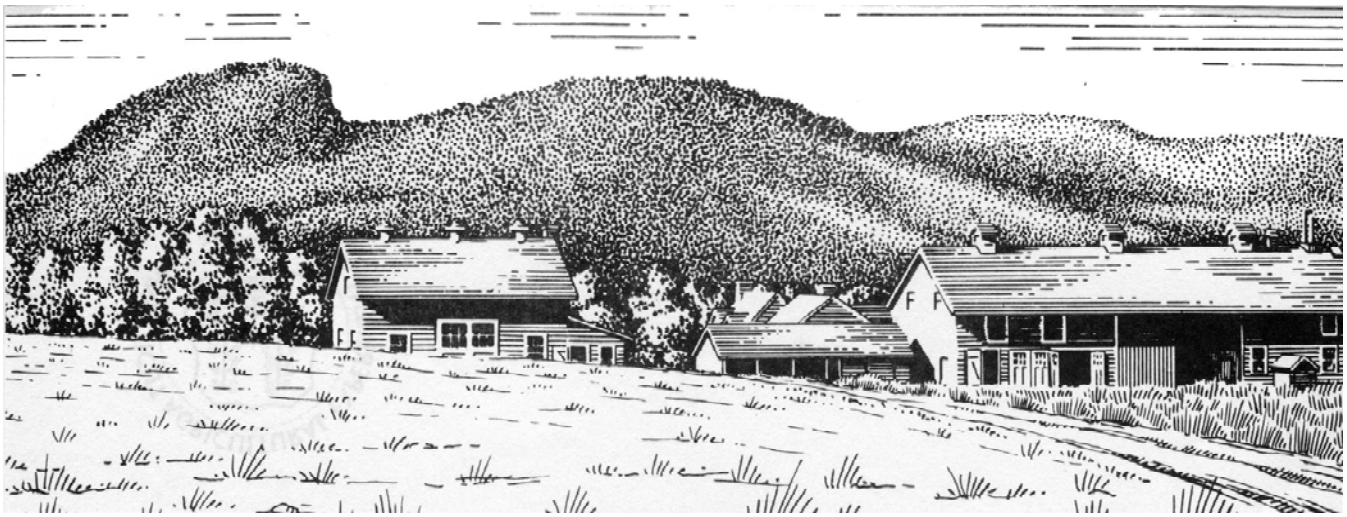
Plant Science Day

- The Annual Samuel W. Johnson Lecture
- Presentations on Research • Technical Demonstrations
- Field Experiments • Passport for Children
- Pesticide Credits • Century Farm Award • Barn Exhibits



Lockwood Farm, Hamden

Wednesday, August 1, 2007

History of Lockwood Farm, Hamden

Lockwood Farm is a research farm of The Connecticut Agricultural Experiment Station. Historically, the farm was purchased in 1910 with monies provided by the Lockwood Trust Fund, a private endowment. The original farm was 19.6 acres with a barn and a house. Since then, several adjacent tracts of land were purchased, enlarging the property to 75.0 acres.

The farm is located in the extreme southern portion of the Central Lowland Physiographic Province. This lowland region is underlain by red stratified sandstone and shale of Triassic age from which resistant lava flows project as sharp ridges. One prominent ridge, observed from the farm, is Sleeping Giant Mountain that lies to the north. The mountain is composed of basalt, a dense igneous rock commonly used as a building material and ballast for railroad tracks.

The topography of the farm is gently rolling to hilly and was sculpted by the Wisconsin glacier that overrode the area some 10,000 years ago and came to rest in the vicinity of Long Island. A prominent feature of the farm is a large basaltic boulder that was plucked from Sleeping Giant by the advancing glacier and came to rest on the crest of a hillock to the south of the upper barns. From this hillock, Sleeping Giant State Park comes into full view and is a favorite spot for photographers and artists.

The soils of the farm developed on glacial drift are composed primarily of the underlying reddish brown sedimentary rocks. The soils, characterized by reddish-brown profiles, are the well-drained Cheshire fine sandy loam (67%), the moderately well-drained Watchaug loam (10%) and the shallow-to-bedrock Sunderland fine sandy loam (16%). Along the western edge of the farm, adjacent to the Farmington Canal Greenway, lies a level terrace of stratified glacial drift. There, the well-drained Branford loam and the moderately well-drained Ellington loam (7%) dominate. Elevations on the farm range from 140 to 220 feet above mean sea level.

The farm lies in the Coastal Plain Climatological District. The local climate is influenced by its proximity to Long Island Sound that lies 9 miles to the south. The average frost-free season is 190 days, compared to 180 days at the inland Valley Laboratory in Windsor.

In 1936, a fully instrumented weather station was established on the farm. The weather data are reported to and published by the U.S. Weather Service in their cooperative observer program. The mean annual temperature for the farm is 49.0 F. A record high temperature, 104.0 F, was observed on July 4, 1949. A record low temperature, -24.0 F was recorded on February 16, 1943. The mean annual precipitation for the farm is 52.6 inches. The greatest total precipitation, 71.2 inches, was recorded in 1983. The least precipitation, 30.4 inches, was recorded in 1965. The mean annual snowfall for the farm is 32.3 inches. The greatest total snowfall, 78.5 inches, was recorded during the winter of 1995-1996. The least total snowfall, 11.3 inches, was recorded in 1972-1973.

The farm provides a field laboratory for many Experiment Station scientists who learn how to control the pathogens and insects that attack trees, fruit, and vegetables. In some experiments, scientists learn how crops grow and develop strategies for efficient crop production. All field research can be observed at Plant Science Day, held on the first Wednesday in August.

CENTURY FARM AWARD

The Century Farm Award goes to a farm that has been in family operation for more than 100 years. The recipient is selected by the Connecticut Agricultural Information Council.

CENTURY FARM CITATION

Mapleleaf Farm
Hebron, Connecticut

Mapleleaf Farm, located at 768 Gilead Street, Hebron, Connecticut, began in 1903. It is currently owned and managed by Ned Ellis. Farming since the mid-1700's, the Ellis family moved from several sites in Hebron to the present location when Ned Ellis' grandfather Asa Ellis purchased the property in the Gilead section of town.

During the early years, farming included raising chickens, vegetables, fruit, and dairy cows. Today, dairy production is the main focus and includes a herd of 400 Holstein cows, 210 of which are milking cows averaging a yield of 67 pounds per day. To control costs, as much feed as possible is raised by growing hay and corn on about 410 acres of land.

Pumpkins are grown on the farm. This activity attracts customers to the property and provides an opportunity to educate the public about farming. Tours are given of a working dairy farm, and special efforts are made to organize field trips for school children.

Ned and his wife Renee are proponents of open space and farmland preservation. They sold the development rights for 240 acres in 2003. An additional parcel of 170 acres, which the family previously leased, was purchased and put into farmland preservation by another family.

Ned Ellis is active in farming organizations. He is a member of Very Alive and Agrimark, a delegate of the Northeast Dairy Promotion Board, and one of six founding members of "The Farmer's Cow", a locally produced milk sold throughout the state.

As Governor, I am happy to join The Connecticut Agricultural Experiment Station and the Connecticut Agricultural Information Council in presenting this Century Farm Award to family members and employees working on Mapleleaf Farm and who are most deserving of this honor.

THE SAMUEL W. JOHNSON MEMORIAL LECTURE

The Station Board of Control established the lectureship to further discuss issues of concern to Connecticut residents and the Station. Professor Johnson was director of the Station from 1877 to 1900 and was a leader in the establishment of American agricultural experiment stations.

ANSWERS TO YOUR QUESTIONS

Staff members in the "question-and-answer" tent are prepared to give information on identification of insects, plant disorders, soils and their management, and other problems of growers and gardeners.

PASSPORT FOR CHILDREN (ages 9 and under)

This is a special event for children to enjoy and explore Plant Science Day. There are six different stations located throughout Lockwood Farm that they can visit and receive a special stamp for their passport. Once the passport is filled, they can go to the children's table in barn A and receive a prize. Brownies can use this to earn the "Plants Try-It!" Once the passport is complete, they can go to the Girl Scout table to collect their "Try-It!"

ACTIVITY FOR CHILDREN (ages 9 and up)

This is a self-guided activity. Once the activity is complete, they can go to the children's table in barn A and receive a prize. Junior Girl Scouts can use this activity to earn the Earth Connections badge. Once this activity is complete, they can collect their badge at the Girl Scout table.

PESTICIDE CREDITS

Pesticide credits will be offered for attending Plant Science Day. If you are interested in obtaining pesticide credits, you must sign-in at the registration desk at the start of the day, between 9:30 a.m.-10:00 a.m., collect signatures for the talks, demonstration, and tours you attended, and sign-out to pick up your pesticide credit form between 2:45 p.m.-4:00 p.m.

Pesticide Credits Offered: Private Applicators (PA): 2 1/2 hours, Ornamental and Turf (3A): 2 1/2 hours, Aquatic (5): 1/2 hour, Rights of Way (6): 1/2 hour, General Pest (7A): 1 1/2 hours, Mosquito (7F): 1/2 hour, Public Health (8): 1/2 hour, Demonstration and Research (10):1 1/2 hours

Visit The Connecticut Agricultural Experiment Station's web page at: www.ct.gov/caes

After the lecture, visitors may remain in the tent for lunch. Coffee and cold drinks are free.

THE 97th ANNUAL PLANT SCIENCE DAY

10:00am—Greeting

MAIN TENT, 11:15 A.M.

Louis A. Magnarelli, Director—PRESIDING

CENTURY FARM AWARD

REMARKS

Edmund Tucker
President, Experiment Station Associates

THE SAMUEL W. JOHNSON MEMORIAL LECTURE

F. Philip Prelli
Commissioner, Connecticut Department of Agriculture
"Connecticut Agriculture—The Local Flavor"

PRESENTATIONS ON RESEARCH AND TECHNICAL DEMONSTRATIONS

10:00 a.m. **TECHNICAL DEMONSTRATION TENT Mary K. Inman, Technician, Department of Plant Pathology and Ecology**

Pruning Ornamental Shrubs

(15-minute demonstration, repeated twice during the day, 10:00 a.m. & 1:30 p.m.)
Pruning is probably one of the least understood and most daunting landscape maintenance practices for most homeowners, although it is essential for maintaining attractive and healthy shrubs and minimizing plant health problems. Many people aren't sure what to do or when to do it. The practice of pruning can be simplified through an understanding of the basic principles and techniques. Although this general discussion focuses on pruning of shrubs, many of the same principles will be applicable for more specialized procedures, such as those used for tree fruit, small fruit, and roses. This demonstration will focus on why, how, and when to prune shrubs. Shrub anatomy, tools, proper pruning cuts, and several specialized pruning techniques will be discussed.

10:15 a.m. **MAIN TENT Dr. Theodore G. Andreadis, Medical Entomologist, Head of the Department of Soil and Water**

Using DNA Fingerprinting to Identify the Blood-Feeding Patterns of Mosquito Vectors of West Nile Virus

Knowledge of the blood-feeding behavior of mosquitoes is a critical element in assessing their role in the transmission of various disease-causing pathogens. Experiment Station scientists have developed a new technique to identity the feeding patterns of the principal mosquito vectors of West Nile virus in Connecticut by isolating and examining DNA from the abdomens of blood-fed mosquitoes collected in the wild. This research has allowed scientists to identify which mosquitoes are involved in the spreading of the virus among wild bird populations and which mosquitoes are likely to transmit the virus to humans. The role of various species of birds in maintaining the virus in nature has also been discovered.

10:45 a.m. **MAIN TENT Dr. Kirby C. Stafford, III., Vice Director, Chief Entomologist , Head Department of Entomology**

What is Happening to Our Honey Bees?

Honey bees and the number of beekeepers have been declining in recent years, with potential adverse impacts on pollination services for a third of our nation's crops, including many here in Connecticut. While the colony collapse disorder (CCD) syndrome has reached public attention only this year, there are a number

of stresses to honey bees, such as mites, bacterial disease, pesticides, and others, that predate CCD and are among the suspects for CCD. Connecticut has around 3,000 registered hives and 387 beekeepers, most of which are hobbyists. These hives are important to our gardeners and Connecticut agriculture. I shall review beekeeping nationally and regionally and discuss research being conducted by scientists in the Departments of Entomology and Analytical Chemistry on bee exposure to pesticides.

11:00 a.m. **TECHNICAL DEMONSTRATION TENT Ira Kettle, Apiary Inspector, Department of Entomology**
Beekeeping Basics
(15-minute demonstration, repeated twice during the day, 11:00 a.m. & 2:00 p.m.)
Raising honey bees to enhance agricultural production and for the production of honey and beeswax has been practiced for thousands of years. These benefits make beekeeping an economically important profession. Caring for honey bees can also be a fun hobby that provides supplemental income. Beekeeping is not a difficult task when one understands the basic techniques and requirements. This demonstration will present the tools needed and the techniques used to get started in beekeeping as well as methods to keep a hive healthy and productive.

11:15 a.m. **MAIN TENT Introductions, Award Presentations, Century Farm Award, and The Samuel W. Johnson Memorial Lecture**

11:40 a.m. **MAIN TENT Guest Speaker, F. Philip Prelli, Commissioner, Connecticut Department of Agriculture**
"Connecticut Agriculture—The Local Flavor"
Commissioner F. Philip Prelli was appointed Commissioner of Agriculture for the State of Connecticut on May 20, 2005. Prior to that, he served as a State Representative from the 63rd District, representing Canaan, Colebrook, Falls Village, Hartland, Norfolk and Winchester from 1991 until 2003.

While a Representative, he served as an Assistant House Minority Leader serving as Chairman of the House Republican Bill Screening Committee and a member of the General Assembly's Banks, Environment, Commerce, Finance Revenue and Bonding, Government Administration and Election (where he served as Ranking Member) and Legislative Management Committees.

Commissioner Prelli served on the Winchester Board of Education from 1983-87 and was a member of the Superintendent Ad-Hoc Search Committee from 1983-84. He also served on the Gilbert School Long-Range Planning Committee from 1989-92.

Commissioner Prelli has served on the Winchester Republican Town Committee from 1983 - 2004 and was chairman of the committee from 1989-92.

He is an Honorary Member and Past Captain, First lieutenant, second lieutenant and secretary of the Winsted Volunteer Fire Department, Co. No. 3.

From 1970 to 1976, Phil was a member of the 729th Railroad Transportation Battalion Army Reserve where he reached the rank of specialist 5.

Prior to being appointed Commissioner, Phil was an insurance agent and a partner in Tangarone and Prelli insurance in Winsted and prior to forming that company was the owner of the Prelli Insurance Agency.

Phil has been a member of the Grange for more than 40 years on the local, county, state and national levels. He is the Master/ President of the Connecticut State Grange and Treasurer of the National Grange. He is a member of St. Andrew's Lodge of the Masonic Order.

Born November 16, 1948 in Winsted, Commissioner Prelli received his Associate of Science Degree from Northwestern Connecticut Community College and his Bachelor of Arts Degree with a major in mathematics and minor in economics from Central Connecticut State University in New Britain.

Commissioner Prelli and his wife, Maureen, have twin daughters, Jennifer Hester and Marie Keefe and 2 Grandchildren Gavin and Anna Hester.

1:15 p.m. **MAIN TENT Scott C. Williams, Wildlife Biologist, Department of Forestry and Horticulture**
Scattering Scats: White-Tailed Deer as Seed Dispersers
The white-tailed deer population in Connecticut has been growing exponentially since the turn of the 20th century to approximately 80,000 animals today. During this same period, the human population in state has

increased 273%. The burgeoning deer and human populations in the state have caused many conflicts including increased prevalence of tick-borne diseases, vehicle collisions, damage to ornamental and landscape plantings, and damage to natural ecosystems. The main objective of our study was to determine if deer disperse seeds, especially those of exotic species, throughout Connecticut forests. The results were surprising and will be discussed in detail during the talk.

1:30 p.m. TECHNICAL DEMONSTRATION TENT Mary K. Inman, Technician, Department of Plant Pathology and Ecology

Pruning Ornamental Shrubs

(15-minute demonstration, repeated twice during the day, 10:00 a.m. & 1:30 p.m.)

Pruning is probably one of the least understood and most daunting landscape maintenance practices for most homeowners, although it is essential for maintaining attractive and healthy shrubs and minimizing plant health problems. Many people aren't sure what to do or when to do it. The practice of pruning can be simplified through an understanding of the basic principles and techniques. Although this general discussion focuses on pruning of shrubs, many of the same principles will be applicable for more specialized procedures, such as those used for tree fruit, small fruit, and roses. This demonstration will focus on why, how, and when to prune shrubs. Shrub anatomy, tools, proper pruning cuts, and several specialized pruning techniques will be discussed.

1:45 p.m. MAIN TENT Dr. Wade H. Elmer, Plant Pathologist, Department of Plant Pathology and Ecology, and Dr. James A. LaMondia, Plant Pathologist, Head of the Valley Laboratory

Are Plant Pathogens Causing Salt Marsh Dieback?

Salt marshes along Connecticut Long Island Sound have been dying since 2002. The phenomenon is called Sudden Wetland Dieback, which refers to the rapid disappearance of smooth cord grass (*Spartina alterniflora)* in the low marsh and saltmeadow cordgrass (*Spartina patens*) and salt grass (*Distichlis spicata*) in the high marsh. Although plant stress is believed to initiate the dieback, plant pathogenic fungi (*Fusarium*) and parasitic root knot nematodes may be involved. We have hypothesized that the presence of these pathogens may hinder the ability of *Spartina* to recolonize dieback sites.

2:00 p.m. TECHNICAL DEMONSTRATION TENT Ira Kettle, Apiary Inspector, Department of Entomology

Beekeeping Basics

(15-minute demonstration, repeated twice during the day, 11:00 a.m. & 2:00 p.m.)

Raising honey bees to enhance agricultural production and for the production of honey and beeswax has been practiced for thousands of years. These benefits make beekeeping an economically important profession. Caring for honey bees can also be a fun hobby that provides supplemental income. Beekeeping is not a difficult task when one understands the basic techniques and requirements. This demonstration will present the tools needed and the techniques used to get started in beekeeping as well as methods to keep a hive healthy and productive.

PESTICIDE CREDIT TOUR

12:15-1:15 p.m. MEET AT REGISTRATION DESK (BARN A) Thomas M. Rathier, Soil Scientist, Valley Laboratory, Windsor

A 1-hour guided tour of selected Barn Exhibits and Field Plots will be conducted by Thomas M. Rathier, Soil Scientist, Valley Laboratory. Participants can discuss experiments and topics with scientists at each station on the tour.

Stops on Tour:

- **Dr. Kimberly A. Stoner, Entomologist, Department of Entomology**
  Has the Swede midge reached Connecticut? Surveying for a new pest.
- **Dr. Wade H. Elmer, Plant Pathologist, Department of Plant Pathology and Ecology**
  Use of earthworms to suppress Verticillium wilt of eggplant.
- **Dr. Francis J. Ferrandino, Plant Pathologist, Department of Plant Pathology and Ecology**
  Environmentally-friendly control of powdery mildew on perennial and annual bedding plants.
- **Dr. Martin P.N. Gent, Plant Physiologist, Department of Forestry and Horticulture**
  Ebb and flood watering of potted ornamental plants.

2:45 p.m.–4:00 p.m. SIGN-OUT (for those requesting pesticide credits)

Attendees pick up Pesticide Credit forms at the registration table.

LOCKWOOD FARM WALKING TOURS

MEET AT REGISTRATION DESK (BARN A) Dr. Robert E. Marra, Forest Pathologist, Department of Plant Pathology and Ecology
A 1-hour guided tour of selected Barn Exhibits and Field Plots will be conducted by Dr. Robert E. Marra, Forest Pathologist, Department of Plant Pathology and Ecology. Participants can discuss experiments and topics with scientists at each station on the tour.

10:15a.m. – 11:15a.m. MORNING WALKING TOUR, Approximately ½-mile, moderately hilly

Stops on Tour:

- **Abigail Maynard, Horticulturist, Department of Forestry and Horticulture**
  Beach Plum Trials
- **Abigail Maynard, Horticulturist, Department of Forestry and Horticulture**
  Pawpaw and Japanese Plum Variety Trials
- **Francis J. Ferrandino, Plant Pathologist, Department of Plant Pathology and Ecology**
  Wind Profiles Inside and Above Soybean Planting
- **James A. LaMondia, Plant Pathologist, Department of Plant Pathology and Ecology, Head, Valley Laboratory, Windsor**
  Oilseed Crops for Biodiesel

2:15p.m. – 3:15p.m. AFTERNOON WALKING TOUR, Approximately ½ mile, moderately hilly

Stops on tour:

- **Wade H. Elmer, Plant Pathologist, Department of Plant Pathology and Ecology and Francis J. Ferrandino, Plant Pathologist, Department of Plant Pathology and Ecology**
  Use of Earthworms to Suppress Fusarium Wilt of Eggplants
- **Abigail Maynard, Horticulturist, Department of Forestry and Horticulture and David Hill, Emeritus, Horticulturist, Department of Forestry and Horticulture**
  Curiosity Garden
- **Martin P.N. Gent, Horticulturist, Department of Forestry and Horticulture**
  Hydroponic Lettuce and Tomatoes
- **Carole Cheah, Entomologist, Department of Entomology, Valley Laboratory, Windsor**
  Biological Control of Hemlock Woolly Adelgid
- **Richard Cowles, Entomologist, Department of Entomology, Valley Laboratory, Windsor**
  Chemical Control of Hemlock Woolly Adelgid
- **Kimberly A. Stoner, Entomologist, Department of Entomology**
  Finding the Swede Midge in Connecticut

Tour of Native Shrubs

12:00pm-12:30pm MEET AT THE WOOD ARBOR OF THE NATIVE WOODY SHRUBS Dr. Jeffrey S. Ward, Forester, Department of Forestry and Horticulture
A ½-hour guided tour of our native shrub planting to be conducted by Dr. Jeffrey S. Ward, Forester, Head Department of Forestry and Horticulture. Learn about using native shrubs for naturalistic landscapes without the use of pesticides and fertilizers.

BARN EXHIBITS (Barn B)

Oilseed to Biodiesel Fuel
Department: Analytical Chemistry and Valley Laboratory
Investigators: Dr. Christina S. Robb, Dr. Walter J. Krol, and Dr. James A. LaMondia
Abstract: We are conducting research to evaluate the growth and yield of rapeseed and soybeans either as summer rotation crops or as winter cover crops with spring seed harvest, where appropriate. We will also determine the oil yields, characteristics, and the fertilizer value of remaining meals after oil pressing.

Genetics and Photosynthesis
Department: Biochemistry and Genetics
Investigator: Dr. Richard B. Peterson
Abstract: Photosynthesis in higher plants is a complex process involving numerous components encoded in the plant genome. We are attempting to unravel the genetic basis for a major energy-dissipating process that could improve fitness and growth of crop plants.

Chemical Control of Hemlock Woolly Adelgid
Department: Entomology
Investigator: Dr. Richard S. Cowles
Abstract: Hemlock woolly adelgid can be effectively suppressed with either foliar sprays or soil-applied systemic insecticides. Best management practices include a systemic insecticide to suppress adelgids, with a follow-up spray of horticultural oil for other hemlock pests, if needed.

New Crops for Connecticut
Department: Forestry and Horticulture
Investigators: Dr. Abigail A. Maynard and Dr. David Hill
Assistant: Cynthia Maxwell
Abstract: Since 1983, the Connecticut Agricultural Experiment Station has investigated over 35 specialty crops to provide new opportunities for Connecticut's farmers. Crops were chosen because they have a high market value and an existing or expanding market. Research on Japanese plums, beach plums, personal-sized watermelons, and calabaza is displayed in this exhibit.

Butternuts and Butternots and their Disease Problems
Department: Plant Pathology and Ecology
Investigator: Dr. Sandra L. Anagnostakis
Assistant: Pamela Sletten
Abstract: Butternut trees are native to Connecticut and are threatened by a number of diseases, including the fungal disease called "Butternut Canker." This disease is believed to be caused by an exotic pathogen that was introduced into North America. We have identified this disease in Connecticut, and it has already killed many butternuts throughout their natural range. Since butternuts readily hybridize with Japanese walnuts and heartnuts planted by many CT homeowners, we examined these hybrids to find out if they were also susceptible to the disease. During our research, we identified several other new fungal diseases.

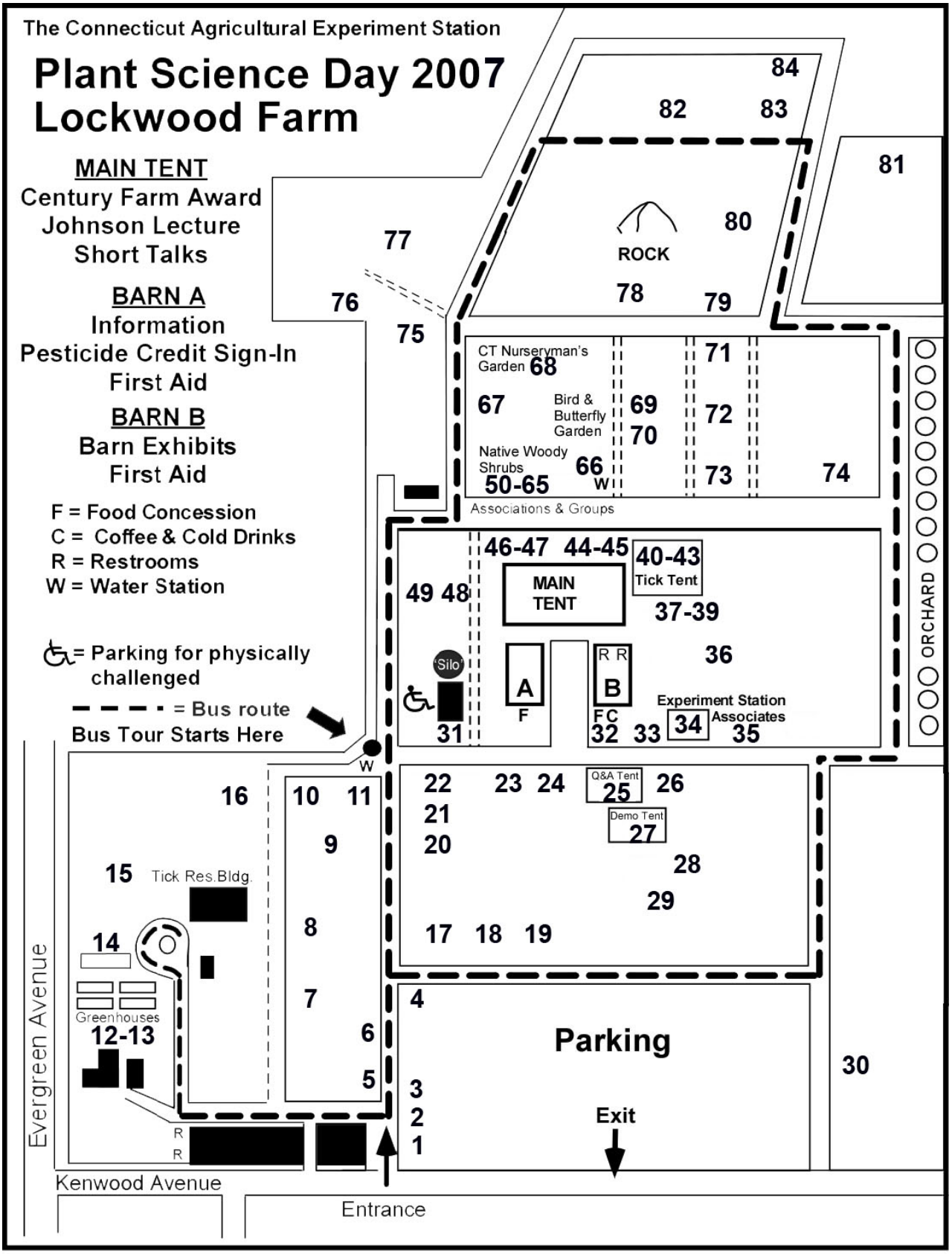
Phytoremediation: Using Plants to Clean Contaminated Soil
Department: Department of Soil and Water
Investigator: Dr. Jason C. White
Abstract: Phytoremediation is a novel technique in which plants are used to remove inorganic and organic pollutants from contaminated soils and sediments. The plant species used depends very much on the pollutant. Some very effective plants have been found containing heavy metals, such as arsenic and cadmium, as well as organic solvents like as trichloroethylene. Persistent organic pollutants (POPs) such as DDT and PCBs, are much more problematic. Phytoremediation research at CAES has focused on developing a plant-based remedial approach for these and other recalcitrant organic contaminants.

THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION
The experiments exhibited here depict only a portion of the work performed by Station scientists. In addition to Lockwood Farm and laboratories in New Haven and Windsor, Station scientists use state forests, private orchards, lakes, and farms for their experiments. Experiments and surveys are conducted in many widely separated towns of the state.

THE EXPERIMENT STATION HAS A WEB PAGE: WWW.CT.GOV/CAES.

TO RECEIVE A COMPLETE LIST OF STATION SPEAKERS: inquire at the publications table in barn A or write to: Publications; The Connecticut Agricultural Experiment Station; P.O. Box 1106; New Haven, CT 06504-1106, phone 203-974-8447, fax 203-974-8502, or e-mail Vickie.Bomba@po.state.ct.us.

TO RECEIVE A COMPLETE LIST OF AVAILABLE STATION PUBLICATIONS: Inquire at the publications table in barn A or write to: Publications; The Connecticut Agricultural Experiment Station; P.O. Box 1106; New Haven, CT 06504-1106, phone 203-974-8447, fax 203-974-8447, or e-mail Vickie.Bomba@po.state.ct.us.



Map Not to Scale

FIELD PLOTS

Outside Organizations (#31, #33, #50-65#, #73, and #79) invited to participate

1. Chinese Chestnut Trees
2. Sheet Composting With Oak and Maple Leaves
3. Curiosity Garden
4. Heirloom Tomato Trials
5. Chinese Cabbage Trials
6. Calabaza Squash
7. The Effect of Culture on the Effect of Verticillium Wilt on Tomato, Eggplant and Pepper Yields
8. Use of Earthworms to Suppress Fusarium Crown Rot of Asparagus
9. Using Soybean Meal and Corn Gluten on Turf
10. Finding the Swede Midge in Connecticut
11. Integrated Pest Management of Eurasian Watermilfoil
12. Effect of Recycled Nutrient Solution on Yield and Composition of Greenhouse Tomato
13. Factors Affecting Composition of Hydroponic Lettuce
14. Ebb and Flood Watering of Potted Ornamental Plants
15. Evironmentally Friendly Controls of Powdery Mildew on Perrenia
16. Biological Control of Hemlock Woolly Adelgid
17. Commercial Chestnut Cultivars
18. Control of Blight on American Chestnuts
19. New Hybrid Chestnut Orchard
20. Table Grape Cultivar Trial
21. Hybrid Winegrape Cultivar Trial
22. High Graft Union Effects on Grapevine Performance
23. West Nile Virus Transmission by Mosquitoes
24. Composting Leaves Using the Static Pile Method
25. Question and Answer Tent
26. Alien Insects in Connecticut
27. Demonstration Tent
28. CAES Weather Station
29. Use of Earthworms to Suppress Verticillium Wilt of Eggplants
30. Nut Orchard
31. Verizon Telephone Transmission Silo
32. Mosquito Surveillance for West Nile and Eastern Equine Encephalitis Viruses in Connecticut
33. The Farmer's Cow
34. Experiment Station Associates
35. Dispersal of Corn Pollen in the Atmosphere
36. Personal-Sized Watermelon Variety Trials
37. Airborne and Leaf Surface Fungi in Two Greenhouses in Connecticut
38. Connecticut Weeds and Wild Plants
39. Oilseed Crops for Biodiesel
40. Lyme Disease in Ticks From Connecticut Citizens
41. Field Trials of the Fungus *Metarhizium Anisopliae* for Tick Control
42. Antibodies to West Nile Virus in Horses
43. The "Deer" Tick *Ixodes scapularis*
44. Mammals as Seed Dispersal Agents
45. A Field Trial of 10 Deer Repellents

46. Invasive Aquatic Plant Program
47. Invasive Aquatic Plant Identification
48. Monitoring the Races of Powdery Mildew on Muskmelon
49. Using Leaf Compost in Home Gardens
50. Bartlett Arboretum and Gardens
51. Connecticut Department of Agriculture
52. Connecticut Green Industries
53. Connecticut Groundskeepers Association
54. Connecticut Horticultural Society
55. Connecticut Invasive Plant Working Group
56. Connecticut Pre-Engineering Program
57. Connecticut Professional Timber Producers Association
58. Northeast Organic Farmers Association
59. Society of American Foresters—Connecticut Chapter
60. The Girls Scouts
61. USDA, Animal and Plant Health Inspection Service, Plant Protection and Quarantine
62. USDA, National Agricultural Statistics Service, New England Field Office
63. Connecticut Tree Protective Association
64. Connecticut Farmland Trust
65. Connecticut Farm Bureau Association
66. Native Woody Shrubs
67. Surveys, Nursery and Bee Inspections
68. Connecticut Nurserymen's Garden
69. Bird and Butterfly Garden
70. Eastern Bluebird *Sialia Sialis* Nest Box Trail
71. The Relation Between Tissue Age and Susceptibility of Pumpkins, Melons and Zucchini to Powdery Mildew
72. Inducing Fusarium Disease Resistance in Gladiolus
73. Sound School Agricultural Science Program-Students from The Sound School
74. The Spread of Septoria Leaf Spot on Tomato
75. Chestnut Species and Hybrids
76. Dense Planting of American Chestnuts
77. Dwarf Hybrid Chestnut Trees
78. Wind Profiles Inside and Above a Soybean Planting
79. Sound School Agricultural Science Program-Students from The Sound School
80. Rocky Hill American Chestnut Trees
81. Pinot Gris Cultural Trials
82. Beach Plum Trials
83. Japanese Plum Variety Trials
84. White Birch Research Orchard

FIELD PLOTS

The plots at Lockwood Farm are planted and maintained by Experiment Station scientists with the help of Farm Manager R. Cecarelli and his assistants, R. Hannan and M. McHill, and the following summer workers: A. Colleran, M. Harris, and S. Molden.

1. CHINESE CHESTNUT TREES
S. Anagnostakis *Assisted by* P. Sletten
These Chinese chestnut trees, planted by Donald Jones in 1941, were selected by chestnut grower W.C. Deming of Litchfield and grafted by the Hartford Park Department. The second tree from the gate is a graft of the cultivar Bartlett that was developed by the Bartlett Tree Co. in Stamford. All have been used by The Experiment Station and the American Chestnut Foundation in crosses with American chestnut trees to produce blight-resistant forest and orchard trees.

2. SHEET COMPOSTING WITH OAK AND MAPLE LEAVES
A. Maynard and D. Hill *Assisted by* C. Maxwell
Many homeowners have a predominance of oak trees in their backyards. Oak leaves are known to be more resistant to decomposition than maple leaves. This experiment is investigating whether this difference in the rate of decomposition leads to decreased yields in soils amended with oak leaves compared to maple leaves and unamended controls. Undecomposed oak and maple leaves were layered about 6 inches thick in the falls of 1995-2006 and incorporated into the soil by rototilling. Last year, lettuce, peppers, onions, and leeks were grown with all plots receiving the same amount (1300 lb/A) of 10-10-10 fertilizer. Yields from plots amended with oak leaves were compared to plots amended with maple leaves and the unamended controls. In 2006, lettuce yields were virtually the same for all the treatments. The greatest pepper yields were from the control plot (3.7 lbs/plot) followed by plots amended with oak leaves (3.5 lbs/plant) and plots amended with maple leaves (3.3 lbs/plant). Plots amended with oak or maple leaves had the greatest onion yields (8.4 lbs/plot) compared to the unamended control plots (7.8 lbs/plot). The control plots averaged the greatest leek yields (8.0 lbs/plot) compared to plots amended with maple leaves (7.6 lbs/plot) and plots amended with oak leaves (6.1 lbs/plot).

3. CURIOSITY GARDEN
A. Maynard and D. Hill *Assisted by* C. Maxwell
This garden contains a potpourri of vegetables grown to pique the interest of home gardeners and growers of niche crops. Included are trials of globe artichokes, grown specifically for annual culture from seed. Early production is triggered by use of vernalized seed (cool moist treatment) and exposing the plants to cool (below 50F) temperatures. The Green Globe variety requires about 500 hours of cool temperatures compared to the Imperial Star cultivar which requires only about 250 hours. Also included in these trials, is Jilo, a tropical plant in the eggplant family, from Nigeria and Brazil. It is a highly popular vegetable grown for farmers' markets in the Waterbury and Danbury area. We are also growing shallots, edamame, and calaloo (vegetable amaranth) in response to interest shown in these crops by farmers and home gardeners.

4. HEIRLOOM TOMATO TRIALS
A. Maynard and D. Hill *Assisted by* C. Maxwell
Interest and sales of heirloom tomatoes have increased dramatically in the past 10 years. More and more consumers are willing to forego appearance for that real old-fashioned tomato taste. But growing heirloom tomatoes can be a challenge. Heirlooms tend to have poor disease resistance and have lower yields when to compared to hybrid tomatoes. They are also more susceptible to cracking due to their tender skin. In this trial, we are evaluating 10 varieties here and at our Valley Laboratory in Windsor. We are comparing yields, disease resistance, and timing of harvest. Last year, Wins All, Amana Orange, and German Johnson Pink had the greatest yields, averaging greater than 23 lbs/plant.

5. CHINESE CABBAGE TRIALS
A. Maynard and D. Hill *Assisted by* C. Maxwell
Local supermarkets have reported increased sales of Chinese vegetables. These sales coincide with the influx of immigrants from the Far East. Vegetables are staples in oriental cuisine and stir-fry cooking has become increasingly popular in the kitchen. In 1988-1989, we tested 26 cultivars of Chinese cabbage at Lockwood Farm and Windsor. Most of these cultivars

are no longer available and, since that time, new cultivars have been developed that are more disease resistant and produce higher quality heads. In 2007, we initiated new Chinese cabbage trials at Lockwood Farm and Windsor. We are evaluating 13 culitvars for yield and quality in both spring and fall plantings.

6. CALABAZA SQUASH

A. Maynard and D. Hill *Assisted by* C. Maxwell

Calabaza squash, also known as tropical pumpkin, is mostly grown in tropical and semi-tropical climates. Calabaza is highly prized by consumers of Hispanic origin. It was identified by the Connecticut Department of Agriculture as one of the most sought-after vegetables at Connecticut's 88 farmers' markets. We are developing a cultivar that produces fruit on shorter vines by saving seeds from plants that have produced fruit within 2 feet of the plant. These seeds are planted at Lockwood Farm and Windsor and selections are again made. Fruit that mature on short vines is appealing to northern growers because the majority of fruit can mature before frost. Fruit that forms on longer vines do not always reach maturity. Last year, 60% of the plants at Windsor produced fruit within 2 feet of the plant compared to 43% of the plants at Lockwood Farm. Selections will continue for several more years.

7. THE EFFECT OF CULTURE ON THE EFFECT OF VERTICILLIUM WILT ON TOMATO, EGGPLANTAND PEPPER YIELDS

F. Ferrandino

Verticillium wilt is a soilborne disease that infects vegetables in the nightshade family (potatoes, tomatoes, peppers and eggplant). Eggplants are especially sensitive to wilt and a 50% yield loss is common. Unfortunately, there are no eggplant cultivars resistant to this disease. In this plot, we are examining the effects of various cultural practices, such as timing and method of fertilizer application and the use of landscape fabric as a mulch, on disease symptoms and fruit yield.

8. USE OF EARTHWORMS TO SUPPRESS FUSARIUM CROWN ROT OF ASPARAGUS

W. Elmer *Assisted by* P. Thiel, J. Bravo, and C. Connelly

Greenhouse trials have shown that when earthworms were added to pots filled with soil infested with Fusarium pathogens, asparagus plants had less disease and were larger. These plots were planted this spring to determine if earthworm activity can enhance yield. Growth will be monitored in 2007 and 2008, and yield will be collected in 2009.

9. USING SOYBEAN MEAL AND CORN GLUTEN ON TURF

A. Maynard and G. Bugbee

Soybean meal is a byproduct in the production of biodiesel fuel from soybeans. It is about 7% nitrogen and can be used for animal feed and as an organic fertilizer. Corn gluten meal is a byproduct in the production of cornstarch. It can also be used for animal feed and as an organic fertilizer. It has also been found to be an effective preemergent natural herbicide. In this demonstration plot, we are evaluating the effectiveness of these organic fertilizers in the growth of turf compared to conventional lawn fertilizer. All plots received the same amount of nitrogen (1 lb/1000 sq. ft.).

10. FINDING THE SWEDE MIDGE IN CONNECTICUT

K. Stoner *Assisted by* N. Brettschneider

The swede midge, *Contarinia nasturtii* (Kieffer), is a common pest of plants in the cabbage family in Europe. It was not known to occur in North America before it was discovered in Ontario, Canada in 1996, causing heavy damage (85% loss) in broccoli crops. It has since been found in 26 regulated areas in Quebec, 23 counties in Ontario, 19 counties in New York state, 1 county in Massachusetts, and 1 county in New Jersey. Last year, we surveyed for swede midge in 4 counties in Connecticut – Litchfield, Hartford, Middlesex, and New Haven Counties. We found one swede midge on a farm in New Haven County. We will continue to look for midges in other counties, and we will follow up in New Haven County to find out if the swede midge has established and spread here.

11. INTEGRATED PEST MANAGEMENT OF EURASIAN WATERMILFOIL

M. Marko, J. White, G. Bugbee, R. Selsky, C. Vossbrinck, K. Deeds *Assisted by* A. Bridgewater, D. Bridgewater, M. Albert, and R. Gent

Eurasian watermilfoil, *Myriophyllum spicatum*, (milfoil) is the most common invasive aquatic plant in Connecticut and is present in 24% of the waterbodies surveyed by CAES from 2004-2006. Milfoil can remain unnoticed in a lake for years, then suddenly grow, forming a dense canopy that outcompetes native vegetation, destroys fish spawning areas, impairs natural aesthetics, decreases property values, impedes navigation, and dangerously impacts recreational activities. Management of nuisance milfoil populations is typically accomplished by chemical (herbicides) or mechanical (harvesters)

control methods. Public concern remains over the safety of herbicides in recreational water bodies used for fishing, swimming and drinking. Mechanical control provides short-term control, but results in fragmentation that actually spreads the plant to unaffected regions. Biological control is an alternative to problematic chemical and mechanical controls. The milfoil weevil, *Euhrychiophsis lecontei*, is a native insect already present in many Connecticut waterbodies that can control watermilfoil under certain conditions. Our goal is to provide a novel technique that integrates the use of herbicides and insects to reduce herbicide applications. The resulting technique would be an effective, affordable, and safe way to control nuisance milfoil populations.

12. EFFECT OF RECYCLED NUTRIENT SOLUTION ON YIELD AND COMPOSITION OF GREENHOUSE TOMATO

M. Gent *Assisted by* M. Short and D. Gilbert

Recycling the nutrient solution used in crop production will reduce the effluent from greenhouse facilities, and abate concerns related to pollution of land and groundwater by agricultural operations. However, various chemicals, such as sodium or sulfate, may accumulate in the solution if it is recycled. Such changes in solution composition may affect the tissue composition of plants grown in hydroponics. We set up hydroponics systems to grow tomatoes. A system in which solution is passed once through the crop is compared to one that completely recycles the nutrient solution. We determine the difference in composition of the solution in the two systems, with an emphasis on the effect of these changes on composition and dietary value of greenhouse-grown vegetables.

13. FACTORS AFFECTING COMPOSITION OF HYDROPONIC LETTUCE

M. Gent *Assisted by* M. Short and D. Gilbert

The composition of lettuce leaves is affected by environmental variables such as light and temperature, and by the nature of the fertilizer or nutrients fed to the plant, such as the concentration of nitrate. We set up a continuous-recirculation hydroponics system to grow lettuce. At various times during the year, plantings are compared under conditions that differ in temperature or nitrate availability. Plants are harvested, freeze dried, and the tissue analyzed for elemental composition, nitrate, sugars, and other metabolites, with an emphasis on the effect of these changes on composition and dietary value of greenhouse-grown vegetables.

14. EBB AND FLOOD WATERING OF POTTED ORNAMENTAL PLANTS

M. Gent *Assisted by* M. Short and D. Gilbert

Sub-irrigation by ebb and flood watering on a greenhouse floor combats the waste of water and fertilizer in traditional overhead watering systems. However, conventional ebb and flood systems achieve nearly complete saturation of the root medium for each watering cycle. There is no ability to restrict the water provided to the plants. Geremia Greenhouse has refined this method to achieve partial saturation with ebb and flood watering of the root medium for production of potted ornamental plants. The water or fertilizer solution is delivered and removed rapidly, resulting in less water absorbed by the pots, and little leaked back out of the pots. This improves plant quality and lessens spread of disease. We compare measure conventional and refined systems of sub-irrigation to determine:

1) Uptake and leakage of water and fertilizer, and plant growth response.
2) Spread of disease from plants inoculated with pathogens.
3) Efficacy of methods of filtration and in-line sterilization of return water to mitigate problems due to spread of disease.
4) Post harvest quality in a controlled environment after production under the two watering systems.

15. EVIRONMENTALLY FRIENDLY CONTROLS OF POWDERY MILDEW ON PERRENIAL AND ANNUAL BEDDING PLANTS

F. Ferrandino and W. Elmer

Powdery mildew is a recurring problem on many ornamental plants used around our homes (e.g.: lilac, azalea, verbena, peonies, phlox, zinnia, and monarda (Bee Balm)). In past years, we have demonstrated that foliar sprays of a mixture of milk and water reduce the impact of powdery mildew on pumpkins, squash and melons. This plot is being established to test how well milk-based treatments control this disease on ornamental plants.

16. BIOLOGICAL CONTROL OF HEMLOCK WOOLLY ADELGID

C. Cheah *Assisted by* B. Ross

Hemlock woolly adelgid, HWA, accidentally introduced into the US from Japan, continues to threaten native eastern and Carolina hemlocks in forests and landscapes from Maine to Georgia. Biological control of HWA using *Sasajiscymnus tsugae*, an imported native HWA ladybeetle adelgid predator from Japan, was first implemented in Connecticut in 1995, and 2007 marks the 12th year of this program, supported by the USDA Forest Service. Connecticut is the first state to report widespread recovery and improvement in hemlock health in the majority of *S. tsugae* release sites from annual surveys and

assessments of hemlock stands. Research in CT has also documented the important influence of winter patterns resulting from climate warming on adelgid and predator population survival trends. Other related research at the Valley Laboratory, in collaboration with Insect Diet and Rearing Research, Tucson, AZ, has made significant progress in the development of an artificial diet for maintaining survival of adult *S. tsugae*. Current research seeks to extend this to a larval rearing system to enhance the biological control program.

17. COMMERCIAL CHESTNUT CULTIVARS
S. Anagnostakis *Assisted by* P. Sletten
These grafted trees are cultivar 'Colossal' and cultivar 'Nevada'. 'Colossal' is the most frequently planted commercial cultivar in the U.S., with large acerages on the west coast. Cultivar 'Nevada' is the pollinizer usually planted to provide pollen for 'Colossal'. We are evaluating the potential of these two kinds of chestnut trees for Connecticut.

18. CONTROL OF BLIGHT ON AMERICAN CHESTNUTS
S. Anagnostakis *Assisted by* P. Sletten
These American chestnut trees were planted in 1976 when they were 3 years old. Chestnut blight cankers were treated for 4 years, from 1978 to 1981, with our biological control using hypovirulent strains of the blight fungus. The control is working well to keep the trees alive and fruiting. Some of the trees are growing better than others. We do not know which trees were from seed collected in Wisconsin and which were from Michigan. It is possible that the difference in their ability to thrive in the presence of blight and hypovirulence indicates genetic differences in resistance. The grafted tree in the center of the east row is from an "American" chestnut in Scientist's Cliffs, MD, and the original tree resisted blight for many years (it may be a European hybrid). It definitely has some resistance, and is the best looking tree in the plot. Two grafted trees at the southeast corner are (*Chinese* X *American*) X *American* (cultivar 'Clapper') and have intermediate resistance to blight.

19. NEW HYBRID CHESTNUT ORCHARD
S. Anagnostakis *Assisted by* P. Sletten
These small trees are from some of our hand-pollinated crosses done in previous years, and were planted as seedlings. All are hybrids of American chestnut trees and blight-resistant Chinese, Japanese, or hybrid trees. They will be grown to evaluate their blight resistance in the presence of the biological control that we assume will move over from the adjoining plot. The trees that look most like American chestnut trees and have good blight resistance will be used in future crosses for timber trees. Others will be developed as orchard trees for Connecticut growers. The paper bags on the trees cover hand-pollinated flowers from this year's crosses.

20. TABLE GRAPE CULTIVAR TRIAL
W. Nail *Assisted by* C. Maxwell
This small vineyard was planted in 2006 as a demonstration planting of four seedless table grape cultivars. As the vineyard matures, the vines will be trained to different training systems and used for pruning and training workshops each spring.

21. HYBRID WINEGRAPE CULTIVAR TRIAL
W. Nail *Assisted by* C. Maxwell
Connecticut's mild, humid growing seasons and cold winters prevent the successful cultivation of many well-known winegrape cultivars. Many varieties fail to ripen properly in most years. Less cold-hardy cultivars suffer extensive damage or death during and after severe winter freeze events. Cultivars and clones are being evaluated for yield and fruit quality under Connecticut conditions.

22. HIGH GRAFT UNION EFFECTS ON GRAPEVINE PERFORMANCE
W. Nail *Assisted by* C. Maxwell
Grafted vinifera grapevines are subject to significant freeze damage in most areas of Connecticut. The coldest layer of air is usually immediately above the soil or snow line, so elevating the graft union may help prevent freeze damage. 'Chardonnay' vines were grafted onto C.3309 rootstocks at both standard (1-2 inches above ground level) and elevated (26 inches above ground level) heights in 2006 and transplanted into this vineyard in 2007. The vines will be monitored for freeze damage and subsequent crown gall, yield, and fruit quality beginning in 2009.

23. WEST NILE VIRUS TRANSMISSION BY MOSQUITOES
J. Anderson and A. Main
Assisted by B. Hamid, T. Goodman, M. Vasil, T. Petruff, A. Penna, A. Florek, M. Misencik, and E. Alves

Until 1999, West Nile virus was a tropical virus that circulated in nature among mosquitoes and birds. It sporadically caused human and equine disease in Europe, but since its relatively recent introduction into the New World, West Nile virus has annually caused human disease in northeastern United States where mosquitoes are inactive during winter. There have been no documented studies to explain how this virus survives winter and reinitiates infection in spring. We have recently demonstrated that the virus is directly transmitted from female *Culex pipiens* mosquitoes to their offspring, that the virus survives in unfed mosquitoes for more than 6 months, and that infected females can transmit the virus on their first feeding after hibernation. Our data suggest that West Nile virus survives winter in unfed, infected female mosquitoes with amplification of the virus occurring in spring when mosquitoes feed on wild birds.

24. COMPOSTING LEAVES USING THE STATIC PILE METHOD

A. Maynard and D. Hill *Assisted by* C. Maxwell

Since the 1991 ban on disposing leaves in landfills, large-scale leaf composting has spread throughout Connecticut. Some 84 municipalities are currently composting their leaves. In static pile composting, leaves are piled and the internal temperature of the pile is monitored. As the leaves decompose, the temperature in the center of the pile reaches a temperature of about 140^{o}F. When the temperature decreases, the pile is turned and fresh material is introduced to the center of the pile. Turning also aerates the pile. Leaf compost is seen here in various stages of decomposition. The finished compost is used in experiments here at Lockwood Farm and at the Valley Laboratory in Windsor.

25. QUESTION AND ANSWER TENT

S. Douglas, R. Hiskes, M. Inman, T. Rathier, G. Ridge, and J. Winiarski

This is a great opportunity to ask the experts about growing plants, testing soil, and identifying plants, plant diseases, and insects. Bring samples of soil, symptomatic plants, and insects for testing and identification. Visit the displays and pick up fact sheets about current insect and disease problems.

26. ALIEN INSECTS IN CONNECTICUT

C.T. Maier *Assisted by* T. Zarrillo, M. Lowry, Justin Beaty, and E. Silva

Insects accidentally introduced from foreign countries have a costly impact upon agriculture and biodiversity in North America. The negative effect upon agriculture can be reduced by early detection and prompt implementation of management programs. During the past decade, we have detected many alien insects new to Connecticut and have studied certain aspects of their biology. We have investigated the distribution, hosts, and period of adult activity of the small Japanese cedar longhorned beetle (*Callidiellum rufipenne*)—a wood-boring pest of coniferous landscape plants; the Asian apple tortrix (*Archips fuscocupreanus*)—a potential leafroller pest of fruit trees and other plants; the European green pug (*Pasiphila rectangulata*)—a blossom-feeding pest of apples and pears; and the European needleminer (*Batrachedra pinicolella*)—a pest of spruces. In our display, we summarize our findings and show specimens of a wide variety of exotic insects.

27. DEMONSTRATION TENT

See the Program pages 5-7 for a schedule of technical demonstrations.

28. CAES WEATHER STATION

We are a participant in the National Oceanic and Atmospheric Administration's (NOAA) Cooperative Weather Observer Network. It is the nation's largest and oldest weather network. We have been making observations since 1936. The network was established under the Organic Act of 1890 to formalize the collection of meteorological observations and establish/record climate conditions in the United States – primarily for agricultural purposes. Many people recorded weather observations long before that time. John Campanius Holm's 1644-45 weather records, for example, are the earliest known climate records in the United States. Subsequently, many others –including George Washington, Thomas Jefferson, and Benjamin Franklin, also maintained weather records. Today, more than 11,000 Cooperative Weather Observations across the United States donate more than one million hours each year to collect daily hydro-meteorological data. The network of 11,000 volunteer weather observers are located at non-airport locations where people live, work, play and grow their food (i.e. locations include urban, suburban and rural areas, farms, mountaintops, national state and local park settings).

29. USE OF EARTHWORMS TO SUPPRESS VERTICILLIUM WILT OF EGGPLANTS

W. Elmer and F. Ferrandino *Assisted by* P. Thiel, J. Bravo, and C. Connelly

Verticillium wilt of eggplant causes growers significant crop loss. These plots were designed to determine the impact of adding earthworms on the disease, growth, and yield. In 2005 and 2006, eggplant plots augmented with earthworms had up to twice the yield as control plots.

30. NUT ORCHARD

S. Anagnostakis *Assisted by* P. Sletten

This orchard of grafted nut trees was planted by Richard Jaynes in the spring of 1981. There are several named cultivars of chestnut and other nut trees included. Last year and this year, we planted several new nut cultivars that we want to test for their production potential in Connecticut.

31. VERIZON TELEPHONE TRANSMISSION SILO

Learn about the cellular transmission tower.

32. MOSQUITO SURVEILLANCE FOR WEST NILE AND EASTERN EQUINE ENCEPHALITIS VIRUSES IN CONNECTICUT

T. Andreadis and P. Armstrong *Assisted by* J. Shepard, M. Thomas, S. Finan, J. Ambrogio, J. Brelsford, E. Calandrella, E. Frank, D. Krause, W. McConaughy, L. Meany-Post, C. Pioli, K. Sweeney, M. Torretta, and T. Watson

Surveillance for West Nile virus (WNV) and Eastern Equine Encephalitis (EEE) in mosquitoes has been integral to the public health response to these human disease-causing viruses in Connecticut. Trapping is conducted daily from June through October at 91 locations statewide. The objectives are to provide: 1) early evidence of local virus activity; 2) information on the abundance, distribution, identity and infection rates of potential mosquito vectors; 3) baseline data that are used to assess the threat of WNV and EEE to the public and; 4.) guide the implementation of mosquito control measures. Since 1996, The Connecticut Agricultural Experiment Station has trapped and tested over 1.3 million mosquitoes. A total of 510 isolations of WNV have been made from 17 different species of mosquitoes, and a total of 197 isolations of EEE have been made from 18 species of mosquitoes. The principal foci of WNV activity in Connecticut have further been identified as densely populated residential communities in coastal Fairfield and New Haven Counties. The principal foci for EEE activity are in more rural locales located in the southeastern corner of the state. We have observed a correlation both temporally and spatially between the isolation of WNV and EEE from field-collected mosquitoes and the elevated risk of human infection that typically extends from late July through September in Connecticut.

33. THE FARMER'S COW

The Farmer's Cow is an innovative, premium milk brand produced and marketed by Connecticut family-owned dairy farms. The Farmer's Cow was formed in response to consumers' interest in purchasing fresh, naturally produced, local products. Collectively, The Farmer's Cow member farms milk 2,300 cows and manage over 6,000 acres of Connecticut farmland. The Farmer's Cow milk is currently available in over 100 grocery stores throughout the state. A complete listing of retailers is shown at www.thefarmerscow.com. The Farmer's Cow is sold in half gallon cartons in whole, 2 percent, 1 percent, and skim varieties. Chocolate milk and single-serve packaging are under development. The owners of The Farmer's Cow are active members in The Connecticut Farmland Trust and The Working Lands Alliance who are working to protect and preserve Connecticut farmland. They were also the founding members of "Very Alive," a non-profit organization dedicated to the promotion of Connecticut Agriculture. Connecticut farms contribute $2 billion annually to the local economy[1]. 51 percent of Connecticut farmland is in dairy or dairy support. In 2003, there were 191 dairy farms remaining in Connecticut[2]. The Farmer's Cow owners are: Paul and Diane Miller, Fairvue Farms, Woodstock, Bill, Tom and Greg Peracchio, Hytone Farm, Coventry; Ned and Renee Ellis, Mapleleaf Farm, Hebron, Jim and Don Smith, and Nate Cushman, Cushman Farms, Franklin, Peter Orr and Family, Fort Hill Farms, Thompson, Robin and Lincoln Chesmer, Graywall Farms, Lebanon. Further information can be found at www.thefarmerscow.com. [1]http://www.ctfarmland.org/ [2]http://www.workinglandsalliance.org/.

34. EXPERIMENT STATION ASSOCIATES

Information is available on this organization formed to help the Experiment Station.

35. DISPERSAL OF CORN POLLEN IN THE ATMOSPHERE

D. Aylor

The recent and rapidly accelerating introduction of genetically modified (GM) corn into agricultural production has sparked renewed interest in quantifying the aerial dispersal of corn (*Zea mays*) pollen. Off-site movement of pollen makes it possible for GM corn varieties to cross with corn in non-GM organic and conventional production fields. We are developing a quantitative model of pollen movement in the atmosphere to help evaluate this possibility. Of central importance is the ability of pollen grains, which are shed by the anthers on the tassels above the corn canopy, to reach the silks at mid-canopy height, be deposited, and then fertilize the ovules, which will become kernels of corn. In this plot we are studying the effect of buffer rows on cross fertilization between two different color kernel varieties (Y = yellow and W = white) of corn by planting blocks of Y and W corn varieties next to each other. At harvest, the number of yellow kernels on white-kernel ears at various distances from the edge of the W block will help us assess the effectiveness of buffer rows. These data, in

combination with our model of pollen movement, will help determine levels of seed purity under various planting and weather conditions.

36. PERSONAL-SIZED WATERMELON VARIETY TRIALS

A. Maynard and D. Hill *Assisted by* C. Maxwell

The newest watermelons in the marketplace are seedless mini "personal" watermelons. They offer an attractive alternative for the consumer that has limited refrigerator space or for small families. These melons, weighing 3-7 pounds each, first became widely available in markets in 2003. They generally have a thinner rind which means more edible flesh. Tests in Oklahoma have discovered these watermelons are an excellent source of lycopene and beta-carotene. In the trials here and at Windsor, we are evaluating 6 varieties for yield and quality. At Windsor, average yield of plants mulched with black plastic was 28 T/A compared to 17 T/A from the unmulched plots. Mulched plots averaged 2.3 melons/plant compared to 1.4 melons/plant from unmulched plots. Miniput had the greatest yields (37 T/A) followed by Vanessa (23 T/A) and Poquito (22 T/A). At Mt. Carmel, mulched plots averaged 22 T/A compared to 19 T/A from the unmulched plots. Mulched plots produced 1.8 melons/plant compared to 1.5 melons/plant from the unmulched plots. Valdoria (25 T/A) and Poquito (24 T/A) had the greatest yields. Petite Treat had the greatest sugar content with an average Brix of 12.7 compared to Poquito (12.3) and Miniput (12.0). All other cultivars at both sites had Brix readings under 12.

37. AIRBORNE AND LEAF SURFACE FUNGI IN TWO GREENHOUSES IN CONNECTICUT

D. Li and J. LaMondia

A study on airborne fungi was conducted in two greenhouses in Connecticut using traditional and Quantitative polymerase chain reaction (QPCR) (used to quantify DNA) methods. The study found that airborne fungi in greenhouses can be very high, up to 49,729 spores/m^3. The difference between the highest and lowest fungal spore concentrations exposures in a 24-hour period was >13 fold. The predominant airborne fungi were plant pathogens and originated from leaf surfaces, with the exception of *Trichoderma*. Airborne spores of *Trichoderma harzianum*, a biocontrol agent applied to potting mix to control plant diseases, was elevated to 36,426 spores/m^3 following its application. We found that using a foliage suspension was a better method than leaf tissue method for determination of foliage fungi. The study also revealed that hyphal fragments were a major component of airborne fungal structures and none of the sampling methods used in the study was perfect. It was found that several environmental factors correlated with airborne fungi and not all foliage fungi correlated to the airborne fungi.

38. CONNECTICUT WEEDS AND WILD PLANTS

T. Mervosh *Assisted by* D. Reiss and B. Ross

Plants found growing wild in fields and landscapes of Connecticut are displayed. Taxonomy, life cycles, and toxicity/edibility information will be presented. Special emphasis will be placed on non-native, invasive plant species. Weed control questions will be addressed.

39. OILSEED CROPS FOR BIODIESEL

J. LaMondia *Assisted by* J. Canepa-Morrison and K. Bradshaw

Biodiesel is an alternative fuel, produced from either vegetable oils (such as soybean or canola) or from waste greases. Typically, biodiesel blends, ranging from 5% biodiesel with 95% diesel up to 20% biodiesel with 80% diesel, are being used in the northeastern U.S. in compression-ignition (diesel) engines and as a replacement for home heating oil. Canola and soybean also have utility as plant fertilizers or as rotation crops used to control weeds and/or plant parasitic nematodes and fungi. In these plots, plants are being grown to evaluate adaptability to Connecticut soils, seed and oil yield and quality, and meal suitability as fertilizer and as soil amendments to control soilborne pathogens.

40. LYME DISEASE IN TICKS FROM CONNECTICUT CITIZENS

J. Anderson *Assisted by* B. Hamid, E. Alves, and R. Castillo

2006 was the first year that we selectively tested deer ticks, based on their blood engorgement. All ticks submitted by municipal health departments were identified to species and degree of engorgement, but only engorged ticks were tested for the presence of the Lyme disease bacterium, *Borrelia burgdorferi*. Studies by other researchers have shown that ticks that have not become engorged with blood do not transmit the disease organism.

In 2006, 4,855 black-legged (deer) ticks (*Ixodes scapularis*) were received, as well as 235 American dog ticks (*Dermacentor variabilis*) and 67 lone star ticks (*Amblyomma americanum*); 22.5% of the tested black-legged ticks were infected with the Lyme disease organisms. The average time between receipt of a tick and reporting on the tick to the health departments was reduced from 24 days in 2005 to 13 days in 2006.

41. FIELD TRIALS OF THE FUNGUS *METARHIZIUM ANISOPLIAE* FOR TICK CONTROL
A. Bharadwaj and K. Stafford *Assisted by* H. Stuber
The entomopathogenic fungus *Metarhizium anisopliae* will kill blacklegged ticks and could provide an alternative to synthetic chemicals in controlling ticks in the residential landscape. Larger field trials with the fungus were conducted in the summer of 2007 to determine field efficacy at actual home sites. This information will assist in determining how the commercial products will need to be applied for tick control and in obtaining full registration with the Environmental Protection Agency.

42. ANTIBODIES TO WEST NILE VIRUS IN HORSES
L. Magnarelli, S. Bushmich (UCONN-Storrs), J. Anderson, M. Ledizet (L^2 Diagnostics), and R. Koski (L^2 Diagnostics), *Assisted by* T. Blevins and B. Hamid
A polyvalent enzyme-linked immunosorbent assay and a plaque reduction neutralization test were performed to detect West Nile virus (WNV) antibodies in horses naturally exposed to or vaccinated against this mosquito-transmitted pathogen. Laboratory analyses confirmed the presence of WNV antibodies in 21 of 23 sera, representing naturally exposed horses in Connecticut and New York State, and in more than 85% of 20 vaccinated horses. Patterns of antibody production in both study groups were similar, but some vaccinated horses did not produce antibodies. Therefore, diagnostic tests should be performed on horse sera after vaccinations to ensure that antibodies were produced. Also, there was no evidence of horse exposure of WNV prior to the 1999 outbreak in New York City and Connecticut.

43. THE "DEER" TICK *IXODES SCAPULARIS*
K. Stafford *Assisted by* A. Bharadwaj, H. Stuber, G. Dunford, L. Colligan, Lisa DiFedele, and Tara Raftery
The blacklegged tick or "deer" tick *Ixodes scapularis* transmits the agents of Lyme disease, babesiosis, and anaplasmosis. Observe live and preserved ticks under the microscope. A revised Tick Management Handbook is available.

44. MAMMALS AS SEED DISPERSAL AGENTS
S. Williams *Assisted by* G. Picard
We investigated the ability of white-tailed deer to disperse plant seeds throughout their range in southern Connecticut. Over 4-years, we gathered 566 deer pellet piles and planted them in a greenhouse. From these samples, 11,512 seedlings germinated, 79% of which were exotic to the state of Connecticut. Seeds of 87 different species of plants germinated, 51 of which were Connecticut exotics. Because of the success of this study, we expanded our survey this year and gathered and planted 65 moose pellet piles from northern Connecticut, 20 coyote scats from Lockwood Farm, and 26 bear scats statewide. Moose, coyote, and bear also disperse seeds of many plant species.

45. A FIELD TRIAL OF 10 DEER REPELLENTS
S. Williams *Assisted by* G. Picard
Browsing white-tailed deer can be a frustrating nuisance to Connecticut gardeners and growers. One option to deter deer from your garden is using deer repellents. There are numerous commercially available repellents on the market. We are in the second year of conducting a field trial on 10 of these repellents on hostas and yews in Woodbridge and Windsor, Connecticut. This year, we have also planted impatiens to assess the effectiveness of the same repellents on annuals. The study will be completed at the end of this growing season. Final results will be disseminated in late 2007. However, some insight may be provided today as to the best application strategies and effectiveness of the repellents we are testing.

46. INVASIVE AQUATIC PLANT PROGRAM
G. Bugbee, K. Deeds, M. Marko, R. Selsky, C. Vossbrinck, and J. White *Assisted by* M. Albert, A. Bridgewater, D. Bridgewater, and A. Russell
Connecticut lakes and ponds face an imminent threat from non-native invasive weeds. Recently introduced plants such as Eurasian milfoil, variable milfoil and fanwort are of great concern. Their dense stands often reach the surface and interfere with recreational uses. Natural aquatic ecosystems are drastically altered leading to the decline in native plants, fish and other beneficial organisms. Requests for station assistance in managing unwanted aquatic vegetation are frequent. Researchers, in the Department of Soil and Water, are documenting our states invasive aquatic plant problem and studying management options. Research includes studies on how watersheds and water chemistry influence invasive plant problems, strategic use of herbicides to minimize harmful effects on native plants, searching for biological control agents, and developing molecular identification techniques. We are continuing a statewide inventory of freshwater aquatic vegetation. From 2004 - 2006 vegetation in over 125 lakes and ponds was surveyed and mapped. Molecular identification techniques have been developed for over 50 invasive and native plant species. A search is underway to discover native and exotic insects that feed on invasive plants and determine if their populations can be enhanced (see plot #11 Integrated Pest Management of Eurasian

Watermilfoil, M. Marko). At this plot, you will see our aquatic plant surveillance and control boats and underwater video equipment. Scientists will be available to discuss problems you are having with your lake or pond.

47. INVASIVE AQUATIC PLANT IDENTIFICATION

G. Bugbee, K. Deeds, M. Marko, R. Selsky, C. Vossbrinck, and J. White *Assisted by* M. Albert, A. Bridgewater, D. Bridgewater, and A. Russell

Invasive aquatic plants pose a serious threat to Connecticut's lakes and ponds. With no natural enemies, these plants can rapidly crowd out native vegetation and degrade natural ecosystems. Aesthetic values and recreational opportunities also can be impacted by invasions, leading to economic losses. Starting in 2004, the Connecticut Agricultural Experiment Station's Invasive Aquatic plant Program (CAES IAPP) has surveyed and mapped the vegetation in 126 lakes and ponds. Approximately two-thirds of the water bodies contained one or more invasive aquatic plant species. Early identification of invasive aquatic plants can drastically help with management efforts. CAES IAPP will have live specimens of invasive aquatic plants and commonly confused native aquatic plants at this field plot. Staff will be available to teach you how to identify these plants.

48. MONITORING THE RACES OF POWDERY MILDEW ON MUSKMELON

F. Ferrandino

Powdery mildew is an annual problem on all crops in the cucumber family (cucumber, squash, pumpkins, and muskmelon). In this plot, there are five different muskmelon cultivars which differ in their susceptibility to different races and strains of the powdery mildew fungus. Disease on each cultivar will be monitored throughout the season. A similar plot has been established at the Valley Laboratory in Windsor Connecticut.

49. USING LEAF COMPOST IN HOME GARDENS

A. Maynard and D. Hill *Assisted by* C. Maxwell

Annual amendment of soil with leaf compost prevents compacting and crusting of the soil surface and promotes root growth and infiltration of rain. In these plots, addition of 1-inch of leaf compost annually since 1982 increased organic matter from 5.9 to 12.6%. Increased root growth in the amended soil allows plants to utilize nutrients in a greater volume of soil than plants in untreated soil of greater density. We are measuring the effect of reduced rates of fertilization (2/3, 1/3, 0 of normal rates) and compost amendments on the yields of several vegetables by comparing them with yields from unamended controls. We are also measuring the nutrient status of the soils in each plot throughout the growing season. Each year since 1982, yields on the leaf compost amended plots fertilized at 2/3 and 1/3 the normal rate have been consistently greater than on unamended plots with full fertilization.

50. BARTLETT ARBORETUM AND GARDENS

J. Kaechele

Nestled among the historic landscape of Southwestern New England is The Bartlett Arboretum & Gardens – a natural preserve like no other in this region. Our property features 91 acres of irreplaceable open space highlighting the best of what Connecticut's native landscape has to offer: magnificent award-winning Champion trees, charming gardens, wildflower meadows, red maple wetlands and boardwalks, woodland walking trails, varied wildlife and native habitats. http://bartlett.arboretum.uconn.edu/

51. CONNECTICUT DEPARTMENT OF AGRICULTURE

R. Macsuga

A photo exhibit will highlight Connecticut agriculture. Brochures and pamphlets will be available, along with information on Farm Reinvestment Program grants, Public Act 490 and farming, and agriculture and taxes. www.ct.gov/doag

52. CONNECTICUT GREEN INDUSTRIES

B. Heffernan

The Connecticut Green Industries represents The Connecticut Greenhouse Growers Association (CGGA) and The Connecticut Nursery and Landscape Association (CNLA). CGGA is the trade association for Connecticut's great Greenhouse Industry, representing nearly 200 growers of potted plants. http://www.flowersplantsinct.com/cgga/cggaindex.htm CNLA is Connecticut's Trade Association for Growers of Trees, Shrubs, Perennial-Annual Flowers, and Nurseries, Garden Centers, Landscapers and Landscape designers. http://www.flowersplantsinct.com/cnla/cnlaindex.htm

53. CONNECTICUT GROUNDSKEEPERS ASSOCIATION
D. Tice
The Connecticut Groundskeepers Association is a membership organization for Connecticut landscaping and groundskeeping professionals and affiliates. http://www.cgka.org

54. CONNECTICUT HORTICULTURAL SOCIETY
B. McLachlan
The Connecticut Horticultural Society is an educational organization dedicated to encouraging and improving the practice of gardening and the dissemination of horticultural information to its members and the public. The Society through its many and varied programs seeks to encourage the enjoyment, appreciation, and understanding of plants, the environment, and the art and science of gardening. www.cthort.org

55. CONNECTICUT INVASIVE PLANT WORKING GROUP
D. Ellis
The Connecticut Invasive Plant Working Group (CIPWG) is a statewide organization whose members gather and convey information on the presence, distribution, ecological impacts, and management of invasive plant species. We promote the use of native or non-invasive ornamental alternatives throughout Connecticut and work cooperatively with researchers, conservation organizations, government agencies, the green industries, and the general public to identify and manage invasive species pro-actively and effectively. The CIPWG website, www.hort.uconn.edu/cipwg provides timely information on non-native invasive plants, including a list of Connecticut invasive species, management information, invasive plant alerts, fact sheets, invasive plant legislation, photos, and a calendar of events. For additional information, or to join the CIPWG electronic mailing list, contact Donna Ellis 860-486-6448; email donna.ellis@uconn.edu).

56. CONNECTICUT PRE-ENGINEERING PROGRAM
M. Coehlo

The Connecticut Pre-Engineering Program's (CPEP) mission is to help underrepresented students discover their potential through science, math and technology. CPEP is designed to identify underrepresented minority and women students who have the potential for college at the upper elementary through the middle/junior high and high schools levels to enter and graduate from quality institutions of higher education. Providing the support system necessary to motivate students to perform well in a pre-college program, CPEP furnishes students with a strong foundation in mathematics, sciences and English to pursue math, science or engineering based fields at the four-year university/college level. www.cpep.org

57. CONNECTICUT PROFESSIONAL TIMBER PRODUCERS ASSOCIATION
J. Nichols
The Connecticut Professional Timber Producers Association, Inc. (CTPTPA) was formed in 2007 from the old Connecticut Wood Producers Association (Woodpac) of the 1970s. The mission of CTPTPA is to address the growing need for an organization to represent the vital interests of the harvesters and sawmills of Connecticut, to promote the use of Connecticut's renewable forest resources, and to enhance the image of the Connecticut forest products industry throughout the state by way of the following activities: A. Communicate information to the membership; B. Institute ethical guidelines and demand a high degree of professional ethics among its members. Establish a Forest Practice Standards for the timber harvesting and forest products profession; C. Promote safety within the profession; D. Promote Best Management Practices (also known as BMP's) for the timber harvesting profession; E. Promote education in the fields of forestry, timber harvesting, and forest products both within the Association and outside; F. Promote superior utilization of forest products; G. Promote the use of Connecticut wood products; and H. Publish a Connecticut Forest Profession directory and publish periodically an industry newsletter. www.timproct.org

58. NORTHEAST ORGANIC FARMERS ASSOCIATION
B. Duesing
The Northeast Organic Farming Association of Connecticut (CT NOFA) is a non-profit educational organization whose members include farmers, gardeners, land care professionals and consumers who are interested in organic methods and in local, organic food. Our display features pictures of this state's organic farms and landscapes. Directories of Connecticut's organic farms and organic land care professionals will be available. Announcements of upcoming events and educational literature to help farmers and home gardeners use organic methods effectively will be provided. For more information about its programs, publications, conferences and special events, contact CT NOFA at www.ctnofa.org, www.organiclandcare.net, 203-888-5146 or Box 164, Stevenson, CT 06491-0164.

59. SOCIETY OF AMERICAN FORESTERS—CONNECTICUT CHAPTER
J. Nichols
The Society of American Foresters (SAF) is the national scientific and educational organization representing the forestry profession in the United States. Founded in 1900 by Gifford Pinchot, it is the largest professional society for foresters in the world. The mission of the Society of American Foresters is to advance the science, education, technology, and practice of forestry; to enhance the competency of its members; to establish professional excellence; and, to use the knowledge, skills, and conservation ethic of the profession to ensure the continued health and use of forest ecosystems and the present and future availability of forest resources to benefit society. SAF is a nonprofit organization meeting the requirements of 501 (c) (3). SAF members include natural resource professionals in public and private settings, researchers, CEOs, administrators, educators, and students. www.safnet.org

60. THE GIRLS SCOUTS
T. Arsenault
Established on March 12, 1912 by Juliette Gordon Low, the mission of Girl Scouts is to build girls of courage, confidence, and character, who make the world a better place. Today there are 3.6 million Girl Scouts, consisting of 2.7 million girls and 928,000 adult members. In Girl Scouts, girls discover the fun, friendship, and power of girls together. Through a myriad of enriching experiences, such as extraordinary field trips, sports skill-building clinics, community service projects, cultural exchanges, and environmental stewardships, girls grow courageous and strong. For more information contact our local Girl Scout council at http://www.girlscoutscttrails.org.

61. USDA, ANIMAL AND PLANT HEALTH INSPECTION SERVICE, PLANT PROTECTION AND QUARANTINE
E. Chamberlain
The mission of Plant Protection and Quarantine: APHIS-PPQ safeguards agriculture and natural resources from the risks associated with the entry, establishment, or spread of animal and plant pests and noxious weeds. Fulfillment of its safeguarding role ensures an abundant, high-quality, and varied food supply, strengthens the marketability of U.S. agriculture in domestic and international commerce, and contributes to the preservation of the global environment.

The mission of Smuggling Interdiction and Trade Compliance: APHIS wants to ensure the availability of domestic and imported foods in the market place, facilitate the exportations of agricultural commodities to foreign countries, and preserve the health and diversity of our agricultural resources. The Smuggling Interdiction and Trade Compliance (SITC) Program seeks to prevent unlawful entry and distribution of prohibited products that may harbor exotic plant and animal pests, diseases, or invasive species. These harmful organisms could seriously damage America's crops, livestock and environment. http://www.aphis.usda.gov/

62. USDA, NATIONAL AGRICULTURAL STATISTICS SERVICE, NEW ENGLAND FIELD OFFICE
G. Keough
Agricultural statistics are important by providing an accurate, unbiased picture of the New England region and U.S. agriculture. Measurement of present and prospective supplies furnishes a sound basis for judgment and action by farmers, agri-businesses, researchers, marketing programs, and agencies which service farmers who take the time to provide the data to make these reports possible.

USDA's National Agricultural Statistics Service (NASS) is a network of 46 field offices (including the New England office in Concord, NH) serving all 50 states and Puerto Rico through cooperative agreements with state departments of agriculture or universities. These field offices regularly survey thousands of farm operators, ranchers, and agri-businesses who voluntarily provide information on a confidential basis. Consolidating these reports with field observations, objective yield measurements, and other data, statisticians then produce state statistics. These statistics are forwarded to NASS headquarters in Washington, D.C., where they are combined and released to the public.

The Internet site contains agricultural statistics, an online data base, all reports, links to other pertinent sites, and even to Kids Page that is targeted to education on agricultural topics. The national website is at http://www.usda.gov/nass while the homepages for New England and each of the six states are at http://www.nass.usda.gov/Neng (CT, NH, ME, MA, RI, VT). For more information, contact us via email at nass-nh@nass.usda.gov or 603-224-9639.

As part of the USDA, the federal program includes the Census of Agriculture conducted every five years and Annual Statistics Program. The Ag Census publishes all agricultural commodities at the state and county level. The Annual

Statistics Program provides timely state level statistics limited to major crop and livestock commodities and a few data series at the county level. Confidentiality is guaranteed to anyone providing information to NASS regardless if it is acting in the federal or state capacity. According to federal law, the mail list is confidential and can never be given or sold to any other entity, public or private (this includes other government agencies). Individual data are exempt from requests under the Freedom of Information Act and exempt from subpoena. Data are only published at an aggregate level so that no one can derive information about any single operation. http://www.nass.usda.gov.

63. Connecticut Tree Protective Association
R. Smith
CTPA is a non-profit, non-partisan association, made up largely of tree care professionals from Connecticut. To promote the protection and care of trees in Connecticut. To encourage the ongoing improvement of tree care practices among tree workers. www.ctpa.org

64. CONNECTICUT FARMLAND TRUST
E. Moore
The Connecticut Farmland Trust (CFT), established in 2002, is a statewide private non-profit conservation organization dedicated to protecting Connecticut's farmland. CFT's mission is to: 1.) Protect Connecticut's prime farmland for agricultural use by acquiring agricultural conservation easements and farmland; 2.) Assist landowners, local land trusts, town officials, and state agencies in identifying and protecting threatened agricultural land; and 3.) Enhance agricultural diversity, agricultural economic development, environmental quality, and rural character. The Connecticut Farmland Trust accepts donations of farmland and agricultural conservation easements as well as purchases farmland and agricultural conservation easements. In its first three years, CFT has protected 7 active farms, totaling more than 675 acres. For more information about CFT or options for protecting farmland, please contact Elisabeth Moore, Director of Projects, Connecticut Farmland Trust, 77 Buckingham Street, Hartford, CT 06106, phone: 860-247-0202, fax: 860-247-0236, email: emoore@ctfarmland.org, website: www.ctfarmland.org.

65. CONNECTICUT FARM BUREAU ASSOCIATION
S. Reviczky
Farm Bureau is a non-governmental, voluntary organization of farm families united to find solutions for concerns facing production agriculture in our counties, state and nation. Connecticut Farm Bureau provides farmers with a strong clear voice in state and national issues. Volunteer leaders and staff work closely with state and federal regulatory agencies and elected officials on issues ranging from economic viability, property rights, taxation, land use planning to labor laws and farmland preservation. One of our goals is to elevate the stature of agriculture in our state. Through education, market promotion and legislative advocacy, we strive to increase farm income and to improve the quality of life not only for Connecticut farmers, but also for their consumers. www.cfba.org

66. NATIVE WOODY SHRUBS
J. Ward *Assisted by* J.P. Barsky
Native woody shrubs offer an alternative to exotics commonly used in landscaping. This collection of shrubs was assembled in 1962 and in 1976 it was arranged in its present form with a dry site on the gravel mound and moist site in the shallow, plastic-lined depression. Many of these shrubs flower in the spring; their flowers can be seen in the photographs. Others, such as sweet pepperbush, spirea, and buttonbush, flower in summer. Witch-hazel flowers in early autumn. Birds are frequent visitors to the garden and quickly eat the mature fruit. These shrubs survive with minimal maintenance. Occasional mowing, annual removal of dead stems, and replenishment of mulch are performed. These shrubs have never been fertilized, watered, or treated for disease.

67. SURVEYS, NURSERY AND BEE INSPECTIONS
V. Smith, J. Fengler, I. Kettle, S. Sandrey, and P. Trenchard
Our personnel uphold state laws enacted to protect Connecticut's vegetation from injurious insects and diseases. Each year, we inspect 7,500 acres of nursery stock grown in 350 nurseries for insects and diseases. When problems are found, control remedies are suggested. We inspect agricultural products to be shipped to foreign or interstate destinations, and we survey Connecticut's woodlands to find troublesome pests such as the gypsy moth and the hemlock wooly adelgid. Examples of insect pests and plant diseases are exhibited. Insect survey maps are shown. Connecticut has about 345 beekeepers tending over 2,300 colonies of honey bees. A task of the Experiment Station is to seek out and eliminate contagious bee diseases and parasitic mites. There will be displays of insects that attack ornamentals, live honey bees, a beehive and various beekeeping equipment, as well as wasps and hornets and their nests. Forest Health Highlights will be available as handouts to the public.

68. CONNECTICUT NURSERYMEN'S GARDEN

The Connecticut Nurserymen's Gardens are showcases of plants discovered or hybridized and introduced to the horticultural trade by Connecticut nurserymen. Similar gardens are at the Valley Laboratory in Windsor and the Main Laboratories in New Haven. All plants were donated by members of the Connecticut Nurserymen's Association and planted in 1986-87. Introductions feature evergreen and deciduous azaleas, mountain laurel, maple, pine, hosta, iris, and other flowering and foliage plants. A brochure containing maps of all three gardens and a brief description of the plants are available.

69. BIRD AND BUTTERFLY GARDEN

J. Canepa-Morrison and R. Bonito *created by* Landscape Designer A. Bell, L. Starr, and B. Payton *Assisted by* R. Cecarelli, Lockwood Farm staff, and R. Bonito, maintained by Spring Glen Garden Club

The garden is a joint project of The Connecticut Agricultural Experiment Station and the Federated Garden Clubs of Connecticut. The second stage of a bird and butterfly garden can be viewed as well as a butterfly meadow. Two bluebird houses have been added to the adjoining meadows. Guided butterfly identification walks will be available as well as literature on butterfly larval and nectar sources.

70. EASTERN BLUEBIRD *SIALIA SIALIS* NEST BOX TRAIL

L. Kaczenski

A Bluebird trail consists of a minimum of 6 nesting boxes spaced a hundred yards or more apart. Here at Lockwood Farm, we have 16 nesting boxes located along the fencing beginning at the entrance of the cottage, along the Christmas tree farm, the vineyard, and then across the farm between the orchard and the weather station. Success of a trail greatly depends on weekly monitoring of the nesting boxes; close monitoring is needed to prevent House Sparrows from nesting in them. House Sparrows and the European Starling are a non-native invasive species introduced to North America in the 1800's; both of which are cavity nesters are very aggressive. They have contributed greatly to the decline of Bluebirds. There is also nesting competition with Tree Swallows, House Wrens, Tufted Titmice, Nuthatches and Chickadees. The population decrease of the Eastern Bluebird declined seriously enough to reach a critical status by the mid 1900's due to habitat destruction, over use of pesticides, and nest predation. Bluebird trails erected across North America have greatly increased their numbers, and due to this increase, they are not protected under the U.S. Endangered Species Act. This trail is registered with The Birdhouse Network; the data collected during the weekly monitoring (inhabitants, clutch size, predation, successful fledging, adult activity, etc.) are submitted to the Cornell Lab of Ornithology, helping scientists with their research of the Eastern Bluebird.

71. THE RELATION BETWEEN TISSUE AGE AND SUSCEPTIBILITY OF PUMPKINS, MELONS AND ZUCCHINI TO POWDERY MILDEW

F. Ferrandino

The rate of increase in a plant disease epidemic depends on the density of host material susceptible to disease. Previous work on vine crops has suggested that young leaves, especially on young fruitless plants, are less likely to be infected by powdery mildew. To test this hypothesis, pumpkins, muskmelons and zucchini seeds were sown every two weeks starting on June 15. The resulting mixed aged planting is being monitored throughout the season for the presence of powdery mildew.

72. INDUCING FUSARIUM DISEASE RESISTANCE IN GLADIOLUS

W. Elmer *Assisted by* P. Thiel, J. Bravo, and C. Connelly

Fusarium corm rot of gladiolus is found wherever gladioli are grown. Soil fungi called *Fusarium* cause the disease. Corms were soaked for 20 min in different rates of a chemical called Actigard that induces plants to become disease resistant. These plots were designed to determine what concentration provides the optimal suppression. In 2006, Actigard (50 ppm) applied as a corm soak produced 48% more flower spikes than controls. The rates examined in these plots are 0, 25, 50, 100, 200, & 500 ppm. In 2006, phytotoxicity was observed at the highest rate, but the horticultural value of the flower spikes was not affected.

73. SOUND SCHOOL AGRICULTURAL SCIENCE PROGRAM-STUDENTS FROM THE SOUND SCHOOL

This is a unique opportunity for students from New Haven who are interested in studying/pursuing a career in Agricultural Science. This is a public high school within the City of New Haven. Our program operates on a 12 month basis in partnership with The Connecticut Agricultural Experiment Station. Today you see an example of students planting, growing, caring and eating fresh vegetables and herbs from their garden, which they have taken care of this summer. Excess produce is used in local soup kitchens.

Our Partnership with the City of New Haven "Youth @ work" program assists in the development of work based on skills under the direct supervision and instruction of a certified Vocational Agriculture Teacher. Please visit our web site: www.soundschool.com.

74. THE SPREAD OF SEPTORIA LEAF SPOT ON TOMATO
F. Ferrandino
Septoria leaf spot is one of the most common diseases of tomatoes in the northeast. It is spread by windborne spores during or immediately following rainstorms. In this field, there are two 200 foot-long rows of tomatoes inoculated on the south side (far side) with Septoria. Disease levels, plant growth and tomato yield will be monitored through the season.

75. CHESTNUT SPECIES AND HYBRIDS
S. Anagnostakis *Assisted by* P. Sletten
These trees are part of the large collection of species and hybrids of chestnut maintained by The Connecticut Agricultural Experiment Station. Great differences can be seen in chestnut blight resistance, form, and nut production. Hypovirulent strains of the blight fungus help protect them from lethal cankers (see CONTROL OF BLIGHT ON AMERICAN CHESTNUTS plot). Plants of all seven species of chestnut are growing here. In 1994, two seedlings from the Caucasus Mountains of Russia that are true European chestnut were planted, but only one has survived our Connecticut winters. European chestnut trees from Turkey have also done poorly. Two trees of the chinquapin native to Florida are planted across the road from an Allegheny chinquapin from Pennsylvania. The cultivar 'Lockwood' is at the southwest corner of the plot.

76. DENSE PLANTING OF AMERICAN CHESTNUTS
S. Anagnostakis *Assisted by* P. Sletten
In 1982, 300 seedling American chestnut trees from Michigan were planted in two dense plots. We treated the north plot with hypovirulence for blight control (see CONTROL OF BLIGHT ON AMERICAN CHESTNUTS plot), and it looks slightly better than the south plot.

77. DWARF HYBRID CHESTNUT TREES
S. Anagnostakis *Assisted by* P. Sletten
These hybrid trees are the results of crosses done in 1934 by Arthur Graves followed by intercrossing by Hans Nienstadt in 1951 and selection by Richard Jaynes from 1970 to 1973. One of the parents in the hybrids was the dwarf species *Castanea seguinii*, and the selected trees that remain produce abundant nut crops and have remained small. These are important parents in our selections of orchard-type trees for Connecticut. The cultivar 'Little Giant' was released to the nursery industry in 1999, 'Hope' in 2003, and 'King Arthur' in 2005 (see signs). New hybrid and species trees are planted next to these dwarf hybrids.

78. WIND PROFILES INSIDE AND ABOVE A SOYBEAN PLANTING
F. Ferrandino
Many plant diseases are spread by tiny windborne spores. The nature of the turbulent air flow above and around plants determine the spread of such diseases. Wind measuring instruments (anemometers) at several heights measure the wind speed and variability at several heights throughout the season. These data will be used to construct a mathematical model of the spread of disease within a soybean field as it grows.

79. SOUND SCHOOL AGRICULTURAL SCIENCE PROGRAM-STUDENTS FROM THE SOUND SCHOOL
This is a unique opportunity for students from New Haven who are interested in studying/pursuing a career in Agricultural Science. This is a public high school within the City of New Haven. Our program operates on a 12-month basis in partnership with The Connecticut Agricultural Experiment Station. Today, you see an example of students planting, growing, caring and eating fresh vegetables and herbs from their garden, which they have taken care of this summer. Excess produce is used in local soup kitchens.

Our Partnership with the City of New Haven "Youth @ work" program assists in the development of work based skills under the direct supervision and instruction of a certified Vocational Agriculture Teacher. Please visit our web site: www.soundschool.com.

80. ROCKY HILL AMERICAN CHESTNUT TREES
S. Anagnostakis *Assisted by* P. Sletten
Seed collected from selected American chestnut trees in Rocky Hill in 1985 grew into the trees planted here. They are used as female parents in our crosses and are being treated with hypovirulence (see CONTROL OF BLIGHT ON AMERICAN CHESTNUTS plot) to keep them alive.

81. PINOT GRIS CULTURAL TRIALS
W. Nail *Assisted by* C. Maxwell
This vineyard was planted in 2004 on two rootstocks (C.3309 and 101-14) and is now coming into bearing. Experiments designed to reduce fruit set with the goal of reducing cluster compactness and consequent harvest rots were instituted in 2006 and will continue through 2008. Preliminary data from 2006 suggest that an application of JMS stylet oil at bloom reduces fruit set (berries per cluster) by 20%. This is accomplished by a temporary decrease in leaf photosynthesis on the sprayed vines; photosynthetic levels returned to normal levels within 12 days of the oil application. As the vineyard matures, other cultural trials will be instituted.

82. BEACH PLUM TRIALS
A. Maynard and D. Hill *Assisted by* C. Maxwell
Beach plum (*Prunus maritime* Marsh.) is a fruiting shrub native to the coastal dunes of the northeastern United States. Beach plum jam has become a premium product especially in the Cape Cod region. Currently, consumer demand for beach plums is greater than the supply. Commercial production is the only way to meet the demand for beach plums and its relatively low growth habit makes it ideal for a pick-your-own operation. In its native seaside habitat, beach plums grow very slowly and bear fruit sporadically. Growth in more fertile soil should be more vigorous and crop size will be improved. In Spring 2003, 210 beach plum seedlings were planted at Lockwood Farm and 96 at the Valley Laboratory. These seedlings were raised at Cornell University from seeds collected from 35 sites from Maine to Delaware. The trees are evaluated annually and select elite individuals will be propagated as possible cultivars in the future. In 2006, total production from Windsor was estimated to be 1,450 lbs from 87 plants. Heavy yielding plants produced as much as 28 lb/plant in 2006. In 2006, the percentage of plants producing increased to 95% compared to 82% in 2005. Plants at Hamden did not bear fruit in 2005 due to deer browse but started bearing fruit in 2006. The effects of the deer browse were still evident as only 23% plants produced fruit with yields as high as 5 lb/plant.

83. JAPANESE PLUM VARIETY TRIALS
A. Maynard and D. Hill *Assisted by* C. Maxwell
As wholesale marketing of major tree fruits becomes unprofitable, many Connecticut growers are turning to retail sales of their fruit. For a retail operation to be successful, there must be a diversity of products. Thus, many growers are interested in adding minor specialty fruits to their operations. Consequently, we have expanded our New Crops Program to include fruits. This trial, also repeated at the Valley Laboratory in Windsor, includes 12 cultivar/rootstock combinations of Japanese plum. At Windsor, the greatest yields in 2006 were from Shiro (62.8 lb/tree) and Obilnaja (56.2 lb/tree). Fortune averaged the largest plums (2.4 oz/plum) with the others averaging less than 1.5 oz/plum. At Mt. Carmel, Shiro (37.3 lb/tree) and Beauty (34.0 lb/tree) had the greatest yields. Trees at Mt. Carmel have been damaged by deer browse and black knot disease.

84. WHITE BIRCH RESEARCH ORCHARD
C. Rutledge
Non-native white birches in landscape and nursery settings in Connecticut are vulnerable to a number of insect pests. These include the bronze birch beetle, which attacks the vasculature of the tree's trunk, and birch sawflies and birch leafminers which attack the foliage of the trees. Together, these insects are responsible for killing many white birch trees causing substantial financial losses to nurseries, landscapers and homeowners. The orchard was established in the spring of 2005 with the kind donations of 5 Connecticut Nurseries: Millane Nurseries, Inc. in Cromwell, Young's Nurseries, Inc. in Wilton, Planters' Choice in Newton, Robert W. Baker Nursery in West Suffield, and Pride's Corner Farms, Inc. in Lebanon. The orchard will allow future research into the biology, ecology, and management techniques for these important pests.

Index of Scientists' Names and their Field Plot Numbers

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History of The Connecticut Agricultural Experiment Station

The Connecticut Agricultural Experiment Station is one of a national network of agricultural experiment stations. Experiment Stations are a cooperative research effort of the states and federal government to deal with local, regional, and national problems. The Station has existed for 132 years.

The Connecticut Agricultural Experiment Station, the first agricultural Experiment Station in the United States, grew out of the efforts of Samuel W. Johnson, a professor of agricultural chemistry at Yale University. Johnson had seen an agricultural experiment station when he did post graduate studies in Germany during the 1850s. He saw how the science of chemistry could be used to aid farmers and campaigned for 20 years until one was established by the Connecticut legislature in 1875. Initially opened in a chemistry laboratory at Wesleyan University in Middletown, the Station was moved to Yale in 1877, where its first bulletin reported on analysis of a fertilizer that had little agricultural value. In 1882, the Station moved to its present location on Huntington Street in New Haven. Besides Lockwood Farm, its outdoor laboratory in Hamden, the Station also has a research farm and laboratories in Windsor.

Through the years, many important discoveries have been made by researchers at The Connecticut Agricultural Experiment Station. For example, the first vitamin was discovered as an outgrowth of studies of the chemical composition of foods. The first practical hybrid of corn was developed, and many experiments in increasing the yield of corn were conducted at Lockwood Farm by Donald F. Jones. This discovery led to the doubling of yields of corn crops throughout the nation and led to more abundant and lower cost of food for mankind. Also, at Lockwood Farm, experiments were conducted which led to the development of organic fungicides, some of which are still in use to combat plant diseases. These fungicides replaced toxic heavy metals previously used to control plant pathogens.

Research at the Station covers plants and their pests, such as diseases and insects, the pests of man and animals such as mosquitoes and ticks, growth of the state's forests, methods of enhancing the growth of plants by protecting them from pests and increasing crop yields through cloning of genes, and studies of environmental contamination and ways to reduce application of pesticides or their impact on the environment. New research has been started on crops for biodiesel fuel production. Staff at the Station also analyze fresh fruits and vegetables for excess pesticide residues, test fertilizers and animal feeds for compliance with label claims, and screen a wide variety of foods as a part of the state's food safety monitoring programs.

Some current research includes:

- Release of a lady beetle to control the hemlock woolly adelgid, which is killing hemlocks throughout the state.
- Studies of the pathogen that causes Lyme disease and means of controlling the tick vector.
- Treatments to reduce the toxicity of organic contaminants in water.
- Studies of natural changes in Connecticut's forests.
- Ways to control insect pests of plants using non-chemical means.
- Surveys and studies of the eastern equine encephalitis virus, West Nile virus, and other viruses in mosquitoes.
- Enhancing growth of crops through the use of compost as a substitute for fertilizer.
- Finding new crops for Connecticut farmers and studying the best varieties of existing crop plants for Connecticut conditions.
- Studies of invasive aquatic plants and methods of control.
- Finding the cause of salt marsh dieback.

The experiments at Lockwood Farm are only a portion of these conducted by Station scientists. Scientists also perform experiments in New Haven and Windsor and carry out other experiments in state forests and on private lands.

PLANT SCIENCE DAY is held annually in August at Lockwood Farm, 890 Evergreen Avenue, Mt. Carmel, Hamden. Friends of the Experiment Station are invited to an *Open House* held in April at our New Haven laboratories on 123 Huntington Street.

THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION, founded in 1875, is the first experiment station in America. It is chartered by the General Assembly to make scientific inquiries and experiments regarding plants and their pests, insects, soil and water, and to perform analyses for State agencies.

OFFICE AND MAIN LABORATORIES

123 Huntington Street; New Haven, CT 06504-1106, 203-974-8500,
toll free, statewide, 1-877-855-2237

VALLEY LABORATORY

153 Cook Hill Road; Windsor, CT 06095-0248, 860-683-4977

LOCKWOOD FARM

890 Evergreen Avenue; Hamden, CT 06518-2361, 203-974-8618

THE STATION'S WEB PAGE AT: WWW.CT.GOV/CAES

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