
PLANT & PEST ADVISORY

A RUTGERS COOPERATIVE EXTENSION PUBLICATION



INSIDE

**Developing an IPM Program for
your Landscape Company.....1**

**Plant Diagnostic Lab High-
lights3**

Diseases of Turfgrass.....4

**Soil Organic Matter Levels
and their Interpretations.....5**

**Workshop: Managing and
Thriving in Tough Times,
When Every Dime Counts!.....7**

Developing an IPM Program for your Landscape Company

Steven K. Rettke, Ornamental IPM Program Associate

Changing a landscape company's philosophy from traditional plant management methods to the use of Integrated Pest Management can be a troublesome procedure. Landscape IPM involves scientific decision-making and requires more written records than traditional methods. To help make this transition easier, a written implementation manual is a good idea. This article provides a sample skeleton outline of what a typical IPM implementation manual might contain.

Develop a Field Manual

Landscape IPM methods require site-specific information. Every landscape typically contains at least several key pests, key plants and key locations that will be unique to each site. These concepts are extremely useful in order to simplify monitoring procedures at any given site. They will enable field technicians to concentrate on plants and locations that are prone to problems as well as those plants and locations that have low aesthetic thresholds.

The potential control strategies of problems at each site need to be considered. Will cultural or biological methods solve the problem or are pesticides necessary? Solving problems with cultural or biological solutions should always be the first line of defense with all IPM programs. When they become necessary, a list of preferred pesticides should be listed for each specific problem. Provide written records of this information for each site!

Establish a Monitoring Calendar and Time Schedule

Many pest problems (insects/mites & diseases) are mostly host specific. As a result, many potential problems on specific plant species can be predicted to occur during certain times of the year. To help further refine scouting activities, a monitoring calendar for each site can be established that will contain the time of the season key pests may occur on the key plants. This information will determine the time of year when monitoring visits for individual sites will be most beneficial and how often the visits are required.

The classic IPM time schedule for ornamental monitoring usually involves one late winter or dormant visit. During the first half of the growing season (late April to mid-July), monitoring visits should ideally be done at two-week intervals. During the second half of the season, monitoring intensities typically can be reduced to perhaps one visit per month.

SEE IPM PROGRAM ON PAGE 2

IPM PROGRAM FROM PAGE 1

A more customized monitoring schedule is often less rigid than the classic schedule and can be more practical. A customized monitoring schedule can be determined by the customer's needs based on the site and what the customer can afford. Furthermore, the first hand experience of the field technician working on the site should help determine how often the site needs to be visited during the year. Provide written records of this information for each site.

Develop an Estimating Sheet

Landscape IPM programs have a reputation of being more expensive to implement than do traditional landscape management methods. IPM programs do have a tendency to be more expensive primarily because of the greater emphasis given to cultural management strategies (pruning, mulching, irrigation, site amendments, IPM appropriate design/redesign, etc.). To keep IPM programs more price competitive, the IPM related services could be charged separately. Their cost would be in addition to the standard fee established for monitoring and decision-making.

The price of an IPM program is generally based on how much time will be required for each monitoring visit. Monitoring time estimates are subsequently based on the size of the property and the number of key plants and key locations present at the site (e.g., there are specific time estimates that have been calculated and can be used as guidelines). Possible spray costs, the number of monitoring visits necessary and the travel time to the site all require consideration when estimating an IPM fee. Provide written records of this information for each site.

What to Emphasize and Discuss on the Initial Visit

When initially introducing an IPM program to a potentially new client or to an existing client it needs to be determined how much they want to be educated on IPM. Obviously, not all landscape clients are the same and although some will express great interest in the IPM approach (they will probably be the most loyal clients), others will only desire that their landscapes are aesthetically pleasing and are not overly concerned how the desired results are achieved. Hence, less time should probably be devoted to attempting to educate this latter client on IPM methods.

Ideally, a pre-written brochure that briefly explains the concept of IPM and gives an outline of the proposed program should be distributed to clients. The brochure can inform the client that landscape IPM programs provide monitoring services and knowledgeable decision-making abilities. The brochure can also state that IPM methods provide superior results over non-thinking traditional landscape management methods that rely exclusively on calendar cover sprays.

During the initial visit, a rough site map can be prepared and later formalized if the customer purchases the IPM program. Site maps can be an excellent way to

show off your knowledge to a potential client. Photocopied maps can also be a convenient method of maintaining monitoring records.

Develop a Record Keeping System

Most importantly, an on site work sheet for the scouts to use each visit needs to be designed. During every monitoring visit, descriptions of particular problems or concerns observed need to be recorded as well as the recommended actions. How a monitoring technician records the information has important practical implications. Extensive narrative records may contain a great deal of information, but will they be too time consuming to write and too awkward to organize? Good records need to be simple and fast and most importantly, need to be useful. Pre-written check-off forms that identify common plants and the problems that commonly afflict them can be a simple but effective type of record keeping. When using a computer to store monitoring information, a letter and number code system works well. For example, numbers can identify specific plant species and letters can represent specific problems. Other combinations of letters or numbers can identify actions taken to solve problems and their evaluations. A potential problem with this method may be finding the time and labor to enter the observations into the computer. The efficient use of palm computers in the field may solve this problem if data entry is fast and easy. Remember, one of the fundamental differences between traditional plant management and landscape IPM is the use of written records. Written records will improve monitoring efficiency and improve decision-making

Finding Personnel Who Will Implement an IPM Program

Finding personnel who have monitoring skills is possibly the most difficult task a landscape company must encounter when first attempting to develop an IPM program. Successful IPM monitoring requires a certain minimum level of knowledge and experience by the field technician. Often times, observant landscapers (i.e., turf managers, arborists, etc.) will naturally develop important IPM monitoring skills over several seasons. Since such knowledge does not happen overnight, it is suggested that a company first developing IPM services should start slowly and only offer them to 5-10% of their client base (this conservative beginning also has financial implications). Hiring experienced IPM practitioners outside the company will probably require higher starting salaries, but may be the fastest way to get an IPM program off and running. And once in place, the monitoring personnel should have access to reference materials. The establishment of a library of books, magazines, and other publications are important so IPM practitioners can keep up on the latest information available. Landscape IPM involves cutting edge information and therefore the continuing education of the practitioners is necessary.

SEE FINDING PERSONNEL ON PAGE 3

Ideally, experienced and well-educated IPM scouts will establish a long employment history with a company. When valued IPM scouts do leave a company, then the established written records become especially important. Otherwise, if written records were not kept, then all of the information that was accumulated over time at the various sites will be leaving together with the lost employee. Monitoring and written records are the backbone of any landscape IPM program.

IPM Spray and Monitoring Equipment

Pesticide treatments within a landscape IPM program are applied selectively and precisely to plant material. Backpack and handheld sprayers are useful IPM equipment that can apply pesticides accurately within a limited area. Backpack sprayers can be especially convenient during monitoring, since both hands are free to inspect plants and record information. When low volume pesticide treatments are required, treatments possibly can be made immediately, hence saving steps and time. When larger spray volumes are necessary, it is important to have spray rigs that provide multiple tanks. For instance, a single 500-gallon tank does not give the desired flexibility required within a landscape IPM program. Ideally, at least three (3) spray tanks should be available for use by the IPM practitioner. Increasing the number of spray tanks to at least three expands the selection of pesticides that can be used. Although IPM does not mean "integrated pesticide management", it is certainly important to expand pesticide choices when managing problems.

There are numerous tools and gadgets that are available for use by the IPM practitioner, with many of them being non-essential equipment. It sometimes appears that these gadgets with their fancy dials and gauges are purchased to mostly impress clients. Although there is nothing wrong with a company buying equipment for this purpose, it is important to have available the basic, but essential IPM monitoring equipment.

The list of a half-dozen essential IPM monitoring tools that should probably be carried with scouts as they monitor the landscape: A 10-15X-hand lens should always be used during every monitoring visit (Never walk the landscape without a hand-lens). A lot of valuable information cannot be observed without the use of magnification. A beating tray needs to be used often during monitoring. Determining population densities of mites, lacebugs, leafhoppers, aphids, thrips, etc., are easily determined through the use of a beating tray during regular monitoring visits. Soil probes and hand trowels are invaluable tools to obtain information about soil conditions and the health of plant roots. Hand-pruners and a pocketknife are used constantly to remove small insect populations, prune-out damaged twigs or small branches, or investigate cankers and borer activity. And finally, although often not thought of as tools the all-important monitoring forms and pen are required to record information on site.

(Reference: *Presentation Outline, "Designing and Implementing an IPM Program for Your Company;" Bob Way, former Rutgers Landscape IPM Program Associate (1995)*). □

Plant Diagnostic Laboratory Highlights

Richard J. Buckley, Laboratory Coordinator

Turf

The turn in the weather to warmer conditions has got the turfgrass samples coming into the laboratory. Most of the poorly performing grass was diagnosed with **cold temperature injury**. Last winter was average in many respects and in the Philadelphia area snow fall totals averaged around 24 inches. Although there was adequate snow, the accumulation was spread out from late-October to March. This left most turf areas exposed to several days of extreme cold and strong winds in February. We are seeing the impact of the extreme weather now.

A sample of golf turf was submitted yesterday with very vigorous infections of **anthracnose basal crown rot**. The sample exhibited dime-sized spots of yellow turf. A slight tug of each yellow plant with some tweezers revealed black fungal stromata at the crown. It is not uncommon to see anthracnose activity in the crown at this time of year. Overwintering plants, most likely infected last year, die when the weather warms and transpiration demands increase. A combination of propiconazole and chlorothalonil (get the dollar spot too) plus some nitrogen should allow the turf on this site to recover.

Yellow patch, which is caused by the fungus *Rhizoctonia cerealis*, was also diagnosed in the laboratory last week. The disease caused faint yellow rings on an annual bluegrass putting green. A night in the laboratory incubators stimulated the fungus to grow like a fuzzy arc across the plug, which made microscopic identification of the fungus easy. A popular tank mix of chlorothalonil and iprodione that many use for pink snow mold control would also be an effective yellow patch treatment. Of course, a little patience and some warm weather will get the grass growing and limit disease activity as well.

Ornamentals

Lots of winter damage in ornamentals this week. Boxwood samples were the dominant submission, but we also had several spruce samples, a couple Douglas fir samples, a Leyland cypress, a holly, and some phlox. Look for more of the same as we move into spring. Simple pruning is the most effective solution. □

Growing in the Season of Change -- Kim Young, VP of Forrest Keeling Nursery and President of Missouri Landscape and Nursery Association

How the economy is challenging growers to examine everything from production methods, fuel efficiency, labor and marketing. **Efficiency** -Move to Lean Production Methods, Best Management Practices, Alternate fuels. **Marketing**-Emerging trends and markets require a hard look at what the grower is offering the consumer. Sustainable landscapes, impact of LEEDS, Green Building Council. Drastic drop in new home construction, commercial development. What is in the Economic Recovery Plan?

Distribution-Regional markets, shopping locally. **Labor**-Current status of H2A and H2B programs and Agjobs. How the economy and unemployment rate drive public opinion these programs. State laws vs. federal.

Panel Discussion: speakers and audience discussion (Q/A) session

For registration information, visit the ASHS webpage: <http://www.ashs.org>, click on conferences, then on registration. See one day attendance price on registration form. □

Diseases of Turfgrass

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

Red thread

Laetisaria fuciformis, the causal agent of **Red Thread**, is now infesting susceptible perennial ryegrass and fine fescue turf throughout the State. Infections are characterized by the appearance of short red threads (1/8" to 1/4" long) emerging from tan-colored leaf blades. Affected patches are typically pink in color and range from 1 to 6 inches in diameter. Velvet bentgrass, Kentucky bluegrass and tall fescue may also be affected. Red thread is typically found on "hungry" (low fertility) turf during cool, wet weather. Well-fertilized turf may also be attacked but to a lesser extent than nitrogen deficient turf. To obtain optimum disease control, maintain adequate fertility levels, keep turf properly irrigated, avoid excessive thatch, and apply Armada, Banner, Bayleton, Chipco 26GT*, Compass, Curalan*, Eagle, Endorse, Headway, Heritage, Insignia, Prostar, Rubigan, Tartan, Trinity or Touche* per manufacturer's recommendations. *Not for use on home lawns.

Leaf Spot and Melting-Out

Drechslera poae, the causal agent of **Leaf Spot** and **Melting-Out**, is once again attacking susceptible Kentucky bluegrass varieties at this time. To prevent severe damage from the melting-out phase of this disease, avoid heavy applications of quick release (water soluble) nitrogen sources in the early spring (such as urea or ammonium nitrate), maintain the cutting height at or above 2 to 2-1/2 inches in landscape areas, remove excess thatch, and apply Armada, Chipco 26GT*, chlorothalonil*, Compass, Curalan*, Headway, Heritage, Insignia, mancozeb, Medallion, Tartan, or Touche* now per manufacturer's recommendations. Avoid the use of acropetal penetrant fungicides (e.g., the benzimidazoles) in the spring in areas with a history of **leaf spot** and **melt-ing-out**, since they may intensify symptom expression. *Not for use on home lawns.

New Fungicide

Triton Flo fungicide has just received EPA registration in the United States for the control of turfgrass diseases. Triton (triticonazole) is a DMI fungicide which is similar in activity to propiconazole and triadimefon. It controls a wide-range of diseases that affect turf in New Jersey. See the label for restrictions and specific diseases controlled.

Turf Field Day

Mark your calendars now for this year's Rutgers Turfgrass Research Field Days which will be held on August 4, 2009 (Golf and Fine Turf Research Field Day at Horticultural Farm II, New Brunswick, NJ) and August 5, 2009 (Landscape Turf Research Field Day and Equipment Demonstrations at Adelpia Research Farm, Freehold, NJ). Additional information and directions to each location will appear in future issues of this newsletter. □

Soil Organic Matter Levels and their Interpretations

Joseph Heckman, Ph.D., Specialist in Soil Fertility

Organic matter in the soil comes from the remains of plants and animals. This includes grasses, trees, bacteria, fungi, protozoa, earthworms, rodents, animal manures and other organic materials.

Fresh organic matter helps physically by keeping the soil open and spongy, and aids chemically by releasing carbohydrates for energy and nutrients for the growth of organisms. Upon decomposition, organic matter releases carbon dioxide, which acts as a solvent on soil minerals to make them more available to plants. As organic matter breaks down, the nitrogen, phosphorus and sulfur, and to some extent all nutrients, are released from the plant and animal tissues to become available for the growth of the next crop.

When organic matter decomposes, the humic acids formed help to improve and stabilize soil aggregates, thereby improving the air and water relationships in the soil.

Organic matter in soils has many functions which may be summarized as follows:

1. Coarse organic matter on the soil surface reduces the impact of the falling raindrop and permits clear water to seep gently into the soil. Surface runoff and erosion are thus reduced, and as a result there is more available water for plant growth.
2. Decomposing organic matter produces humic acids which help to form and to stabilize desirable soil structure.
3. Live roots decay and provide channels down through which new plant roots grow more luxuriantly. These same root channels are effective in transmitting water downward, a part of which is stored for future use by plants. These channels also serve as air exchange tubes.
4. Fresh organic matter supplies food for such soil life as earthworms, ants, and rodents. These animals burrow in the soil and, in so doing, permit plant roots to obtain oxygen and to release and discharge carbon dioxide as they grow.
5. Trashy and coarse organic matter on the soil surface will reduce soil losses by wind erosion. Surface mulches also lower soil temperatures in summer and keep the soil warmer in winter, and reduce evaporation losses of water.
6. Upon decomposition, organic matter supplies some of all the essential plant nutrients, and many hormones and antibiotics. These nutrients are released in harmony with the needs of the plants. When environmental conditions are favorable for rapid

growth, the same conditions favor a rapid release of nutrients from the organic matter.

7. A soil high in organic matter has more available water for plant growth than has the same soil with less organic matter.
8. Organic matter helps to buffer soils against rapid chemical changes due to the addition of lime and fertilizers.
9. Organic acids released during the decomposition of organic matter helps to dissolve minerals and to make them more available to growing plants.
10. Humus (decomposed organic matter) provides a storehouse for the exchangeable and available cations: potassium, calcium and magnesium. Humus also holds ammonium in an exchangeable and available form on a temporary basis.
11. Fresh organic matter has a special function in making soil phosphorus more readily available in acid soils. Upon decomposition, organic matter release citrates, oxalates, tartrates, and lactates which combine with iron and aluminum more readily than does phosphorus. The result is the formation of less of the insoluble iron and aluminum phosphates, and the availability of more phosphorus for the plant.
12. Organic matter is the only long-range storehouse of nitrogen in soils.

The amount of organic matter in a soil is determined by a loss on ignition method or by a chemical oxidation method.

1. **Loss of ignition:** This method is used to determine organic matter in soils containing 10 percent or more organic matter. In this method a soil sample is dried in an oven, weighed, heated until the organic matter has been destroyed, reweighed, and the percentage of organic matter calculated.
2. **Chemical oxidation:** This method is used to determine organic matter in soils containing less than 10 percent organic matter. In this method, a soil sample is digested with potassium dichromate and sulfuric acid and the amount of carbon oxidized is calculated. The amount of carbon calculated is converted to an organic matter figure by multiplying by a conversion factor.

There is a relationship between the organic matter levels in a soil and its carbon and nitrogen content. These relationships will vary in soils depending on the kind and stage of decomposition of the organic matter present. In humid regions the ratios between nitrogen, carbon and organic matter are fairly constant. The carbon-nitrogen (C:N) ratio is about 10 to 1, the organic matter to carbon ratio is about 2 to 1, and that of organic matter to nitrogen is about 20 to 1. Thus, if a soil contains 0.15 percent nitrogen, it contains about 1.50 percent carbon and 3.0 percent organic matter. Calculated in terms of pounds per acre (2 million pounds) of soil,

SEE ORGANIC MATTER ON PAGE 6

ORGANIC MATTER FROM PAGE 5

the approximate weight of nitrogen is 3,000 pounds, that of carbon 30,000 pounds, and that of organic matter 60,000 pounds. A soil containing 3,000 lbs. of total nitrogen per acre will release from 1 to 3 percent (30 to 90 pounds per acre) of available nitrogen for use by the growing crop depending on weather conditions.

It requires 20,000 lbs. of dry organic matter additions per acre to increase the organic matter level in a soil one percent. This is equivalent to approximately 450 lbs. per 1,000 sq. ft. of soil area. It is usually recommended that an attempt be made to increase the organic matter content of low organic content lawn and home garden soils by one-half to one percent.

Considered from the point of view of its usefulness as a source of nutrients for plants, particularly nitrogen, the quality of organic matter is closely related to the recentness of its origin and its percentage of nitrogen.

Fresh organic matter is of much more value than that remaining as a more or less final decomposition product. Well-rotted manure, clover, sods, and young green manures are much more useful as sources of nitrogen than are straw, cornstalks, timothy sods, woodchips, sawdust, etc. The smaller the percentage of nitrogen in organic materials, the less the amount remaining for plant use after the microorganisms of decomposition have had their nitrogen requirements satisfied. Unless organic materials contain over 1.5 percent nitrogen, on a dry-weight basis, little or none of this element will be released for plant use during the season immediately following their incorporation into the soil.

Therefore, if organic materials containing more than 1.5 percent nitrogen are added to soils, that fraction of nitrogen exceeding 1.5 percent will be available in a relatively short period of time for the growing crop.

However, when such materials as wheat straw, cornstalks, woodchips, sawdust, etc., that contain less than 1.5 percent nitrogen are incorporated into the soil, it is necessary either that considerable time be allowed to elapse before a crop is planted, or that extra nitrogen be added to meet the further needs of the soil microorganisms and to feed the crop.

The organic matter content of New Jersey soils vary widely depending on soil texture, past cropping history, degree of water and wind erosion, drainage conditions, cultivation practices followed, etc. The following classification system may be used to rate inorganic soils in the state on the basis of their organic matter content.

Maintaining soil organic matter is difficult almost everywhere, and under continuous tillage is nearly impossible. The organic matter content of soils usually grows less the farther removed they are from the virgin state. This makes it necessary to develop soil-management practices that tend to restore organic matter as rapidly as it is lost and raise it to a higher level. This necessitates the use of cropping rotations, summer and winter cover crops, and use of animal manures, whenever possible. The use of the proper kind and amount of fertilizers will also help in increasing the yields of green manure crops as well as improving the yields of cash crops, thereby in many cases leaving more crop residues to be returned to the soil.

It must be remembered that maintaining good soil structure, of which organic matter is essential, is often the secret to obtaining and maintaining high crop yields. The most limiting factor to obtaining good crop yields on many New Jersey soils is poor physical conditions resulting from excessive tillage operations without adequate organic matter additions. □

Levels of Organic Matter in New Jersey Soils

Organic Matter	Soil Textural Class			
Percentage	Loamy Sand	Sandy Loam	Loam	Silt Loam
0-0.5	Very Low	Very Low	Very Low	Very Low
0.5-1.0	Low	Very Low	Very Low	Very Low
1.0-1.5	Medium	Low	Very Low	Very Low
1.5-2.0	High	Medium	Low	Very Low
2.0-2.5	Very High	High	Medium	Low
2.5-3.0	Very High	Very High	Medium	Medium
3.0-4.0	Very High	Very High	High	Medium
4.0-5.0	Very High	Very High	Very High	High
Above 5.0	Very High	Very High	Very High	Very High

Workshop: Managing and Thriving in Tough Times, When Every Dime Counts!

Moderator/Coordinator: Dr. Gladis Zinati, Department of Plant Biology and Pathology, Rutgers University, New Brunswick, NJ 08901

Sponsors: Nursery Crops (NUR) and Marketing and Economics (MKEC) Working Groups, and the American Nursery and Landscape Association (ANLA)

Abstract: The 2009 economic crisis involving the United States has many nursery operators worried about thriving in tough times. The economy downturn prompts new challenges to the nursery growers that force them to get creative, rethink the management strategies, invest in people, and change as the consumer changes in spending habits. In this workshop, a panel of invited speakers will present and discuss the impact of the current economy on controlling costs, supply and demand, and provide insight on creative management strategies that improve marketing of nursery crops, sustain profits, and continue to serve the consumer demands in a period of high competition.

When: Sunday, July 26, 2009: 8:00 AM

Where: Laclede (Millenium Hotel St. Louis, MO)

Workshop Program

Introduction--- Dr. Gladis Zinati, Rutgers University
Making Cents of Green Industry Economics --- Dr. Charlie Hall, Texas A&M University

Many current economic trends and driving forces point to the fact that we are in a period of hypercompetition and maturing consumer demand in the Green Industry today. A number of folks have already been forced out of the Green Industry during this shakeout period. This presentation will: (1) provide an overview of current economic trends and their influence on the Green Industry, (2) discuss supply-side methods of (and technologies for) controlling costs during an economic downturn, and (3) address proactive demand-side differentiation and pricing strategies that will not only help ensure survival, but will also position nursery growers, service providers, and retailers for competing profitably in this period of hypercompetition.

Strategies Producers in the Northeast are Using to Reduce Costs and Increase Profits in Tough Economic Times --- Dr. Robin Brumfield, Rutgers University

The greenhouse and nursery industry in the Northeast is an important component of agricultural production with over \$3.4 billion in farm cash receipts,

equating to 20.4% of all farm cash receipts across the country. It is the number one agricultural commodity in 5 Northeastern states. Competition in the green industry has become fierce. The recent volatility of fossil fuels and general energy prices, domestic competition, off-shore production, a weakening and stressed economy, and the growth of the mass market add-up to collectively put downward pressure on prices. Nationally, the number of producers continues to decline as a direct result of the newly defined economic risks. The industry's profit margins are typically low, leaving little room for growers to absorb significant increases in costs or decreases in revenues. Unlike farmers who produce field crops, nursery firms bear the entire price, market, and production risks because these crops have had no government support programs. In this presentation I will discuss what strategies producers in the Northeast are using to reduce costs and increase profits in tough economic times. How have they honed their marketing and management skills to continue to survive and respond to current trends?

Will Marketing Be Enough to Sustain Nursery Businesses --- Dr. Jennifer H. Dennis, Purdue University

In an economic downturn many businesses are facing constraints. Most nursery owners are deemed "technicians" and focus on what they know how to do best-grow! Those businesses who will survive will have a complete business toolkit and will incorporate the managerial and entrepreneurial sides into their business. As an Extension Specialist, how do you provide services to nursery clientele to help them prosper? This presentation will discuss the state of the nursery industry and how cash management, customer capital and business planning will help nursery stakeholders become more successful.

Florida Nurseries: Why Some Struggle and Some Sail Through Economic Hard Times ---Teresa Olczyk and Juanita Popenoe, University of Florida

The Florida nursery industry generated \$3 billion in farm gate sales in 2005, positioning Florida as the nation's second largest nursery crop production state after California. This industry directly employs 294,000 people statewide and has a total economic impact of \$101.9 billion (2008 numbers). The recent downturn in the economy and collapse of the housing market has had a negative impact on some sectors of the industry, forcing many of the nurseries producing landscape plant material out of business, but leaving some nurseries untouched.

An informal survey by extension agents indicated nurseries are coping with various strategies including reductions in labor force, increased efficiencies in irrigation and fertilizer, BMP adoption, creative marketing strategies, specialization in the production of unique crops and innovative production and business techniques.

SEE WORKSHOP ON PAGE 4



New Jersey Agricultural
Experiment Station

Plant & Pest Advisory
Rutgers School of Environmental
and Biological Sciences
ASB II, 57 US Hwy. 1
New Brunswick, N.J. 08901

FIRST CLASS
POSTAGE PAID
PERMIT #576
MILLTOWN, NJ 08850

PLANT & PEST ADVISORY **Landscape, Nursery & Turf Edition Contributors**

Rutgers NJAES-CE Specialists and Staff

Bruce B. Clarke, Ph.D., Turf Pathology
Ann B. Gould, Ph.D., Ornamentals Plant Pathology
Steven Hart, Ph.D., Weed Science
Joseph R. Heckman, Ph.D., Soil Fertility
Albrecht Koppenhofer, Ph.D., Turfgrass Entomology
James A. Murphy, Ph.D., Turf Management
Gladis Zinati, Ph.D., Nursery Management
Richard J. Buckley, Coordinator, Plant Diagnostic Laboratory

RCE County Agricultural Agents and Program Associates

Bergen, Joel Flagler (201-336-6780)
Burlington, Raymond J. Samulis (609-265-5050)
Camden, Steven Rettke, Program Associate IPM (856-566-2900)
Cape May, Jenny Carleo (609-465-5115)
Cumberland, James R. Johnson (856-451-2800)
Essex, Jan Zienteck, Program Coordinator (973-353-5958)
Gloucester, Jerome L. Frecon (856-307-6450, ext. 1)
Hunterdon, Winfred P. Cowgill, Jr. (908-788-1338)
Middlesex, William T. Hlubik (732-398-5260)
Monmouth, Richard G. Obal (732-431-7261)
Morris, Peter Nitzsche (973-285-8307)
Passaic, Elaine F. Barbour, Agric. Assistant (973-305-5740)
Somerset, Nick Polanin (908-526-6293)
Sussex, Brian Oleksak, Program Associate (973-948-3040)
Union, Madeline Flahive-DiNardo (908-654-9854)
Warren, William H. Tietjen (908-475-6505)

Newsletter Production

Jack Rabin, Associate Director for Farm Services, NJAES
Cindy Rovins, Agricultural Communications Editor

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.

Use of Trade Names: No discrimination or endorsement is intended in the use of trade names in this publication. In some instances a compound may be sold under different trade names and may vary as to label clearances.

Reproduction of Articles: RCE invites reproduction of individual articles, source cited with complete article name, author name, followed by Rutgers Cooperative Extension, Plant & Pest Advisory Newsletter.

For back issues, visit our web site at:
www.rce.rutgers.edu/pubs/plantandpestadvisory