Phosphorus: Do we use too much or too little?

Loren Muldowney, Soil Scientist, Rutgers NJAES Soil Testing Laboratory

The answer to the above question is “both”. Phosphorus is an essential plant “macro”-nutrient, meaning it is needed in large quantities for plant growth. It is one of the three elements listed, by law, on commercial fertilizer, one of the trilogy of N-P-K so familiar to anyone involved in land care. Phosphorus is the “P.”

New Jersey, like many states, is out of compliance with the federal Clean Water Act, which requires that the waters of the United States shall be “swimmable, fishable, and drinkable.” One strategy of the quest for compliance is to reduce the amount of Phosphorus entering surface waters. What good will that do? One of the problems in the streams of New Jersey is an excess of nutrients. This leads to luxuriant growth of algae and other aquatic plants in density completely out of scale with the normal habitat for fresh-water ecosystems. Sometimes the entire surface of a lake is covered shore to shore with floating vegetation. Light does not reach the lower levels, the balance of dissolved gases is disturbed, and notably, when the plants eventually die and decompose, the decomposition consumes so much oxygen that fish die. They, in turn, also begin to decompose and of course, stink. This situation is in direct conflict with making our waters more swimmable, fishable and drinkable.

There have been proposals for mandating a reduction in the phosphorus content of commercially available fertilizer. Despite the economical and convenient availability of soil testing services, many homeowners and landscaping services do not regularly assess nutrient status before applying fertilizer. The result is a one-size-fits-all approach where nutrients are often applied in excess and whatever is not taken up by the on-site plants can run off into storm sewers or seep into ground water and eventually makes its way to surface water bodies.

At the Rutgers Soil Testing Lab, we have compiled recent sample data and found that approximately 75% of lawn samples are already high in Phosphorus. If this is representative of the larger population, it suggests that 75% of the P being applied to lawns across the state is not only unnecessary but quite possibly contributes to harmful non-point source water pollution. The remaining 25% of samples indicate a need for more added P in order to properly feed the crop of interest, typically

See Phosphorus on page 3
Diseases of Turfgrass
Bruce B. Clarke, Ph.D., Specialist in Turfgrass Pathology

General
Dollar spot, stem and crown rust, and take all patch are all active at this time. Refer to recent issues of this newsletter for additional information about the identification and management of these diseases.

Pink Snow Mold / Microdochium Patch
This disease, caused by the fungus *Microdochium nivale* (*Fusarium nivale*), does not need snow cover to develop and will soon occur on golf and landscape turf. Cool (32-60 F), cloudy and wet weather is ideal for disease development. To prevent pink snow mold from developing on susceptible turf this fall, avoid excessive nitrogen applications, continue mowing turf until dormancy, use snow fencing to prevent snow drifts on high value areas, and apply Armada, Banner, Chipco 26GT, chlorothalonil, Compass, ConSyst, Disarm, Eagle, Headway, Heritage, Insignia, Instrata, Medallion, PCNB, Spectro, Tartan, thiophanate-methyl, Trinity, Triton or vinclozolin per manufacturer’s recommendations. For best results, apply fungicides in late-October/early-November and then repeat in late-January if the snow cover recedes. Do not reapply PCNB after mid-January since this product has a three month residual and can yellow turf during warm (>80F) weather.

Stripe Smut
This disease, caused by the fungus *Ustilago striiformis*, is starting to appear on sensitive Kentucky bluegrass cultivars. Symptoms typically appear as long black streaks (striations) between the veins of infected leaf blades. These areas eventually rupture releasing abundant black smut spores. One well-timed application of a penetrant fungicide in early- to mid-October offers excellent protection from stripe smut and is therefore superior to multiple applications in the spring (mid-May). For best results, apply Armada, Banner, Bayleton, Eagle, Rubigan, Tartan or thiophanate-methyl now per manufacturer’s recommendations.

Take-all Patch
Several reports of Take-all Patch, caused by the root and crown infecting fungus, *Gaeumannomyces graminis var. avenae*, have been received recently on bentgrass greens and fairways in the tri-state region. Although this disease is most prevalent from April through June, late-summer and fall outbreaks are not uncommon. Patches are usually circular or ring-shaped and range in size from several inches to two feet or more in diameter. The centers of affected turf are frequently colonized by bluegrass, fine fescues or weeds. The disease is enhanced by poorly drained, light-textured and high pH soils. Although take-all patch is difficult to control, best results have been achieved with the use of acidifying fertilizers during cool weather (e.g., ammonium sulfate) to avoid burning, and preventive applications of Banner, Bayleton, Disarm, Headway, Heritage, Insignia, Trinity, Triton or Rubigan in October and November. If take-all has been particularly severe this fall, fungicides should be reapplied twice next spring at 21 to 28-day intervals beginning at green up in early-April. Chemicals should be applied in 4 gal water/1000 sq ft or irrigated into the root zone (1/8 to 1/4” of water) for maximum effectiveness. Whenever practical, overseed infested areas with less susceptible grasses such as fine fescues, Kentucky bluegrass or perennial ryegrass to mask symptom expression. Maintain soil pH at approximately 6.0 since the disease is enhanced in alkaline soils. Manganese (2 lb Mn/A), applied once at green up in early-April, can help reduce disease severity in soils that are deficient in this micronutrient. When applying manganese, use a “foliar” spray to avoid this nutrient from being tied up (converted to an unavailable form) by the pathogen in the rhizosphere.

Turfgrass Expo
The 2009 Turfgrass Expo will be held at the Trump Taj Mahal Casino/Resort on December 8-10, 2009. To help celebrate the 40th anniversary of the New Jersey Turfgrass Association, this year’s EXPO will feature presentations from past graduates of the Rutgers Turfgrass Program. This is a great opportunity to meet old friends and receive the latest turf management information from nationally renowned speakers. So put this year’s Turfgrass Expo on your calendar today. For additional information, please contact Cece Peabody (973) 812-6467 or e-mail executivedirector@njturfgrass.org or Anne Diglio (732) 932-9400 ext. 339 or e-mail diglio@aesop.rutgers.edu.
Black Knot of Prunus
Ann B. Gould, Ph.D., Specialist in Plant Pathology

Black knot, caused by the fungus *Apiosporina morbosa*, is a canker disease of many trees in the genus *Prunus*. The disease is indigenous to North America, and on susceptible species, tree value is reduced when black, spindle-shaped galls form on branches. Hosts commonly affected by black knot include almond, apricot, blackthorn, most cherries, chokecherry, peach, and many wild and cultivated plums. In commercial plantings, serious losses due to this disease may occur, and the unsightly knots ruin the aesthetic value of susceptible trees in the landscape. Black knot can be difficult to control.

Black knot first appears in the fall as small, light-brown swellings on current-season twigs. These swellings continue to enlarge through the next growing season to form a canker or knot. Eventually the knot splits to reveal a velvety, olive-green fungal stroma (structure bearing spores) that turns hard and black the following winter. Well-developed knots are black, roughened, and spindle-shaped. Although the average knot caused by *Apiosporina* is 4 to 12 inches in length, the swellings can enlarge yearly and grow each season closer to the base of the branch. Knots eventually girdle affected branches, and tissue distal to the knot dies. Occasionally, the fungus will grow into the main trunk, girdling the tree and killing it.

An integrated approach to control of black knot begins with the selection of planting material that is free from disease. To avoid moving the disease into the landscape, choose only top quality, disease-free trees from a reputable dealer, and inspect trees before planting. Disease impact is reduced in trees that are properly maintained. Healthy, vigorous trees can resist infection by reducing the spread of the disease through affected branches. To ensure plant vigor, choose sites that are suitable to the horticultural requirements of newly planted trees. Be sure to adequately space the plants. In older, established plantings, maintain or improve plant vigor with proper pruning, fertilization, and irrigation. Decrease humidity in the tree and around the planting by pruning unnecessary limbs and branches. Thoroughly clean up wild cherries and plums in the vicinity of desirable trees. Resistance to black knot varies among cultivars; consider selecting plant material that tolerates the disease. Plum varieties with some resistance include President (high) and Brodshaw, Early Italian, Fellenberg, Formosa, Methley, Milton, Santa Rose, and Shiro (moderate). Susceptible varieties include Shropshire and Stanley.

Through careful monitoring and early detection, black knot can be eradicated before the value of a tree is reduced. Branches with symptoms of the disease should be promptly removed. When pruning, remove affected branches at least 6 to 8 inches below knotted tissue in late fall or in early spring prior to budbreak. Since pruning tools are an excellent way to spread the disease, surface-sterilize tools with denatured alcohol between cuts, and prune only during dry weather to avoid unnecessary spread of spores. If possible, remove the branch from the tree by properly cutting the limb flush to the branch collar, not flush to the trunk. Since *Apiosporina* can persist and sporulate in dead plant material for extended periods, branches removed from diseased trees should be taken from the site and destroyed. Although fungicides are not recommended for use in the landscape, Junction (mancozeb + copper hydroxide) (professional use only) may be applied for control.


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Phosphorus from page 1

lawn grasses. An underfertilized lawn will not grow well and is more vulnerable to soil erosion, which also can lead to non-point source pollution, so landscapes which have low P should be amended.

Another factoid about P recently in the news is concern over dwindling supplies. The source of P fertilizer is a type of mined sedimentary rock which is not especially common or distributed equally around the world. Organic agriculture uses the ground rock to amend fertility directly, and many other commercial fertilizer products are made by reacting the ground rock with strong acids or other chemicals. Current supplies are projected to last in the range of 20 years but many people are concerned that economical supplies of P will be depleted with no replacement in sight.

You can expect to see low or no Phosphorus fertilizer formulations increasingly available, and should prepare for the possibility that there will be some restrictions on its application. Of course, anyone with soil test results documenting a low level of P should not have any trouble making the case that it should be applied.

For the sake of the lakes and streams, measure your Phosphorus and apply only when needed!

Information on submitting soil samples is available through Rutgers NJAES Cooperative Extension county offices or at: [http://njaes.rutgers.edu/soiltestinglab](http://njaes.rutgers.edu/soiltestinglab).
Some Thoughts on the Biointensive IPM Approach for the Management of Whitefly on Poinsettias

Steven K. Rettke, Ornamental IPM Program Associate

Resistance Problems

Unquestionably, chemical controls such as Marathon, Safari, Distance and Avid are presently some of the premiere whitefly management materials with poinsettias. Typically they have shown to be outstanding insecticides and have enabled growers to reduce the number of treatments previously required when managing a poinsettia crop. Unfortunately, these control materials have become regional wide management approaches with their use commonly applied during all phases of the crop’s development stages.

It needs to be remembered that insecticide resistance is a reality in our industry. For example, during the past few years Marathon has experienced widespread resistance problems against silverleaf whiteflies (Q-Biotype strain). When the same insecticide is used extensively over an extended period of time, then resistance will inevitably begin to occur. There are at least 3-dozen insecticides which whiteflies in the Bemisia genus (silverleaf whitefly) are resistant to. Consequently, it is important to try to break the cycle of continual applications of insecticides that presently work best. For example, for the past 2-3 years Safari has become the material of choice for many poinsettia growers. Simply loading up on the latest and greatest insecticide presently available will produce problems. Hoping the pest control industry will continue to be able to produce new materials after others become resistant is an approach that will eventually lead to failures. Can these premier insecticides be used more judiciously?

Supplementing Chemicals with Beneficials

Biointensive IPM is an approach where a combination of management strategies is implemented to maintain plant health. The use of biological control is emphasized in this integrated approach. It is designed to allow the build-up of beneficial populations (usually insects & mites). It is well known that no single pest management strategy will be 100% successful. Therefore, other control strategies are also involved, including the use of chemical insecticides. Are there reliable combination approaches that will allow the grower to stop the continual use of chemical insecticides throughout the production period?

Poinsettias are the #1 or #2 container grown crop in the United States in terms of economic value. The value of a poinsettia crop per acre is estimated to exceed $200,000. With a crop this valuable it is crucial that alternative management strategies are successful. Any recommended methods have to be practical and economically feasible. It is important to provide examples of biological control successes that are cost competitive. They cannot be 5 or 10 times more expensive than conventional methods and they must provide good results. Research and commercial attempts have successfully shown biological control costs can be equivalent to that of applying traditional insecticides.

Releasing Parasitic Wasps

It needs to be emphasized that biological control is not a rescue methodology. Successful whitefly management on poinsettias has been achieved using chemical controls early (such as Marathon, Flagship or Distance) and then releasing parasitic wasps later in the season. Later in the season has proven to be a good time to interject new alternatives other than Marathon, Safari or other long residual insecticides. With the cooler temperatures, the whitefly pests do not reproduce as effectively as during the warmer earlier months. Therefore, successful biointensive IPM programs in the Northeast have typically released parasitic wasps for a two-month period from late September to late November. Releases are usually stopped by late-November when whitefly populations should be at minimal population levels.

Successful examples of biointensive IPM whitefly control programs have typically released parasitic wasps once per week on average over a 6 to 8 week period. The recommended rates or density of wasp release has been determined through trial and error from numerous studies. The recommendations below were provided from a trial with researchers at the University of Maryland.

**Recommended Rates:**

- **Preventive:** 1.5 pupa/m² released every 1-2 weeks
- **Curative:** 3-9 pupa/m² releases once a week

Weekly crop monitoring also helps determine if the weekly releases are adequate. If whitefly larval counts become too high, then additional releases may become necessary. The number of releases made during the 2-month period can be limited to make it comparable to the cost of traditional insecticide treatments and still provided satisfactory controls.

It is important to determine the percentage of successful emergence of the parasitic wasps after release into the crop. Upon delivery they should begin to emerge within a few days. Insectaries will attempt to time the shipping arrival within a day or two before wasp emergence. Most if not all of the wasps should emerge within a week. The counting of the number of wasps after one week will give a good indication of the percentage that have successfully emerged. If no emergence has occurred after a few days, then a problem exists and the insectary needs to be contacted.

See Parasitic Wasps on page 5
The beneficial wasps that are used to control insects are very different than hornets, yellowjackets or Africanized honeybees that are known to occasionally attack people. They are typically very host specific and certainly more effective at hunting and locating whitefly larvae than scouts are capable of doing. Greenhouse and silverleaf whiteflies are the most damaging species that feed on poinsettias. Only 15 to 20 years ago greenhouse whitefly species were typically more numerous in the north, whereas the silverleaf whiteflies were more common down south. However, for over a decade the silverleaf whitefly in northern areas has become more numerous and is now often more common than the greenhouse species. In fact, in most NJ greenhouses the silverleaf species is found exclusively on poinsettias. Each whitefly pest requires specific species of parasitic wasps to achieve best results. The *Encarsia formosa* wasp has been found to be most effective against the greenhouse whitefly, while the *Eretomocerus eremicus* wasp is most effective against the silverleaf whitefly. It is possible to have both whitefly pest species present on a poinsettia crop simultaneously.

**Reasons Biointensive Controls Fail**

A brief summary of some studies have identified some of the common reasons for the total failure of biological controls:

1. Biological controls fail if releases are made when whitefly population levels are on the rise. Do not wait for whitefly populations to start to increase before intervention is begun. Since biological control does not work as a rescue approach, if whitefly populations have already begun to build, then the beneficial wasps released will struggle and often are not capable of catching up.

2. When the parasitic wasps released are of inferior quality. Total failure of the biological stage of the IPM approach can occur if a large percentage of the parasitic wasps do not emerge after release. Quality control in the biocontrol industry can be a problem (i.e., non-viable wasps). It is of utmost importance to find an insectary that is reliable.

3. When a portion of the crop production cycle was let unprotected (i.e., misting of cuttings). There are few control materials available to protect poinsettia cuttings during the mist spray period (approximately 4-week duration). Whiteflies can still come in and lay eggs during this time. Therefore, protect the beginning of the Christmas crop production cycle.

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**Parasitic Wasps from page 4**

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**Rutgers Plant Diagnostic Laboratory Services**

The Rutgers Plant Diagnostic Laboratory & Nematode Detection Service is a full-service plant health diagnostic facility sponsored by Rutgers New Jersey Agricultural Experiment Station. The Lab’s mission is to provide accurate and timely diagnoses of plant health problems for the residents of New Jersey.

Located on the George H. Cook campus in New Brunswick, NJ, the Lab provides plant health diagnostic services in cooperation with Extension faculty, staff, and other university personnel. The Lab serves residential and commercial clientele.

The Rutgers Plant Diagnostic Laboratory provides the following services:

- Disease and Insect Pest Diagnosis
- Plant and Weed Identification
- Insect Identification
- Fungus and Mold Identification
- Nematode Assays
- Screening for Acremonium Endophytes
- Fungicide Resistance Screening
- Other Services Available by Contract

For fees and instructions on how to submit samples, go to the web at: [http://njaes.rutgers.edu/services](http://njaes.rutgers.edu/services) or call the lab at 732-932-9140, fax 732-932-1270 or e-mail clinic@njaes.rutgers.edu.
Rutgers Soil Testing Laboratory Services

The Rutgers Soil Testing Laboratory is a part of Rutgers New Jersey Agricultural Experiment Station outreach component. Located on the George H. Cook campus, the Rutgers Soil Testing Laboratory is a service unit that performs chemical and mechanical analyses of soils for the residents of New Jersey and for University research personnel. The mission of the Laboratory is to provide accurate and timely soil and water test reports to meet the increasing agricultural and environmental needs of the state.

For testing and fees provided for Greenhouse Samples or Other Organic Matter-based Growing Media or for Field, Commercial Vegetable and Fruit, or Nursery Crops, go to the web at: http://njaes.rutgers.edu/services or call the Lab at 732-932-7000, ext. 4231 or e-mail soiltest@rce.rutgers.edu. Soil test kits are available through your county Rutgers Cooperative Extension office.

South Jersey Nursery Meeting - Back to the Basics
October 29, 2009, 8:30 AM - 4:15 PM
Rutgers NJAES Cooperative Extension of Cumberland County, 291 Morton Avenue (County Route 634) Millville, NJ

Agenda
8:30 Registration
9:00 Welcome & Introductions Jim Johnson, Cumberland County Nursery Crop Agent
9:05 Water: Management of water resources in the nursery Dr. Chris Obropta, Rutgers Water Quality Specialist
9:35 Insects: identification & control Dr. Jim Lashomb, Rutgers Entomology Specialist
9:50 Break
10:05 Media, nutrients & water: Options for the nursery Jim Johnson, Agricultural Agent
10:35 Innovation: Ideas with an international flair to make nurseries more efficient Jim Johnson
11:05 Diseases: identification & control Dr. Ann Gould, Rutgers Nursery Plant Pathologist
11:35 Mediterranean firs: They’re cool when it’s hot! Dr. Rick Bates, Penn State Extension Specialist in Ornamental Horticulture
12:05 Lunch
1:00 Bare-root trees: Improving establishment and survivability Dr. Rick Bates
1:45 Weeds: Identification & control Dr. Steve Hart, Nursery Weed Control Specialist
2:15 Aphids: Sucking the life out of perfectly good plants Steve Rettke, Rutgers IPM Program Associate
2:45 Break
3:00 Farmworker safety training: rules, regulations & common sense Dr. George Hamilton, Rutgers Pesticide/Pest Management Specialist
3:30 Stakeholder input: Tell us how the Rutgers Cooperative Extension nursery management program be more effective. All specialists and agents
4:00 Anticipated pesticide recertification credits: 2 Core and 3: category PP2 & 3A.
4:15 Adjourn

Pesticide Recertification credits anticipated: 2 Core, 3 PP2, 3 for 3A and 2 for Category 10

$20 per person includes breaks and lunch
For registration form go to: http://events.rutgers.edu/pdfs/09_SJ_Nursery_Trifold_pdf.pdf
or call RCE of Cumberland County at 856-451-2800.
Registrations are confirmed when forms and payments are received by Cumberland County RCE. No confirmation notice will be sent. Registration and refund deadline: Friday, October 23, 2009.
This meeting is being financially supported in part by the New Jersey Nursery and Landscape Association.
temperatures averaged near normal north and central, and above normal south, averaging 55 degrees north, 58 degrees central and 60 degrees south. Extremes were 80 degrees at numerous locations on the 10th, and 34 degrees at Belvidere on the 12th. Weekly rainfall averaged 0.51 inches north, 0.08 inches central, and 0.08 inches south. The heaviest 24 hour total reported was 0.70 inches at Canoe Brook on the 9th to 10th. Estimated soil moisture, in percent of field capacity, this past week averaged 81 percent north, 75 percent central and 57 percent south. Four inch soil temperatures averaged 55 degrees north, 58 degrees central and 60 degrees south.

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WES KLINE -- GDD BASE 40 PINEY HOLLOW
LAST WEEK 137 (Ending 10/5/09)
THIS WEEK 133 (Ending 10/12/09)
TOTAL UNITS BASE 40 FOR FEBRUARY=55
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Pesticide User Responsibility: Use pesticides safely and follow instructions on labels. The pesticide user is responsible for proper use, storage and disposal, residues on crops, and damage caused by drift. For specific labels, special local-needs label 24(c) registration, or section 18 exemption, contact RCE in your County.

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