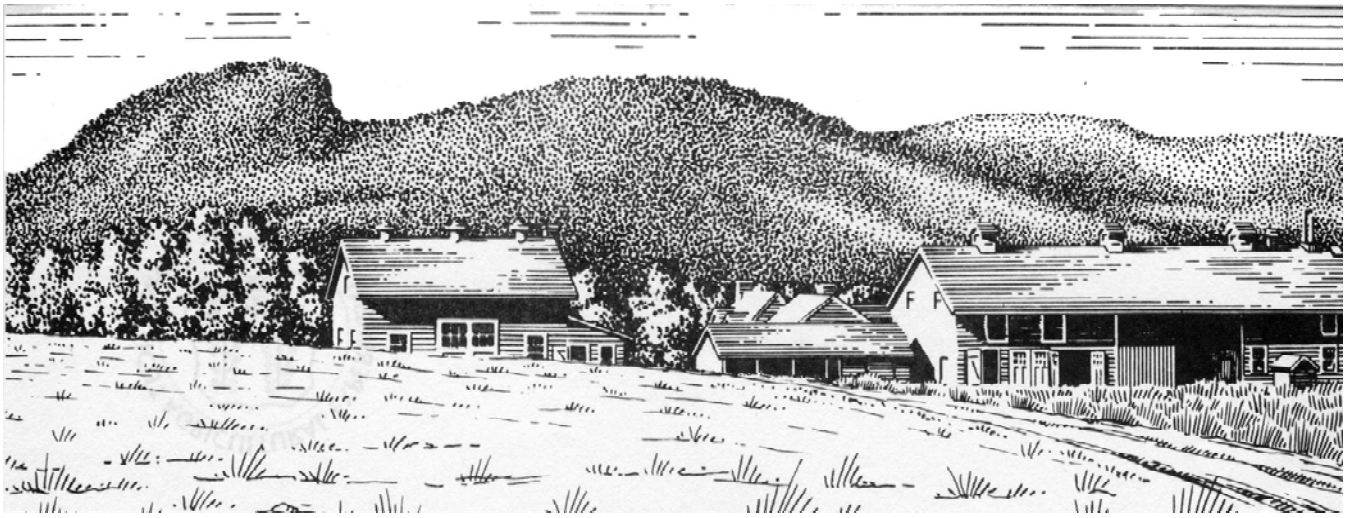
Plant Science Day

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



Lockwood Farm, Hamden
Wednesday, August 2, 2006

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 F, was observed on July 4, 1949. A record low temperature, -24 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

Mulnite Farms
Broad Brook, Connecticut

Mulnite Farms, located at 28 Miller Road, Broad Brook, Connecticut, began in 1905. It is currently operated by cousins Leonard Mulnite and Tom Crockett. Broadleaf tobacco, the first crop, is still grown today along with shade tobacco on the 350-acre farm.

Like most farms in New England, changes had to be made in farming operations. During the early years, honey bees were raised to produce hundreds of pounds of honey. There were more than 3,500 chickens raised on the farm during the Great Depression. Potatoes became another important crop, which was rotated with broadleaf tobacco. In 1957, shade tobacco was grown as another new crop. By the mid-1950's, 250 beef cattle, along with tobacco and potatoes, were grown on the farm. A nursery for trees and shrubs, located on 250 acres, was also started during this period. The nursery continued through 1998.

Today, tobacco is the main crop, an important export item to foreign countries. Although modern farming techniques have replaced the old hand-planting methods of 1905, the emphasis still remains on producing a quality crop.

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 the Mulnite Farms 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 registration desk 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 registration desk 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., and sign-out to pick up pesticide credit forms between 2:45 p.m.-4:00 p.m. Pesticide Credits Offered: Private Applicators (PA): 2 hours; Arborist (ARB): 1 ½ hours; Forest Pest Control (2): 1 ½ hours; Ornamental and Turf (3A): 2 hours.

The Connecticut Agricultural Experiment Station has a web page at: http://www.caes.state.ct.us

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

THE 96th 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

Gary Crump
"Wine and Grapes in Connecticut"
Partner, Winemaker, and Manager of Priam Vineyards in Colchester

PRESENTATIONS ON RESEARCH AND DEMONSTRATIONS

10:00 a.m. **DEMONSTRATION TENT Richard S. Cowles, Entomologist, Department of Entomology, Valley Laboratory, Windsor**
Monitoring and Managing Insects in Lawns
(15-minute demonstration, repeated twice during the day, 10:00 a.m. & 1:30 p.m.)
Techniques will be demonstrated for monitoring insect pests to determine whether they exceed economic thresholds. Soil sampling methods will be described, and the importance of standardizing the surface area being sampled will be emphasized. Multiple samples need to be taken to account for the aggregated distribution of white grub larvae. The irritant drench technique, using liquid dishwashing detergent, will be discussed for surface feeders, including billbugs, sod webworm, cutworms and armyworms. Finally, the flotation method for quantifying chinch bug populations will be displayed. Available chemical, cultural, and biological control tools will be discussed relative to each of these pest groups.

10:15 a.m. **MAIN TENT Victoria L. Smith, Deputy State Entomologist, Department of Entomology**
Recent Gypsy Moth Outbreaks in Connecticut
In 2005, hardwood trees in many forests and landscaped areas suffered defoliation due to feeding by Gypsy moth larvae. The damage was much more severe and widespread than in previous seasons. Defoliation was documented throughout the state, quantified by aerial survey, confirmed by data collected from ground surveys. Egg mass surveys conducted in winter showed that populations of this non-native insect pest are very high in certain localities. More damage was anticipated. Reasons for the sudden increase in Gypsy moth populations and corresponding damage to trees will be discussed.

10:45 a.m. **MAIN TENT Kimberly A. Stoner, Entomologist, Department of Entomology**
Organic Farming in Connecticut
Organic farming is growing rapidly across the United States and the world. Dr. Stoner will present information, based on her work with organic farmers in Connecticut and across the Northeast, on how organic farmers build soil fertility, how they manage weeds, diseases, and insect pests, and how they market their products.

11:00 a.m. **DEMONSTRATION TENT Todd L. Mervosh, Botanist (Weed Specialist), Valley Laboratory, Windsor**

Managing the Toughest Lawn Weeds

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

Many plants are considered weedy when they appear in lawn environments in which the desired outcome is a monoculture or mixture of specific turfgrasses. Of course, a totally weed-free lawn is nearly impossible to achieve and generally not a practical or worthwhile goal. With proper cultural practices, most weeds can be maintained at reasonably low and acceptable populations in a lawn. However, there are some plants that are widely considered lawn weeds because they are highly competitive and spread aggressively in lawns. The presentation will focus on some of the toughest weeds to control, such as crabgrass, speedwells, ground ivy, violets, yellow nutsedge and bentgrasses. Potted specimens of these species and less well-known lawn weeds will be presented for identification, and proper weed management options (cultural and chemical) will be discussed.

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, Gary Crump, Owner, Winemaker, and Manager of Priam Vineyard in Colchester**

Grapes and Wine in Connecticut

Gary Crump is partner/winemaker/vineyard manager of Priam Vineyards, in Colchester, CT. He is originally from northern Louisiana, where he had considerable exposure to agriculture on the family farm. He is completely self taught as a winemaker. His background in petroleum engineering and agriculture has given him an understanding of chemistry and science needed to manage winemaking and vineyards.

In 1998, Gary and his wife Gloria founded Priam Vineyards in Colchester, CT, initially to focus on being growers for the CT vineyard industry. In April of 2003, Priam Vineyards opened their winery.

Priam grows classic European varietals: Cabernet Sauvignon, Cabernet Franc, Chardonnay, Gewurztraminer, Riesling, Muscat, and Merlot as well as French American hybrids: Seyval, Cayuga and St. Croix, producing wines in the style of northern France and Germany. Since opening their winery, Priam has won over 36 international medals in worldwide competition.

Gary has become very involved as a member of The CT Vineyard and Winery Association (CVWA) and has pursued legislation to enhance and further develop the wine industry in CT. He recently participated in writing and passing the new law affecting direct shipping for the State of CT. Since 2001, he lobbied at the Capitol to establish funding for the CT Grown Program; initiated the concept of and lobbied legislation for a loan program to expand vineyard acreage throughout the state, established a supporting member program for CVWA to both build membership and legislative presence, as well as build funding for the marketing and advertising of CVWA and was instrumental in crafting legislation to increase the deduction of vineyard and winery equipment from $100,000 to $200,000. He is Vice President of The CT Vineyard and Winery Association (CVWA) and Chairman of the CT Farm Wine Development Council. The CT Farm Wine Development Council is a commission that directs policy of the vineyards and wineries of the state and is an appointment by the Governor of CT. He is also a delegate of the New London County Farm Bureau and is on the Board of Directors of the CT River Coastal Conservation District. He was named CT Wineperson of the Year in 2001 by Amenti delVino.

Priam Vineyards, 11 Shailor Hill Road, Colchester, CT 06415, 860-267-8520, 860-267-8715 FAX, priamvineyards@earthlink.net, http://www.priamvineyards.com.

1:15 p.m. **MAIN TENT Abigail A. Maynard, Horticulturist, Department of Forestry and Horticulture**

Mini-Watermelons and Japanese Plums: Bigger is Not Always Better

Since 1983, scientists at The Connecticut Agricultural Experiment Station have investigated over 30 specialty crops to provide new opportunities for Connecticut's farmers. Certain crops were chosen because they have a high market value and an existing or expanding market that would readily accommodate these commodities. This presentation reports on trials of mini-watermelons and Japanese plums. Varieties, cultural methods, and disease management techniques of these crops will be discussed.

1:30 p.m. **DEMONSTRATION TENT Richard S. Cowles, Entomologist, Department of Entomology, Valley Laboratory, Windsor**

Monitoring and Managing Insects in Lawns

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

Techniques will be demonstrated for monitoring insect pests to determine whether they exceed economic thresholds. Soil sampling methods will be described, and the importance of standardizing the surface area being sampled will be emphasized. Multiple samples need to be taken to account for the aggregated distribution of white grub larvae. The irritant drench technique, using liquid dishwashing detergent, will be discussed for surface feeders, including billbugs, sod webworm, cutworms and armyworms. Finally, the flotation method for quantifying chinch bug populations will be displayed. Available chemical, cultural, and biological control tools will be discussed relative to each of these pest groups.

1:45 p.m. **MAIN TENT Philip M. Armstrong, Virologist, Department of Soil and Water**

Diversity of Mosquito-Borne Viruses in Connecticut

Mosquitoes transmit a number of different viruses in northeastern United States including important human pathogens such as West Nile virus and eastern equine encephalitis virus. The mosquito surveillance program was established in 1997 to identify all viruses associated with mosquitoes and track their distribution in Connecticut. To date, we have isolated 9 different kinds of viruses from mosquitoes during the course of routine surveillance. Fortunately, most of these viruses do not or rarely cause disease in humans or domestic animals. In this presentation, I will review the transmission cycles of some of these viruses and discuss their impact on human health. Finally, I will present our recent discovery of another mosquito-borne virus- La Crosse virus to illustrate how viruses are isolated from mosquitoes and identified in the laboratory.

2:00 p.m. **DEMONSTRATION TENT Todd L. Mervosh, Botanist (Weed Specialist), Valley Laboratory, Windsor**

Managing the Toughest Lawn Weeds

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

Many plants are considered weedy when they appear in lawn environments in which the desired outcome is a monoculture or mixture of specific turfgrasses. Of course, a totally weed-free lawn is nearly impossible to achieve and generally not a practical or worthwhile goal. With proper cultural practices, most weeds can be maintained at reasonably low and acceptable populations in a lawn. However, there are some plants that are widely considered lawn weeds because they are highly competitive and spread aggressively in lawns. The presentation will focus on some of the toughest weeds to control, such as crabgrass, speedwells, ground ivy, violets, yellow nutsedge and bentgrasses. Potted specimens of these species and less well-known lawn weeds will be presented for identification, and proper weed management options (cultural and chemical) will be discussed.

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:

- **Timothy M. Abbey, Entomologist (IPM Specialist), Department of Entomology, Valley Laboratory, Windsor**
  Plant Health Care for the Connecticut Nursery and Landscaping Industries
- **Francis J. Ferrandino, Plant Pathologist, Department of Plant Pathology and Ecology**
  The spread of plant diseases by airborne spores
- **Wade H. Elmer, Plant Pathologist, Department of Plant Pathology and Ecology**
  Inducing Fusarium disease resistance in gladiolus
- **Carole Cheah, Entomologist, Department of Entomology, Valley Laboratory, Windsor**
  Biological control of hemlock woolly adelgid

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

10:00a.m. – 11:00a.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 and Wade H. Elmer, Plant Pathologist, Department of Plant Pathology and Ecology**
  Use of Earthworms to Suppress Fusarium Wilt of Tomato
- **Francis J. Ferrandino, Plant Pathologist, Department of Plant Pathology and Ecology and Wade H. Elmer, Plant Pathologist, Department of Plant Pathology and Ecology**
  Inducing Fusarium Disease Resistance in Gladiolus
- We'll also be passing by the station's chestnut and apple orchards, and beehives. We should have some commanding views of Sleeping Giant State Park from The Rock, so bring your cameras.

1:00p.m. – 2:00p.m. AFTERNOON WALKING TOUR, Approximately ¼-mile, easy walk

Stops on tour:

- **Richard Cowles, Entomologist, Department of Entomology, Valley Laboratory, Windsor and Carole Cheah, Entomologist, Department of Entomology, Valley Laboratory, Windsor**
  Chemical and Biological control of hemlock woolly adelgid
- **Kimberly A. Stoner, Entomologist, Department of Entomology**
  Surveying for the Swede Midge
- **Martin P.N. Gent, Horticulturist, Department of Forestry and Horticulture**
  Hydroponic Lettuce and Tomatoes
- **Wade H. Elmer, Plant Pathologist, Department of Plant Pathology and Ecology**
  Use of Earthworms to suppress Fusarium Crown Rot of Asparagus
- **Abigail Maynard, Horticulturist, Department of Forestry and Horticulture and David Hill, Emeritus, Horticulturist, Department of Forestry and Horticulture**
  New Crops Program (Jilo, Artichoke, Calabaza Squash, Personal-size Watermelon, and Cauliflower)

BARN EXHIBITS (Barn B)

New Techniques for Analyzing Food for Toxins
Department: Analytical Chemistry
Investigators: Brian D. Eitzer, David E. Stilwell, Walter J. Krol, MaryJane Incorvia Mattina, Christina S. Robb, Terri Arsenault, Craig L. Musante, William A. Iannucci-Berger
Abstract: The analytical chemistry department, utilizing monies from FDA, has acquired new instrumentation for food analyses. Our new instruments will allow us to analyze a wide variety of foods for toxic agents. This work is supported by FDA in response to the possibility of terrorist attacks against our food supply. We are now able to detect more toxins at lower levels than ever before.

Wine Grape Cultivar and Clone Evaluation
Department: Forestry and Horticulture
Investigator: William R. Nail
Assistants: Cynthia Maxwell

Abstract: Connecticut's mild, humid growing seasons and cold winters prevent the successful cultivation of many well-known wine grape 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.

Identification of Invasive Aquatic Plants in Connecticut using DNA Technology
Department: Soil and Water
Investigator: Charles R. Vossbrinck
Abstract: The identification of aquatic plants is often difficult even for an expert. Treatment of lakes for invasive aquatic weeds cannot proceed until both the weed and any possible endangered plants in the lake are properly identified. We are using DNA technology, first to build a data base of DNA sequences for all aquatic plants in Connecticut and secondly to match DNA sequences from our database to plants which are obtained from Connecticut lakes.

Alien Insects Damaging Woody Plants in the Northeast
Department: Entomology
Investigator: Chris T. Maier
Assistants: Tracy Zarrillo, Morgan Lowry, Shalyn M. Zappulla, Julia S. Daigler, Stephen J. Struble, and Matthew R. Wohlstron
Abstract: Insects accidentally introduced from foreign countries can have a costly impact upon woody plants. This exhibit highlights several emerging pests that have injured woody plants in Connecticut or other northeastern states.

How Earthworm Activity Enhances Plant Health
Department: Plant Pathology and Ecology
Investigator: Wade H. Elmer
Assistants: Joan L. Bravo and Alen Chery
Abstract: Earthworms are known to enhance soil health by several mechanisms, such as processing plant debris into organic matter and increasing drainage. We are studying how earthworm activity reduces plant disease by increasing beneficial microbes around plant roots.

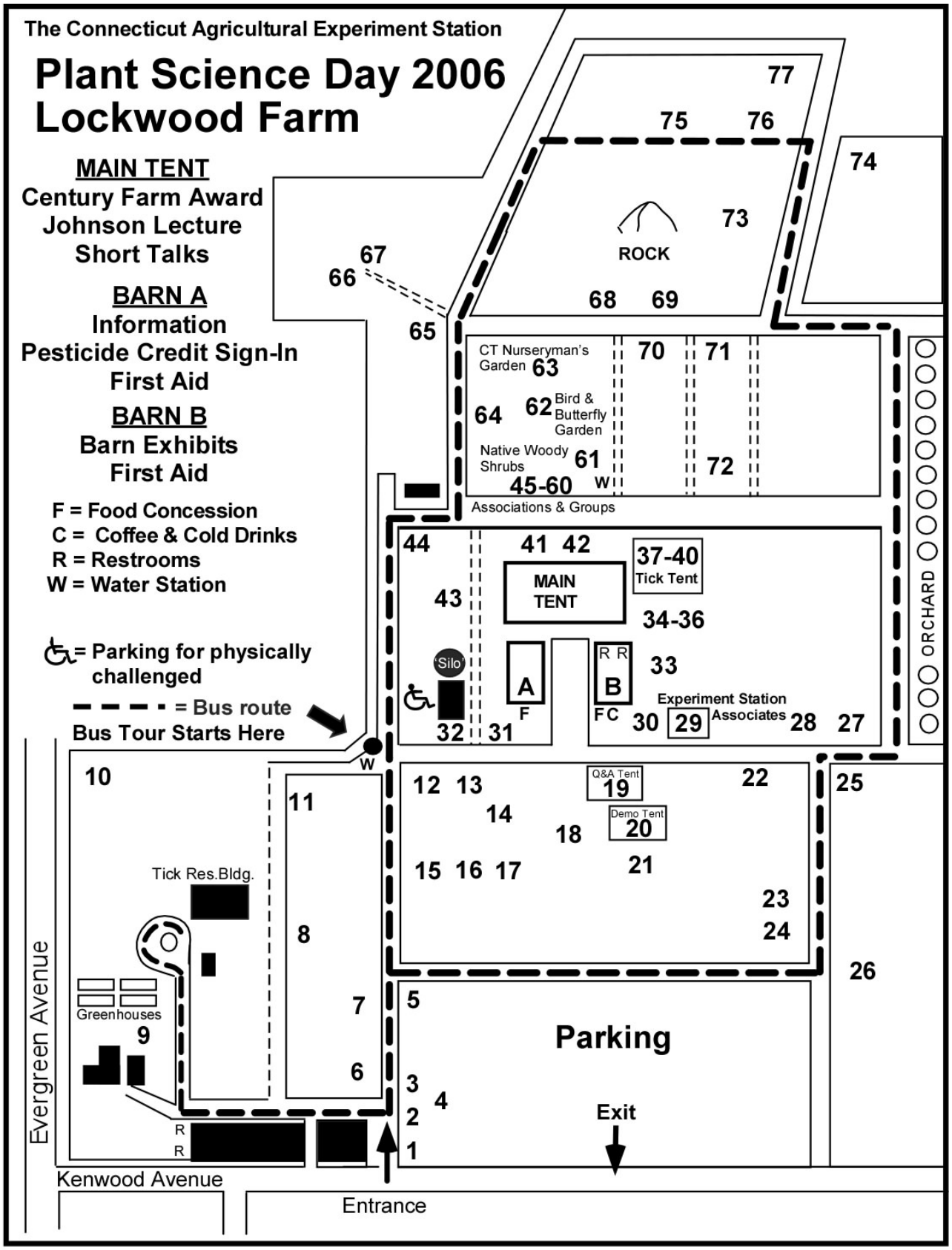
Patterns in the Environmental Distribution of Milky Spore Disease Bacteria
Department: Biochemistry and Genetics
Investigator: Douglas W. Dingman
Assistants: Cynthia Musante
Abstract: Genomic DNA fingerprints of different isolates of milky spore disease bacteria have been used to assemble phylogenic groupings (i.e., families based on evolutionary relatedness). All isolates of *Paenibacillus popilliae* obtained from diseased insects in Connecticut were found to be clustered into one phylogenic group. Isolates of *P. popilliae* obtained from diseased insects in Ohio and from several commercial insecticides were determined to be clustered into a different phylogenic group.

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

THE EXPERIMENT STATION HAS A WEB PAGE: WWW.CAES.STATE.CT.US.

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, 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, Fax 203-974-8447, or e-mail Vickie.Bomba@po.state.ct.us.



Map Not to Scale

FIELD PLOTS

Outside Organizations (#23, #24, #30, #32, #45-#60, #72) invited to participate

1. Chinese Chestnut Trees
2. Sheet Composting with Oak and Maple Leaves
3. Annual Culture of Globe Artichokes
4. Jilo Trials
5. Personal-Sized Watermelon Variety Trials
6. Calabaza Squash
7. Cauliflower Trials
8. Use of Earthworms to Suppress Fusarium Crown Rot of Asparagus
9. Composition of Lettuce and Tomatoes Grown in Hydroponics with Recycled Nutrient Solution
10. Biological Control of Hemlock Wooly Adelgid
11. Has the Swede Midge Reached Connecticut? Surveying for a New Pest
12. Wine Grape Cultivar and Clone Evaluation
13. The Catch Basin and West Nile Virus
14. Composting Leaves Using the Static Pile Method
15. Commercial Chestnut Cultivars
16. Control of Blight on American Chestnuts
17. New Hybrid Chestnut Orchard
18. Use of Earthworms to Suppress Verticillium Wilt of Eggplants
19. Question and Answer Tent
20. Demonstration Tent
21. CAES Weather Station
22. Alien Insects in Connecticut
    23. The Connecticut National Guard, 14th Civil Support Team (Weapons of Mass Destruction)
    24. The Connecticut Department of Environmental Protection's Hazardous Materials Testing Mobile Analytical Laboratory
25. Addition of 'Fertilizer' Stimulates the Breakdown of Highly-Persistent Hazardous Chemicals by Native Soil Bacteria
26. Nut Orchard
27. Dispersal of Corn Pollen in the Atmosphere
28. Phytoremediation of Agricultural Soils Contaminated with DDE
29. Experiment Station Associates
    30. The Farmer's Cow
31. Mosquito Trapping and Testing for West Nile Virus
    32. Verizon Telephone Transmission Silo
33. Heirloom Tomato Trials
34. Connecticut Weeds and Wild Plants
35. Plant Health Care for the Connecticut Nursery and Landscaping Industries
36. Oilseed Crops for Biodiesel
37. Serologic Evidence of Tularemia in Cats
38. The "Deer" Tick *Ixodes scapularis*
39. Use of a Rodent Baitbox for the Control of the "Deer" Tick
40. Field Trials of the Fungus *Metarhizium anisopliae* for Tick Control
41. Invasive Aquatic Plant Program: Protecting Connecticut
42. Overabundant White-Tailed Deer as Seed Dispersal Agents
43. Monitoring the Races of Powdery Mildew on Muskmelon
44. Using Leaf Compost in Home Gardens

45. The Northeast Organic Farming Association of Connecticut (NOFA)
46. Connecticut Farmland Trust
47. USDA, Animal and Plant Health Inspection Service, Plant Protection and Quarantine
48. Connecticut Invasive Plant Working Group (CIPWG)
49. USDA Farm Service Agency
50. Connecticut Department of Agriculture – Marketing Bureau
51. Southwest Conservation District
52. Bartlett Arboretum and Gardens
53. Connecticut Tree Protective Association
54. The Connecticut Department of Environmental Protection - Division of Forestry
55. Olin-Yale-Bayer New Haven Public School Science Fair Program (CPEP)
56. USDA Forest Service - Northeast Research Station
57. Connecticut Nursery and Landscape Association
58. Connecticut Greenhouse Growers Association
59. Connecticut Grounds Keepers Association
60. Girl Scout Exhibit
61. Native Woody Shrubs
62. Bird and Butterfly Garden
63. Connecticut Nurseryman's Garden
64. Surveys, Nursery and Bee Inspections
65. Chestnut Species and Hybrids
66. Dense Planting of American Chestnuts
67. Dwarf Hybrid Chestnut Trees
68. The Spread of Septoria Leaf Spot on Tomato
69. Dispersal of Spores in a Soybean Crop
70. Use of Earthworms to Suppress Fusarium Wilt of Tomato
71. Inducing Fusarium Disease Resistance in Gladiolus
72. Sound School Agricultural Science Program
73. Rocky Hill American Chestnut Trees
74. Pinot Gris Cultural Trials: Wine Grape Cultivar and Clone Evaluation
75. Beach Plum Trials
76. Pawpaw and Japanese Plum Variety Trials
77. 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 H. Mizak, and the following summer workers: J. Gesino, M. Harris, and D. Matos.

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 un-amended controls. Un-decomposed oak and maple leaves were layered about 6 inches thick in the falls of 1995-2003 and incorporated into the soil by rototilling. Last year, lettuce, peppers, edible soybeans, and rutabaga 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 un-amended controls. In 2005, lettuce yields were virtually the same for all the treatments. Plots amended with oak leaves averaged the greatest soybean yields (2.7 lbs/plot), compared to plots amended with maple leaves (2.2 lbs/plot) and the control plots (2.0 lbs/plot) (all dry weights). The greatest rutabaga yields were from plots amended with maple leaves (2.8 lbs/plant) compared to plots amended with oak leaves and the control plots (1.8 lbs/plant).

3. ANNUAL CULTURE OF GLOBE ARTICHOKES
A. Maynard and D. Hill *Assisted by* C. Maxwell
Connecticut lies at the center of one of the largest artichoke-eating populations in the United States. Fully 40% of California's crop is sold through regional markets from New York to Boston. Annual production of Green Globe is triggered by use of vernalization (cool, moist treatment). Green Globe requires 500-600 cumulative hours of below 50F temperatures to induce budding compared to Imperial Star which needs only 250 hours of cool temperatures. This year, if plants do not produce buds by late July, we will treat them with gibberellic acid, a natural plant hormone, to induce budding.

4. JILO TRIALS
A. Maynard and D. Hill *Assisted by* C. Maxwell
Jilo (*Solanum gilo*) is a solanaceous plant akin to eggplant. This tropical vegetable is grown principally in Nigeria. Its culture was transported to central and southern Brazil where it has became a minor crop. Its principal use is in vegetable stew (ratatouille) and sweet and sour mixes with chicken and pork. In 1998, a Bethel grower obtained seeds from a member of the Brazilian community in the Waterbury-Danbury area (estimated population 4500). The Connecticut Department of Agriculture obtained some of the seeds and sent them to the Experiment Station for further testing. We found that jilo grows well in Connecticut's climate and can produce up to 11 lb/plant when mulched with black plastic to warm the soil. We also found that jilo flowers abort when subjected to moisture stress. This year, we are growing some plants with black plastic mulch, while others are being grown with drip irrigation to insure a constant supply of water when droughty periods occur. These will be compared to plants grown on bare soil with water supplied only by natural rainfall. Last year, average yield of fruit from Comprido Verde Claro was 3.7 lb/plant in plants grown with black plastic mulch and 6.6 lb/plant with drip irrigation, compared to 2.6 lb/plant in control plots. It appears that supplemental drip irrigation was especially important in the hot and dry summer of 2005. We have repeated the experiment this year.

5. 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 revealed that 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. Last year, Extazy and experimental cultivar S133 had the greatest yields (43 T/A) followed by experimental cultivar S130 (33 T/A) and Vanessa (30 T/A). Bobbie averaged the greatest sugar content with an average Brix of 13 compared to Extazy (11.5). Extazy was very high in lycopene (95-99 ug/g) (as determined by Dr. Penelope Perkins) with the other cultivars averaging (54-85 ug/g). Research will continue with evaluations of additional varieties and various cultural methods.

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 65 farmers' markets. In 2003, one plant of La Estrella produced mature fruit in only 90 days on 12-foot vines. We saved the seeds from the fruit and have planted them here and at Windsor. Last year, at Windsor, 17% of the plants produced early-maturing fruit (90 days), while only 4% produced early fruit at Mt. Carmel. The greater success at Windsor may be due to an adjacent cover crop of buckwheat, a known bee attractant, which helped to pollinate early forming female flowers. At Mt. Carmel, the adjacent cover crop was soybeans which did not attract bees. This year's crop at Mt. Carmel is surrounded by buckwheat hopefully to improve the production of early fruit. Fruit that mature in 90 days is appealing to northern growers because the majority of fruit can mature before frost. With a traditional maturity of 120 days, some fruit that form late on the vine do not reach maturity.

7. CAULIFLOWER TRIALS

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

Recent developments in the fast-food industry, to provide low-carbohydrate foods to diet-conscious consumers, prompted a replacement of mashed potatoes with mashed cauliflower. In 1986, 1987, 1988, and 1994, we tested 47 cultivars of cauliflower for yield and quality. Most of the cultivars tested are no longer available from seed companies. Last year we tested 20 new cultivars released since 1994 to find those that grow well in Connecticut's soil and climate. These new cultivars have natural tight wrapper leaves which are needed to blanch the curds, thus eliminating the need for tying the leaves, an expensive step in cauliflower production. Last year, average yield of 12 cultivars at Windsor was 8.5 T/A. Yield of Freedom was greatest (10.9 T/A) with Absolute, Attribute, Cumberland, Minuteman, and Wentworth exceeding 9.5 T/A. There was a crop failure at Mt. Carmel due to severe browsing from woodchucks.

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

W. Elmer *Assisted by* J. Bravo and A. Chery

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 micro-plots were planted in 2005 to determine if earthworm activity can enhance crop yield. The plastic lining is designed to prevent the earthworms from migrating to other plots at night. In the fall of 2005, plots that were augmented with earthworms had plants that were 42% larger than controls. Growth will be monitored in 2006 and yield will be determined in 2007.

9. COMPOSITION OF LETTUCE AND TOMATOES GROWN IN HYDROPONICS WITH RECYCLED NUTRIENT SOLUTION

M.P.N. Gent *Assisted by* M. Short

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 lettuce and 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.

10. BIOLOGICAL CONTROL OF HEMLOCK WOOLY ADELGID

C. Cheah *Assisted by* J. Preste

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 ladybeetle adelgid predator from Japan, was first implemented in Connecticut and 2006 marks the 11th year of this program. Current mass rearing of all predators of HWA for the national biological control program, supported by the USDA Forest Service, is entirely dependent on field collections of adelgids. Related research at the Valley Laboratory, in collaboration with the Insect Diet and Rearing Institute, 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. 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.

11. HAS THE SWEDE MIDGE REACHED CONNECTICUT? SURVEYING FOR A NEW PEST

K. Stoner *Assisted by* A. Scheinkman

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 16 regulated areas in Ontario, 20 regulated areas in Quebec, and six counties at the western tip of New York State. Because the adult midges are poor fliers, the primary avenues for long distance movement are probably by movement of plants and soil by humans. Swede midge larvae damage plants by feeding in the growing tip of the plant and producing a secretion that liquefies the cells and changes the plant physiology, resulting in formation of a gall and distorting the growth of the plant. We have begun surveying for swede midge this year in Connecticut, putting out pheromone traps for the adults on eight farms in New Haven, Middlesex, Hartford, and Litchfield Counties.

12. WINE GRAPE CULTIVAR AND CLONE EVALUATION

W. Nail *Assisted by* C. Maxwell

Connecticut's mild, humid growing seasons and cold winters prevent the successful cultivation of many well-known wine grape 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.

13. THE CATCH BASIN AND WEST NILE VIRUS

J. Anderson and A. Main *Assisted by* B. Hamid, T. Goodman, M. Vasil, T. Petruff, A. Penna, A. Florek, M. Misencik, and E. Alves.

Culex pipiens is the most important mosquito species in the natural history of West Nile virus in Connecticut. It was the most abundant species captured in Stratford and Stamford in 2004 and 2005, and more than 90% of the isolations of West Nile virus were made from this species. Relatively large numbers of juvenile mosquitoes develop in catch basins in cities and along highways. Female mosquitoes lay eggs on water that accumulates in the bottom of many catch basins, and larvae develop in the water containing organic matter. In fact, catch basins likely are the most important breeding areas for *Culex pipiens*. Larvae are collected from April through October. Frequencies of infected mosquitoes were higher in traps placed in the tree canopy than elsewhere, but higher in catch basins than at ground level. More than one half of females captured in catch basins were gravid, suggesting that females, after ingesting blood and developing their eggs, descend to catch basins for shelter and deposition of eggs.

14. 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.

15. COMMERCIAL CHESTNUT CULTIVARS

S. Anagnostakis *Assisted by* P. Sletten, and R. Rawle

These grafted trees are cultivar 'Colossal' and cultivar 'Nevada'. 'Colossal' is the most frequently planted commercial cultivar in the U.S., with large acreages 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.

16. 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.

17. NEW HYBRID CHESTNUT ORCHARD

S. Anagnostakis *Assisted by* P. Sletten, and R. Rawle

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.

18. USE OF EARTHWORMS TO SUPPRESS VERTICILLIUM WILT OF EGGPLANTS

W. Elmer and F. Ferrandino *Assisted by* J. Bravo and A. Chery

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 on yield. The plastic lining is designed to prevent the earthworms from migrating to other plots at night. In 2005, eggplant plots augmented with earthworms had twice the yield as control plots.

19. QUESTION AND ANSWER TENT

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

Ask questions about plants, soils, and insects here.

20. DEMONSTRATION TENT

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

21. 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).

22. ALIEN INSECTS IN CONNECTICUT

C.T. Maier *Assisted by* J. Feldhouse, M. Lowry, J. MacDonald, and T. Zarrillo

Insects accidentally introduced from foreign countries have a costly impact upon agriculture 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 exotic insects new to Connecticut and have studied 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 alien insects.

23. THE CONNECTICUT NATIONAL GUARD, 14TH CIVIL SUPPORT TEAM (WEAPONS OF MASS DESTRUCTION)

J. McCarroll

The 14th Civil Support Team is Connecticut's rapid response team for chemical, biological, and radiological terrorism. The team consists of 22 active duty National Guard Army and Air Force personnel with specialized equipment and training to assist state and local authorities in the event of an incident involving weapons of mass destruction. There are currently 55 teams in the United States and its Territories. The mission of the CST is to support local and state authorities at domestic WMD/NBC incident sites by identifying agents and substances, assessing current and projected consequences, advising on response measures, and assisting with requests for additional support. The CST display will include a mobile laboratory, communication vehicles, and detection and decontamination equipment.

24. THE CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION'S HAZARDOUS MATERIALS TESTING MOBILE ANALYTICAL LABORATORY

P. Zack, P. Clark, J. Chen, T. McGloin

Emergency Response and Spill Prevention Division's Site Assessment and Support Unit

The Connecticut Department of Environmental Protection's Mobile Analytical Laboratory is routinely deployed to perform real time assessment of the nature and extent of surface and subsurface petroleum and hazardous materials plumes emanating from unpermitted discharge sites. On a statewide basis, the Mobile Lab thereby provides an invaluable means for rapid identification of immediate and imminent threats to public health and safety during emergency response and weapons of mass destruction incidents. The Mobile Lab is equipped with a variety of highly sophisticated instruments engineered to test for volatile organic compounds in air, water and soil, including two gas chromatographs with mass selective detectors (GC/MSD), and also can test for metals in soil samples using X-Ray Fluorescence. Further analyses include total petroleum hydrocarbons in soils and water by Ultra Violet Fluorescence, and tests for chemical warfare simultants using a portable HAP Site GC/MSD system. Situations arise throughout the State where chemicals are observed to such an extent and degree that levels pose potential threats to human health and the environment. The Department receives notification of these types of incidents through its Dispatch Center (860-424-3338), which is manned on a 24 hour basis seven days a week. When the lab is not on the road, it is stationed at DEP's Field Operations Facility in Windsor, where it receives environmental samples to be tested.

25. ADDITION OF 'FERTILIZER' STIMULATES THE BREAKDOWN OF HIGHLY-PERSISTENT HAZARDOUS CHEMICALS BY NATIVE SOIL BACTERIA

J. Pignatello and J. Li

Early twentieth-century coal gasification technology has left a legacy of coal tar pollution in soil surrounding many thousands of former manufactured gas plant (MGP) sites. The most abundant component of coal tar is the family of compounds known as polycyclic aromatic hydrocarbons (PAH). This study was initiated to determine the feasibility of *in situ* bio-remediation of soil at a MGP site in Connecticut. We measured the biodegradation of a set of 15 PAHs by native soil bacteria under various conditions. The experiments were conducted in well-mixed, aerated soil-water mixtures over a 93-106 day period. In separate sterilized mixtures, we also measured the rate of physical desorption of PAH molecules from soil particles to water, where they could be trapped.

PAH molecules of the largest size were neither biodegraded nor desorbed. However, the others—comprising 80% of the total—were biodegraded. Biodegradation was greatly stimulated by addition of inorganic nutrients (N, P, K and trace metals), resulting in an overall 80% decline in the concentration of total PAHs. Nutrient-assisted biodegradation was even faster than desorption, suggesting that native bacteria have "access" to some adsorbed molecules. The findings indicate that native bacteria in soil at this MGP site are poised to degrade the PAH compounds, but are nutrient limited. This offers a likely explanation for the decades-long persistence of PAHs at this, and possibly other MGP sites. The results also suggest that an effective strategy for bioremediation could consist simply of adding inorganic nutrients.

26. 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.

27. DISPERSAL OF CORN POLLEN IN THE ATMOSPHERE

D. Aylor and M. Boehm *Assisted by* P. Thiel and A. Chery
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 two aspects of the problem: 1) the effect of time differences between pollen production and silk growth on kernel production and 2) the effect of buffer rows on cross fertilization between two different color kernel varieties (Y = yellow and W = white) of corn. Time differences, which occur naturally because of variation in soil type in a field, were simulated by covering and uncovering silks at various times and at various stages of silk growth. The effect of buffer rows to reduce cross-pollination is being studied by planting differing numbers of Y and W corn varieties next to each other. At harvest, the number of yellow kernels on white-kernel ears will help us assess the effectiveness of buffer rows. Likewise, the number of kernels produced at various locations along a cob is correlated with the amount of pollen produced and with the weather conditions during the times when individual silks were uncovered and exposed to pollen. These data, in combination, will help determine levels of seed purity under various planting and weather conditions.

28. PHYTOREMEDIATION OF AGRICULTURAL SOILS CONTAMINATED WITH DDE
J.C. White, *Assisted* by A. Bridgewater
DDE is the main breakdown product of DDT and both compounds are persistent organic pollutants (POPs). Field experiments previously conducted to investigate the effect of common plants (rye, alfalfa, mustard, vetch, clover, spinach, squash, pumpkin, melon, cucumber) on the fate and behavior of weathered residues of DDE have indicated tremendous species variability in the accumulation of the pesticide residue from soil. Data have shown that certain species of summer squash may absorb large quantities of the pollutant into their roots and translocate it throughout their shoots. If certain plants can remove enough of the pollutant, phytoremediation, or plant-assisted cleanup of these residues, may be of practical use for field contaminated soils. This study will determine the optimum planting density for remediation; 1, 4, 8, or 16 plants per 290 kg of soil.

29. EXPERIMENT STATION ASSOCIATES
Information is available on this organization formed to help the Experiment Station.

30. 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]www.ctfarmland.org [2]www.workinglandsalliance.org

31. MOSQUITO TRAPPING AND TESTING FOR WEST NILE VIRUS
T. Andreadis and P. Armstrong *Assisted by* J. Shepard, M. Thomas, S. Finan, T. Cloherty, S. DeGennaro, O. DeMasi, D. Krause, L. Meany-Post, E. McClure, R. O'Neil, M. Nelson, C. Pioli, G. Piscitellli, and M. Torretta
Mosquito trapping and testing for West Nile virus (WNV) has been integral to the public health response to WNV in Connecticut. Trapping is conducted daily from June through October at 91 locations statewide. The objectives are to provide: 1) early evidence of local WNV activity; 2) information on the abundance, distribution, identity and infection rates of potential mosquito vectors and; 3) baseline data that are used to assess the threat of WNV to the public and guide the implementation of mosquito control measures. Since 1999, The Connecticut Agricultural Experiment Station has trapped and tested over one million mosquitoes. West Nile virus has been isolated from 17 species of mosquitoes and 5 species,

Culex pipiens, Culex salinarius, Culex restuans, Culiseta melanura, and *Aedes vexans* have been implicated as the most likely vectors of WNV in the region. The highest concentrations of WNV activity in Connecticut, including human cases, have been in densely populated residential communities in coastal Fairfield and New Haven Counties. We have observed a correlation both temporally and spatially between the isolation of WNV from field-collected mosquitoes and subsequent human cases in these locales, and the incidence of human cases has closely paralleled the number of virus isolations made from mosquitoes with both peaks occurring in early September. The highest risk of human infection with this virus extends from early August through the end of September in Connecticut.

32. VERIZON TELEPHONE TRANSMISSION SILO
Learn about the cellular transmission tower.

33. 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. Five varieties are repeated from last year, and there are five new varieties. We are comparing yields, disease resistance, and timing of harvest. Last year, Pineapple, Anna Russian, Giant Ponderosa, and Kellogg's Breakfast averaged greater than 22 lbs/plant.

34. CONNECTICUT WEEDS AND WILD PLANTS
T. Mervosh *Assisted by* K. Olszewski and D. Reiss
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.

35. PLANT HEALTH CARE FOR THE CONNECTICUT NURSERY AND LANDSCAPING INDUSTRIES
T. Abbey
Plant health care for ornamental plants is a management strategy that includes traditional integrated pest management (IPM) used in production nurseries, and also emphasizes proper plant selection, planting procedures, and plant maintenance (pruning, watering, etc.) in the landscape. Nurseries in Connecticut receive on-site assistance with development of IPM programs to improve pest management.

36. 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 soy 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 for home heating. Canola and soybean also have utility as plant fertilizers or as rotation crops used to control weeds and/or plant parasitic nematodes. In this plot, plants are being grown to evaluate adaptability to Connecticut soils, seed and oil yield and quality, and meal suitability as fertilizer.

37. SEROLOGIC EVIDENCE OF TULAREMIA IN CATS
L. Magnarelli, S. Levy (Durham Veterinary Hospital), and R. Koski (L^2 Diagnostics), *Assisted by* T. Mastrone
Serologic tests were conducted to determine if cats were exposed to the bacterial agent that causes tularemia. Of the 91 serum samples analyzed by microagglutination methods, 11 (12%) were positive. Analyses of the same sera by indirect fluorescent antibody staining methods revealed 22 (24%) positives. Cats living in widely separated areas of Connecticut were exposed to the pathogen that causes tularemia or a closely related agent. Although human cases of this disease are rare in the state, this tick-associated disease should be monitored. Cats may serve as important sentinel animals.

38. THE "DEER" TICK *IXODES SCAPULARIS*
K. Stafford *Assisted by* A. Bharadwaj, H. Stuber, J.P. Barsky, G. Dunford, L. Colligan, B. Ross, and F. Sansevero
The blacklegged tick or "deer" tick *Ixodes scapularis* transmits the agents of Lyme disease, babesiosis, and anaplasmosis (i.e. human granulocytic ehrlichiosis). Observe live and preserved ticks under the microscope. A new Tick Management Handbook is available.

39. USE OF A RODENT BAITBOX FOR THE CONTROL OF THE "DEER" TICK

K. Stafford *Assisted by* A. Bharadwaj, H. Stuber, J.P. Barsky, G. Dunford, L. Colligan, B. Ross, and F. Sansevero

Evaluation of the commercially available fipronil-based rodent bait box (Maxforce® TMS, Bayer ES), was continued in inland residential settings in Westport, Weston, Canaan, Cornwall, and Salisbury, Connecticut. In 2004, for example, mice and chipmunks visited 99% of the boxes in two Westport and Weston neighborhoods, resulting in a 99% reduction of ticks on these hosts and, in 2005, a 79% reduction in nymphal ticks at the treated homes in Westport.

40. 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 the "deer" tick *Ixodes scapularis* and could provide an alternative to synthetic chemicals in controlling ticks. Laboratory and field tests are being conducted with the fungus to determine field efficacy, optimum dosage, spore survival, and frequency of application. This information will assist in determining how the commercial products being developed will need to be applied for tick control.

41. INVASIVE AQUATIC PLANT PROGRAM: PROTECTING CONNECTICUT

G. Bugbee, R. Capers, K. Deeds, M. Marko, R. Selsky, C. Vossbrinck, and J. White *Assisted by* F. Beecher**,** A Bridgewater, D. Bridgewater, and E. Pysh

Aquatic plants are essential components of healthy freshwater ecosystems. Non-native plants, however, are often harmful because of their potential for explosive growth and ability to displace native species. Resulting declines in the aesthetic and recreational value of water bodies can adversely affect tourism and real estate values. Once established, invasive aquatic plants are difficult to remove. In cooperation with towns, lake associations and the CT Department of Environmental Protection, The Connecticut Agricultural Experiment Station is conducting research on methods for controlling invasive aquatic weeds. Priorities of the research are to find new ways to eliminate invasive aquatic plants while minimizing adverse effects on people and native ecosystems. Currently, experiments using herbicides, hydroraking and cutting are underway in Bashan Lake, East Haddam, Lake Quonnipaug, Guilford and Grannis Lake East Haven. Control experiments using biological control agents, including native insects and plant-eating fish, are proposed.

42. OVERABUNDANT WHITE-TAILED DEER AS SEED DISPERSAL AGENTS

S. Williams *Assisted by* G. Picard

We examined the role of suburban white-tailed deer (*Odocoileus virginianus*) in dispersal of plants in forests bordered by medium-density housing in southern Connecticut. Estimated deer density on the research site was 59 deer/ mile^2 with higher local densities along the suburban/woodland interface. From summer 2002 - fall 2005, 566 pellet piles were collected on site. All samples were vernalized at 5°C for 60 days. Pellet groups were placed in a growing medium in trays in a temperature controlled greenhouse for six months. Seeds germinated in 47% of samples, which included 11,087 seedlings of 75 different plant species. Seeds of 43 species germinated that were not native to Connecticut. We estimated that deer had the potential to disperse between 1800 - 2300 viable exotic seeds/ day/ mile^2 during our sampling period. Birds, small mammals, and abiotic factors are known important dispersal agents for exotic plants, some of which are invasive. Our results indicate that white-tailed deer are another important dispersal agent of exotic species. Thus, white-tailed deer may not only alter vegetation structure through direct browse damage of established plants, but also indirectly by lowering reproductive output of native plants and simultaneously distributing seeds of exotic species.

43. 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.

44. 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 un-amended 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 under 2/3 and 1/3 the normal rate of fertilization have been consistently greater than on un-amended plots with full fertilization.

45. THE NORTHEAST ORGANIC FARMING ASSOCIATION OF CONNECTICUT
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.

46. 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.

47. USDA, ANIMAL AND PLANT HEALTH INSPECTION SERVICE, PLANT PROTECTION AND QUARANTINE
E. Chamberlain, N. Campbell , and K. Aitkenhead
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.

48 CONNECTICUT INVASIVE PLANT WORKING GROUP (CIPWG)
D. Ellis and E. Corrigan, Co-Chairs
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).

49. USDA FARM SERVICE AGENCY
J. Breakell
The Mission of the Farm Service Agency is "to equitably serve all farmers, ranchers, and agricultural partners by delivering effective efficient agricultural programs for all Americans." As a major agency of the U.S. Department of Agriculture, FSA's mission supports the Department's broad goals. FSA's plan focuses on three major goals:

1. Supporting Productive Farms and Ranches – for producer security

2. Supporting Secure and Affordable Food and Fibre – for domestic consumers
3. Conserving Natural Resources and Enhancing the Environment – for all present and future generations

FSA delivers a variety of programs to support these goals through the following categories:

- Farm Loan Programs
- Income Support and Disaster Assistance Programs
- Conservation Programs
- Commodity Operations

The agency is located at 344 Merrow Road, Suite B, Tolland, CT 06084, and the phone number is 860-871-2944.

50. CONNECTICUT DEPARTMENT OF AGRICULTURE – MARKETING BUREAU
R. Olsen
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.

51. SOUTHWEST CONSERVATION DISTRICT
J. DeRisi
The Southwest Conservation District, located at 900 Northrop Road, Wallingford, Connecticut is a non-profit conservation agency established in 1946. The primary mission of the Southwest Conservation District is to supply technical assistance, information and education in natural resource conservation and management to agricultural cooperators, landowners and the municipalities in Southwest Connecticut. The Southwest Conservation District provides service Monday through Friday from 8:30 AM to 4:30 PM. Since we are in and out of the office, you are invited to call first (203-269-7509) to be sure someone is in. You can also visit our web site at: www.conservect.org.

52. 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.

53. CONNECTICUT TREE PROTECTIVE ASSOCIATION
R. Smith
The CTPA is a non-profit educational association made up of individuals who wish to advance the care of trees in Connecticut. The majority of CTPA's 700 members are licensed, practicing arborists, although the membership also includes tree wardens, scientists, educators and other tree workers.

54. THE CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF FORESTRY
C. Donnelly and R. Rocks
The CT DEP Division of Forestry provides a variety of services for the citizens of Connecticut. These include the management of about 170,000 acres of state-owned forest land (the State Forests), outreach to the owners of private forest land, the certification of forest practitioners, technical assistance on urban forestry issues and assistance in the monitoring of the overall health of Connecticut's forests. In attendance at Plant Science Day will be a service forester, responsible for outreach to the owners of private forest land, and an urban forester. These individuals will be on hand to answer questions, provide suggestions as to what individuals might do who wish to manage their trees or woodlots, and to provide an overview of the services provided by CT DEP Division of Forestry.

55. USDA FOREST SERVICE, NORTHEAST RESEARCH STATION
R. Nisley
The mission of the USDA Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations.

The USDA Forest Service commitment to land stewardship and public service is the framework within which natural resources are managed. Implicit in this statement is the agency's collaboration with partners and the public.

As the lead Federal agency in natural resource conservation, the USDA Forest Service provides leadership in the protection, management, and use of the Nation's forest, rangeland, and aquatic ecosystems. Our ecosystem approach to management

integrates ecological, economic, and social factors to maintain and enhance the quality of the environment to meet current and future needs. Through implementation of land and resource management plans, the agency ensures sustainable ecosystems by restoring and maintaining species diversity and ecological productivity that helps provide recreation, water, timber, minerals, fish, wildlife, wilderness, and aesthetic values for current and future generations of people.

Through technical and financial assistance, the USDA Forest Service assists States and private landowners in practicing good stewardship, promoting rural economic development, and improving the natural environment of cities and communities. The agency continues to develop and use the best available scientific information to facilitate achievement of our goals and objectives. Domestic and international activities are directed at developing values, products, and services in such a way as to maintain ecosystem health.

56. OLIN-YALE-BAYER NEW HAVEN PUBLIC SCHOOL SCIENCE FAIR PROGRAM/CPEP
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, science and English to pursue math, science or engineering based fields a the four-year university/college level.

57. CONNECTICUT NURSERY AND LANDSCAPE ASSOCIATION
B. Heffernan
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

58. CONNECTICUT GREENHOUSE GROWERS ASSOCIATION
B. Heffernan
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

59. CONNECTICUT GROUNDS KEEPERS ASSOCIATION
D. Tice
The Connecticut Grounds Keepers Association is a membership organization for Connecticut landscaping and groundskeeping professionals and affiliates. http://www.cgka.org

60. GIRL SCOUT EXHIBIT
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. NATIVE WOODY SHRUBS
J. S. Ward
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.

62. 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 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.

63. 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.

64. 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 seed 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.

65. CHESTNUT SPECIES AND HYBRIDS
S. Anagnostakis *Assisted by* P. Sletten, and R. Rawle
These trees are part of the large collection of species and hybrids of chestnut maintained by The 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 number 16. 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.

66. 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 number 16. CONTROL OF BLIGHT ON AMERICAN CHESTNUTS plot), and it looks slightly better than the south plot.

67. DWARF HYBRID CHESTNUT TREES
S. Anagnostakis *Assisted by* P. Sletten, and R. Rawle
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.

68. 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.

69. DISPERSAL OF SPORES IN A SOYBEAN CROP
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.

70. USE OF EARTHWORM TO SUPPRESS FUSARIUM WILT OF TOMATO
W. Elmer and F. Ferrandino *Assisted by* J. Bravo and A. Chery
Most commonly grown tomato varieties are resistant to the old races of the fungus that cause Fusarium wilt. However, new races of the fungus can emerge and threaten new varieties as well as the old ones. Earthworm activity has been shown to suppress Fusarium wilt in greenhouse trials. These plots were planted with two varieties of tomatoes, one resistant and one susceptible. We will determine the impact of the adding earthworm on disease, yield and growth. The plastic liners are to prevent migration of the earthworms.

71. INDUCING FUSARIUM DISEASE RESITANCE IN GLADIOLUS
W. Elmer *Assisted by* J. Bravo and A. Chery
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 call Actigard that induces plants to become disease resistant. These plots were designed to determine what concentration provides the optimal suppression. In 2004, 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.

72. 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. Our program operates on a twelve month calendar. Today, you see an example of students growing, caring, and eating fresh vegetables from their garden which they have taken care of this summer. These students are from our "Youth to Work" Program; where they develop work based skills under the direct supervision and instruction of a Vocational Agriculture Teacher. The Sound School Agricultural Science Program, 17 Sea Street, New Haven, CT 06519, telephone number 203-946-6937. http://soundschool.com/

73. 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 number 16. CONTROL OF BLIGHT ON AMERICAN CHESTNUTS plot) to keep them alive.

74. PINOT GRIS CULTURAL TRIALS: WINE GRAPE CULTIVAR AND CLONE EVALUATION
W. Nail *Assisted by* C. Maxwell
A new planting of Pinot Gris was established in 2004, and will be used for cultural experiments beginning in 2007. The vines are on two different rootstocks, C.3309 and 101-14, which will be compared for yield, time of ripening, and winter hardiness.

75. 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. Since colonial times, people have collected wild fruit to make preserves and jelly. 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 their third growing season, seedlings from Cape Henlopen State Park, Delaware, averaged the greatest growth (21.2 inches) at Lockwood Farm while seedlings from Delaware Seashore State Park averaged 20.3

inches. There was no production due to severe deer browse. At Windsor, 44% of the New Hampshire cultivar plants and 15% of the cultivar Ocean Side produced over 6 pounds/plant.

76. PAWPAW AND 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 and 4 cultivars of pawpaws. At Windsor, the greatest yields in 2005 were from Shiro (129 lbs/tree) and Friar (122 lbs/tree). Beauty and Obilnaja averaged 64 lbs/tree. Production at Mt. Carmel has been delayed due to heavy deer browse.

77. WHITE BIRCH RESEARCH ORCHARD

C. Rutledge *Assisted by* C. Hayes and S. Hicks

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 spring 2005 with the kind donations of 5 Connecticut Nurseries; Millane Nurseries, Inc. in Cromwell, Young's Nurseries, Inc. in Wilton, Planters' Choice in Newtown, 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 131 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. Besides Lockwood Farm, its outdoor laboratory in Hamden, the Station also has a research farm and laboratory 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. The Station also analyzes fresh fruits and vegetables for excess pesticide residues, tests fertilizers and animal feeds for compliance with label claims, and tests a wide variety of foods as 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.

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

VALLEY LABORATORY
153 Cook Hill Road; Windsor, CT 06095

LOCKWOOD FARM
890 Evergreen Avenue; Hamden, CT 06518

THE STATION'S WEB PAGE AT: WWW.CAES.STATE.CT.US