

# The Connecticut Agricultural Experiment Station

## *At a Glance*

**LOUIS A. MAGNARELLI, Director**

**Kirby C. Stafford, III, Vice Director**

**Established – 1875**

**Statutory authority – CGS 22-79 – 22-118**

**Central office – 123 Huntington Street,  
New Haven, CT 06511**

**Number of employees – 91**

**Recurring operating expenses -**

**General Fund – \$6,872,996**

**Federal Funds – \$3,129,814**

**Other - \$1,223,407**

**Total – \$11,226,217**

**Organizational structure – Administration, Analytical Chemistry, Biochemistry & Genetics, Entomology, Environmental Sciences, Forestry & Horticulture, Plant Pathology & Ecology, Valley Laboratory (Windsor, CT), Griswold Research Center (Griswold, CT).**

## **Mission**

*The mission of The Connecticut Agricultural Experiment Station is to develop, advance, and disseminate scientific knowledge, improve agricultural productivity and environmental quality, protect plants, and enhance human health and well-being through research for the benefit of Connecticut residents and the nation. Seeking solutions across a variety of disciplines for the benefit of urban, suburban, and rural communities, Station scientists remain committed to “Putting Science to Work for Society”, a motto as relevant today as it was at our founding in 1875.*

## **Statutory Responsibility**

Statutory responsibilities for The Connecticut Agricultural Experiment Station (CAES) focus on insects, ticks, plants and related diseases, and the development of methods to reduce pesticide use (i.e., integrated pest management). Field and laboratory studies are conducted, as determined by the agency’s Board of Control, state residents (eg., growers), or as requested by the General Assembly, pursuant to Connecticut General Statute (CGS Section 22-81). Scientists and technicians analyze food and other items at the request of any state agency; test ticks for the Lyme disease agent upon request of a state or municipal health officer or for scientific research

purposes; test mosquitoes for encephalitis viruses; oversee official control, suppression or extermination of insects or diseases, which are or threaten to become serious pests of plants; conduct research on integrated pest management (CGS Section 22-84a); inspect for diseases of honey bees and register beekeepers (CGS Sections 22-89, 22-90); and survey towns for gypsy moths, Asian longhorned beetles, Emerald ash borers, and other insect pests of economic or public health importance. The Director is in charge of all matters pertaining to serious pests of plants and has regulatory authority (CGS Sections 22-84); responsibilities include the inspection and certification of nurseries, the registration of dealers of nursery stock, and enforcement of federal and state quarantines or regulations. Findings are reported to the public and scientific community by correspondence, lectures, media interviews, the agency's website, or published works. Emphasis is placed on submitting scientific manuscripts to peer-reviewed journals.

Station staff members provide prompt answers to routine and difficult but important agricultural, food safety, forestry, environmental, consumer protection, or public health questions by performing analyses; providing services to state residents; assisting small and large businesses, municipalities, state agencies and the scientific community; and by giving oral and written reports of research findings. Transferring new scientific information to the public and businesses is a high priority. The enhanced agency website ([WWW.CT.GOV/CAES](http://WWW.CT.GOV/CAES)) continues to be an efficient means of communicating results and reducing operating costs. There were about 2,686,464 page views during this reporting period. This total is more than double the figure (1,113,099) reported last year. The average visit duration was about 10 minutes. Staff members gave more than 800 talks and interviews to civic groups and the media. Two open house events were held during the spring and summer to give state residents an opportunity to meet scientists, hear presentations on scientific progress, see experimental plots and laboratories, and to make comment on research and outreach programs.

## **Public Service**

Public service remains a high priority. The CAES serves a diverse group of state residents, large and small businesses, municipalities, and the scientific community within its areas of expertise. More than 48,000 jobs in agriculture, wood-products industry, and other business sectors are supported by the services provided by CAES staff members. People bring or mail samples or call with questions to the New Haven or Windsor facilities. Extensive contacts with state residents are particularly important for the early detection of emerging insect or plant disease problems. Global marketing of plants and plant products increase the chances for the introduction of invasive pests, such as the Asian longhorned beetle and Emerald ash borer. In October 2011, a fungus (*Cylindrocladium pseudonaviculatum*), previously unknown in North America, was discovered infecting boxwood plants in Connecticut. On July 16, 2012, the Emerald ash borer was detected in the Town of Prospect. Subsequently, this destructive tree pest was found in Naugatuck, Bethany, and Beacon Falls. A state quarantine was declared for all of New Haven County, effective August 9, 2012. State regulations control the movement of wood and other regulated articles. More than 20,000 state residents received direct assistance from staff members at the CAES during the past year. Station scientists also visit farms when difficult or unique problems arise and provide information to growers and the media when asked. In addition, scientists served on advisory boards and provided information to about 110 stakeholder organizations. Employees of other state agencies, such as the Departments of Agriculture, Consumer Protection, and Energy and Environmental Protection, also requested help from Station staff members when they sent specific samples for chemical, biological or microscopic

analyses. All of these activities helped identify emerging problems, facilitated prompt and accurate responses to state residents, and ensured safe foods and other products. Receiving comments from citizens on evaluation or survey forms at public workshops, open house events, and other agency functions helps administrators gauge the effectiveness of research programs and services and provides opportunities to realign program goals. In addition, there is an annual assessment of whether or not objectives listed in the agency's 5-year strategic plan are being achieved. This strategic plan and accomplishment reports are requirements for USDA funds. Both documents are reviewed annually by federal officials.

New testing procedures are developed as needed to improve analyses, particularly when samples require more sensitive and specific methods. Scientific research at the CAES involves identifying a problem, investigating existing published knowledge, and designing experiments which will provide new information to help solve a problem, enhance Connecticut's economy, or improve the well-being of state residents. In many instances, scientific results have impacts nationally.

Specific examples include the following:

- **Food Safety:** Connecticut General Statute [Sec. 22-81(c)] directs the CAES to conduct analyses as required by any state agency. In addition, CAES chemists work closely with the US Food and Drug Administration (FDA) in the Food Emergency Response Network and the US Environmental Protection Agency. The CAES has a 5-year, \$2 million grant from the FDA. During this reporting period, there was a joint pilot program conducted by the CAES and the CT Department of Health to test foods for chemicals and microbials. Kale was contaminated with the microorganism *Listeria monocytogenes*. Other analyses revealed chemical contamination of watermelon, alfalfa, and kale with excessive residues of acephate (insecticide), atrazine (herbicide), and linuron (herbicide), respectively. The kale was recalled nationally. With increased commerce from foreign countries and more emphasis on large-scale food processing domestically, there is potential for foods, beverages, and other consumer products to be contaminated with toxic chemicals, such as pesticide residues, melamine, cadmium, or lead. Chemists at the CAES continue to assist the 14<sup>th</sup> Connecticut National Guard Civil Support Team and the Federal Bureau of Investigation as a part of the counter-terrorism program on toxic chemicals.
- **Mosquitoes:** *Culex pipiens* transmits the West Nile virus to birds and is instrumental in amplifying the virus in nature. Catch basins are an important habitat for the development of larval mosquitoes. Field tests on biological controls (*Bacillus* species that are specific for this mosquito) effectively reduced larval *Culex pipiens* in catch basins. Public health sanitarians are now using biological controls rather than chemical methods. In other studies, genetic analyses for *Culex pipiens* revealed that the species is actually a complex of closely related subspecies that have different feeding preferences for hosts. *Culex pipiens pipiens*, which occurs in Connecticut, feeds primarily on birds, whereas *Culex pipiens quinquefasciatus* in southern United States feeds on mammalian and avian hosts. It is likely that these subspecies play different roles in encephalitis virus transmission.
- **Control of Invasive Aquatic Plants:** CGS Section 22-81(c) directs the CAES to perform experiments on plants. Members of lake associations have reported extensive growths of aquatic weeds and have asked for CAES assistance in improving water quality. Explosive growth of aquatic weeds can reduce public access to water, restrict boat navigation, increase harmful sedimentation and eutrofication processes, and negatively alter wildlife habitats. Extensive growths of Eurasian water-milfoil (*Myriophyllum spicatum*) can significantly

reduce water quality and alter wildlife habitats. Candlewood Lake, the largest body of fresh water in Connecticut and an important source of hydro-electric power, is infested with this invasive plant. Water levels in the lake were dropped in varying amounts in an effort to reduce the plant population. A 10-foot drawdown was ineffective. It was concluded that the timing of water drainage is crucial in maintaining sufficient water supply, while still controlling the weed. The maximum depth of water drawdown must be carefully timed with onset of shoreline water freezing.

- **Integrated Pest Management:** Mile-a-minute vine (*Persicaria perfoliatum*), a fast-growing invasive plant, has been found at several locations in southern Connecticut. An introduced weevil, *Rhinoncomimus latipes*, which is native to China, was released at selected sites to assess biological control. The weevils have survived two years, reproduced, and are controlling the invasive plant. Dispersal of the weevil has been documented to be at least 0.5 miles from the original release site. The weevil shows promise in pest management programs.

### **Improvements/Achievements 2011-12**

New statutory authority (CGS 22-82a) permits the CAES to seek patents, trademarks, and licensing agreements. Papers have been filed to patent a new cultivar of strawberry and to eventually use portions of the royalties for operating costs and reinvesting into the crop research programs. An application also has been filed to protect a new method of controlling bed bugs.

Efforts have been made to reduce energy and other operating costs of the agency. Electricity and heating costs of \$602,220 comprise about 70% of the operating budget at the CAES. Motion light sensors were installed in laboratories and offices and agency personnel took advantage of the Governor's Lead by Example Energy Grant Program to reduce costs. There were realized annual savings of about \$15,000 associated with the motion light sensors. With new grant funding of \$280,862, energy efficient windows will be installed in buildings and two oil-fueled furnace burners will be converted to use natural gas. These changes are expected to save another \$80,000 annually. In addition, the website at CAES has been enhanced to improve public accessibility to new scientific information. Facebook, Twitter, You Tube, and Wikipedia have been recently added. The estimated annual savings in lowered publication and mailing costs for the agency is \$15,000.

In October 2011, plant pathologists at the CAES examined diseased boxwood plants and confirmed that a fungus, previously unknown in North America, was causing mortality. Boxwood is an economically important nursery crop and a popular ornamental plant in landscapes. The fungus (*Cylindrocladium pseudonaviculatum*) occurs in Western Europe and New Zealand. Several hundred thousand infected plants have since been found in 9 other states and two Canadian provinces. Diseased plants in Connecticut nurseries and garden centers have been disposed of by burial or incineration based on guidance and Connecticut General Statutes 22-84 and 22-98. On June 29, 2012, CAES plant pathologists confirmed that the boxwood blight fungus infested an established planting of pachysandra, a common groundcover plant, in Fairfield County, Connecticut. With input from the nursery industry, personnel at the CAES responded to these problems by developing guidelines on best management practices concerning boxwood blight for landscapers, commercial plant producers, and homeowners. These documents and basic information on the fungus (including pictures of infected plants) are posted on the CAES website ([www.ct.gov/caes](http://www.ct.gov/caes)).

The CAES reaffirms its continuing policy of commitment to affirmative action and equal opportunity employment as immediate and necessary objectives and relies solely on merit and accomplishment in all aspects of the employment process and research programs. One Hispanic male was hired as a Postdoctoral Research Scientist. Ten minority seasonal research assistants (college students) were also employed along with 20 white males and 26 white females during the summer as a part of a mentoring program. The student intern program, designed to teach scientific methods in brief periods, was continued to include 22 persons. The goals of mentoring programs are to promote interest in science and provide specialized training. Station scientists also participated as judges in science fairs in New Haven and encouraged high school students to further their science education. The CAES continues to comply with diversity training requirements and is also participating in the University of Connecticut's Employee Assistance Program. The agency's goals in awarding contracts to small businesses and minority business enterprises were exceeded. The agency's Affirmative Action Plan was filed on schedule and approved by the Commission on Human Rights and Opportunities.

### **Information Reported as Required by State Statute**

Scientists and technicians performed chemical, seed, soil, fertilizer, pesticide, animal feed, mosquito, and tick tests; answered inquiries; conducted plant, nursery, and bee inspections; and surveyed for the gypsy moth and other insect pests as listed below.

<b>Service or Test Number</b>	<b>2011-2012</b>
Inquiries answered (all departments)	20,318
Field visits and diagnostic tests	1,827
<b>Soil Tests completed</b>	
New Haven and Windsor	11,924
<b>Samples Tested</b>	
Department of Agriculture	364
Department of Consumer Protection (DCP)	29
Department of Energy & Environmental Protection	6
CAES Departments	445
Municipal Health Departments, Police, Nonprofits	31
UConn Cooperative Extension	26
Seed Samples Tested (vegetable, lawn, field crop)	360
Plant Samples Tested (incl. more tests for DCP)	3,347
<b>Nursery and Seed Inspections</b>	
Greenhouse plants	3,629
Nursery stock containers and bare root	247,708
Perennial plants	4,587
Nurseries inspected	311
Nursery inspections	721
Tobacco (bales, boxes, bundles, and cartons)	144,939
Permits to move homeowner plants out of state	6
Seed (cartons and bags)	314
Acres of nursery stock inspected	7,925

**Gypsy Moth Survey**

Forest acres surveyed for gypsy moth by air 1.8 million

**Bee Inspection**

Beekeepers registered 955

Beehives examined for mites and foulbrood 561

**Tick Identification and Testing**

Ticks identified 2,837

Ticks tested for Lyme disease spirochetes 1,289

Ticks infected with spirochetes 250 (19.3%)

**Mosquito Testing**

Mosquitoes trapped, identified, and tested for EEE,  
West Nile, and other encephalitis viruses 331,806

Number of trapping sites 91