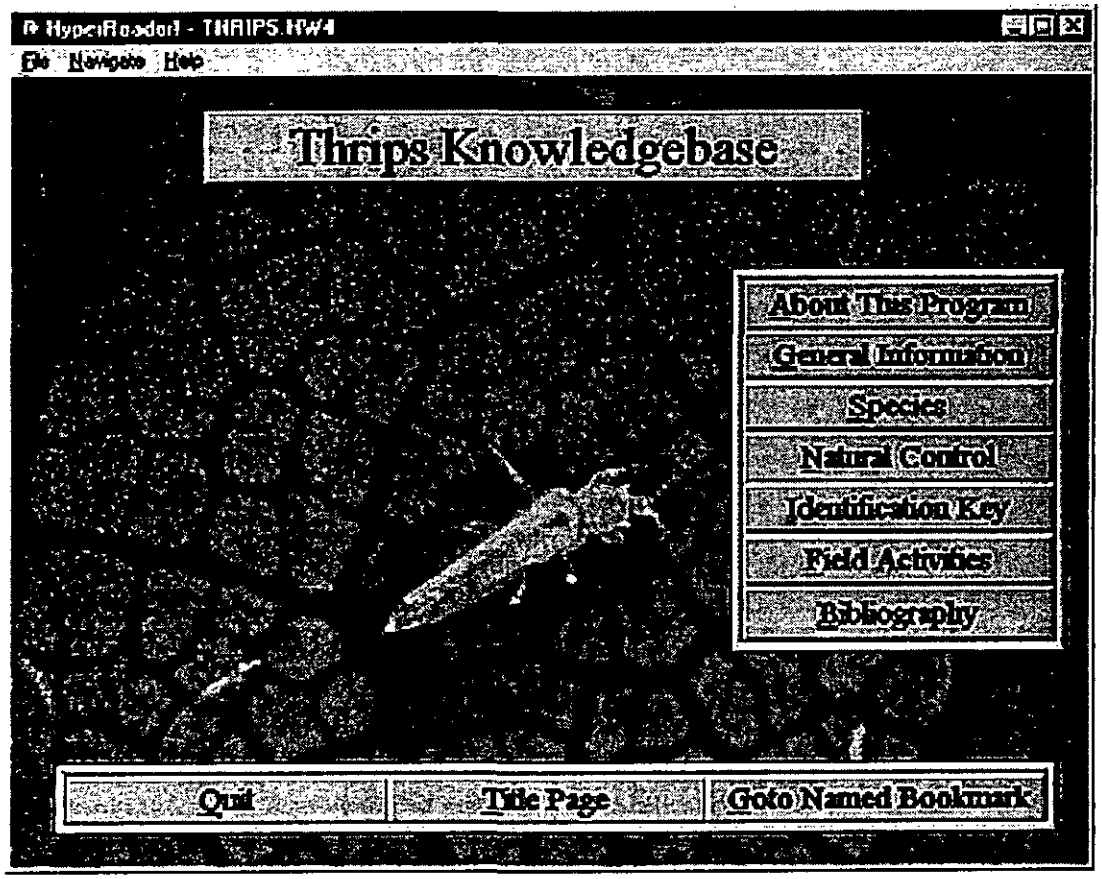
6. Hotson, J.W. 1934. Key to the Rusts of The Pacific Northwest Vol. 3. University of Washington Press, Seattle, Washington 193 pp. $22.50

Please add
$3.00 for the first book and $1.50 each book thereafter for postage and handling in the U.S. and Canada. First come, first served. To order contact: G.W. Simone 352-392-1795/FAX 352-392-3438 or E-mail gws@gnv.ifas.ufl.edu.

Wanted: Need several corn stalks with common stalk rots as well as several ears with common ear rot diseases. Stalk rots needed include charcoal rot (*Macrophomina phaseolina)*, Gibberella/Fusarium rots and Stenocarpella (Diplodia) stalk rots. Any ear rot pathogens acceptable. Need samples for Plant Disease Diagnosis course.

Contact: G.W. Simone 352 392-1795/Fax 352-392-3438 or E-mail gws@gnv.ifas.ufl.edu

A Hypertext Knowledgebase on Vegetable Thrips



Thrips is a computerized, hypertext knowledgebase of thrips vegetable pests. These include *Thrips palmi*, *T. tabaci*, *Frankliniella bispinosa*, *F. fusca*, *F. occidentalis*, *F. schultzei*, *F. tritici* and *Limothrips cerealium*. The latter is included due to its similarity to the *F. fusca* and *F. schultzei* species.

This program contains information on thrips identification, biology, life cycle, damage, scouting, trapping, inspecting, sampling, and preserving specimens. The program also includes literature references in almost every area of thrips research. Thrips provides a graphical key to help users identify which of the species is causing them problems.

The knowledgebase uses a hypertext system that allows users to select pop-up windows for hundreds of definitions. Hypertext also allows quick access to dozens of graphics and full screen color photographs. Program users can quickly reach the desired information without being constricted to a menu structure. Most screens have buttons that allow users to return to

higher menu levels, but simply pressing the Esc key on the keyboard or the right button on the mouse serves the same function.

Any text highlighted in blue can be "clicked on" to call a pop-up definition. These pop-up windows contain links to still more definitions. Text highlighted in yellow is linked to over 70 screen graphics and color photographs.

Thrips has a feature, called Reader's Notes, that allows users to add and edit their own information on every screen. This feature even allows users to save these notes to ASCII files for printing.

The Thrips knowledgebase also contains a bookmark feature. This allows users to create bookmarks so they can quickly reach important information, graphics, or photos. Thrips allows users to print text on any printer. This knowledgebase runs on any IBM-compatible PC with a 3.5-inch floppy drive, 7 MB of hard disk storage space, and Microsoft Windows.

As with most commercial software, Thrips comes with a self-install program that creates the directories, and loads the files onto your system's hard drive.

The cost is $50 (plus tax if applicable), which includes shipping and handling in the USA. International purchasers must contact the vendor for postage rates. Sales to Florida residents must also include $3 state sales tax. Checks, money orders or corporate/academic purchase orders only are accepted.

Thrips was developed by Glades Crop Care, Inc. of Jupiter, Florida. Glades Crop Care provided a grant to the University of Florida's Entomology and Nematology Department to develop the software that delivers the information.

Send orders to:

Extension Pest Control Advisory Committee
P.O. Box 110831
Gainesville, FL 32611-0831

(Federal ID # 59-3436557)

Telephone: (352) 392-1795 (voice); (352) 392-3438 (fax)

Internet site address: http://gnv.ifas.ufl.edu/~ent1/software/det_thrips.htm

EIGHTH ANNUAL VIRUS INCLUSION WORKSHOP

Dates: January 25 - 27, 1999

Place: University of Florida
Florida Extension Plant Disease Clinic

Registration Fee: $450.00 - Limit 9

Hosts :
Gary W. Simone, Ph.D., Professor, Richard E. Cullen, Senior Biologist, Plant Pathology Department, Richard G. Christie, Senior Biologist (emeritus), Department of Agronomy, Mark D. Gooch, Biological Scientist, Valerie Jones, Research Biologist, Plant Pathology Department, University of Florida, I.F.A.S.

Plant virus inclusions are valuable for diagnosing viruses at the group level, and in some instances can be used to identify a specific virus. They can be detected with a light microscope when properly stained. Inclusions induced by a specific virus have the same characteristic appearance across a host range. The procedures are simple, rapid and inexpensive and can save valuable antisera as well as direct in the selection of proper techniques for identifying plant virus diseases.

Course Description:

A 3 day introductory course for scientists, diagnosticians, and/or technicians who have no previous experience or limited experience with virus inclusion identification. "Hands-on" labwork will include virus inclusion identification of potyviruses, tobamoviruses, potexviruses, cucumoviruses, comoviruses, tomato spotted wilt virus, and geminiviruses. Other groups will be demonstrated through the use of prepared slides and kodachrome slide presentations. Staining techniques, tissue selection, and tissue preparation will be covered. All materials will be provided including use of a compound microscope for each participant. A monograph of virus inclusions will be supplied to participants.

Due to limited space and facilities, interested individuals must pre-register for this limited enrollment workshop.

For additional details, course agenda, or registration, please contact:
Dr. Gary W. Simone
Florida Extension Plant Disease Clinic
P.O. Box 110830
Gainesville, FL 32611-0830
Phone 352-392-1795
FAX 352-392-3438
University of Florida E-mail: extppclinic@gnv.ifas.ufl.edu

Registration:

The registration fee for this 3 day workshop is $450.00 per person. Registration includes the costs of preparation of infected plant material for at least 18 viruses representing eight major virus families. In addition, each participant will receive a revised Plant Virus Inclusion Monograph, and a pair of watchmaker's fine forceps for tissue stripping. Shuttle service from airport and hotel to the workshop each day and lunch trips is provided. Refreshments during the day are complimentary. Registration does not include meals, lodging, or travel-related costs.

Attendance is limited to the first 9 individuals that confirm interest to FEPDC staff by phone or FAX. Registration form and fee must be received no later than January 1, 1999 to confirm a place in this workshop. Please complete the lower portion of this registration form and return this with remittance to:

Florida Extension Plant Disease Clinic
University of Florida
Bldg. 78 Mowry Rd.
Gainesville, FL 32611-0830

Make registration check payable to: Plant Disease Clinic
A registration receipt can be procured at the start of the workshop.

8th ANNUAL PLANT VIRUS INCLUSION WORKSHOP REGISTRATION

(Print, complete, and return)

Name: _____

Date: January 25 - 27, 1999

Institution: _____

Address: _____

_____

Phone: _____ FAX:_____ E-mail:_____

Arrival by: Air____ Car____
If air, Airlines_____ Flight#_____
Date/Time of Arrival_____
Will you need shuttle from airport? (circle) Yes No
Lodging Selection (circle)
Hampton Inn - Cabot Lodge - Archer House - Super 8 Motel - Motel 6

Will you need daily shuttle service? (circle) Yes No