RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

# PLANT & PEST ADVISORY

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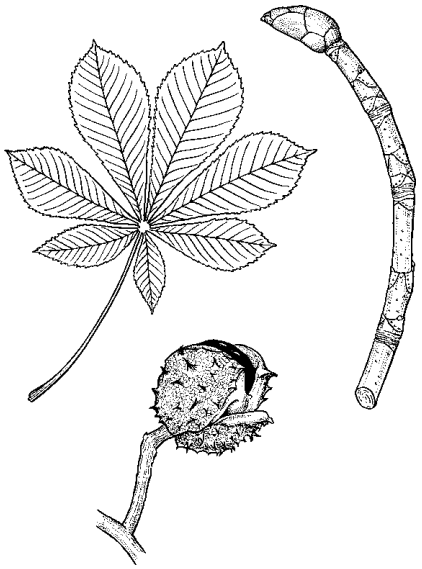

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## Ornamental Pest Notes

*Deborah Smith-Fiola, Ocean County Agricultural Agent and Steven K. Rettke, Landscape IPM Program Associate*

**Woolly Beech Aphids: (GDD=350 - 700)(PPI=Start—Kousa Dogwood / End—Mockorange):** Woolly beech aphids are found feeding on twigs or the undersides of leaves of beech (especially the European varieties of beech). Aphid bodies are covered with long, white waxy filaments that extrude from their bodies. Look for cast "skins" (old aphid skeletons) attached to the leaves which may give foliage a whitish appearance. Leaves are small, distorted, stunted, and new growth may stop completely. Honeydew and superficial sooty black mold may also be prevalent. Natural enemies often hold these pests in check, and even huge populations often do not cause significant damage. Pesticides may be necessary at times. Treatments include horticultural oil, imidacloprid (Merit), chlorpyrifos (Dursban), Scimitar, fluvalinate (Mavrik), and malathion. An insect killing fungus called *Beauvaria* is also labeled and sold under the trade name of 'Naturalis-L'.

**Privet Rust Mites : (GDD = 300 - 800)(PPI = Ruby Horse chestnut)—1st generation:** This eriophyid mite attacks Amur privet and California privet. They are pale yellow in color and spindle shaped, with four legs (not eight). Even with a 10x lens they are difficult to see since the adults are less than 1/2 mm in length (at least a 30x microscope is recommended). Mite feeding causes a silvery stipple damage; they also inject toxins that cause leaves to cup downward and turn olive green. Premature leaf drop may result with serious infestations. Most damaging activity occurs during the spring and early summer months. A dormant oil spray (to reduce the overwintering adults on privet twigs) may prevent spring outbreaks. Predaceous mites are the most effective natural enemy, but treatment in early June can reduce populations. Use a summer oil (1%) or insecticidal soap (1%) in the spring if required to suppress adults and immatures; oxythioquinox (morestan), Avid, Kelthane and fluvalinate (Mavrik) are also labeled. There are several generations each year.

**Boxwood Mite : (GDD = 450 - 700) (PPI = Kousa Dogwood ; Cranberry Bush):** This spider mite which attacks all boxwoods, is neither a true cool or warm season mite since it is usually most active with intermediate temperatures during mid-spring and early summer. The adult is yellow-tan in color with long legs. When the boxwood mites are active, they can be found on both the top and bottom of new growth. Eggs are light yellow and overwinter on leaves and twigs.

*SEE BOXWOOD ON PAGE 2*

*BOXWOOD FROM PAGE 1*

There are several generations a year. Boxwood mite feeding damage results in foliage with yellow to bronze stippling which may resemble injury caused from thrips. With high mite populations, entire leaves may develop yellowish streaks, turn yellowish white; premature defoliation can occur. Detected overwintering eggs are treated with dormant oils (2-3%). Although normally unnecessary, summer oils (1-2%) or insecticidal soaps are recommended to control mild mite populations. With high infestations, the use of a residual miticide such as dimethoate (Cygon), fluvalinate (Mavrik) or oxythioquinox (Morestan) may be necessary.

**White Prunicola Scale : (GDD = 707-1151 - crawlers) (PPI = Mt. Laurel ; Linden):** This armored scale is found predominately on members of the *Prunus* genus (flowering cherry, lilac, purple leaf plum). Males are white and have a narrow elongate shape, while females are circular and white with yellow shed skins near the center. There may be 2 to 3 generations per year with huge populations building up over a relatively short period. Crawlers are salmon colored. These scales do not feed on leaves, but only suck phloem sap from twigs and branches. The heaviest infestations are often first found on the outer branches. Leaf yellowing and premature leaf drop are the initial symptoms followed by die back of small branches. The Japanese flowering cherry is usually the most susceptible to this pest. Monitor for the first generation crawlers during June and into July. Predators and parasitoids such as lady bird beetles and parasitic wasps are often abundant enough to achieve suppression, but are not always reliable. In the summer, use horticultural oil sprays to conserve beneficials and target them against the crawler stage. Oil sprays (2-3%) during the dormant season can also be effective. Management of this pest is often difficult. The most reliable control may be to manually scrub patches of white scale covers off branches of small trees. Prune off unhealthy branches that are heavily infested.

**Juniper Scale : (GDD = 707-1260—crawlers) (PPI = Mock-orange):** This imported armored-scale insect is found on the foliage and twigs of primarily Juniper and occasionally Arborvitae. The female covers are circular and white (1/16 inch in diameter). The male covers are white and elongated and are even smaller in size. Yellowish cast skins are attached to the surface of the waxy covering of both sexes. Adult females overwinter on the foliage and there is only one generation each year. With light infestation there are often no apparent symptoms. Significant populations of 10 or more scales per 1/2 inch of twig, can result in yellowed foliage and needle drop. Populations which remain unabated will cause die back and a unattractive plant. Scales usually build up first on the south side of shrubs or on the side against buildings. Crawlers start hatching by mid-June and can continue well into July. Controls may *not* be required if many beneficials are present (especially monitor for parasitoid emergence holes in covers). Dormant oil sprays can be used and summer oils or insecticidal soaps can be targeted against the crawlers. A late summer systemic insecticide such as acephate (Orthene) can be applied if the crawler stage is missed.

**Birch Leafminers : (GDD = 530 - 700—2nd generation larvae):** The gray and white birch trees have long been the target of annual sprays because of birch leafminer. The first generation larvae has completed its feeding; the second generation adults are active and inserting eggs into the leaf surfaces of susceptible birches. The female can successfully use its ovipositor only in the soft tissue of recent secondary leaf flushes (the older leaves have "hardened-off" and can no longer be penetrated). Therefore, damage from this second generation may be mostly cosmetic with relatively few leaves being affected. It is probably *not* necessary to spray for the second generation leafminers, especially if the first generation caused little damage. There may even be a third generation in the southern half of New Jersey, but its presence is barely noticed.

One cultural control (primarily aimed at the 1st generation) is the use of "pupation barriers." These barriers consist of tightly woven fabric mulch or black plastic, that are positioned underneath the birch canopy and extend out beyond the drip line. They prevent leafminer larvae from reaching the soil as they drop from the leaves. Larvae must find soil in order to successfully pupate, if not, death of the larvae occurs.

Repeated attacks, combined with drought conditions, may weaken a tree and make it more susceptible to the bronze birch borer. Keep birches well irrigated and mulched. Acephate (Orthene) is the standard control, imidichlopri (Merit) works well given plenty of lead time. Dimethoate (Cygon) applied as a drench (mix with water and pour at the base of the tree) is labeled and commonly used in the mid-west.

**Fireblight :** Fireblight is caused by the bacterium, *Erwinia amylovora.* This disease attacks plants belonging to the rose family, but is most damaging to apple and pear. The bacteria live from one season to the next in branch and twig cankers on infected plants. In the spring, the cankered areas produce a white to orange colored ooze. The wind, rain and insects can carry this bacterial ooze to infect new foliage, flowers and fruit of susceptible plants. Disease development is favored by warm temperatures between 65-80°F. Diseased flower blossoms become water soaked and turn brown. Newly infected twigs are watery, dark green, and somewhat oily. When these infected twigs dry, they darken in color and the branch terminals appear to have been scorched by fire, but the leaves do not drop. The "burned" terminals produce the characteristic symptom resembling a "shepherd's crook" or upside down "j". The initial damage of this disease results in terminal die back. The infection becomes more serious when the bacteria enters through wounds or natural openings and moves into main branches. The cankered areas produce light brown bark that becomes sunken and cracked. If the collapsed vascular tissue girdles the branch, then the above portion of the plant dies.

In dry weather prune out infected branches at least 6" below the infected wood. Dip pruners in rubbing alcohol between cuts. Avoid using too much nitrogen around fireblight prone plants so as not to produce excessive amounts of soft, succulent growth. Next

*SEE FIREBLIGHT ON PAGE 3*

*FIREBLIGHT FROM PAGE 2*

spring, a copper fungicide or bactericide can be used, however, many orchardists question the value of such sprays. Furthermore, the frequency of applications required and the cost of these materials may not be practical in the landscape.

**Applescab:** Lesions on crabapple leaves that resemble grease spots have been evident in many parts of the state since the third week of May. Apple scab is caused by a fungus, *Venturea inaequalis,* that overwinters in diseased fallen leaves from the previous season. The initial symptoms appear on the leaves as olive-green smudgy spots with feathery margins and range in size up to 1/2 inch in diameter. The spots often concentrate along the mid-vein, and can occur on either side of the leaf. The fungus is capable of forcefully ejecting spores into the air. Wind currents carry the spores through the air to settle on young leaves and fruit during the spring. At a temperature of 70°F and 9 hours of continuous wetting, the spores will germinate and invade the plant tissue. At a lower temperature of 46°F, 20 hours of continuous wetting is necessary for the fungus to successfully establish. Therefore, it only requires a light rain during a warm spring night to produce severe infection to susceptible *Malus* varieties. Complete suppression of apple scab disease with susceptible varieties is not practical in the landscape. However, where it is desirable to prevent major defoliation of apple or crabapple in a key location, then a couple well-timed fungicide treatments can help. Usually the aesthetic appearance of the tree is still satisfactory if less than 30% of the tree defoliates from the infection. Systemic fungicides, plus a spreader-sticker need to be used in order to provide some residual capabilities (Cleary 3336 and Banner are examples). The first fungicide application should be applied before flower blooming occurs. The second treatment needs to be sprayed approximately 3 weeks later. After 3 weeks the residual effectiveness of these fungicides is over. Since fungal spore dispersal may continue for a period of six weeks in the spring, the two treatments can give partial suppression. During wet springs the above strategy may prove unsuccessful, but with moderately dry conditions these two timed applications may provide sufficient protection.

**Bacterial Blight of Lilac:** A disease of lilacs caused from the bacteria *Pseudomonas syringae.* During some years this infection can be prevalent. Symptoms include circular water-soaked spots on leaves, and irregular sunken brown cankers on young shoots. Shoot tips also wilt and blacken much like the response of fruit trees to fireblight. Confirmation can only be done via microscopic examination.

To minimize additional infections, cut out and destroy infected shoots as soon as symptoms appear. Disinfect tools between cuts. When disease incidence has become intolerable, spray once in mid-September with elemental copper. As a preventative measure, prune to prevent dense growth in order to improve air circulation. As is the case with nearly all plant diseases, some lilac varieties are more susceptible than others. (Source: Branching Out IPM NewsLetter; May 23, 1997; Cornell Cooperative Extension)

**Gypsy Moth : ( GDD = 90 - 731):** The fungal pathogen, *Entomophaga maimaiga*, is once again decimating gypsy moth populations throughout much of the Northeast. USDA/Forest Service requests from states for gypsy moth treatments are the lowest in 29 years. This imported Asian fungus was intentionally introduced into Massachusetts during the 1930's as an attempt to suppress this pest. It required nearly 50 years before the fungus became fully established within the Northeastern states. The pathogen has been most effective during the past five years in New Jersey. The mild wet winter and cool spring strongly favors this fungus. It is keeping gypsy moth populations down, and this year has been the most effective yet. From 1995 to 1996 the gypsy moth defoliation levels in the 14 states impacted by the pest decreased by 85%. In 1997, an additional 35% reduction occurred compared to last year. The NJ Dept. of Agriculture only treated 4,480 acres this year, which is a 80% reduction from 1996. This is the second lowest figure since NJ cooperative gypsy moth suppression projects began in 1970. (Source : NEWSLETTER Monmouth Co. Shade Tree Commission ; 5\97

**Ash\Lilac Borer**: Adult lilac borer moths are flying, which attack lilac and ash. Ash is primarily attacked by the banded ash clearwint borer, which is not active until late August\early Sept. So if you've been spraying ash in May when you see dieback and frass, you may have been spraying for the wrong pest!

Lilac borers lay eggs on the back of large stems of old lilacs. A spray of Dursban or Lindane on the bark now will kill and prevent new larvae from tunneling within the bark. A better option is to start renewal pruning over the next year or two to remove these old stems (plants will flower better, too).

**Bagworms (600-900 GDD = egg hatching) (PPI = Mt. Laurel; Japanese tree lilac):** The larvae of this pest have begun to hatch, or will soon do so, and will then begin to feed. They immediately start to build their bags, incorporating bits and pieces of the plant they are feeding on. At first they carry the bag on their backs; pointing up. Later on, as they grow larger, the bags hang down under the branch they are feeding on. They seem to prefer evergreen conifers, arborviate in particular, but will also feed on many deciduous plants. When they first emerge, the wind can pick them up and disperse them around the plant or to plants nearby. When populations are small, the best control is to hand pick the overwintering bags by mid-May *before* the eggs inside them hatch. Good control can be achieved with B.t. (Bacillus thuringensis) when they are small.

Larger bagworms can be controlled with acephate (Orthene), fluvalinate (Mavrik), or cyfluthrin (Tempo 2) as well as many others. The use of entomopathogenic nematodes have proven effective even against larger caterpillars. ❑

# Plant Diagnostic Lab Highlights

*Richard J. Buckley, Coordinator, Plant Diagnostic Laboratory*

**•Landscape**

As usual, the laboratory received many samples of ornamental landscape plants with injury due to **poor site conditions**, **improper cultural practices**, and **environmental extremes**. **Twig pruner** injury was identified in oak branches from a Somerset County landscape. **Maple bladder gall mite** is active at this time. The colorful galls formed by the mite were identified on maple leaves from a Bergen County landscape. **Phytophthora root and crown rot**, was identified on yew from a Middlesex County landscape.

**•Nursery and Greenhouse**

**White mold**, caused by the fungus *Sclerotinia*, was diagnosed on *Ageratum* and *Centaurea*. These plants were sent to the laboratory from a Monmouth County greenhouse. **Rhizoctonia root and crown rot** was identified as a problem on peony in a production field. This plant was submitted by a Cumberland County grower. **Nutrient toxicity** problems were diagnosed on plants from two New Jersey greenhouses. **Boron toxicity** was caused by excess boron levels in the irrigation water of a Hunterdon County greenhouse and **ammonium toxicity** was due to faulty proportioners in a Morris County facility.

**•Turf**

The big news with golf course turf is still the impact of the weather. With night temperatures consistently below 50°F and frequent rainy days, the turf is still dormant on many sites. Most superintendents report a little growth in the bentgrass, but no response with the annual bluegrass. A little summer weather should solve the problem. **Anthracnose**, caused by the fungus *Colletotrichum graminicola*, was diagnosed on golf turf from Monmouth and Camden Counties this period. On the samples from the Monmouth County course, the **anthracnose** infected turf was also infected with the fungus *Gaeumannomyces graminis*, the cause of **take-all patch**. **Yellow patch**, caused by the fungus *Rhizoctonia cerealis*, was active on golf turf submitted from Atlantic and Cape May Counties. **Pink snow mold** is also still a problem on golf turf. Samples with active **snow mold** were sent from New York. Once again, a little summer weather should solve this problem.

On landscape turf, **leaf spot and melting out**, **Ascochyta leaf blight**, **strip smut**, and **red thread** are all problematic at this time. High populations of **oriental beetle grubs** were found in samples of bluegrass from a Monmouth County landscape. ❑

# Diseases of Turfgrass

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

**Anthracnose**: This disease, caused by the fungus *Colletotrichum graminicola*, has been quite prevalent on annual bluegrass, fine fescue, perennial ryegrass, and Kentucky bluegrass recently. The fungus typically attacks turf growing under low soil fertility and/or heat and drought stress. Low cutting height 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 light applications of nitrogen, maintain adequate irrigation, reduce thatch, raise the cutting height (when possible). On a preventive basis, apply Banner, Bayleton, Cleary 3336, Daconil, Heritage, Manicure, Rubigan, Sentinel, or Thalonil per manufacturer's recommendations. Once the disease develops, best results have been obtained with a tank mix of Bayleton 25DF (2 oz/1000 $ft^2$)+ Daconil 2787 4F (10 to 12 fl oz/1000 $ft^2$) or Cleary 3336 50W (4 to 6 oz) + Daconil 2787 4F (10 to 12 fl oz./1000 $ft^2$).

**Brown Patch**: Begin preventive fungicide applications *now* to control this destructive summertime disease caused by the fungus *Rhizoctonia solani*. For best results, avoid heavy applications of nitrogen fertilizers during hot, humid weather, water in the early morning hours (12 midnight to 8 am), 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.

**Dollar Spot**: This disease, caused by the fungus *Sclerotinia homoeocarpa*, was observed on greens and tees recently. To prevent **dollar spot** from causing damage on susceptible turf again this year, maintain adequate nitrogen fertility, water in the early morning hours, reduce thatch, avoid the sole use of any fungicide for prolonged periods of time (to reduce the possibility of fungicide resistance), and apply Banner, Bayleton, Chipco 26019, Curalan, Daconil, Eagle, mancozeb, Manicure, Rubigan, Sentinel, Thalonil, Touche, or Vorlan per manufacturer's recommendations. Repeat fungicide applications as needed through mid-October.

**Red Thread**: This disease, caused by the fungus *Laetisaria fuciformis*, is very prevalent on sensitive turf throughout the State. Infections are characterized by the appearance of short red threads (1/16-1/14" long) emerging from tan-colored leaf blades. Affected patches are typically pink in color and range from 1 to 6 inches in diameter. Although perennial ryegrass and fine fescue are most susceptible, bluegrass, bermudagrass, and tall fescue may also be affected. **Red thread** is typically found on "hungry" (low fertility) turf during cool, wet weather. Well fertilized turf, however, may also be attacked. To obtain optimum disease control, maintain adequate fertility levels, avoid drought stress and excessive thatch, and apply Banner, Bayleton, Chipco 26019, Curalan, Eagle, Fungo, Heritage, Rubigan, Sentinel, Touche, or Vorlan per manufacturer's recommendations. ❑

# Diseases of Greenhouse Crops

*Ann B. Gould, Ph.D., Ornamentals Plant Pathology*

**Geraniums**: **Black leg**, caused by the fungus *Pythium*, is primarily a disease of young geranium cuttings in propagating benches. The disease begins as a basal rot of affected stems that progresses upward until the leaves wilt and die. Affected stem tissues turn black. Since *Fusarium* and *Rhizoctonia* may also be involved, control measures should include the use of sterilized soil or fresh artificial mix, reduced soil moisture, proper sanitation, and the application of a fungicide drench containing thiophanate-methyl plus Truban, Banol, or Subdue. Do not use until cuttings are well-rooted.

Symptoms of **bacterial leaf spot and wilt**, an extremely serious disease of greenhouse geraniums, appear on leaves as either small, water-soaked spots (1/16 inch in diameter) or as large, angular, areas of dead tissue. Older leaves frequently wilt and cling to the plant for one or two weeks before they drop off. In the later stages of disease development, portions of the stem turn black and decay. To prevent disease spread, discard all diseased plants, do not water late in the day, avoid splashing, lower the relative humidity, increase spacing, use only sterilized soil or fresh artificial mix, maintain strict sanitation practices, and sterilize benches with a 10% bleach solution before reintroducing healthy stock into the greenhouse. Phyton 27 may be used as a preventive spray in conjunction with proper cultural management practices.

**Bedding Plants**: The soil fungi *Pythium, Fusarium*, and *Rhizoctonia* affect not only geranium, but can cause serious **root and stem rots** on all kinds of bedding plants in the greenhouse. To control these diseases, it is very important to use sterilized soil or fresh artificial mix, avoid overwatering, and drench at the first sign of disease with Truban (or Subdue) plus thiophanate-methyl per manufacturer's recommendations. Banrot, a commercial formulation of Truban and a benomyl-like compound, may also be used for this purpose, and fosetyl-Al may be applied as a foliar spray on some hosts (consult label). Repeat applications at 2- to 6-week intervals as specified on the label.

**Bulbs**: **Bulb rot** on plants such as tulip, lily, narcissus, and hyacinths is a common problem caused by the fungi *Fusarium* and *Penicillium*. This disease occurs when bulbs are planted in poorly pasteurized soil or when infected bulbs are not discarded prior to planting. For now, discard pots containing diseased plants and drench the remaining stock at 2- to 4-week intervals with thiophanate-methyl. In the future, remove tunics, destroy all bulbs exhibiting decay before planting, avoid wounding, use only sterilized soil or fresh artificial mix, and soak bulbs in a 55 to 75°F solution of thiophanate-methyl for 15 to 30 minutes prior to planting. For best results, change the solution every 24 hours or whenever it becomes dirty. To control bulb mites, which are often associated with bulb rot, place bulbs in an onion sack and dip for 3 minutes in a 120°F water bath.

**Gladiolus**: To prevent **leaf spots** from developing on sensitive varieties again this year, spray gladiolus with maneb, thiophanate-methyl, chlorothalonil, or mancozeb when plants are 8 to 10 inches tall and then repeat (depending on the fungicide used) at 10- to 21- day intervals. Use a spreader-sticker to enhance spray coverage.

**Fuchsia**: **Rust**, caused by the fungus *Pucciniastrum*, can be a problem on fuchsia in the greenhouse. If left unchecked, extensive defoliation can occur. For best results, apply mancozeb as soon as the disease appears and then repeat at 7- to 10-day intervals; *or* use myclobutanil at 10- to 14-day intervals. ❑

# Reporting Crop Damage

*Submitted by Jerome L. Frecon, Gloucester County Agricultural Agent*

*The following information was recently sent to all agriculture leaders by Secretary Art Brown.*

In an effort to reduce crop damage caused by deer and other wildlife populations, I'm writing you and members of your organization at the request of the State Board of Agriculture, to urge you to report crop damage caused by wildlife to the Division of Fish, Game and Wildlife (F,G&W). Here's Why!

In April, members of the Sate Board of Agriculture met with representatives of F,G&W to discuss their management plan for deer. According to F,G&W statistics, regulated hunting continues to be the most efficient, economical and humane means to control deer and other wildlife populations, and prevent the damage they cause. Yet the most *serious problems inhibiting the adequate control of deer and other wildlife are the lack of hunter access to such wildlife and not reporting damage caused by wildlife.*

Deer management zones are the key element of New Jersey's deer management program. And one of the major components to setting annual harvest goals is deer damage incurred and reported by farmers, as well as other landowners, homeowners, and the motoring public. Thus *it is absolutely essential for farmers to annually report any deer damage* so that it is included in the formula used to set annual deer harvest goals by zone. Unfortunately, in 1996 only 387 farmers in the state reported any crop damage to F,G&W.

To report deer and other wildlife damage or lack of hunter access to such wildlife, call the F,G&W's Deer and Wildlife Damage Hotline (908-735-6938 or 908-735-8793) 24 hours a day to leave a recorded message. To report damage to a wildlife management specialist, call 908-735-8793, weekdays from 8:30 AM to 4:30 PM or call the regional wildlife management office in your area. ❑

# Scheduling Garden Mums, Part II

*George Wulster, Ph.D., Floriculture*

*The cultural factors that impact scheduling covered in Part I in the previous issue of this newsletter were Rooted or Unrooted Cuttings, Pot Size, and Pinching. Part II continues with the remaining cultural factors.*

**Cultural Factors:**

Growth Regulators : In recent years interest has increased in the chemical control of flowering and plant appearance using chemical growth retardants and the ethylene releasing agent Florel ™ . The growth regulator B-Nine, in many years of trials, has frequently lead to flowering delay compared to untreated plants and plants treated with other materials such as paclobutrazol (Bonzi), photos 3 and 4. The significance of the delay depends upon variety, concentration, and time of application. It is possible to have as much as one week's delay for every application at a concentration of 0.2% B-Nine, especially if applications are made well after flower initiation.

The work and educational efforts of Dr. Peter Konjoian and Yoder Brothers has lead to the labeling of the growth regulator Florel™, which is used to reduce early crown buds and reduce or eliminate a second pinch. Florel™ is also an effective material for delaying flowering. The extent of delay is related to the timing and number of applications. In our experience we have also observed varietal and environmental (temperature) interactions that can significantly affect scheduling considerations. Table 5. shows the impact of two 500 ppm Florel™ applications on the flowering of some garden mum varieties grown under controlled conditions where night temperatures were maintained either between 55-60°F or 70 -75°F.

**Table 5. Impact of Florel™ on garden mum flowering under 'cool' or 'warm' night temperatures.****

| Cultivar | Manual pinches 55-60°F night flowering date | Manual pinches 70-75°F nigh' flowering date | Florel* Applic. 50-60°F night | Florel* Applic. 70-75°F night |
|---|---|---|---|---|
| Red Remarkable | 10/12 | 10/12 | 4 | 8 |
| Grenadine | 9/30 | 10/2 | 13 | 15 |
| Bravo | 9/14 | 9/22 | 6 | 22 |
| Jessica | 9/17 | 9/22 | 1 | 8 |
| Target | 9/21 | 9/30 | 6 | 12 |
| Debonair | 9/14 | 9/13 | 2 | 2 |
| Allure | 9/13 | 9/16 | 5 | 16 |
| Encore | 10/11 | 10/11 | 0 | 1 |
| Tolima | 10/12 | 10/13 | 0 | 7 |

**The number of days flowering was delayed compared with a manual pinch. Plants were pinched manually 6/3 followed by a second pinch on 6/14. Florel was applied at 500 ppm on 6/4 and 7/16 to unpinched plants.*

***These results were obtained from research supported by the Fred C. Gloeckner Foundation*

Later applications at warm night temperatures result in greater delays and an increased lack of uniformity compared with results obtained when cooler night temperatures prevail and applications are made earlier. The use of Florel is promising, however it is important to understand its potential in the context of your varietal selection, environmental conditions, and scheduling objectives. Consult with your plant supplier and adopt an experimental approach as with any new chemical treatment.

Environmental Factors: Several factors may require you to adjust your schedules. Most environmental stresses promote the premature formation of buds on many garden mum varieties. Minimizing stresses from the following sources is important to maintaining vegetative growth and vigor, and scheduling reliability.

Temperature: High temperatures can delay flowering up to 2-3 weeks depending upon variety and duration. This factor can also interact with cultural practices such as growth regulator treatments. Conversely, low temperatures can dramatically stimulate flowering too early, especially on plants planted outdoors in the field or containers. Placing mums in the field prior to the second week in June in the MidAtlantic region is an invitation to crown bud formation. Earlier placement is possible in southern areas.

Nutrition and watering: Failure to provide adequate water and nutrition will also compromise scheduling plans, frequently resulting in reduced plant size and premature bud set.

Generally, any stressful conditions will likely result in deviations from generic schedules where optimizing cultural practices are normally presumed.

Following are some 'typical' Schedules** for the same variety grown for several different market objectives.

**Table 6. Spring flowering in small containers**
**Objective: 1997 spring flowering 4 inch pot without lighting or shade.*****

| Cultivar | # cttngs. | Plant date | Pinch date | Light | Shade | Flwering date 7 wk. |
|---|---|---|---|---|---|---|
| Tolima + 1 | | 3/3 | 3/17 | None | None | 4/21 |

*** A minimum night greenhouse temperature of 60°F is necessary.

+ Tolima is a 7 week mid season variety recommended for most garden mum programs.

**Table 7. Spring flowering in larger containers**
**Objective : 1997 spring flowering 6 inch pot with lighting and shade. ******

| Cultivar | # cttngs. | Plant date | Pinch date | Light | Shade | Flwering date 7 wk. |
|---|---|---|---|---|---|---|
| Tolima visible color | 4 | 3/3 5/5 | 3/17 | 3/10-3/24 | | 3/24- |

**** Long night interruption rather than extending day lengths is best. This can be accomplished by providing lighting (10 fc) from incandescent bulbs from 10 pm to 2 am. Shading is accomplished using a black cloth system.

**Table 8. Early summer garden mums.**

**Objective: Early shaded garden mums 6 inch pots *****

| Cultivar | # cttngs. | Plant or arrvl date if unrooted | Pinch date | Light | Shade | Flwering date 7 wk. |
|---|---|---|---|---|---|---|
| Tolima (rooted cuttings) | 1 | 4/28 6/2 2nd | 5/12 1st | til shade date | 6/2 | July 21 |
| Tolima unrooted cuttings) | 1 | 4/14 | 5/12 1st 6/2 2nd | til shade date | 6/2 | July 21 |

***** If high temperatures (> 80°F ) occur flowering may be delayed. Pulling cloth later in the evening and later in the morning may help minimize heat buildup under the cloth.

**Table 9. Fall flowering natural season 'fast crop' ***
**Objective: Fast crop garden mum 6 inch pots**

| Cultivar | # cuttings | Plant date or arrival if unrted | Pch date | Flowering date Mid-season |
|---|---|---|---|---|
| Tolima (rooted) | 1 | July 15-30 | no pinch | 9/25-10/10 |
| Tolima (rooted) | 1 | June 30- July 15 | no pinch, plant 7/15-7/30 | 9/25-10/10 |

* Pinching is not recommended and adequate water and fertility are important in pushing growth.

**Table 10. Natural season container crop.**
**Objective: Natural season 6 - 8 inch container fall crop.**

| Cultivar | #cuttings | Plant or arrvl if unrooted | Pinch date (approx.) | Flowering date Mid-season |
|---|---|---|---|---|
| Tolima (rooted) | 1 | 5/15-6/15 | 1st 5/25-6/25 2nd 6/14-7/14 | Sept.-early Oct. |
| Tolima | 1 | 5/1-6/1 | 1st 5/25-6/25 2nd 6/14 - 7/14 | Sept.-early Oct. |

**Table 11. Natural season field grown crop.**
**Objective: Natural season field grown for digging.+**

| Cultivar | #cuttings | Plant date or arrvl if unrooted | ++Pinch date (approx.) | Flowering date Mid-season |
|---|---|---|---|---|
| Tolima | 1 | 5/15-615 | 1st 5/25-6/25 2nd 6/14-7/14 | Sept.-early Oct. |

+ Consult with your supplier regarding suitability of varieties for digging. Some varieties that are excellent in containers do not dig well or may not size as well in the field.

++ Planting dates for going directly into the field will vary by location. In the MidAtlantic region plants placed in the field prior to the 2nd week in June may be difficult to maintain vegetatively. Your supplier is the best source of information for dates in your area.

There is a great deal of detailed information available in supplier catalogs and through supplier representatives regarding response groups, growth habit, suitability for digging etc. Understanding your market needs, environmental conditions, and cultural practices is the best guarantee for successfully scheduling a *quality* garden mum crop.

** *Tables 6-11 were developed from cultural and scheduling information provided in Yoder Brothers 1996-1997 Garden Mum brochure.* ❑

# Christmas Tree Growers Shearing Demonstration and Twilight Meeting

**Thursday, June 12, 1997, 5:30 p.m.**
**Rutgers Display Gardens**
**New Brunswick, NJ**

- ❖ Pesticide Update and Safety - Dr. George Hamilton, RCE
- ❖ Disease ID and Control - Richard Buckley, RCE
- ❖ Insect ID and Control - Dr. Paula Shrewsbury, RCE
- ❖ Shearing Demonstration - Dr. Mark Vodak, RCE

Pesticide credits available.
Contact Sylvia or Janet at Rutgers Cooperative Extension of Middlesex County at (908) 745 3443.

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# North Jersey Christmas Tree Grower Twilight Meeting

**Wednesday June 18, 1997 6-8 p.m.**
**Al's Tree Farm, Rt. 579/Croton Road**
**Croton, NJ Hunterdon County**

- ❖ Hand and Machine Shearing of Pines-Dr. Mark Vodak, RCE
- ❖ Several Mechanical Rotary Shearers will be demonstrated by growers
- ❖ Pesticide update and Safety- Dr. George Hamilton-RCE
- ❖ Weed Control Considerations-Win Cowgill-RCE

Contact Win Cowgill, RCE of Hunterdon County (908) 788-1339