RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

ORGANIC FARMING EDITION $1.50 AUGUST 28, 2003

INSIDE

Improving Postharvest Quality Begins at Harvest

William H. Tietjen, Warren County Agricultural Agent

Proper handling of produce after harvest will directly affect freshness and salability. Maintaining cool temperatures to slow deterioration and high humidity to prevent moisture loss are the most effective means of preserving quality. There are a number of additional factors to consider when striving to improve postharvest quality.

1. Harvest the product at the correct stage of maturity to have peak quality.
2. Reduce physical handling; each time a product is handled there may be additional damage due to cuts, abrasions, and bruising. Most of the postharvest diseases caused by fungi and bacteria are weak pathogens requiring an injury to gain entrance and cause rots.
3. Controlling temperature is the most important way to reduce deterioration. If possible, harvest early in the day. Use shade covers to keep produce out of direct sun.
4. Packing lines should be kept clean. Avoid or minimize the distance and speed that the product may encounter on the packing line. Impact bruising usually shows up during display at retail.
5. Use boxes or containers which prevent damage to the product during transit. Stabilize loads to prevent vibration, which causes bruising.
6. Cool the product after grading and packing. University of California research has shown that generally for every hour of delay from harvest to cooling, one day of shelf life is lost.
7. Know the handling requirements of your produce, i.e., temperature, relative humidity, sensitivity to chilling injury. (See Table for specific postharvest recommendations for vegetables on page 2). In addition, the University of California Postharvest Technology and Information Center website has a wealth of information at: http://postharvest.ucdavis.edu.
8. Employee training is essential to get workers to harvest and handle produce to minimize damage. Maintain strict worker hygiene at all points during postharvest handling and marketing.
9. At retail, display only good quality produce for sale. Poor quality will never improve. Shade the sales display from direct sun.

Following these guidelines will help to improve the salability of your produce by maintaining quality (appearance, texture, flavor, nutritive value and safety) and reduce losses between harvest and consumption.

SEE POST HARVEST HANDLING TABLE ON PAGE 2

Handling Produce for Higher Quality and Longer Market Life[1]

	Recommended Cooling Methods[2]				Important Handling Factors[3]				
Vegetable Crop	Forced Air or Room Cooling	Hydrocooling	Package Ice or Liquid Icing	Vacuum Cooling	Transit Icing	Recommended Transit and Storage Temperature, °F	Recommended Transit and Storage Relative Humidity,%	Expected Marketable Life Under Best Conditions	Sensitivity to Chilling Injury
Asparagus		+		+	N	32-36	95	1-2 weeks	L
Basil	+				N	46-50	90-95	4-7 days	H
Beans, lima & pod	+	+			N	38-42	90-95	7-10 days	M
Beans, snap	+	+			N	40-45	90-95	7-10 days	M
Beets, bunched		+			R	32	95	1-2 weeks	I
Broccoli			+		E	32	90-95	1-2 weeks	I
Brussels sprouts	+	+	+	+	R	32	90-95	3-5 weeks	I
Cabbage	+				N	32	90-95	3-6 weeks	I
Cabbage, Chinese	+		+	+	R	32	90-95	4-8 weeks	I
Carrots, bunched	+		+		E	32	90-95	1 month	I
Cauliflower	+		+	+	R	32	90-95	2-4 weeks	I
Celery		+			R	32	90-95	2-3 weeks	I
Collards & kale		+	+		R	32	90-95	1-2 weeks	I
Cucumbers	+	+			N	50	90-95	1-2 weeks	H
Eggplant	+				N	50	90-95	1 week	H
Endive & escarole				+	R	32	90-95	2-3 weeks	I
Horseradish	+				N	30-32	90-95	1 year	I
Kohlrabi	+	+	+		R	32	90-95	2-4 weeks	I
Leeks		+	+	+	R	32	90-95	1-3 months	I
Lettuce, crisphead				+	N	32-36	95	2-3 weeks	I
Lettuce, leaf & bibb			+	+	R	32-36	95	1 week	I
Lettuce, romaine				+	R	32-36	95	1-2 weeks	I
Muskmelon, 3/4 slip	+		+		R	36-40	85-90	1-2 weeks	M
Muskmelon, full slip	+		+		R	32-36	85-90	4-7 days	M
Okra		+			N	45-50	95	1 week	VH
Onions, dry					N	32	65-70	1-8 weeks	I
Onions, green		+	+		N	32	90-95	7-10 days	I
Parsley		+	+		E	32	95	1-2 months	I
Parsnips	+				N	32	90-95	2-6 months	I
Peas		+	+		E	32	90-95	1-2 weeks	I
Peppers	+			+	N	45-50	90-95	2-3 weeks	M
Potatoes, early	+				N	40	90	2-4 months	L
Potatoes, late	+				N	40-45	90	5-8 months	L
Pumpkins					N	50-55	70-75	2-3 months	H
Radishes, bunched		+	+		E	32	95	1-2 weeks	I
Rhubarb		+	+		R	32	95	3-4 weeks	I
Rutabagas	+				N	32	95	2-4 months	I
Spinach		+	+	+	E	32	90-95	7-10 days	I
Squash, summer	+	+			N	50	90-95	4-7 days	H
Squash, winter	+				N	50-55	50-75	2-6 months	M
Strawberries	+				N	32	95	1 week	L
Sweet potatoes	+				N	55-60	85-90	3-5 months	VH
Sweet corn	+	+	+		E	32	90-95	5-7 days	I
Tomatoes, green	+				N	60-70	85-90	1-3 weeks	H
Tomatoes, pink	+				N	55-65	85-90	5-10 days	M
Tomatoes, ripe	+				N	55-60	85-90	4-7 days	M
Turnips	+				N	32	95	4-5 months	I
Turnip & mustard tops		+	+	+	E	32	90-95	1-2 weeks	I
Watermelons		+			N	45-50	85-90	3-4 weeks	M

[1]Information on optimum temperatures, relative humidity, and storage life was adopted from USDA Handbook 66 and modified by experience under eastern conditions.

[2]Cooling Method: + = cooling method is suitable for the crop.

[3]Transit Icing: The importance of transit icing depends on time in transit, transit conditions, and outside temperature. N - not recommended, R = recommended, and E = essential.

Sensitivity to Chilling Injury: I = insensitive, L = low sensitivity, M = medium sensitivity, H = high sensitivity, and VH - very high sensitivity.

Source: 2003 Commercial Vegetable Production Recommendations for New Jersey, Rutgers Cooperative Extension

Corn and Weed Residue Decomposition in Organic and Conventional Dairy Farms

R.I. Vazquez, B.R. Stinner, and D.A. McCartney

Reprinted from Agriculture, Ecosystems & Environment, 95(2-3): 559-565.

Increasingly, farmers claim that management practices can significantly influence soil quality. For instance, it is common practice for dairy farms in their rotation cycle to harvest grain and then leave stubble and weeds overwinter on the soil surface before ploughing in spring ahead of planting crops. Corn stubble and weeds protect soil in winter, decompose through the seasons, and release nutrients that are utilized by crops and microorganisms. Also, plant residues may harbor increased soil decomposing organisms that feed upon them. Both conventional and organic farmers tend to follow these practices with the major difference that in the conventional systems, inorganic fertilizers and pesticides are applied.

Organic matter breakdown in soils under different management (organic versus conventional) may differ because some inorganic chemicals are known to affect soil decomposers. These might be less abundant in soils with less food resources, since the organic farmers rely totally on soil fertility derived from organic sources.

This hypothesis was tested in an on-farm decomposition study conducted on an organic and a conventional farm that grew corn (*Zea mays* L.) for dairy cattle feed, in Wayne County, OH. Mesh bags containing crop and weed residues were laid on the soil surface at the onset of winter and sampled thereafter to determine decomposition. Mass loss was significantly different among substrates, with crop residues decomposing faster than weeds. Mass and nitrogen (N) loss varied among substrates and variations were greater in summer. Between farms, mass and N losses were significantly higher on the organic farm in summer. Earthworm population density was significantly higher on the organic farm.

In summary, corn residues decomposed faster than weed residues, and differences in decomposition among substrates increased in summer. Decomposition was faster in summer at both farms, however, it was higher at the organic one, where more soil decomposers were found. The higher metabolic activity in the soil of the organic farm in warmer weather suggests a more active soil biota, which may be crucial for farms whose main or sole source of nutrients derives from organic matter decomposition.

Submitted by Joseph R. Heckman, Ph.D., Specialist in Soil Fertility. ❑

Fate of Coliform Bacteria in Composted Beef Cattle Feedlot Manure

Francis J. Larney, L. Jay Yanke, James J. Miller and Tim A. McAllister

Reprinted from Journal of Environmental Quality 32:1508-1515 (2003), American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America

The link between livestock production, manure management, and human health has received much public attention in recent years. Composting is often promoted as a means of sanitizing manure to ensure that pathogenic bacteria are not spread to a wider environment during land application.

In a two-year study (1998 and 1999) in southern Alberta, Canada, we examined the fate of coliform bacteria during windrow composting of cattle (Bos taurus) manure from feedlot pens bedded with cereal straw or wood chips. Numbers of total coliforms (TC) and Escherichia coli declined as the composting period progressed. In 1998, TC levels (mean of both bedding types) were log10 7.86 cells g-1 dry wt. for raw manure on Day 0, log10 3.38 cells g-1 by Day 7, and log10 1.69 cells g-1 by Day 14. More than 99.9% of TC and E. coli were eliminated in the first 7 days when average windrow temperatures ranged from 33.5 to 41.5°C. The type of bedding did not influence the numbers of TC or E. coli. Desiccation probably played a minor role in coliform elimination, since water loss was low (<0.07 kg kg-1) in the first 7 days of composting. However, total aerobic heterotroph populations remained high (>7.0 log10 CFU g-1 dry wt., where CFU is colony forming units) throughout the composting period, possibly causing an antagonistic effect. Land application of compost, with its nondetectable levels of E. coli compared with raw manure, should minimize environmental risk in areas of intensive livestock production.

Abbreviations:
CFU = colony forming units
MDL = minimum detection level
TAH = total aerobic heterotrophs
TC = total coliforms

Submitted by Joseph R. Heckman, Ph.D., Specialist in Soil Fertility. ❑

Improving Drainage of Wet Soils with Gypsum

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

Higher-than-normal amounts of rainfall are stressful to crops grown on poorly drained soils. Use of gypsum to improve the structure and drainage of wet soils has a long history. The practice of applying gypsum (also called landplaster) to agricultural land began in Europe and the idea came to America around 1770. The New Jersey Agricultural Experiment Station published in 1953 an excellent bulletin entitled "Gypsum for Improving Drainage of Wet Soils". This article will summarize the major points of that bulletin, which is no longer in print, and offer a current perspective on how to use gypsum for soil improvement.

Application of finely ground gypsum improves soil drainage and aeration as a result of the binding of calcium to dispersed clay particles. This effect of calcium of bringing clay particles together into relatively unstable clusters is called flocculation. Calcium flocculation of clay particles is especially helpful on sodium or salt damaged soils. Although organic amendments such as manure or compost can also improve soil structure, the joint use of organic amendments and gypsum gives the best results (Figure 1).

The combination of calcium flocculation and organic matter decomposition can lead to the formation of relatively stable soil aggregates, improved soil structure and better water infiltration.

Wet spots are widespread on New Jersey farm fields. They typically occur in basins where there is no outlet for surface drainage. Because these low-lying positions often receive runoff from upland areas, the amount of water that needs to drain is far in excess of normal rainfall. Fine soil particles also tend to collect and settle in these wet spots, which further increases their tendency to puddle.

During dry years crops may grow fine but in wet years these ponded areas may result in reduced yield or in complete crop failure. Even a short period of ponding can cause stress to seeded or transplanted crops. Root development is curtailed due to lack of oxygen and due to the formation of toxic compounds in soil (reduced iron and manganese). Also, the crops may become starved for nitrogen because soil nitrate will be converted to gaseous forms of nitrogen that will be lost to the atmosphere.

Growers can still benefit from the research findings based on experiments conducted during the 1940's and 50's with the use of gypsum on New Jersey soils. The important findings and recommendations follow:

❖ Calcium sulfate applied in the form of the anhydrite ($CaSO_4$) or the hydrated form known as gypsum ($CaSO_4 \cdot 2H_2O$) were equally effective.

❖ Limestone ($CaCO_3$) also adds calcium to soil and improves flocculation, but gypsum is faster acting and more effective because gypsum has a much higher solubility.

❖ Applying organic amendments such as manure or compost in combination with gypsum is more effective for improving soil structure and water infiltration than either amendment applied alone.

❖ Gypsum is especially valuable for overcoming surface crusting. The recommended application rate of gypsum is 2 tons/acre. The gypsum should be applied to the soil surface with a lime spreader and disked in, followed by deep plowing, to achieve a through mixing with the plow layer. Plowing should be deeper than usual for the greatest benefit. Deeper tillage and subsoiling may increase the effectiveness of the gypsum application.

❖ Some poorly drained soils cannot be helped with gypsum. On soils that are poorly drained because of a clay bed below the plow layer the use of gypsum may do little to improve water infiltration. Digging a hole to explore the soil profile for deeper impenetrable layers can help to identify sites where gypsum may not be effective.

❖ The application of gypsum at the rate of 2 ton/acre is slightly acidifying. On loam soils the pH may decease by about 0.3 units.

❖ Gypsum is also an excellent source of plant available sulfur and calcium. The

See Gypsum on page 7

Chemistry of Gypsum

When calcium sulfate is hydrated ($CaSO_4 \cdot 2H_2O$), or combined with water, it is called gypsum, and when it is free of water, it is referred to as the anhydrite ($CaSO_4$). Gypsum contains 23% calcium and 19% sulfur while calcium sulfate contains 29% calcium and 24% sulfur. Calcium sulfate gradually converts to gypsum when in contact with water. Finely ground gypsum is many times more soluble in water than finely ground agricultural limestone or calcite ($CaCO_3$).

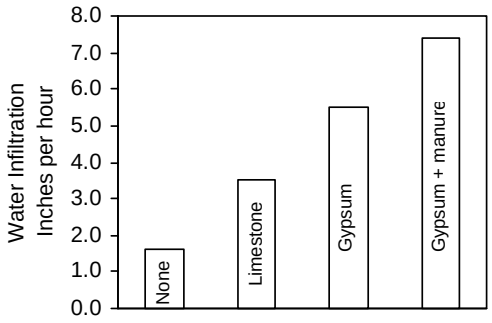

Figure 1. Effect of limestone, gypsum, and gypsum-plus-manure on water infiltration into a Sassafras soil. Limestone and gypsum were each applied at the rate of 4 tons/acre. Manure was applied at 10 dry tons/acre. Measurements were taken at 23 days after treatment.

Vinegar as an Herbicide

Reprinted from the "Vinegar as an Herbicide" Information Page of the Sustainable Agricultural Systems Laboratory, USDA: http://www.barc.usda.gov/anri/sasl/vinegar.html

Vinegar can be produced naturally by decomposition of plant products under anaerobic conditions. Acetic acid, commonly called ethanoic acid, with a chemical formula CH_3COOH, is formed by the fermentation of alcohol. Vinegar of about 5% acetic acid concentration is prepared from wine (grapes), cider (apples), or malt (grain). The biological process of vinegar manufacture involves conversion of sugars into alcohol and carbon-dioxide through fermentation. By an oxidative process, the alcohol in presence of certain bacteria reacts with air to form vinegar. Concentrated acetic acid as used in industry is prepared by several synthetic processes, such as the reaction of methyl alcohol and carbon monoxide (CO) in the presence of a catalyst, or the oxidation of acetaldehyde or petroleum. This synthetic process is not acceptable for agricultural use by the organic community. Acetic acid concentration of vinegar derived from plant sources can be increased from 5 % to 15% via distillation and to 30% via freeze evaporation or other processes. The organic community approves of these processes for agricultural use.

Environmental fate of acetic acid: Acetic acid readily degrades in water and shows little potential for bioaccumulation. It is biodegradable (MITI Report 1984, Ministry of International Trade and Industry, Tokyo). In an experiment conducted at Swedish Agricultural University it was found that addition of 24 % vinegar to a peat soil decreased the pH of the soil from 7.3 to 5.6. However, after 48 hours the pH values of the soil returned to 7.0-7.5.

Research Results from USDA

Greenhouse and field research have been conducted at Beltsville, MD, to determine the efficacy of vinegar for controlling weeds. The results indicate that vinegar can kill several important weed species at several growth stages. Vinegar at 10, 15 or 20 % acetic acid concentration provided 80-100 percent kill of selected annual weeds, including **giant foxtail** up to 3 inches in height, **common lambsquarters** up to 5 inches, **smooth pigweed** up to 6 inches, and **velvetleaf** up to 9 inches. Control of annual weeds with vinegar at the 5 % acetic acid concentration was variable. **Canada thistle** shoots were highly susceptible with 100 percent kill by 5 % vinegar. However, there was re-growth from Canada thistle roots.

Spot spraying at the base of corn rows in the field indicated that corn plants were not affected by vinegar, and 90-100 percent control of weeds was obtained. Broadcast application of vinegar would be expensive; approximate costs would be $66.00 and $99.00 per acre, for 20% and 30% acetic acid concentrations, respectively. However, band applied vinegar would be cheaper, costing approximately $22.00 and $33.00 per acre for 20% and 30% concentrations, respectively.

Vinegar products used in this project include:

1. A commercially supplied white vinegar distilled from grain with acetic acid concentrations ranging from 5-30%.
2. A vinegar made from apples at concentrations up to 14 % acetic acid. There may be other sources of vinegar. However in order for vinegar to be allowed in organic agriculture, production must be from a natural source by natural fermentation methods. Vinegar purchased at the supermarket is 5 % acetic acid.

WARNING: Note that vinegar with acetic acid concentrations greater than 5% may be hazardous and should be handled with appropriate precautions.

Submitted by Olga Wickerhauser, Sustainable Agriculture Coordinator, NJAES. ❑

Results from corn fields spot-sprayed with 20.3 %vinegar

Leasing Birding Rights: A New Form of Agritourism for NJ

Russell Blair, Cape May County Agricultural Agent

Many growers invite visitors onto their property in order to attract business to their farms. The growers provide an activity or education for the guests in exchange for business, through a form of marketing that has come to be called "agritourism". There are many forms of agritourism, including corn mazes, hay rides, choose and cut Christmas tree farms, U-pick operations, wineries/wine tastings, petting zoos, community supported agriculture (CSAs), horse riding, farm based B&Bs, etc.

Recently, farmers in New Jersey have begun a new form of agritourism developed for the birding industry. For several years, farmers have "leased birding rights" of their fields to the New Jersey Audubon Society. The New Jersey Audubon Society rents the margins of the fields (mostly the equipment drive rows) in order for their members to enjoy the birds attracted to the properties. The farmer still uses the fields for cropping, and visitors are encouraged to purchase farm products from the retail market located on the farm.

New Jersey has a nationally recognized habitat for migratory birds. Areas of South Jersey near Cape May and the Delaware Bayshore are especially sought after for the birds that congregate there. For example, over 400 species of birds can be found along the Delaware Bayshore during migration. Over 100,000 people visit Cape May County annually to witness these birds. Birders add an estimated $31 million dollars into the economy of Cape May County each year.

◆ **Rules for Birding on the Farm** - It is important to post guidelines at the entrance of the field for guests on the farm for birding. Growers should consult legal advice for notices that should be posted for visitors. Examples of rules for guests on the farm:

- Access is permitted for birding and bird photography only.
- Access is limited to area defined by a posted map.
- Pesticides are routinely applied to fields and crops. Stay out of fields when signs are posted.
- Never walk across plowed fields. Walk along the edges of fields only.

◆ **Fees -** Leasing of birding rights to a non-profit organization so that their members can use a small portion of the property takes care of the need to charge a fee for each individual user. The farmer deals with the organization rather than each birder. In a previous study, only 4% of growers involved in agritourism actually charge an "admission fee"[1]. The activity is provided by the farm in order to attract visitors to the farm retail store (farm market, pick-you-own operation, etc.). In some cases, liability might be reduced by not charging admission, but growers should consult additional legal advice on this important matter. Owners are still required for maintaining a safe environment for visitors at all times.

◆ **Site Preparation** - Several site considerations need to be addressed in order to accommodate bird watchers to your farm. For example, walking trails will need to be enhanced. In many cases, equipment drive rows along the margins of the fields make for adequate walking trails, but the drive rows may need to be improved.

Parking will be necessary. Growers may need to consult with local zoning ordinances on parking requirements. This issue is currently being examined by the SADC through Right-to-Farm requirements.

Growers will need to have a place for visitors to obtain information. An information kiosk for guests is necessary in order to post rules and regulations for those visiting the farm.

Recently, farmers in New Jersey have begun a new form of agritourism developed for the birding industry. For several years, farmers have "leased birding rights" of their fields to the New Jersey Audubon Society.

There are other considerations to keep in mind when adding any agritourism component to your farm. Some major areas of concerns for growers are[1]:

1. **Liability and insurance** - The single most important aspect to agritourism is having enough protection for your business when inviting people onto your property. Protecting your business may include purchasing adequate insurance, regularly making any needed repairs to your property, performing a risk analysis of the business, turning the business into a limited liability partnership or corporation, having visitors sign a disclaimer, posting hazard signs, or carefully monitoring visitors' activities.
   There are many ways to protect your business, and growers need to consult legal advice from an attorney as well as from an insurance representative from the start.
2. **Costs of marketing and promotion** - Small fortunes can be spent on ineffective advertising to local markets. Unfortunately, the most cost-effective form of advertising in your area will most likely be learned from trial and error.
3. **Labor** - Finding good labor that is accustomed to working in retail business speaks for itself.

For more information, contact Russell Blair, Agricultural Agent at Rutgers Cooperative Extension of Cape May County at 609-465-5115.

[1]Kuehn, D., and D. Hilchey. 2000. Agritourism in New York: Management and Operations. New York Sea Grant. ❑

GYPSUM FROM PAGE 4

need for sulfur by New Jersey soils and crops is increasing as coal burning power plants reduce emissions of sulfur dioxide to curb acid rain. Calcium can compete with magnesium and potassium for plant uptake. Thus, be careful to monitor and maintain a good balance of calcium to magnesium to potassium on soils that may have low soil test levels.

❖ Studies conducted on New Jersey soils with gypsum applied to poorly drained sites in the 1950's demonstrated that timothy, rye, and corn yields were increased by 27 to 75%. It is reasonable to assume that when gypsum improves drainage of wet spots, comparable benefits are likely to occur with today's crops.

❖ In addition to improving drainage, gypsum can provide other agronomic benefits. Improved seedling emergence on crusting soils has been documented. Gypsum can also improve water acceptance into the soil, decrease runoff, and conserve water for use by crops. Although wet spots will benefit most from the application of gypsum, a blanket application to fields prone to surface crusting may also be beneficial.

❖ Avoid the use of some by-product gypsums such as phosphogypsum which are known to contain radium.

❖ Mined gypsum may cost $50 to $100/ton or $6.50/50 lb bag. Pelletized gypsum may cost $260/ton. Recycled wallboard gypsum costs about $65/ton.

❖ Considering that the beneficial effects of gypsum may last about three years, significant yield increases are required to make the outlay for gypsum economically viable.

References: Rinehart, J.C.; Blake, G.R.; Tedrow, J.C.F.; Bear, F.E. Gypsum for Improving Drainage of Wet Soils. New Jersey Agricultural Experiment Station Bulletin 772, June 1953. Rutgers University, New Jersey.

Shainberg, I.; Sumner, M.E.; Miller, W.P.; Farina, M.P.W.; Pavan, M.A.; Fey, M.V. Use of Gypsum on Soils: A Review. Advances in Soil Science, Volume 9, 1989. Springer-Verlag New York Inc. ❑

NJ Pesticide Applicator Website

Patricia Hastings, Program Associate, Pest Management

Not sure if you are in compliance with the new pesticide applicator regulations? Check out the Rutgers Cooperative Extension Pest Management Office 'Pesticide Applicator Training' web page at: www.pestmanagement.rutgers.edu/PAT. The purpose of these pages is to provide information and tools to meet the November 2001 licensing requirements for New Jersey commercial and private applicators. This is especially important to growers that now must become certified pesticide applicators because they are using organic products that are also general use pesticides.

It is a good resource for those seeking a license for the first time, as well as those that wish to keep their certification and license current.

For licensed applicators, it offers the current schedule of recertification training courses in New Jersey. Further, there are links to easy-to-use templates for required pesticide application record forms. These templates incorporate all of the 'new' record-keeping requirements of the revised regulations. Remain in compliance with these easy-to-use tools. ❑

Sustainable Horticulture Research Twilight Meeting

September 10, 2003
6:00-9:00 pm rain or shine
Rutgers Snyder Research and Extension Farm
140 Locust Grove Road, Pittstown, NJ

Sponsored by Rutgers Cooperative Extension
In cooperation with the Northeast Organic Farming Association of NJ

Participate in informal tours and discussions of the following research projects led by Rutgers Cooperative Extension/NJAES Agricultural Agents and Specialists:

Vegetable ◆ Specialty & Heirloom tomato cultivar showcase ◆ Organic insect control trial for sweet corn ◆ Ornamental kale and cabbage cultivar trial ◆ Kaolin Clay Formulation Research on Vegetables and Grapes for insect control ◆ Broccoli cultivar trial ◆ Organic methods and cultivar trials for edamame & tofu soybeans, popcorn ◆ Organic insect control for white potatoes ◆ Calabaza (tropical pumpkin) variety & disease resistance trial

Fruit ◆ Tour of High Density Apple Planting Research-Super Slender Spindle ◆ Apple and peach cultivar showcase (over 50 selections), tour NE 183 apple plots

Precision Agricultural Instrumentation

Core Training ◆ Personnel Protective Equipment for Pesticide Application and NJ Pesticide ◆ Certification Update

NJ pesticide recertification credits will be warded

For more info contact: Win Cowgill at Rutgers Cooperative Extension of Hunterdon County at (908) 788-1339 or cowgill@aesop.rutgers.edu. ❑

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