

PLANT & PEST ADVISORY

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Native Cedar for Fence Posts

Income-Producing Tree and Shrub Species for Riparian Areas

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Restoring Riparian Forest Buffers

New Jersey's many streams, rivers, lakes, and bays are an invaluable natural resource. Clean and naturally-functioning water bodies are vital to New Jersey's environment, economy, and quality of life. It is important that measures to enhance and protect water quality become established practices and are incorporated into land-use planning efforts.

Nonpoint source pollution (NPS) is a major threat to New Jersey's water quality. NPS pollution differs from point source pollution or 'end-of-the-pipe' pollution because the pollution originates from many sources which are not easily identifiable, including agricultural operations, commercial development, industrial operations, residential development and the state's transportation system. NPS pollutants can be anything that is placed on or under the land's surface with the potential to wash or leach into our waterways and include such things as:

- fertilizers, herbicides, and insecticides from agricultural and residential areas;
- oil, salts, and toxic chemicals from roadways, parking lots and urban development;
- sediments from construction sites, cropland and eroding streambanks;
- bacteria and nutrients from livestock, pet wastes, and defective septic systems.

Storms and snowmelt create stormwater run-off which can carry pollutants over and through the landscape into streams, rivers, and other bodies of water.

Riparian areas are the lands adjacent to streams, rivers, lakes, and bays that form a transition zone between aquatic and terrestrial environments. Riparian forests are woodlands which occur in riparian areas. They are important for ensuring water quality and healthy aquatic environments.

Riparian forest buffers are one of the best management tools for enhancing water quality and protecting water bodies from NPS pollution. A riparian forest buffer is composed of trees, shrubs, and tall grasses planted to help protect the integrity of a waterway, act as a vegetative filter strip, and reduce impacts of the surrounding land-use on water quality. Riparian forest buffers:

SEE RIPARIAN FOREST BUFFERS ON PAGE 2

INSIDE

Income-Producing Tree and Shrub Species for Riparian Areas 1

Highlights from the Rutgers Sustainable Ag Research Farm Tour 5

Decontaminating and Storing Sprayers 4

Horse Manure Management on Small Farms Meeting..... 5

Leafy Crucifers IPM Field Guide 6

RIPARIAN FOREST BUFFERS FROM PAGE 1

- improve water quality by filtering sediments and absorbing chemical and nutrients;
- reduce erosion by stabilizing stream banks;
- provide wildlife habitat by providing cover and food;
- enhance aquatic habitat by stabilizing water temperature, reducing sediment and providing woody debris;
- restore landscapes to a more natural state;
- offer both educational and recreational opportunities.

New Jersey's existing riparian forests should be protected and managed. Where they are degraded or missing, restoring riparian forest buffers should be a planning and management practice to help counteract NPS pollution.

There are also other alternatives for protecting riparian forests, including active forest management, easements, ordinances, public acquisition and incorporation of riparian protection into land-use planning and municipal master plans. Government officials, natural resource managers, land-use planners, private landowners - even the general public - must accept the challenge of clean water and healthy riparian environments.

Income-Producing Tree and Shrub Species for Riparian Areas

A project to restore riparian forest buffer planted on an agricultural site (pasture) was done in Vincentown, NJ. The Vincentown Project demonstrates how a riparian forest buffer can be designed and implemented on a working farm to provide environmental benefits and product/income potential to the farm.

Government cost-share programs and incentives encourage farmers and landowners to plant riparian forest buffers on their property. Properly designed, these buffers can be managed as a productive part of the farm or woodlot. Planting trees and shrubs with product-and income-producing potential in riparian areas not only protects waterways from sedimentation and other non-point source pollution but also keeps these areas as viable, productive, contributing parts of the farm or woodlot.

While the following lists are not exhaustive, they provide examples of income-producing riparian species.

This project was a cooperative effort of Rutgers Cooperative Extension, USDA Natural Resources Conservation Service, and New Jersey Forest Service.

For more information on Restoring Riparian Forest Buffers, visit Rutgers Cooperative Extension's web site at: <http://www.rce.rutgers.edu/njriparianforestbuffers>.

Income-Producing Tree and Shrub Species for Riparian Areas

Trees - Overstory

- Sugar maple - *Acer saccharum* - syrup, timber, firewood, charcoal, honey
- Sweet birch - *Betula lenta* - essential oils
- Hickory - *Carya spp.* - nuts, timber, tool handles, firewood, charcoal
- Ash - *Fraxinus spp.* - timber, tool handles, firewood
- Black walnut - *Juglans nigra* - nuts, timber, firewood, dyeing
- Tuliptree - *Liriodendron tulipifera* - timber
- Black cherry - *Prunus serotina* - timber, firewood
- Oak - *Quercus spp.* - timber, firewood, charcoal
- Linden - *Tilia americana* - honey
- Eastern hemlock - *Tsuga canadensis* - floral products, essential oils
- Slippery elm - *Ulmus rubra* - herbals/medicinals

Trees - Understory

- Alder - *Alnus spp.* - smoke/flower wood, honey, dyeing
- Shadbush or Serviceberry - *Amelanchier spp.* - fruits, jellies, honey
- Pawpaw - *Asimina triloba* - fruit, jellies
- Redbud - *Cercis canadensis* - floral products
- Persimmon - *Diospyros virginiana* - fruit
- Flowering dogwood - *Cornus florida* - floral products, firewood
- Witch hazel - *Hamamelis virginiana* - herbals/medicinals
- American holly - *Ilex opaca* - floral products
- Red cedar - *Juniperus virginiana* - fenceposts, essential oils
- Sweet-bay magnolia - *Magnolia virginiana* - floral products
- Blackhaw - *Viburnum prunifolium* - herbals/medicinals, jellies

Shrubs

- Black chokeberry - *Aronia melanocarpa* - dyeing
- Redosier dogwood - *Cornus stolonifera* - floral products
- Hazelnut - *Corylus spp.* - nuts
- Winterberry - *Ilex verticillata* - floral products
- Northern bayberry - *Myrica pennsylvanica* - essential oils
- Common ninebark - *Physocarpus opulifolius* - firewood, herbals/medicinals
- Rosebay rhododendron - *Rhododendron maximum* - floral products
- Pussy willow - *Salix discolor* - floral products
- Common elderberry - *Sambucus canadensis* - fruit, jellies
- Steeplebush - *Spirea tomentosa* - floral products
- Highbush blueberry - *Vaccinium corymbosum* - fruit, dyeing

Highlights from the Rutgers Sustainable Agriculture Research Farm Tour

Bill Sciarappa, Win Cowgill, and Pete Nitzsche, Rutgers Cooperative Extension Agricultural Agents

A very successful sustainable horticultural research meeting was held at the Clifford E. and Melda C. Snyder Research and Extension Farm; Rutgers Center for Sustainable Agriculture in Pittstown, NJ, on September 10. Coordinators Win Cowgill, Bill Tietjen and Pete Nitzsche of Rutgers Cooperative Extension in collaboration with Karen Anderson, Director of the Northeast Organic Farm Association of New Jersey, greeted over 80 participants and then gathered them into two comfortable hay wagons. The group toured the 398 acre research center and viewed numerous sustainable agriculture projects that will hopefully lead to more effective crop production and cultural transitions.

The first stop was at an extremely high-density demonstration planting of apple cultivars grown in a Super Slender Spindle Training System. In row tree spacing was only 2-2.5" apart with the between row spacing of 10". The purpose of this trial is to demonstrate a new but proven growing technique and to evaluate what apple cultivars will work in Northern New Jersey. Win Cowgill explained that such a system is already successful in British Columbia, Canada with several thousand acres in production. It is also implemented throughout Western Europe and western New York. Win cautioned growers on the high management skill as well as the large number of chemical and plant growth regulator (PGR) inputs necessary to produce apples in this system. However the rewards are potentially high with excellent crop production in the second leaf. At this tree density of 2000 trees per acres, Win pointed to the Braeburn selections with 8-10 apples per tree. He explained that this translated to over 200 boxes for fruit being produced this year. Early production of high quality fruit is the goal. This early yield is phenomenal considering the New Jersey state average is only 350 boxes/acre in mature apple orchards.

Bill Sciarappa then demonstrated his organic method plot work involving a three-year rotation of high value human food crops. These crops include popcorn and pumpkin and vegetable soybean varieties known as edamame, along with a cover crop. The tasty edamame bean appears promising as a new fresh market crop with 40% protein, major health benefits and a delicious flavor. This crop may be suitable for small farms that can get U-Pick customers or have access to suburban markets. The novelty of microwavable organic popcorn was discussed,

as well as some difficulties in controlling insects and diseases in pumpkins under wet conditions. Weed control methods compared barley straw, mechanical cultivation and plasticulture using trickle irrigation. Bill also talked about another 3-acre agronomic plot comparing four food grade type soybeans for growth and yield that could be processed into tofu, soymilk and other soy products for human consumption.

Peter Nitzsche showed the results of his ethnic crop research with the Hispanic Calabaza squash, also known as the tropical pumpkin. Traditional calabaza is a long season crop popular with Caribbean Hispanics. The trial is evaluating disease resistance in two cultivars of hybrid calabaza which are semi-bush in habit and have been shown to yield mature marketable fruit in northern New Jersey. These hybrids should be available to growers in the next few years allowing them to capitalize on this growing market.

Bill Tietjen demonstrated the tremendous number and diversity of tomato varieties in the heirloom experimental block. Many of these selections are the open pollinated type with seed saved for generations, which is of special interest to many organic farmers. This was soon followed by a taste test in which the meeting participants eagerly compared several varieties of heirloom and hybrid grape and cherry types. The research group gave credit to the wonderful work done in these plots by the Master Gardeners volunteers over the last few years lead by Mimi McWold.

In the organic sweet corn block, Agricultural Agent Ray Samulis explained the use of the "Zea-lator" in applying organic substances such as oil and Bt on the silks to prevent earworms from laying eggs and infesting the crop. Ray mentioned the possibility of some pollination problems deriving from this practice. Nearby, Agricultural Agent Michelle Infante-Casella displayed some unique ornamental cabbages and some that were edible as well. These crops add excellent value and color to small farm operations in extending the fall sales season.

As the sun set, the group meandered back inside to dine on a variety of delicious Jersey Fresh peaches and apples in a fruit variety showcase with over 60 trays of new fruit cultivars. Win Cowgill and Dr. Joe Goffreda, NJAES tree fruit breeder, hosted the showcase with the help of the Snyder fruit team.

Martha Maletta, RCE of Hunterdon County Research Assistant, and her research team (Win Cowgill, Kris Holmstrom, Gerry Ghidui, Mel Henninger,) spoke about potato leafhopper control for organic production of 'Red Norland' and 'Superior' potatoes. The spuds were grown at 3 foot row spacing and 9 inch plant spacing on certified organic land at the Snyder Research and Extension Farm. Treatments were: untreated check; Surround (kaolin clay), 25 lb/acre; PyGanic (pyrethrins), 1.0 pt/

SEE RESEARCH FARM TOUR ON PAGE 5

Decontaminating and Storing Sprayers

Andrew Landers, Ph.D., Pesticide Application Technology Specialist, Cornell University

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Sprayer Decontamination and Maintenance

Sprayers must be thoroughly decontaminated, inside and outside, after use. Regular maintenance of spraying equipment will prolong its life and ensure accurate trouble-free operation. This allows spraying to be done with the minimum loss of time and taking full advantage of favorable weather conditions.

NOTE: Read the manufacturer's instructions before beginning to wash out a sprayer. Wear protective clothing appropriate to the pesticide which has been used. This may include an apron, rubber gloves, boots and face shield.

It is important to clean everything thoroughly including associated equipment such as mixers, the site where mixing and filling is done, and, of course, yourself.

Dispose of Pesticide Waste

REMEMBER: Cleaning up should be done in such a way that washings DO NOT enter public sewers or any water courses, not fields which have under-drainage and certainly not catchment areas for boreholes or wells.

The safe disposal of pesticide waste is a serious responsibility for sprayer operators. It is important, therefore, that everything should be done to keep waste generation to a minimum. Remember that pesticide waste is of four types:

1. Concentrated products
2. Diluted pesticides including washings
3. Empty containers
4. Contaminated clothing and other materials

Try to keep the volume of tank washings to a minimum. Special low volume, inexpensive washing systems are now available which consist of a spinning nozzle(s) mounted in the tank. The device can be connected to a hose or water tank. Water passes through the rotating nozzle(s) and cascades down the inside walls of the tank.

Preparation for Storage

Any spray liquid or contamination left in the tank should be disposed of correctly. Remove tank drain plugs or open drain cock. Hose down the inside and outside of the tank, including the tank top. Scrub where necessary or use a low volume pressure washer. Replace drain plug or close drain cock. Remove the suction, main and in-line filter elements. Wash them thoroughly in clean water with a soft brush and replace. Remove nozzles, nozzle filters and nozzle bar end caps if they are so fitted. Soak them all in a bucket of water with a material recom-

mended for cleaning of spray machinery. Scrub clean with a soft brush. Partly fill the tank and pump out to flush all parts. Ensure that you open and close boom valves a few times during the flushing to clean out crevices. Refill the tank with clean water or a recommended cleaning agent. There are about a dozen commercial tank cleaners designed to remove or neutralize most of the modern low-rate chemicals. If no cleaning agent is available, one gallon of household ammonia per 50 gallons may be used. DO NOT use chlorine-based cleaners such as bleach. Re-circulate for 15 minutes, and then pump a quantity through the pipes and booms. Leave the remainder for as long as practicable; overnight if possible. Discharge at least on quarter of the contents of the tank through the booms and drain the rest. Check that no deposits remain in the tank or filters. If any remain, hose them down and scrub them off. To ensure thorough cleaning and decontamination, the last three steps can be repeated. Store nozzles and filters in a safe place. Leave valves open and the tank lid loosely closed. Ensure that the sprayer and all parts are completely empty of water, especially the pump. If you are unable to completely drain the system, you can use an antifreeze solution. An environmentally safe antifreeze diluted to 50% may be acceptable. Hose down the outside parts of the sprayer, scrubbing if necessary. Ensure that the sprayer is parked safely and securely. Wash down waterproof clothing, apron, boots and face shield. Wash outside and inside of gloves with soap and water and rinse and dry them. Finally, thoroughly wash your face, neck and hands with soap and water.

Mechanical Maintenance

Lubricate all appropriate parts prior to storage. Check oil levels. Check soundness of all components, particularly booms and boom hinges. Electrical connections and components which control valves, spray monitors, etc. should be cleaned and protected as directed by the owner's manual. Check wheels, wheel bearings and tire inflation.

Storage of Sprayers

Store sprayers under cover, taking care to prevent dirt and moisture from affecting the tank or working parts. Remember sunlight softens and weakens rubber materials and can degrade plastic materials. Storing in a building also allows you the opportunity to conduct any routing or pre-season maintenance. □

Horse Manure Management on Small Farms Meeting

Saturday, November 1, 2003

10:30 a.m. – 3:30 p.m.

Allentown Firehouse

82 Route 526, Allentown, NJ

Speakers will include Rutgers Cooperative Extension personnel discussing horse manure management options and Best Management Practices for Composting on small horse farms. The Natural Resources Conservation Service will inform you about design and construction assistance, and the New Jersey Department of Agriculture will discuss how nutrient management plans can be implemented on horse farms.

For anyone interested in horse manure management.

Supported by a grant from NJDEP, Office of Watershed Management and the Rutgers University Equine Initiative.

Lunch will be provided. To register call Rutgers Cooperative Extension of Monmouth County at 732-431-7260. □

RESEARCH FARM TOUR FROM PAGE 3

acre; Surround+PyGanic; silver plastic mulch installed before planting. PyGanic and Surround+PyGanic reduced the number of leafhopper nymphs and leafhopper damage (hopperburn) compared to the untreated check and Surround treatments. Leafhopper nymphs and hopperburn were higher with the silver mulch treatment than on the untreated check. In spite of this, marketable yield of both varieties from the silver mulch plots was more than double that from the untreated plots. Yields from PyGanic and Surround+PyGanic plots were 50% higher than from the untreated plots. Surround alone increased 'Superior' yield somewhat, though not as much as PyGanic treatments.

Aside from these organized demonstrations, a lot of interacting and networking was apparent. These informal discussions were among the organic oriented growers, some interested conventional growers, the "organic" representatives from the NEON group, NOFA's Erich Bremer and the Rutgers sustainable ag leaders Jack Rabin and Olga Wickerhauser of the New Jersey Agricultural Experiment Station at Cook College. We thank the Research Center Director Dr. John Grande, farm manager Ed Dager and the farm crew for promoting practical sustainable methods in such a scenic and well-maintained facility. □

Leafy Crucifers IPM Field Guide: Collards, Mustard Greens, Kale, Turnip Greens

Compiled by Wesley Kline, Cumerland County Agricultural Agent and Shirley Kline, Horticultural Consultant

Reprinted from Integrated Crop & Pest Management Field Guides & Database, Rutgers Cooperative Extension, 2000. For the entire manual or individual crop field guides, contact Rutgers Cooperative Extension of Cumberland County, Extension Education Center, 291 Morton Ave., Millville, NJ 08332 or call 856-451-2800.

Pre-planting Decisions:

1. Use hot water seed treatment and resistant varieties for disease control.
2. Practice 3 year rotation from cole crops for **black rot**, **Alternaria leaf spot**, **white leaf spot**, **downy mildew** and **sugar beet cyst nematode** control; 4 year rotation for **blackleg** control and 7 year rotation for **clubroot** control.
3. Adjust soil pH with hydrated lime to as close to 7 as possible for **clubroot** control. Improve drainage by making ditches and growing crop on raised beds.
4. Fertilize according to soil test recommendations.
5. Take soil samples in the fall prior to planting leafy cole crops to determine whether **nematodes** are a problem and treatment is required.
6. Destroy weeds bordering the field to avoid **aphid-transmitted virus diseases**.
7. Identify the weeds in each field and select recommended control strategies for those weeds. Map perennial or noxious weeds. Match any preplant incorporated or preemergence herbicide rates to soil type and % organic matter in each field.

Emergence to Harvest:

Begin scouting one week after seedling emergence or transplanting. Sample 5 plants in 10 random locations.

Pest	Damaging Stage	Method	Sampling	Frequency	Threshold	Notes
Flea Beetles	adult	Pay particular attention to field margins. Because flea beetles jump quickly, make observations as the plant is approached. Avoid allowing your shadow to fall on plants being scouted.		2x/week	50% of plants infested and "shothole injury" present OR 1 beetle/plant throughout the field OR 3-5 beetles/plant on 10% of stand OR 1 flea beetle/plant up to the 6 leaf stage	Spot treat if flea beetles are concentrated on plants near field margins.
Aphids: Green Peach Aphid Turnip Aphid	all	Scout upwind borders of fields with cruciferous weeds or crops, checking all quadrants because populations often are clumped. Random sample 5 plants in 10 locations, checking undersides of leaves. Check for predators & parasites.		weekly	No threshold established.	Overuse of pyrethroids kill predators/parasites that help keep aphid populations under control. Aphids transmit turnip mosaic virus in less than one minute of feeding.
Diamondback Moth (DBM), Imported Cabbageworm (ICW), Cabbage Looper (CL)	larval	Sample 5 plants in each of 10 random locations. If a larva of any species is found, record the plant as an infested plant. Multiply # of infested plants by 2 to get % infested plants.		weekly	Spring to mid-May 20% plants infested. mid-May - mid-Sept. 12% plants infested. those after mid-Sept: 20% plants infested	Immediately plow down harvested cole crop fields to eliminate the buildup of DBM in crop residues.

SEE LEAFY CRUCIFERS IPM FIELD GUIDE PAGE 7

LEAFY CRUCIFERS IPM FIELD GUIDE FROM PAGE 6

Look for the presence of disease while scouting for Lepidopterous larvae. Investigate any suspicious plants.

Disease	What to Look For	Frequency	Threshold	Notes
Anthraxnose	Small, rounded spots with dry, generally straw colored centers on leaves, petioles & stems	weekly	presence	Favored by leaf wetness for > 16 hours & temperatures of 60-77°F. Sporulation abundant with relative humidity > 90% for > 12 hours + temperature > 57°F.
Black Rot	V shaped, bright yellow to orange areas on the margins of leaves.	weekly	presence	Enter field only when leaves are dry to avoid spreading the disease.
Clubroot	Look for plants which wilt late in the day, often appearing stunted, unthrifty, perhaps with a blue green color. Check for large swollen, distorted roots.	weekly	presence	No control in infected plants. Rogue infected plants and remove from field. Use information for preplant decisions in the future (see above).
Fusarium Yellows	Symptoms appear as a unilateral wilting (one sided) with vascular discoloration.	weekly	presence	No control in infected plants. Use information for preplant decisions in the future. (see above)
White Leaf Spot	Scattered, minute, circular, white to tan spots contained by leaf veins	weekly	presence	Favored by cool temperatures (55 to 75° F), rainfall & long periods of high humidity.
Alternaria Leaf Spot	Brown, round spots which often have concentric rings, usually on older leaves.	weekly as plants near maturity.	presence	Most severe during the coolest part of the season. Favored by leaf wetness > 16 hours & temperatures of 60-77° F. Sporulation abundant with relative humidity > 90% for >12 hours + temperature > 57° F.
Powdery mildew	Extensive white powdery fungal growth, principally on upper surface of leaves	weekly	presence	Favored by prolonged dry periods with cool nights. Affects both new and old foliage. Can appear suddenly. Sulfur sprays effective for control.
Downy mildew	white, downy type of mold on undersides of leaves. Later, slight yellowing occurs on top side of leaves in poorly delineated spots.	weekly when conditions are favorable for disease development.	presence	Favored by temperatures 50 - 59° F, high humidity, dew formation, drizzling rain and heavy fog.

Contributors: Gerald M. Ghidui, Extension Specialist in Entomology and Stephen A. Johnston, Extension Specialist in Plant Pathology (posthumous), Rutgers Agricultural Research & Extension Center, Bridgeton, NJ

Scouting procedures, thresholds, and crop management recommendations have been compiled from a number of sources and may not be valid for all areas within the Mid-Atlantic Region. They are meant to be used as guidelines. As such, they should be validated on small acreages before relying on them. No guarantee of their validity, success, or failure to perform in the field is implied or expressed. Consult your local Cooperative Extension for additional information or assistance.

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