RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION $1.50 JULY 10, 2003

INSIDE

Basics of IPM: A Magnifying Hand Lens - Don't Walk the Landscape Without One

Steven K. Rettke, Ornamental IPM Program Associate

A Useful Tool

Of the many helpful tools that an IPM scout uses, arguably the most important may be a magnifying hand lens. Improving the abilities of the eyes to see the tiny world of insect and disease organisms will improve IPM decision-making in the field.

A hand lens is a tool that magnifies the small area of interest and can conveniently be placed in a pocket or worn around the neck, where it is always handy. Landscape pest managers *not* routinely using the aid of a hand lens are working at a great disadvantage. Once it is discovered how valuable the proper use of a hand lens is when monitoring, it soon becomes an indispensable tool.

Since the early detection of a plant pest is important in any IPM program, the use of a hand lens enables the pest to be detected before obvious damage appears on the plant. Also the pest population can more readily be evaluated when magnification is used.

Identification

Another component of landscape IPM is the actual identification of the pest. Without the help of a hand lens, it often becomes difficult to distinguish between the different species of mites, scales, whiteflies and other pests. For example, eriophyid mites are notoriously small pests that have baffled many landscapers for years. These tiny mites are very difficult to see without magnification and hence, a wrong diagnosis is typical when a powerful hand lens is not available (at least a 15x to 20x power is recommended). Although fruiting bodies of some disease organisms can be seen with only a 10x lens, many pathogen signs are typically beyond the capabilities of even the highest magnifying hand lens. Therefore, compound microscopes and laboratory analysis are often necessary.

Another major factor in IPM is the proper timing of a pesticide treatment. A hand lens not only helps to ID the pest, but can also be invaluable when determining the pest life stages present on the plant (e.g., egg, immature or adult). Seeing and learning the different life stages of pests improves the decision-making abilities of the IPM techni-

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cian. Visually verifying scale crawlers emerging from under the female scale, or the number of overwintering mite eggs on leaves, are just two examples of important information about pest life stages a hand lens can provide the plant manager. Improved control timing can now be utilized, and then the efficacy of the treatments can be measured, again with the aid of the hand lens.

Proper Use and Selection

Whenever magnification is used in the landscape, a potential limiting factor is adequate light on the subject under examination. Even during bright and sunny days, observations can be compromised when shadows are cast from buildings and plants, as well as shadows from the hands, hat or body of the landscaper using the hand lens. Therefore, it is important that the object being studied be held so that light strikes it directly and is not in a shadow. Also a common mistake many novice hand lens users make is to hold it at arm's length and attempt to focus on the object. The proper method is to hold the lens close to and nearly touching the eye, and then with the other hand, bring the subject toward the eyepiece until it comes into focus.

A hand lens can be purchased in different powers (e.g., 10x, 16x, 20x, etc.), with magnification expressed as "x". For example, a 20x magnifier enlarges an object 20 times bigger than life. When choosing a magnifier, a 10x is a good general-purpose power with a broad, bright field of view. However, when observing spider mites it is best to use a lens with at least a 15x power. All powers have their good points, but since increased magnification decreases both "depth of field" and "field of view," it is best to select the least amount of magnification needed for the task. Therefore, use lower power when initially scouting for pests. Once a pest is located, then a higher power lens can be utilized to inspect it in greater detail and to finalize the identification. As the sophistication level of the IPM scout advances, then the number and range of magnifiers the scout uses will also usually increase. *(Reference: F. Dinsmore, "Your Hand Lens and You—Use It Right and You Won't Be Without It"; PA Dept. of AG, (1997); and "Choosing a Magnifier"; GEMPLER'S – IPM Buyers' Guide, (1998).* ❑

Diseases of Turfgrass

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

General

Pythium blight, **brown patch**, **dollar spot**, **anthracnose**, and **slime mold** are all active on golf and landscape turf at this time**.**

Anthracnose

This disease, caused by the fungus *Colletotrichum graminicola*, has been apparent on annual bluegrass, fine fescue, perennial ryegrass, and Kentucky bluegrass. The fungus typically attacks turf growing under low soil fertility and/or heat or drought stress. Low cutting height and traffic can also enhance symptom development. To identify anthracnose in the field, look for small black fruiting bodies with protruding black spines. For best results, increase turf vigor with frequent, light applications of nitrogen, maintain adequate irrigation, reduce thatch, and raise the cutting height (whenever possible). On a preventive basis, apply Banner, chlorothalonil, Compass, ConSyst, Eagle, Heritage, Rubigan, Spectro or thiophanate-methyl per manufacturer's recommendations. Resistance has been reported at some locations for the QuoI (strobilurin) and benzimidazole fungicides. Also, Prostar may enhance the severity of this disease, therefore, restrict the use of this product to sites that do not have active infections.

Pythium Blight

Pythium blight has been very active on golf and landscape turf during the past two weeks. Since pythium thrives in low or poorly drained areas, especially when the night temperatures are above 70^0F, we should see a lot more of this disease as the "hot muggy" weather continues this summer. For best results, improve drainage, water in the early morning hours, avoid over fertilization, and apply Banol, Chipco Signature, Heritage, Koban, Magellan, Prodigy, Quell, Subdue MAXX, or Terrazole, according to the manufacturer's recommendations. Apron may be used as a seed treatment to prevent damping-off. Mancozeb can be used to control this disease but it is generally less effective than the other products mentioned above. Use of Koban and Terrazole on fairways is prohibited.

Turf Field Day

Mark your calendars now for this year's turf research field days. The **Rutgers Landscape Turf Research Field Day** has been set for July 30, 2003 at the Plant Science Research Farm in Adelphia, N.J. Registration will begin at 8:00 AM. Guided tours will commence at 9:00 AM and will conclude at 3:30 PM, "rain or shine." The **Rutgers Golf Turf Research Field Day** will be held on July 31, 2003 at the Turf Research Farm (Ryders Lane) in New Brunswick, N.J. This event starts at 8:30 AM (registration); field tours will run from 9:30 AM to 2:30 PM, "rain or shine." The cost of registration for each day will be $35 (including lunch). Recertification credits will be available at the conclusion of each program. Call Marlene at (732) 932-9400 Ext. 339 for further information or directions. ❑

Diseases of Rose

Ann B. Gould, Ph.D., Specialist in Plant Pathology

Roses grown in nurseries, greenhouses, and landscapes are prone to diseases caused by all kinds of biotic and abiotic disease agents. One very troublesome disease of roses and other ornamentals, called **Botrytis blight** (or gray mold), was discussed in the June 12th edition of this newsletter. Discussed today are other diseases that affect this popular ornamental: **black spot**, **powdery mildew**, **downy mildew**, **stem and branch canker**, and **rose mosaic**.

Black spot

One of the most common diseases of rose is **black spot**, caused by the fungus *Marssonina rosae* (*Diplocarpon rosae*). This disease occurs worldwide and was first reported in the northeast about 1830. Although not normally seen in greenhouses, black spot can cause damage all season long in temperate climates where leaf tissue remains wet for extended periods.

Black spot is most troublesome early in the growing season. In the spring, fungal spores are produced and disseminated from lesions on canes and leaves infected the previous year. These spores infect young leaves (6- to 14-days old) when a 7-hour period of continuous leaf wetness occurs. Disease development is greatest at temperatures of 75 to 85°F with greater than 85% relative humidity. Symptoms appear as black leaf spots (0.1- to 0.5-inch) on the upper leaf surface within 3 to 16 days following infection. These spots have feathery edges and are accompanied by yellow "halos" of leaf tissue. Spores produced in these spots continue to infect newly expanding leaves and canes throughout the summer. Black spots may also form on the lower leaf surface about a month following infection. On first-year canes, irregular, raised, red-purple blotches appear that become blackened and blistered.

Marsonnina produces a toxin that causes affected leaves to turn yellow and defoliate prematurely. Indeed, heavily infected plants lose much of their carbohydrate reserves, thus they grow poorly and become more susceptible to winter injury and other stresses. Since the fungus overwinters on diseased leaves and canes, rake old leaves, and prune diseased and damaged canes before spring. Avoid overhead watering and excessive shade, and when planting, space plants to avoid excessive humidity. Disease management before the growing season begins is critical; control is difficult once black spot is established in a planting. Resistance to black spot varies among the different types of roses. Floribunda, shrub, and climbing roses tend to be more tolerant to this disease, whereas hybrid tea, grandiflora, and miniature roses are more susceptible.

For best results, spray fungicides after budbreak (mid-May) and repeat at intervals specified on the label. Compounds labeled for black spot control include captan, chlorothalonil, Consyst, copper (hydroxide, metallic, salts, sulfate), ferbam, Junction, mancozeb, maneb, Manhandle, myclobutanil, neem oil, paraffinic oil, propiconazole (outdoor use only), Spectro, sulfur (elemental, flowable, wettable), SysStar, thiophanate-methyl, trifloxystrobin, ziram, and Zyban. Use a surfactant to enhance fungicide coverage if this practice is listed on the fungicide label, and rotate classes of chemicals to reduce the likelihood that fungal resistance to compounds will develop. Pay close attention to spray practices during wet periods, especially when caring for roses that are highly susceptible roses to this disease.

Powdery mildew

Another very common disease of roses is **powdery mildew**, caused by the fungus *Sphaerotheca pannosa*. This widely distributed disease of landscape, nursery, and greenhouse roses occurs wherever species of *Rosa* are grown. Symptoms of **powdery mildew** include discrete, white-to-buff patches of powdery spores on leaves, flowers, and shoots. In spring, new leaves and shoots are infected by spores that are released from previously infected material and dormant buds. Disease development is favored by temperatures of 70 to 80°F and high (90 to 100%) relative humidity. Within 7 days of infection, the characteristic powdery patches first appear on lower leaf surfaces, to be soon followed by symptoms on upper leaf surfaces and canes. Young tissue infected by the powdery mildew fungus is frequently distorted and twisted, and infected flowers can be of poor quality. Although the fungus most often does little physiological harm to the plant, the market value of heavily affected roses can be reduced.

To manage powdery mildew, rake old leaves, prune shoots infected the previous growing season, and take measures to reduce humidity such as spacing out plants and increasing air circulation. Apply fungicides according to label timing and rates: AQ10, azoxystrobin, copper (hydroxide, metallic, salts, sulfate), fenarimol (field and landscape only), hydrogen dioxide, Junction, kresoxim-methyl, Manhandle, myclobutanil, neem oil, paraffinic oil, piperalin (enclosed structures only), potassium bicarbonate, propiconazole (outdoor use only), Spectro, sulfur (dusting, elemental, flowable, wettable), SysStar, thiophanate-methyl, trifloxystrobin, triadimefon, triflumizole, ziram, or Zyban.

Downy mildew

Another fungal disease called **downy mildew** (caused by *Peronospora sparsa*) may appear as red-to-black spots on leaves, petals, and stems, especially when conditions are cold and wet. These spots are often "angular" in appearance because leaf veins can restrict fungal growth. The disease is most likely to occur during cool (65°F),

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Plant Diagnostic Laboratory Highlights

Richard J. Buckley, Laboratory Coordinator

Turf

The trend in turfgrass samples in early-July is stress. Numerous cup cutter plugs of golf turf – approximately 25 per day over the last week – have been submitted to the laboratory with poorly performing turfgrass. While we have seen some disease, the majority of the samples were diagnosed with **abiotic disorders**. **It seems that the radical change in the weather of late-June from cool and wet to hot and dry has had a major impact on turf health.** The never ending spring of overcast skies, cool temperatures (coldest April, May, June since 1923) and excess rain (June all-time record) cost the turf some carbohydrate reserves. Toss in some seed heads, growth regulators, and wet soil that won't support spray rigs, mowers, and aerifiers and the stage is set for disaster. Slow growing, weak grass that will not recover from normal mechanical operations, traffic, and golf. How about some **thatch, compaction, and poor drainage**? All of the rain in June caused **anaerobic soil conditions on these poor sites**, and in some cases, created **pools of standing water** on greens, tees, and fairways. One of my favorite samples this week came with photographs of the green underwater and another photo of the green a week later with a dead spot the exact shape of the puddle in the first photo. Some courses still are not dry nearly two weeks after the rain tapered off. Oh yea, what about **winter kill and drought**? There are many samples that we believe were **true annual bluegrass strains** – grass that recolonized spots killed by last year's drought or over the winter – that simply kicked off – like they were supposed to do – when it finally got hot. We were worried about the pace of sample submissions in June. Not anymore! **One final note, much of the grass killed or stressed by abiotic factors has been colonized by opportunistic fungi.**

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fairly humid (85%) weather when fungal spores from previously infected tissue infect new growth. As infection progresses, leaves lose color and fall prematurely. Under conditions conducive to disease development, "downy" tufts of spores associated with leaf lesions may appear on lower leaf surfaces. Fungal development ceases when weather becomes dry and warmer than 80°F for 24 hours.

All rose cultivars are susceptible to this disease, although the severity of disease may vary. In greenhouses, management of downy mildew includes reducing relative humidity to less than 85% and raising temperatures to 80°F during the warmer parts of the day and during evening hours. In outdoor production, preventive fungicides should be used when conditions are conducive to disease development. Apply azoxystrobin (during period of active plant growth and prior to dormancy or severe infection), copper (sulfate), fosetyl-Al, kresoxim-methyl, phosphite, Stature (cut, potted, or miniature rose), or trifloxystrobin according to label instructions.

Stem and branch canker

In established rose plantings outdoors, **stem and branch cankers** are noticeable at this time of year. In most cases, infections begin on branch stubs or on wounded tissue. Although not all cankers are caused by the same fungi, adequate control can usually be obtained by pruning diseased canes several inches below discolored wood, maintaining plant vigor, and removing large branch stubs. For best results, always prune plants during dry weather and surface-sterilize shears with alcohol or 10% bleach to limit disease spread. Spray plants as for black spot.

Rose mosaic

Characteristic symptoms of **rose mosaic**, caused by *Prunus necrotic ringspot virus* (PNRV) and *Apple mosaic virus* (AMV) in greenhouse and nursery stock include chlorotic, white line "oak leaf" patterns, ring spots, mottling, and necrosis. Infected plants tend to be less vigorous than healthy stock and are more sensitive to winter injury. Symptoms, which vary with the cultivar and time of year, are most evident in the spring. Disease transmission only occurs through grafting and cannot be spread by pruning. To control, remove infected plants and use virus-indexed stock for propagation.

Fungicide usage notes for Roses: Avoid neem oil (Triact) without prior testing for sensitivity. Zyban has caused some injury on the varieties Red Empress, Blossom Time, and Golden Showers. Check for phytotoxicity before large-scale use of copper fungicides, and do not spray plants with copper, Junction (contains copper), or mancozeb compounds just before selling season to prevent residues on commercial plants. Avoid captan in combination with, or immediately before or after, oil sprays. Lime, lime-sulfur, and Bordeaux will reduce the efficacy of captan.

Sources:

Horst, R. K. 1983. Compendium of Rose Diseases. APS Press, St. Paul, MN.

Philley, G., Hagen, A. K., and Chase, A. R. 2001. Rose Diseases. Pages 342-348 in: Diseases of Woody Ornamentals and Trees in Nurseries. R. K. Jones and D. M. Benson, eds. APS Press, St. Paul, MN. ❑

LAB HIGHLIGHTS FROM PAGE 4

Some of these fungi are reported in pathology texts to cause diseases known as "**senectopathic disorders**." The label implies that the fungi in question are simply weak pathogens that attack plant material that is already dead or dying. The most common fungi in this category include *Curvularia*, *Fusarium*, and *Leptosphaerulina*. Some even consider *Colletotrichum graminicola* (**anthracnose**) and **root-invading Pythium** species to be included in the group of opportunists and weak pathogens. At any rate, it is not uncommon to find these critters on your plugs, so don't be alarmed by a pathologist reporting the presence of these fungi, just **focus on the underlying stress and get your grass growing again**.

Even with all the junky fungi, and abiotic problems, we are seeing some "real" disease in the laboratory. **Anthracnose** is starting to show up in the lab with increasing frequency. Samples with anthracnose were sent from golf courses in Massachusetts, Virginia, Pennsylvania, New York, and from Burlington, Middlesex, and Somerset Counties in New Jersey. Another summer disease, **Summer Patch**, is beginning to exhibit symptoms in the field. Samples with summer patch were submitted from New York, Indiana, Virginia, and from Burlington and Passaic Counties in New Jersey. Excess soil moisture in the spring is often associated with increased summer patch activity later, so we expect to see many more summer patch samples over the next two to three weeks. **Dollar spot** is still active at this time. Samples of dollar spot were diagnosed on turf from Atlantic and Middlesex Counties, as well as on a couple from Long Island. **Pythium blight** was active in turf from northern Delaware, and **brown patch** was identified on plugs from New York and Middlesex County. Also of interest, we got some **annual bluegrass weevils** from two New York golf courses and one Monmouth County course. We also had some other samples of suspect **ABW** damage, but found no insects. ❑

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged much above normal. Extremes were 95 degrees at Freehold on the 5th, and 53 degrees at Charlotteburg on the 1st and the 2nd. Weekly rainfall averaged 0.04 inches north, 0.44 inches central, and 1.41 inches south. The heaviest 24 hour total reported was 2.02 inches at Atlantic City Marina on the 2nd to 3rd. Estimated soil moisture, in percent of field capacity, this past week averaged 53 percent north, 49 percent central and 51 percent south. Four inch soil temperatures averaged 73 degrees north, 75 degrees central and 77 degrees south.

Weather Summary for the Week Ending 8 am Monday 7/07/03

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
BELVIDERE BRIDGE	.04	22.16	5.93	94	57	77.	6	1041	46	41
CANOE BROOK	.00	22.74	5.40	93	58	77.	5	1078	89	51
CHARLOTTEBURG	.05	23.74	6.20	90	53	73.	4	772	-13	44
FLEMINGTON	.00	20.70	4.07	91	57	75.	3	1011	-11	52
LONG VALLEY	.00	18.58	.78	86	58	72.	3	725	-127	47
NEWTON	.16	19.85	3.97	91	57	76.	6	929	56	49
FREEHOLD	.11	19.00	2.74	95	60	77.	4	1112	-8	47
LONG BRANCH	.33	20.70	4.44	93	64	77.	4	978	-69	32
NEW BRUNSWICK	.03	20.86	4.90	93	59	77.	3	1070	-122	58
TOMS RIVER	1.44	20.17	3.87	94	62	77.	3	1079	27	64
TRENTON	.28	18.70	3.71	92	61	76.	1	1050	-192	34
CAPE MAY COURT HOUSE	1.32	16.65	2.29	91	63	77.	3	1041	-90	51
DOWNSTOWN	.87	19.12	4.34	92	64	77.	3	1136	-122	51
GLASSBORO	1.20	20.43	4.53	93	66	78.	4	1230	-7	60
HAMMONTON	1.06	16.79	1.19	94	64	78.	4	1197	-33	48
POMONA	1.66	18.23	4.12	93	64	78.	5	1071	-62	74
SEABROOK	2.33	20.04	5.79	93	66	78.	4	1272	7	96
ATLANTIC CITY MARINA	MISSING									
SOUTH HARRISON	.48	19.41	3.45	93	66	78.	NA	1221	NA	NA

WES KLINE — GDD BASE 40 PINEY HOLLOW Last Week 264 (Ending 6/30/03) This Week 260 (Ending 7/07/03)

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