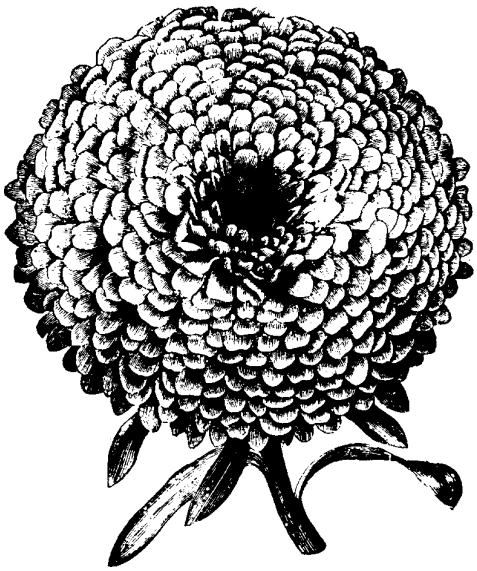
RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION $1.50 JULY 15, 1999



INSIDE

Diseases of Ornamentals

Ann B. Gould, Specialist in Ornamental Plant Pathology

China Aster

Be on the lookout this summer for **Fusarium wilt** and **Phomopsis stem canker** in China aster. In plants affected by **Fusarium wilt**, the leaves turn yellow, the lower leaves wilt, and the roots decay. In some cases, the underground portion of the stem is coated with a pinkish mass of spores and mycelium. **Phomopsis stem canker** causes the lower stem portion of diseased plants to exhibit a purple to brown discoloration. Unlike **Fusarium wilt**, however, the roots usually remain healthy.

To manage either disease, discard infected plants, prevent wounding, maintain adequate fertility, use resistant varieties, avoid extremes in soil moisture, and, if possible, replant next year in a new location. Thiophanate-methyl, applied as a soil drench, may provide some control on a preventive basis, but will not cure plants once diseased. Add a spreader-sticker to improve spray coverage.

At the first sign of **powdery mildew** on China aster, the following products may be used: *Ampelomyces quisqualis* or thiophanate methyl every 7 to 14 days; OR apply triflumizole every 7 days.

Snapdragon

Look for **Leaf rust** on snapdragon this time of year. If left untreated, severely infected plants will eventually die. For best results, apply mancozeb, Ziram at 7- to 10-day intervals; maneb weekly; myclobutanil at 10- to 14-day intervals; propiconazole (see label); OR use triadimefon at 14- to 21-day intervals.

To manage **powdery mildew** on snapdragon, spray *Ampelomyces quisqualis*, thiophanate-methyl at 7- to 14-day intervals; Benefit, myclobutanil at 10- to 14-day intervals; triadimefon at 14-day intervals; OR kresoxim-methyl (Potomac Rose, Potomac White), piperalin plus a spreader-sticker, triforine at 7- to 10-day intervals.

Zinnia

During hot, dry weather, zinnia varieties susceptible to **stem and root rot**, caused by the non water mold fungi *Fusarium* and *Rhizoctonia*, can rapidly wilt. To control **stem and root rot**, discard wilted plants, avoid soil moisture extremes, and drench remaining stock with fungicides at the intervals specified: Banrot (4 to 8 weeks); Benefit, thiophanate-methyl (2 to 4 weeks); iprodione (14 days); fludioxonil, triflumizole (3 to 4 weeks); OR PCNB at transplant and repeat once in 4 to 6 weeks. ❑

At the first sign of **powdery mildew** on zinnia, the following products may be used: *Ampelomyces quisqualis*, chlorothalonil, lime-sulfur, thiophanate-methyl (7 to 14 days); Benefit, fenarimol, myclobutanil (10 to 14 days); kresoxim-methyl, triforine (7 to 10 days); piperalin, propiconazole (see label); triadimefon (14 days); triflumizole, Zyban (=Duosan) (7 days); OR use SunSpray Ultra-Fine Oil at 2- to 4-week intervals (outdoor plants only, conduct a phytotoxicity test on two or three plants of the same variety before treating the entire crop) or Phyton 27 (see label).

NOTE: Avoid use of chlorothalonil during bloom where flower injury is unacceptable. ❑

Diseases of Turfgrass

Bruce B. Clarke, Ph.D., Turfgrass Pathology

Brown Patch

This disease, caused by the fungus *Rhizoctonia solani*, continues to be reported on tees, greens, and home lawns due to the warm, humid weather. To reduce the incidence and severity of **brown patch**, avoid nitrogen applications during hot weather, irrigate between midnight and 8 a.m. to reduce the period of leaf wetness, and spray turf with Banner, Chipco 26019, Cleary 3336, Curalan, Daconil, Eagle, Fungo, Heritage, mancozeb, Manicure, Prostar, Sentinel, Thalonil, or Touche per manufacturer's recommendations.

Pythium Blight

With the return to hot, humid weather, **pythium blight** has been reported on golf greens and tees, recently. **Pythium** thrives in low or poorly drained areas, especially when the night temperatures are above 68 to 70^0 F. For best results, improve drainage, water in the early morning hours, avoid over-fertilization, and apply Aliette, Banol, Heritage, Koban, mancozeb, Prodigy, Subdue, or Terraneb SP, Terrazole, according to the manufacturer's recommendations. ❑

Plant Diagnostic Lab Highlights

Richard Buckley, Laboratory Coordinator

Turfgrass

Hot! Hot! Hot! There is nothing like a heat wave to kick things up a notch in the golf turf industry. The period after the July 4th weekend was one of the biggest golf turf rushes in the history of our laboratory. One colorful assistant superintendent from an Essex County golf course called Tuesday, July 6th, "**the day of death**." Since then, the laboratory received 91 turfgrass samples, of which 86 were from golf courses. As of yesterday all of the sample evaluations were finished and responses have been sent (I'm tired!). The samples included 45 greens, 6 collars and surrounds, 20 fairways, 11 tees, and 4 rough areas. Most of the turf consisted of bentgrass and *Poa annua* with some perennial ryegrass from the fairway, tee, and rough areas. Samples were submitted from 12 New Jersey counties and seven states. The highest concentration of samples came from golf courses clustered in Burlington and Camden counties (19), and from several in the Bergen and Morris County region (20).

Pythium blight wins as the disease of the week with 40 samples showing some *Pythium* activity. It seems many turf managers were caught without adequate fungicide protection before the heat wave. It is important to watch the weather trends and maintain a preventive fungicide program for **pythium blight** at this time of year. Samples that were diagnosed with **heat and drought stress** was the next most common submission. This problem was most often characterized by the rapid decline of annual bluegrass on greens and fairways. Annual bluegrass is supposed to be a winter annual weed that dies in the summer. It takes a gentle hand to maintain a stand of annual bluegrass during excessive heat and humidity, particularly at a 1/8th inch cutting height. Hard hit were managers that use growth-regulator products, like Primo. One superintendent was using the material to aid in conversion to bentgrass. I guess he converted all in one weekend as every blade of *Poa* died in the heat. **Brown patch** and **anthracnose** were also very common during the period. **Summer patch** was diagnosed on six samples, **fairy ring** on one, **dollar spot** on one, and **leaf spot and melting out** on two. We also got 15 soil samples for **nematode** counts, 13 of which had levels well over reported thresholds. **Damage thresholds** are very subjective and depend on many factors, but most of the samples had **nematode** populations so high that there was no question they were causing a significant stress on the turf. Nematicide treatments were recommended.

Another comment on **gray leaf spot**: The scare continues. **Gray leaf spot** was the tentative diagnosis of many of the fairway samples submitted over the last week. For the most part, these samples were diagnosed with **stressed annual bluegrass** or **pythium blight**. Remember that **gray leaf spot** is a disease of perennial ryegrass. The fungus was shown to attack other grasses in the **laboratory and greenhouse.** However, these types of tests are often artificial and may not represent what really happens in the field. Except for incidences of the disease on tall fescue in North Carolina and Kentucky, and the perennial problem on St. Augustine grass in the deep-south, no other grass has shown the disease is the field! Bentgrass, bluegrass, and most fescues exhibit excellent field resistance.

One final note on the **gray leaf spot** scares this season. In many cases, stressed turf is covered with the fungus *Curvularia*. *Curvularia* is a very minor pathogen of turf that has been implicated as the cause of a disease known as **fading out**. Generally, the fungus is found on **drought stressed** turf and is common on any dead plant tissue. I find some in almost every turf sample. To an untrained eye, the conidia might resemble *Pyricularia grisea*. Furthermore, the conidiophores (stalks) that hold *Curvularia* spores may give the affected turf a velvety or "fuzzy" appearance when viewed through a hand lens. This is very similar to what you might see with *Pyricularia*, so if you are a cart-path pathologist or new to microscope use, be sure to use caution when making a **gray leaf spot** diagnosis. I often have to do a double take when looking at samples with lots of *Curvularia*.

To date, the laboratory has not seen the disease. An informal survey of other pathologists from South Carolina to Massachusetts over the last week resulted in no confirmed (by microscopic evaluation) disease outbreaks. We think that infection periods for **gray leaf spot** occur in late-July, so we expect to see it anytime in the next few weeks. **It might be prudent to consider preventive fungicide applications to your ryegrass at this time**. In the past we did not get samples in our laboratory until mid-August. It is very dry, so be alert to the possibility of **gray leaf spot** problems.

Landscape

Yes, we still got some landscape samples during the turf rush. Another Princeton area elm was diagnosed with **Dutch elm disease**. Other diseases of note this week include: **botryosphaeria canker** on rhododendron, English walnut, and Bradford pear from Mercer, Somerset, and Hudson counties respectively, **phytophthora root and crown rot** on rhododendron from Passaic County, and damage from **lesser peachtree borer** and **shot-hole borer** in a Kwanzan cherry from Atlantic County. Finally, several large trees were sent to the laboratory that died suddenly last week. The sudden death of an established plant is generally due to multiple factors that include temperature and moisture extremes, possible cultural problems, and site-related stresses. Even though the trees died during a period of heat stress, it probably had problems for some time. The recent stress period was just the straw that broke the camel's back.

Nursery

Pythium seedling blight was identified in a seedling nursery in Cumberland County. In Gloucester County a flower grower had **botrytis blight** problems with their *Stephanotis*. ❑

Rutgers Turfgrass Research Field Days

Landscape Turf Research Field Day

July 29, 1999

rain or shine

8:00 a.m. - Registration
9:00 a.m. to 3:30 p.m. - Guided field tours

Plant Science Research Farm
Adelphia, NJ
Cost of registration: $20.00 ($30.00 with lunch)

Call (732) 932-9400 Ext. 339 for more information or directions

Golf Turf Research Field Day

August 5, 1999

rain or shine

12:30 p.m. - Registration
1:30 to 5:00 p.m. - Field tours

Turf Research Farm on Ryders Lane
North Brunswick, NJ
Cost of registration: $25.00

Call (732) 932-9400 Ext. 339 for more information or directions

Recertification credits will be available at the conclusion of each program

Commercial Production of Ornamental Aquatic Plants

August 6, 1999

1:00 - 4:30

Cumberland County College
Vineland, NJ
Sandy Hook, NJ (distance education site)
Seating limited to 28
Cost $25.00 ($15.00 for students)

Aquatic plants are a new and potentially profitable niche crop for New Jersey growers. Interest in backyard ponds and aquatic plants is booming, but consumers are having difficulty finding good quality product. This program is for growers who would like to know more about this new opportunity.

Sponsored by Rutgers Cooperative Extension and Cumberland County College

For more information, call
Chris Dubois, Atlantic County 609-625-0056

Hurry! Registration deadline: July 30, 1999

Some Integrated Pest Management Control Methods

Editor's Note*: This paper is from the* Pesticide Applicator Training Manual: Commodity Area: Greenhouse and Florist*,* 1994 *and slightly modified for the purposes of this publication.*

Chemical Techniques

Chemical control is the most common technique and includes the use of pesticides. If applied at the correct rate and time, pesticides can be effective. The goal of chemical control is to deliver a sufficient amount of an effective pesticide to the target organism to cause its death or stop its damage. This requires several important considerations:

Target organism
Pesticide used
Method of delivery
Amount applied

Target Organism

A target organism is the pest species or, in many cases, the life stage of a pest species, at which control tactics are directed. Many pesticides are only effective against certain pests, and often only against certain life stages. For example, insecticides are most effective against scales and mealybugs during their crawling life stage, before they have produced a waxy covering that protects them from insecticides. Pesticides applied against the wrong life stage of a pest are not likely to be effective. This is one reason why it is important to know the correct identity of a pest, as well as its life cycle and biology. Repeated applications may be necessary to gain control of pests with overlapping life stages.

Pesticides

Certain pesticides are effective against some pests but not others. For example, certain insecticides are effective against mites, but acaricides (miticides) are rarely effective against insects. It is important to use an appropriate pesticide against each pest to avoid wasted time, money, and pesticide. Pesticide labels contain information and specific instructions about which pests a pesticide may be used to control.

The shelf life of a pesticide can also affect its efficacy. Consult the pesticide label or the manufacturer if you have a question regarding the shelf life of a pesticide.

The misuse or overuse of effective pesticides can lead to problems with resistant pests and result in the loss of a previously effective pesticide. Some tactics for managing resistance are presented next month.

Delivery

The way that a pesticide is delivered, or applied, can greatly affect its efficacy. With many important pests, chemical control is most successful with application equipment that creates small pesticide droplets and uniform particle distribution over the treated surfaces, provides good canopy penetration, and effectively covers the lower surfaces of leaves where many pests occur. The effectiveness of a pesticide application can also be enhanced if the pesticide used happens to have systemic or translaminar properties. Systemic pesticides are taken up by plants and transported within the plant to its various parts. Pesticides with translaminar properties are able to move across leaves from the upper to the lower leaf surface. The movement of systemic or translaminar pesticides in the plant can compensate for incomplete coverage.

Amount

The amount of pesticide used can affect its efficacy. The pesticide label is your guide for determining how much of the pesticide to use. For systemic insecticides placed in soil, be sure that irrigation water contacts the granules to release the insecticide into the growing media where it can be taken up by the plant. The effectiveness of systemic insecticides can vary with the age of the plant and depends on how much insecticide is translocated to where the pests are.

Reprinted from Greenhouse IPM Notes, July 9, 1999 ❑

Greenhouse Pest Report

Jim Willmott, Camden County Agricultural Agent

Chrysanthemum: Several species of aphids attack garden mums. Early detection is critical for control. Once plant canopy size increases, it is difficult to achieve good spray coverage. Don't wait too long to monitor your crop. Aphids, late in production, are trouble! Aphid populations are often resistant to insecticides - especially pyrethroids and organophosphates. Rotate between chemical classes to minimize chances for resistance and improve control. Many insecticides are labeled for foliar application. Soil/media applications of Marathon to young, actively growing plants will give extended control up to 12 weeks. When monitoring observe for beneficial predators and parasites. Insecticidal soap and horticultural oils are safe to most beneficials and work well - provided spray coverage is good. Insect growth regulators like Azatin, Enstar II, Neemazad and Precision are safe to adult beneficials. Leafminers are also active on chrysanthemums. Damage begins as brown spots which enlarge into blotches that cover leaves. Look for black fecal pellets on foliage. Often larvae can be observed by holding infested leaves up to lights. Handlenses with 10 - 20X greatly help in seeing them. Adult leafminers are small, yellow and black flies. They can easily be detected with yellow sticky traps. Astro, Avid, Citation, Dursban and neem products are labeled for field use. Monitor mums for other likely pests including: two spotted spider mites, thrips, caterpillars, plant bugs and whiteflies.

Field Grown Cut Flowers

General Comments: Rotate crops: avoid growing related crops in the same locations. This reduces pest troubles. Keep in mind certain crops such as legumes (clover, alfalfa) may harbor problems that can damage field flowers. For example, rotation from legume or crucifer crops may increase problems with Sclerotinia white mold – especially on composite flowers. Avoid crowding plants to promote better air movement and improve spray coverage. Irrigate as early in the day as possible to promote leaf drying. This reduces foliar disease. Test field soils for pH and nutrient levels. Adjust pH if necessary and fertilize according to recommendations. (Cont. on page 2)

Field cuts: Naturally occurring beneficial insects and mites, often abundant in outdoor crops, suppress pests. Avoid routine spraying of pesticides that reduce beneficial populations. Monitor crops and treat only when pests have reach damaging levels.

Asclepias (Butterfly weed): may be troubled with mites – especially when grown under high moisture and fertility. Look for bronzing or silvering of foliage. Check beneath leaves for webbing and mites.

Aster spp.: Prone to aster yellows, an infectious disease that causes yellowing, distortion and stunting. Monitor and control leafhoppers, which vector the pathogen.

Celosia: Does not have many pests, but mites, melon and green peach aphids can be troublesome.

Delphinium: Cyclamen mites cause blackened, distorted buds. These are tiny and difficult to see without magnification. Numerous fungi attack foliage causing powdery mildew and leaf spots. Sclerotium attacks stems at the soil line and results in wilting.

Echinacea (purple coneflower): Aster yellows can be serious. Infected plants are yellowed, stunted and distorted. The pathogen is spread by leafhoppers. Monitor and control leafhoppers. Damage by Japanese beetle is also common.

Gladiolus: Thrips prefer to feed in cloudy weather. European corn borer may damage glads, check with vegetable IPM specialists in your area for population counts.

Gomphrena (globe amaranth): is troubled by aphids, mites and thrips.

Helichrysum (strawflower): Aster yellows can be serious. Infected plants are yellowed, stunted and distorted. The pathogen is spread by leafhoppers. Monitor and control leafhoppers.

Helianthus (sunflower): Prone to problems with aphids and, when grown close to corn, European corn borer can be troublesome. Spotted and striped cucumber beetles feed on and damage flowers. Leafminer damage occurred last year. Monitor and control aphids on lilies to prevent the spread of lily mosaic virus. Various leaf spots can be troublesome. Septoria leaf spot is worse on underfertilized crops.

Lisianthus: Botrytis can be serious – space adequately to allow good air circulation. Apply overhead irrigation in early morning to promote quick drying. Drip or trickle irrigation will reduce problems.

Phlox: Troubled by mites, thrips and, of course, powdery mildew. Powdery mildew has been bad this year on many plants. Various fungi cause leaf spots. Fusarium and Sclerotium cause basal stem rots which result in wilting.

Rudbeckia: Various leaf diseases caused by fungi and bacteria. Insure positive diagnosis before treating.

Snapdragons: Rust, downy mildew and botrytis are often damaging. Apply overhead irrigation in early morning to promote quick drying. Drip or trickle irrigation will reduce problems. Pollination results in petal shatter - growing under cloth tents can prevent.

Statice: Aster yellows can be serious. Infected plants are yellowed, stunted and distorted. The pathogen is spread by leafhoppers. Monitor and control leafhoppers.

Zinnias: Japanese beetles love them and should be monitored and controlled now. Fungicides may be needed for Alternaria leafspot and powdery mildew.

Other Crops:

Flowering cabbage and kale: Cabbage looper, imported cabbageworm and diamondback moth attack and damage this popular fall crop. Larvae hatch shortly after egg laying. Frequent monitoring and early detection are key to control. Check with vegetable IPM specialists in your area for population counts. Inspect beneath foliage for young larvae and look for small holes in leaves. Insure that insecticides deposit on lower leaf surfaces. Spreader-sticker improves control. Numerous insecticides are labeled including biological products containing Bacillus thuringiensis (BT) and Beauveria bassiniana (Naturalis-O, BotaniGard). Aphids and flea beetles can also be troublesome. Various infectious disease problems can occur including downy mildew and alternaria leaf spots. Early detection and accurate diagnosis are critical for proper selection of fungicides.

Pansy: Black root rot damage is becoming increasingly common. Infected plants appear stunted and chlorotic. Effective disease management requires appropriate cultural practices. Adjust peat-based media pH to about 5.5 and thoroughly sanitize all crop handling equipment and work areas. Spores of the causal pathogen Thielaviopsis basicola are highly persistent. Preventative fungicides include Banrot, Terraguard, Fungo, Cleary's 3336 and Domain. Curative treatments may suppress disease, but it may develop later – after transplanting to gardens.

Perennial seedlings: Most species are prone to damping off from various fungi including Rhizoctonia, Pythium and Alternaria. Healthy, vigorous seed and proper cultural management will minimize problems. Thoroughly sanitize all equipment, work areas and flats. Start crops in quality pathogen free media suitable for germination. Test media for pH and nutrient content prior to planting and make appropriate adjustments. Provide appropriate **media** temperatures for germination. Avoid excessive moisture in germination mix, insure appropriate pH preferences for species grown and maintain low fertilizer salts until true leaves develop.

Poinsettia: Check cuttings closely on arrival for evidence of whitefly infestations. Egg, nymph, and pupal stages infest lower leaf surfaces and, unlike winged adults, are often overlooked. Small numbers on cuttings increase rapidly into larger infestations later in the crop cycle. Also, be sure production greenhouses are free of weeds that harbor whiteflies and thrips. Don't apply Marathon too soon – wait until there is extensive root development. Thrips damage young plants by feeding on newly developing tissue. Growth distortion and scarring are often evident as foliage develops. Troubles frequently carry over from spring production. Monitor with yellow sticky cards.

Eliminate fungus gnat infestations before sticking cuttings. Gnats are most damaging to young plants. Treat floors and other surfaces. Labeled products included Dursban, Knox-out and several insect growth regulators including Precision. After treating, monitor for adults with yellow sticky cards. Adults can be controlled with aerosol "bombs".

Keep alert for mites! Lewis mites have caused sporadic damage in recent years presumably since Marathon does not control mites. For poinsettia diseases, thoroughly clean and disinfest propagation areas, tools and media. Bacterial soft rot caused by Erwinia is common on unrooted cuttings when the propagation environment gets too hot. Phyton 27 is the only product labeled for control. Don't use it unless you have a confirmed problem. Some pathologists have raised concerns regarding injury to unrooted cuttings. Rhizopus may cause a rot if it gets too hot – insure adequate cooling. Inspect fans and vents prior to crop planting. Insure proper operation for the season to avoid overheating. Pythium and Rhizoctonia often injure young plants. Fungicides can control, but they may also injure unrooted cuttings. Reduce the presence of pathogens through sanitation and maintain favorable rooting conditions. Avoid media temperature and moisture extremes.

For additional pest management information consult 1999 Cornell Recommendations for the Integrated Management of Florist Crops and the 1999 Rutgers Pest Control Recommendations for Commercial Flower Growers. Contact Pat Gray for ordering information: 856-566-2907.

Reprinted from Greenhouse IPM Notes, July 1999 ❑

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