RUTGERS COOPERATIVE RESEARCH & EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION $1.50 JUNE 30, 2005

INSIDE

White Pine Weevil: From Ordinary to Enigmatic

Jenny Carleo, Agricultural Program Associate, Rutgers Cooperative Research & Extension of Atlantic County

Now is the time of year when beautiful white pines and spruces appear to fall victim to the **white pine weevil** (WPW). By now though, the damage has already been done. Egg lying occurring in April manifests itself in June and July as a dry, dead top contorted into the "shepherd's crook" characteristic of this detrimental pest. In the summertime new adults emerge from the wood causing this type of damage paired with telltale oozing and bored holes in the terminal leader only. WPW (*Pissodes strobi*) had been relatively simple to control in the past with applications of the long-residual insecticide Lindane. In the years since the stop-sale of this organochlorine pesticide, farmers and landscapers have seen more WPW damage than ever before. Not only is the damage increasing but we are realizing that we know even less about this elusive insect and its control than previously thought.

After requesting input from the New Jersey Christmas Tree Growers' Association, many farmers have fingered the WPW as their most serious pest. Although low on the radar of research funding institutions, WPW has a significant impact on Christmas tree growers in the northeast typically devouring 10% of their sales according to the growers. This does not include lost labor time during the extensive process of attempting to repair damage to the terminal leader on a still potentially saleable tree.

Current pesticide control recommendations appear to be insufficient, commonly including a very high application of a carbamate insecticide such as chlorpyrifos. The Dursban 50W label, for example, indicates an application rate of up to 32 lbs/100 gallons. But to no avail, WPW reigns over the Christmas tree kingdom. The word on the street (or drive-row as we may have it) is that those who happen to have stockpiles of Lindane are having just as much trouble as everyone else. Preliminary field trials on two similar farms in Atlantic County indicate equal numbers found in traps over spring 2005. One farmer routinely uses Lindane and the other rotates his insecticides attempting to get better control. Both are anticipating severe damage - the Lindane user noting on April 19th "March 30 application of Lindane not effective, sprayed bifenthrin".

One of the reasons that chemical control measures tend to be ineffective is that accurate spray timing is difficult to pinpoint. In south-

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ern New Jersey growers have noted that the flowering of Forsythia is no longer a reliable plant indicator for beginning control measures of the WPW. Another perplexing issue about this notorious pest is that it seems able to emerge before the accepted 7 or 8 growing degree days (GDD). Traps in Hammonton and Mays Landing first caught the insect on March 28 (0.6 GDD) and April 2 (13.5 GDD) respectively. Forsythia bloom on these locations occurred on April 7 (42 GDD) and April 2 (13.5 GDD) respectively. Therefore, although the farm in Mays Landing observed Forsythia flowering simultaneously with the first trap of WPW the GDD on-site were reported as being 13.5. The Hammonton farm observed the WPW 10 days (or 41 GDD) prior to Forsythia bloom. Data from these preliminary trials potentially confirms growing suspicions that determining the onset of WPW activity is unpredictable.

So what can growers do to control populations on their farms? The current answer is through IPM practices and cultural control. First, each farmer should carefully track the GDD schedule on the farm. Temperature data beginning around March 1st should be taken daily. Calculate the growing degree days (base 50) by using the following equation:

Daily GDD base 50 = ((max. temperature + min. temperature) ÷ 2) – 50

Secondly, as soon as GDDs begin, monitor populations with traps. Trap designs and supply information can be found at:
http://ctrees.cas.psu.edu/pdfs/whitepinewvtraps.pdf

Realistically, these traps are not made out of durable and weighty enough material to be used in the field. Since they are relatively cheap (about $15), purchasing one and using it as a model to build your own base out of plywood is easy and much more practical. The idea here is to spray trees just at mating time, when mature adults are active and about to mate but have not yet had a chance to lay eggs in the leaders.

Thirdly, it is extremely important to prune out any affected leaders in the early part of June and dispose of them properly. This will remove any eggs that were laid in the leaders before the pupae have a chance to emerge as new adults and drop underground for the winter.

Although trapping may be a reliable emergence indicator there are still a few pieces of the WPW puzzle to be solved. These include 1) determining precisely when the adults emerge from the ground in the spring, 2) discovering preventative cultural control methods, 3) identifying an effective chemical control and 4) developing a management program to employ 1, 2 and 3. ❑

Recognizing a Few Less-Obvious Landscape Beneficials

Steven K. Rettke, Ornamental IPM Program Associate

Many landscapers are familiar with the larger beneficial insects such as lady beetles, praying mantids, lacewings, and flower flies. However, predatory mites, parasitic wasps/flies are examples of landscape beneficials that are typically less recognized. Learning about the life cycles and how to identify these less well known but important biological control organisms are reviewed in this article.

Predatory Mites

Phytoseid mites are generally the most abundant predatory mite species found in the landscape. This species is especially active during the summer months and is regularly found preying on two-spotted mites, as well as other pest mite species. Similar to monitoring for pest mites, sampling for beneficial mites is most efficiently done by beating foliage over a hard white surface (= beating tray). This technique allows for the ratio of predator to prey to be directly observed. The standard action threshold of 20 pest mites per beating tray sample can generally be doubled when a few predatory mites are observed. It is advisable to perform weekly samplings to manage short generation phytoseid mites during warm weather.

Use a 15x magnifying hand-lens when attempting to closely observe predatory mite eggs, larvae, nymphs, and adults. The eggs of phytoseid mites are oval in shape and white in color and are about the same size as spider mite eggs. Within an infested spider mite population look for phytoseid eggs laid singly along the veins on the bottom surfaces of leaves. All life stages of phytoseids are oval, shiny white to tan and are similar in size to spider mites. They are fairly easy to distinguish from spider mites because of their shiny, unspotted, pear-shaped and nearly hairless appearance. The most dramatic difference between pest and prey mites is their speed of movement. As would be expected, predatory mites are many times faster than spider mites.

The life cycles of phytoseid mites and spider mites closely resemble one another. Uniquely, phytoseid mites in some cases can have a shorter time interval between generations than their mite prey. Also, they both lay about the same number of eggs (60) under average conditions over several days. However, predatory mite egg-laying rates will increase in response to larger prey populations. Phytoseid mites will typically consume approximately 20 spider mites each, but some voracious species can gobble-up over 100.

Parasitic Wasps & Flies (Parasitoids)

Within the landscape, beneficial parasitic wasps or flies are generally called “parasitoids.” It is unfortunate that parasitoids are often under-appreciated, because they are often capable of providing even better biological control than the larger predators. In many situations, parasitoids will give superior suppression of pests because they: (1) are more

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host specific; (2) have a better searching ability; (3) work at lower pest densities; (4) require less food to complete development; (5) are better synchronized to their host's life cycle; and (6) eliminate the hazards of host seeking since eggs are laid in or on the host.

Since parasitoid adults are usually significantly smaller and less stationary than many of our well-known landscape predators, they often go undetected by landscapers. Since parasitoid larvae often develop inside the host, it is difficult to monitor for and appraise their impact on a pest population. Monitoring for adults within the landscape may not be practical, although yellow sticky traps can be attempted. More effective field evaluations can be made by observing host symptoms such as the swelling of aphids into mummies, the blackening of soft scale insects, and the exit holes in armored scale insect covers.

Monitoring: What to Look for

Aphids: Aphids are the hosts of a large number of biological control organisms and wasp parasitoids. An egg laid by the female wasp hatches inside the aphid with the larva consuming the internal structures of the host. Aphids containing parasitoids will typically become brown, swollen and have a circular hole cut out of a hollowed body (these host symptoms are given the name "aphid mummies"). "Mummies" remain attached to stems and leaves for an extended period of time. Insecticide sprays can be avoided if many mummies are observed. If sprays are judged necessary, then soaps or oils will reduce detrimental impacts upon the beneficials.

It should be noted that specific pest and prey ratios needed to achieve satisfactory suppressions of most pests have not yet been adequately established through research. Some biological control interactions are better understood than others, but as a general rule it is a limitation to good field decision making when evaluating the impact of any given beneficial.

Scales: It is generally understood that wasp parasitoids are capable of providing the most effective biological controls for reducing scale pest populations. Research has shown this to be particularly true for the suppression of armored scale insects. The larvae of parasitoids feed on the adult scales beneath their protective waxy cover. It is impractical in the field to monitor for the level of suppression by turning over the covers and examining individual insects with a hand-lens. A more effective method is to observe characteristic circular holes in the scale covers that are created by emerging adult wasps. There is usually only one exit hole per scale cover. If irregular or ragged holes are noticed in scale covers, then lady beetle predators were probably present.

When inspecting scale infestations, if a large number of scale covers are seen having circular exit holes, then it is recommended that insecticide sprays not be made. The conservative use of control sprays is especially suggested if scale population densities are low and no plant symptoms are evident. Numerous studies have indicated that the random or non-timed spraying of various insecticides against armored scale populations in the field is often counterproductive. Many times scale populations can be successfully suppressed by wasp parasitoids, but this ability is compromised when sprays are applied. All too often, improperly applied insecticides destroy beneficial parasitoids, have little impact on the scale pest populations, and actually may cause scale populations to increase.

In order to help reduce the destruction of beneficial parasitoids, the use of control sprays should be applied when plant damage symptoms are above aesthetic thresholds and beneficial populations are low. When warranted, a 3% horticultural oil spray is suggested during the late winter dormant season. However, do not expect this application to completely solve the scale problem. Additional 1-2% horticultural oil treatments should be applied when flying adult male scales emerge. Another summer oil spray should then be applied after crawler activity has ended. Therefore, two well-timed oil sprays are applied to each generation of scale insect (various armored scale species have between 1 to 3 generations per year). This control strategy allows parasitoids to maintain maximum effectiveness. This alternate strategy is different than most recommendations that state insecticides be applied when scale crawlers emerge.

Reference: Syllabus of Advanced IPM Short Course, Vol. III: MD Coop. Extension Service; 1997. ❑

LAB HIGHLIGHTS FROM PAGE 4

The last issue in turf to be discussed is environmental. Many turf stands throughout the region are starting to take a beating from a litany of summer stresses. Extremes in moisture and temperature have local landscape turf in and out of dormancy. On golf courses, we are seeing the decline of bentgrass stands in the heat and severe thinning of ryegrass fairways. Poor site conditions like excessive thatch, poor drainage, layering, compaction, and shade compound the effects of heat, drought, heavy rain, and high humidity. Imbalances in fertility input and growth regulators, as well as low cutting height, scalping, traffic, and bruising from aerification, top dressing programs, and mowing also increase the stress and the subsequent turf decline. The senectopathic fungi *Curvularia*, *Fusarium*, *Leptosphaerulina*, and sometimes *Colletotrichum* are commonly found on these sites. Remember, the real issues are environmental and cultural, and no amount of fungicide will fix the problem.

Ornamentals

Samples of ornamental plants yielded a number of routine diagnoses this period. The **shade tree anthracnose** and **rust** samples that dominated the spring are still being submitted, but are beginning to wane. Samples of **juniper tip blight** were common, as well as **cankers** caused by *Botryosphaeria*, *Nectria*, and *Cytospora*. Our nemesis (job security fungus) *Phytophthora* is also active on wet sites in the summer heat. Samples of juniper and rhododendron were diagnosed with **root and crown rot** cause by *Phytophthora*. Both samples were new transplants that were being heavily irrigated. Last but not least, a stand of vinca in Mercer County was ravaged by the fungus *Phomopsis livella*. ❑

Diseases of Turfgrass

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

Brown Patch

This disease, caused by the fungus *Rhizoctonia solani*, continues to be reported on golf courses, and home lawns due to the hot, 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 Chipco 26GT, chlorothalonil, Compass, ConSyst, Curalan, Eagle, Endorse, Heritage, Insignia, mancozeb, Medallion, Prostar, Spectro, thiophanate-methyl, or Touche per manufacturer's recommendations.

Pythium Blight

This disease has been reported on golf and landscape turf recently throughout the region. **Pythium** thrives in low or poorly drained areas, especially when the night temperatures are above 70^{0}F. For best results, improve drainage, water in the early morning hours, avoid over-fertilization, and apply Alude, Banol, Chipco Signature, Heritage, Insignia, Koban, Magellan, mancozeb, Prodigy, Quell, Subdue MAXX, or Terrazole, according to the manufacturer's recommendations.

Slime Mold

Although slime mold is not actually a disease, inquiries have been received recently about the appearance of tan to black colored clumps on turf, flowerbeds, and home gardens. In many cases, this material has been reported to occur virtually overnight on plant stems, grass blades, soil mounds, or other vertical objects and is easily removed with light pressure. Leaf tissue underneath these clumps is green and healthy. Upon close examination, these mysterious structures are actually clumps of the common **slime mold** fungus *Fuligo*. Fuligo is not injurious to plants and will soon disappear on its own. However, it can be easily dispersed with a rake or steady stream of water if desired. No fungicides are recommended.

Turf Field Day

Mark your calendars now for this year's Rutgers Turfgrass Research Field Days which will be held on August 3, 2005 (Landscape Turf Research Field Day at Adelphia, NJ) and August 4, 2005 (Golf Turf Research Field Day at Hort Farm II, Ryders Lane, New Brunswick, NJ). This year's Lawn and Landscape Research Field Day & Trade Show will be held in cooperation with the New Jersey Turfgrass Association (NJTA) and the Sports Field Managers Association of New Jersey (SFMA). Highlights of this event will include: (1) trade show and equipment demonstrations, (2) new herbicides for landscape turf, (3) major advances in turfgrass breeding – "See tomorrow's cultivars today", (4) identification and control of grubs and other insects, and (5) latest efforts for disease control on lawns. The Golf and Fine Turf Research Field Day highlights will include: (1) latest on the management of anthracnose on *Poa annua*, (2) current efforts to convert *Poa* fairways and greens to bentgrass, (3) new bentgrass cultivars for greens and fairways, (4) irrigation management and wetting agent studies on bentgrass, and (5) advance in spray application technology. Pre-registration (before July 22, 2005) $35 (members of NJTA, Golf Course Superintendents Association of New Jersey (GCSANJ) or SFMANJ), $50 (non-members). On site registration will be $45 (member of NJTA, GCSANJ, or SFMANJ), $60 (non-members). For directions to the field days or to access the registration form go to www.njturfgrass.org. Contact: Michelle Rickard, Executive Director, NJTA, PO Box 340, Milltown, NJ 08850, phone (215) 757-6582, or FAX (215) 741-6582. ❑

Plant Diagnostic Laboratory Highlights

Richard J. Buckley, Laboratory Coordinator

General interest

My wife called me yesterday from our house to tell me there were a million Japanese beetles in my back yard. Maybe there weren't a million, but at least there were a couple hundred thousand. It is amazing how fast they can skeletonize the leaves on a tree. I don't live far from Grovers Mill, so maybe the aliens Tom Cruise is running from in all those TV commercials are not really Martians, but Japanese beetles……

Turf

Patch diseases, **summer patch** (*Magnaporthe poae*) on annual bluegrass greens, and **take all** (*Gauemannomyces graminis*) on the bentgrass were common submissions during this period. Summer patch was identified on golf turf samples from Monmouth, Morris, Middlesex, Camden, and Hunterdon County golf courses, and from a Long Island country club. Take all was identified on turf from Pennsylvania, New Jersey, Florida, and New York. In the midst of all the patch samples, **anthracnose** took its rightful place as the primary turf disease diagnosed in the Plant Diagnostic Laboratory. Golf turf samples diagnosed with active **anthracnose** in some form or another were submitted from Atlantic, Burlington, Camden, Morris, and Somerset Counties in New Jersey as well as on golf turf from Pennsylvania and New York. Turf plugs containing **annual bluegrass weevil larvae** have dropped off at this point, but we found a huge population of adults on the research farm. If you had weevil problems in the past, now might be a good time to survey your clipping baskets or do some soap flushes on your hot spots. Other turf diseases of note include several cases of **brown patch**, a few **fairy rings**, and some **pythium root dysfunction**.

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Botrytis Blight on Ornamental Plants

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

Although much of this season has been hot and dry, **Botrytis blight** (or **gray mold**) can be troublesome on landscape, nursery, and greenhouse ornamentals when weather turns very humid and overcast (like this past week!). The very common and widely distributed cause of this disease, *Botrytis cinerea*, readily colonizes dead organic matter and, under the right conditions, attacks many different species of plants, including begonia, carnation, chrysanthemum, cyclamen, geranium, impatiens, marigold, peony petunia, and tulip. Although symptoms most often appear on flowers and leaves, other plant parts, such as stems, buds, and roots, can also be attacked by the pathogen. During propagation, spores may also lodge on surfaces of stems on stock plants, and when cuttings are taken and stuck in the propagating bench, the spores germinate and cause a basal cutting rot. The fungus persists as small hardy structures called microsclerotia and in plant debris as well.

Leaves and petals affected by Botrytis blight may appear faded or have tan, irregular spots. If infected during the bud stage, tissues appear water soaked and the buds will fail to open. Under conditions of high humidity (> 85%), the fungus produces a characteristic gray, fuzzy mycelium on infected tissue. Spores produced on the mycelium move throughout the greenhouse or outdoor planting on air currents. The spores penetrate tissues most often through wounds.

To manage Botrytis blight, keep relative humidity below 85%. Ensure good air circulation and adequately space plants (both in the greenhouse and in outdoor plantings). Remove infected blossoms and other plant parts as part of a regular sanitation program - senescent and dead plant tissues are readily colonized and may serve as a "base" from which the fungus spreads to healthy tissue. Avoid mechanical injury. For bulb crops such as tulip, look for diseased bulbs and discard them.

For chemical control of Botrytis blight, products such as chlorothalonil, copper, Exotherm-Termil (foliage only), fenhexamid, ferbam, fludioxonil, iprodione, mancozeb, Manhandle, myclobutanil, Mycostop, Phyton 27, *Streptomyces griseoviridis*, thiophanate-methyl, Spectro, SysStar, trifloxystrobin, or Ziram may be used. Some of these products are for use in enclosed structures (greenhouses) only; check label for hosts, timing, and rates. No endorsement or preference of pesticides is implied. Follow all label directions carefully when applying pesticides.

NOTE: Although compounds containing thiophanate-methyl or iprodione are registered for control of Botrytis blight or gray mold, isolates of *Botrytis* that are resistant to these compounds may be present. If a treatment applied as per label recommendations is not effective, shortening the interval or increasing the rate will not improve disease control. As a result, another fungicide should be used. To reduce the possibility of fungal resistance in the future, avoid the sole use of any fungicide for extended periods of time when other reliable products are available. ❑

Weather Summary for the Week Ending 8 am Monday 6/27/ 5

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
BELVIDERE BRIDGE	.00	11.63	-3.23	92	51	71.	1	845	35	54
CANOE BROOK	.67	13.16	-2.83	96	43	72.	2	1022	244	71
CHARLOTTEBURG	.48	14.98	-1.18	91	48	69.	2	819	214	60
FLEMINGTON	.21	15.14	-.13	92	52	73.	2	946	139	58
NEWTON	.53	12.91	-1.65	91	54	70.	2	879	198	64
FREEHOLD	.57	15.57	.57	92	50	72.	1	959	62	65
LONG BRANCH *	.10	14.10	-.97	87	52	71.	0	921	92	47
NEW BRUNSWICK	.22	12.68	-1.96	94	51	73.	0	999	47	64
TOMS RIVER	1.15	15.04	.13	91	46	70.	-1	873	49	61
TRENTON	.19	12.27	-1.36	92	52	72.	-1	1004	1	35
CAPE MAY COURT HOUSE	.25	12.75	-.49	81	46	67.	-5	743	-161	26
DOWNSTOWN	.12	11.68	-1.82	90	48	70.	-3	920	-102	30
GLASSBORO	.34	13.75	-.86	91	56	74.	1	1098	97	42
HAMMONTON	.31	12.15	-2.07	92	46	71.	-2	972	-22	29
POMONA	.21	12.99	.09	89	46	71.	0	879	-110	30
SEABROOK	.23	12.73	-.21	89	52	73.	0	1126	97	33
SOUTH HARRISON	.25	13.69	-.90	89	54	72	NA	1035	NA	NA

*SOME CUMULATIVE VALUES ESTIMATED DUE TO MISSING PAST DATA

WES KLINE — GDD BASE 40 PINEY HOLLOW Last Week* 268 (Ending 6/13/05) This Week 227 (Ending 6/20/05)

* February total base 40 equals 32 units

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