

PLANT & PEST ADVISORY

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Improve Soil Quality Through Leaf Mulching This Fall

Daniel Kluchinski, Mercer County Agricultural Agent

Leaf mulching is the application and incorporation of collected municipal shade tree leaves on agricultural land. Research conducted by Rutgers University has shown that leaf can improve soil quality. Soil organic carbon and organic nitrogen concentrations increased with three consecutive years of application. Calcium levels were significantly increased and there was no decrease in soil pH.

Therefore, leaves can provide a desirable source of organic material for soil improvement, add organic matter and nutrients, and can provide additional income through tipping fees paid by municipalities. However, careful planning and specific crop management must be followed. If you are interested in starting an on-farm leaf mulching operation, these ten steps should be followed to ensure success:

Get the facts: Review Rutgers Cooperative Extension (RCE) Fact Sheet 718 *On-Farm Use of Leaf Waste: Regulations* available through the RCE web site at: <http://www.rce.rutgers.edu/>. Then, contact your county solid waste or recycling office to determine what permitting or approval process is required, as the process varies from county to county. Approvals may take several months, so plan accordingly.

Follow the rules: Leaf mulching is state regulated. Leaves can be accepted and spread on farm fields at a depth of 6 inches annually, cannot be stockpiled at the farm for more than seven days, and must be incorporated into the soil by spring.

Push the pencil: Determine the fields to which leaves are to be applied and determine the total acreage. The six-inch application rate is equivalent to approximately 800 cubic yards of leaves per acre. Calculate the total amount of leaves you would need. Initially, consider accepting small quantities of leaves or operating on a limited acreage.

Plan, plan, and plan: Have an all-weather road for truck traffic and a site for unloading. Remember that leaf deliveries will quickly "add up," especially if wet or freezing weather delays spreading.

Find a leaf source: Ask county solid waste/recycling officials about municipalities who are looking for farmers to accept leaves, or contact potential leaf sources directly.

Form an agreement: Ask any supplier if an agreement or contract stating the specific terms of the agreement can be made. Consider the following factors:

SEE LEAVES ON PAGE 2

- ❖ length of agreement
- ❖ time period when leaves will be delivered
- ❖ amount of leaves to be delivered
- ❖ tipping fee (dollars per cubic yard or ton of leaves) to be received
- ❖ location(s) leaves are to be unloaded
- ❖ delivery schedule
- ❖ acceptable quality standards/conditions upon which loads can be rejected
- ❖ responsibility for removal of non-biodegradables and other trash
- ❖ responsibility for damage to fields from delivery trucks
- ❖ methods for dispute arbitration

Educate: Make it clear to the leaf supplier why farm fields should not be driven on, or how bottles or trash can break equipment or injure animals. Explain that the leaves must be collected, handled and delivered properly to insure quality.

Experiment: Test different spreading and incorporation equipment. Consider a manure spreader and chisel plow which have been shown to work well. Try different application rates. Research has determined that leaf mulching can increase soil moisture retention, increase surface residue, and may extend lower soil temperatures in early spring. This may affect planting or crop establishment. Leaf application may temporarily tie up soil nitrogen. Experiment with different crops, seeding rates, or combinations of nitrogen supplying materials such as manure. Consider legumes or low nitrogen use crops immediately after incorporating leaves, or transplants versus direct seeding.

Plan for problems: Have written contingency plans should problems arise. For example, if odors become a problem with stockpiled leaves, will you apply limestone to neutralize odors? Move the material off site? Spread it immediately? What will happen if your spreading equipment breaks down and you cannot spread the material in a timely manner? Will you spread it by a different method? Be able to stop deliveries until the equipment is repaired? Plan ahead and have a response ready for any problems that may occur.

Keep good records: Record leaf deliveries, application rates, spreading and incorporation methods, cropping practices, crop vigor and yields. These records will help you to determine the effects of the practice. In addition, they can be used to illustrate your successful use of the practice should problems arise, such as local opposition to or inspection of your operation.

These guidelines should help you prepare to start on-farm leaf mulching. Obviously, the success of such an operation depends on a good plan and proper execution. For additional information, contact your local Extension office; municipal, county or state solid waste management office, or other farmers practicing leaf mulching. □

Crop Residue Management

Joe Ingerson-Mahar, Vegetable IPM Coordinator

Now that the growing season is coming to an end, it seems that it is too early to begin thinking about next year's crops and management. The reality, of course, is that it is not. How this cropping year wraps up could have a significant impact on next year's crops and pest levels.

A good example of this is the fall of 1999. We had a very wet fall, starting with Hurricane Floyd that broke the drought conditions for us. Unfortunately, the weather remained wet and cool. Poor crop quality and prices meant that some crops were left in the field. Field corn especially, was a victim of both weather and prices. As a result, there was standing corn in fields even into late spring of this year. The problem was that one of our primary vegetable pests, **European corn borer**, overwintered in the corn stalks, leading to large surges in the first generation of corn borer in some areas of the state.

The same thing can happen with other insects and plant diseases. Undisturbed plant residues may contain disease pathogens that overwinter and reinfest susceptible crops in the spring of the following year. That is why our production recommendation books include residue management practices such as mowing and plowing, and in some cases, burning of the residue. In situations where the crop residue can't be turned under or burned, crop rotation in the following year becomes more of a factor. If the previous crop residue can't be broken down, then move susceptible crops to other locations on the farm.

For those of you who are planning to sell your produce as IPM produce, you will find in the IPM crop guidelines (available at the RCE website, under the vegetable pest management program) that residue management is one of the high priority items to be done by growers to manage disease pests.

Of course, for those with sloping ground, you must be aware of erosion problems that could be compounded by fall plowing. If erosion is a severe problem, then you may require the assistance of either your county agent or local Natural Resources and Conservation Service representative to help plan the best way to manage both crop residue and soil conditions. □

Vegetable Crops Diseases

Stephen A. Johnston, Ph.D., Plant Pathology

✓ **Asparagus:** Once the foliage turns brown in late fall or early winter, mow field completely, and disc debris into the soil to promote breakdown of the ferns. This will reduce the carryover inoculum of the fungi that cause **purple spot & rust**.

✓ **Carrot:** Following harvest grade out damaged carrots prior to going into storage, dip carrots in a Mertect solution for 10 seconds and maintain storage facility at 32°F and 90-95% relative humidity to reduce **storage rots**.

✓ **Cilantro: Bacterial leaf spot** is present in some fields at this time. Infected leaves contain numerous angular-shaped, dark lesions. Avoid working in the fields while the foliage is wet to reduce spread.

✓ **Collards:** Apply Aliette as a foliar spray for control of **downy mildew**.

✓ **Greens (Mustard, Turnip): Downy mildew** is present in some fields at this time. Scout fields for the presence of **downy mildew**. Once observed apply a copper fungicide or Aliette every 7-10 days for control.

✓ **Lettuce: Bacterial leaf spot** is present in some fields of romaine. Older leaves have numerous angular shaped brown lesions present. Avoid working in fields while the foliage is wet to reduce spread.

✓ **Pepper:** Following the production season, fields should be mowed, and debris incorporated completely into the soil to reduce overwintering inoculum of the pathogen that causes **bacterial spot**.

✓ **Potato (sweet):** Avoid injury during harvest and begin curing potatoes within one hour after harvest to minimize the incidence of **surface rot**. Curing temperature should be maintained at 80°-85°F and 90% relative humidity for 6-8 days. After curing, storage temperature should be maintained at 55°F and relative humidity at 85%. Proper curing is essential for controlling **storage diseases**.

✓ **Pumpkin & winter squash:** Fruit should be harvested before frost. Avoid injury during harvest. Cure after harvest at 80°-85°F and 75-80% relative humidity for 10 days. Following curing, store at 55°F and 55% relative humidity. Temperatures below 50°F cause chilling injury and promote storage diseases.

✓ **Spinach:** Apply mefenoxam (Ridomil Gold, Ultra Flourish) as a soil surface application shortly after seeding for control of **damping-off** and early season control of **white rust**. For older fields, scout for the presence of **white rust**. Once observed, apply Quadris as a foliar spray at the rate of 9.2 – 12.4 fl oz/A and repeat every 7-10 days for a total of no more than 3 applications consecutively. If an additional fungicide application is warranted, then use Aliette.

✓ **Tomato:** Following the production season, completely disc crop debris into the soil to promote the breakdown of pathogens that will cause disease in the 2001 season if the crop debris does not breakdown over the winter. For staked tomato fields, remove stakes from the soil, wash thoroughly to remove soil and plant debris, and soak stakes in a chlorine solution or treat with methyl bromide prior to reuse.

SEE SIDEBAR FOR FALL AND WINTER RECOMMENDATIONS

General Fall and Winter Disease Recommendations

❖ Grade fields with a land plane to reduce low areas that will promote **Phytophthora** in fields where cucurbits, eggplants, peppers or tomatoes will be grown in 2001.

❖ Collect soil samples from areas of poor plant growth in 2000, and send to the Rutgers Plant Diagnostic Laboratory in New Brunswick for a nematode assay. For a submission form call the lab at 732-932-9140 or check the web at <http://www.rce.rutgers.edu/plantdiagnosticlab/index.html> or call RCE's faxback system at 732-932-6767 and request document 3604.

❖ Apply soil fumigation to fields that are nematode infested or infested with soil borne pathogens such as **Phytophthora, Sclerotinia** or **Verticillium**.

❖ Remove plant debris from greenhouse soil beds, and apply a soil fumigant to reduce soil borne pathogens that will result in **damping-off** in vegetable transplants next spring.

❖ Bring the soil pH to 7.0 or above by applying lime to fields where crucifers will be grown in 2001 to reduce the incidence of **clubroot**.

❖ Review seed catalogs for disease resistant varieties, and grow these varieties whenever possible to reduce disease pressure in the 2001 season.

❖ Attend winter grower meetings to keep up to date on new fungicide registrations for the 2001 season. Pay particular attention to information regarding the new bactericide, Actigard, which will have registration on tomatoes and spinach in New Jersey in 2001.

❖ Resubscribe to the Plant & Pest Advisory –Vegetable Crops edition to keep up to date on disease management for the 2001 season. □

New Jersey Growers' Irrigation Log Book Available

Rutgers Cooperative Extension (RCE) has developed a convenient pocket-sized New Jersey Growers' Irrigation Log Book. In addition to the log section, the book contains examples, tips on irrigation methods, conversions and resources for further information. The log book is free and available from your RCE County Office.

For growers who prefer to keep records on a full page format, log forms on 8 1/2 X 11 paper can be obtained from your County Agent.

The purpose in creating this practical record keeping booklet is to assist growers in complying with the New

Jersey Department of Environmental Protection (DEP) Agricultural Irrigation Certification record keeping requirements. Voluntary reporting will help keep the growers' certifications free and reduce the need for further DEP regulation.

Rutgers Snyder Research & Extension Farm sustainable agriculture education funds paid for the publication costs for these guides. □

Editor's Note: This is the last issue of the Vegetable Crops edition of the Plant & Pest Advisory for the 2000 season. Thank you for subscribing.

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged much below normal. Extremes were 75 at Pemberton on the 2nd and 27 degrees at Charlotteburg on the 29th and 30th. Weekly rainfall averaged 0.55 inches north, 1.86 inches central, and 2.92 inches south. The heaviest 24 hour total reported was 3.49 inches at Atlantic City Marina on the 25th to the 26th. Estimated soil moisture, in percent of field capacity, this past week averaged 94 percent north, 94 percent central and 93 percent south. Four inch soil temperatures averaged 50 degrees north, 59 degrees central and 61 degrees south.

Weather Summary for the Week Ending 8 am Monday 10/ 2/00

WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON %FC
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	
BELVIDERE BRIDGE	.50	31.12	2.44	71	34	52.	-6	2376	-246	93
CANOE BROOK	.72	29.59	-.57	72	30	53.	-5	2770	133	94
CHARLOTTEBURG	.42	27.45	-3.03	70	27	50.	-5	2073	-11	89
FLEMINGTON	.55	30.18	1.42	71	34	52.	-6	2806	103	88
LONG VALLEY	Missing									
FREEHOLD	1.53	26.22	-1.70	70	38	54.	-6	3038	153	93
LONG BRANCH	1.91	35.16	6.91	71	41	55.	-6	2805	-25	85
NEW BRUNSWICK	.92	29.42	1.02	72	36	55.	-6	2952	-63	95
PEMBERTON	2.36	30.19	1.61	75	35	57.	-4	3508	550	79
TOMS RIVER	2.57	33.19	4.28	72	39	55.	-5	2950	120	86
TRENTON	Missing									
CAPE MAY COURT HOUSE	3.09	28.89	3.81	73	44	57.	-7	3095	201	84
DOWNTOWN	2.72	28.72	2.47	73	38	56.	-6	3184	23	87
GLASSBORO	2.60	31.35	3.68	73	42	57.	-4	3339	217	85
HAMMONTON	3.16	28.98	1.36	73	37	56.	-5	3082	-46	85
POMONA	2.18	32.85	7.98	74	41	55.	-5	3010	105	86
SEABROOK	2.88	30.16	4.81	73	41	56.	-6	3296	114	85
ATLANTIC CITY MARINA	3.80	34.71	10.75	72	49	60.	-2	3186	275	80
SOUTH HARRISON	2.57	32.01	4.94	71	40	55	NA	3237	NA	NA
WES KLINE — GDD BASE 40 PINEY HOLLOW										
Last Week 188 (Ending 9/25/00)										
This Week 112 (Ending 10/2/00)										

Rutgers Cooperative Extension - NJAES
U.S. DEPARTMENT OF AGRICULTURE
Rutgers - The State University of New Jersey
Plant & Pest Advisory
18 College Farm Road
Cook College
New Brunswick, N.J. 08901-8551

PLANT & PEST ADVISORY VEGETABLE CROPS EDITION CONTRIBUTORS

Rutgers Cooperative Extension Specialists

Joseph A. Fiola, Ph.D., Small Fruit & Viticulture
Stephen A. Garrison, Ph.D., Vegetable Crops
Gerald M. Ghidui, Ph.D., Vegetable Entomology
George Hamilton, Ph.D., Pest Management
Joseph R. Heckman, Ph.D., Soil Fertility
Stephen A. Johnston, Ph.D., Plant Pathology
Bradley A. Majek, Ph.D., Weed Science

Rutgers Cooperative Extension County Agricultural Agents

Atlantic, Richard W. VanVranken (609-625-0056)
Burlington, Raymond J. Samulis (609-265-5050)
Cape May, Russell Blair (609-465-5115)
Cumberland, Wesley Kline, Ph.D. (856-451-2800)
Gloucester, Michelle Infante-Casella (856-307-6450)
Hunterdon, Winfred P. Cowgill, Jr. (908-788-1338)
Mercer, Daniel Kluchinski (609-989-6830)
Middlesex, William T. Hlubik (732-745-3443)
Monmouth, Bill Sciarappa, Ph.D. (732-431-7260)
Morris, Peter J. Nitzsche (973-285-8300)
Salem, Peter R. Probasco (856-769-0090)
Warren, William H. Tietjen (908-475-6505)

Vegetable IPM Program (732-932-9802)

Joseph Ingerson-Mahar, Vegetable IPM Coordinator
Kristian E. Holmstrom, IPM Program Associate
Sarah Walker, IPM Program Associate

Newsletter Production

Jack Rabin, Assistant Director, NJAES
Cindy Rovins, Editor and Designer
Mary Ann Hughes, Assistant Editor

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