

PLAN OF WORK

NEW HAMPSHIRE AGRICULTURAL EXPERIMENT STATION

**COLLEGE OF LIFE SCIENCES AND
AGRICULTURE**

**UNIVERSITY OF NEW HAMPSHIRE
DURHAM, NEW HAMPSHIRE**

Federal Fiscal Years 2005 through 2006

**NEW HAMPSHIRE AGRICULTURAL EXPERIMENT STATION
PLAN OF WORK
for Fiscal Year 2005 - 2006**

INTRODUCTION

The New Hampshire Agricultural Experiment Station (NH-AES) resides within the University of New Hampshire College of Life Sciences and Agriculture. It has the responsibility for the Hatch, McIntire-Stennis, Animal Health, and Multi-State Research Programs. This report of accomplishments does not include New Hampshire Cooperative Extension, which is a separate administrative unit in New Hampshire. However, there is effective coordination of appropriate programs between both units. Through the NH-AES Advisory Committee representing key stakeholder groups, we are working to facilitate constituent input and to improve our delivery of research findings.

By reference the New Hampshire AES adopts the Northeast Experiment Station Directors plan for the Multi-State Research Program for fulfilling our responsibility for multi-state, multi-disciplinary, and integrated activities.

I. Planned Programs

Goal 1: An Agricultural System that is Highly Competitive in the Global Economy

Issue

Provide both basic and applied research to support increased knowledge to improve production, marketing and processing of American agriculture.

Performance Goals

Output Indicator

increased basic and applied projects related to New Hampshire agricultural needs

Outcome Indicators

increase in agricultural production in New Hampshire
growth in income to New Hampshire farm operations

Key Program Components

genomic basis for resistance to avian diseases*
improve supply of nutrients to dairy cows#
predicting bovine fertility*
improving nutrition for dairy calves*
characterizing avian tumor viruses*
molecular basis for retina functioning
role of ethylene in signal transduction in plants
genetic transposition in soil nematodes
genetics and breeding of Cucurbita*
nitrogen release from land application of soil amendments #

epidemiology and control of apple scab
methods to increase growth seasons for plants
inhibition of photosynthesis by UV-radiation
genetic control of strawberry flowering
genetic and molecular control of carrot embryogenesis
evaluation of new apple cultivars*#
reproductive performance of brown algae
calcium control of plant enzyme activity
strawberry production in modified environments#
conservation of plant genetic resources*
relationship of nitrogen fixation and oxygen deficit in plant roots
pesticide impact assessment*#
lobster habitats and survival
causes of soft shell clam decline
genetic improvement of tilapia for aquaculture
increased efficiency of producing sea urchin roe
genetic mapping of aquaculture species*
Control of pigment production of summer flounder
impact of fouling species on oyster populations
hormonal; control of beetle reproduction and rearing characteristics
management of arthropod pests of livestock and poultry*

Internal and External Linkages

* Identifies projects under this goal that are multi-disciplinary, multi-institutional and/or multi-state projects. # Identifies integrated activity projects.

Targeted Audience

We are focused on small farming, forestry, and aquaculture activities normally found in New Hampshire.

Program Duration

The research projects that contribute to this goal are generally of three to five years duration. All projects are targeted for mid and long term problems.

In fiscal year 2003 the New Hampshire Agricultural Experiment Station had 9.6 full time equivalents of scientists time assigned to Goal 1. Their research was funded with \$631,727 of federal funds from the Hatch, MacIntire-Stennis, and Multi-State Research Programs and State appropriations of \$1,348,526. There were 5.0 full-time equivalents of technical staff attached to these projects. Professional help doing research on these projects amounted to 7.7 FTEs. For this goal, as well as all subsequent goals, there are matching funds from the State of New

Hampshire through a budget line within the University of New Hampshire's budget. It is not anticipated that small changes in federal funding in the next five years would significantly alter the spectrum of key program components for Goal 1.

During FY 05 and 06, it is anticipated that expenditures in Goal 1 will increase by 3% from state funds with no increase from federal funds.

Goal 2: A Safe and Secure Food and Fiber System

Issue Foods are in constant threat of contamination by microorganisms. The agricultural system has a responsibility to insure that the foods produced are safe to eat

Performance Goals

Output Indicator

increased research results from projects dealing with microorganisms that are potential harmful contaminants of foods.

Increased understanding of the processes whereby harmful microbes carry out their infective processes

Assess the impact of pathogenic bacteria on humans, animals and the environment

Outcome Indicators

a decrease in the bacterial contamination of foods

increase in successful treatment of individuals who are exposed to microorganisms

a reduction of bacterial illness

Key Program Components

role of bacterial genes in diseases

factors affecting *Listeria* virulence

host defenses against *Salmonella*

Internal and External Linkages

* Identifies projects under this goal that are multi-disciplinary, multi-institutional and/or multi-state projects. # Identifies integrated activity projects.

Targeted Audience

Although applicable to New Hampshire residents, in fact the output of this research serves all consumers.

Program Duration

All projects (3) are for a three to five year period. All projects are targeted for mid and long term problems.

In fiscal year 2003 the New Hampshire Agricultural Experiment Station had 0.9 full time equivalents of scientists time assigned to Goal 2. Their research was funded with \$67482 of federal funds from the Hatch, MacIntire-Stennis, and Multi-State Research Programs, and State appropriations of \$148,616. There were 0.9 full-time equivalents of technical staff attached to these projects. Professional help doing research on these projects amounted to 0.8 students. For this goal, as well as all subsequent goals, there are matching funds from the State of New Hampshire through a budget line within the University of New Hampshire's budget. It is not anticipated that small changes in federal funding in the next five years would significantly alter the spectrum of key program components for Goal 2.

During FY 05 and 06, it is anticipated that expenditures in Goal 2 will increase by 3% from state funds with no increase from federal funds.

Goal 3: A Healthy, Well-Nourished Population

Issue The reasons people eat particular foods are complex and the foods that are included in a diet have short-term and long-term health consequences. Knowledge of food-consumption patterns and the results of those choices are needed.

Performance Goals

Output Indicator

increased research results from projects dealing with why particular foods that make up a diet are chosen.

Increased research results detailing the short and long term consequences of food consumption patterns on health issues.

Outcome Indicators

Healthier food choices resulting in a better balanced diet for consumers.

Fewer incidences of disease or disorders directly related to improper diet choices.

Key Program Components

hormonal control of fat oxidation in adipose tissue

control of adipose tissue metabolism

assessing the nutritional risk of the elderly*#

gender relationship to atherogenesis

functional properties of food proteins*

Internal and External Linkages

* Identifies projects under this goal that are multi-disciplinary, multi-institutional and/or multi-state projects. # Identifies integrated activity projects.

Targeted Audience

The projects within this goal yield results of value to all consumers including those of

New Hampshire.

Program Duration

The research projects that contribute to this goal are generally of three to five years duration. All projects are targeted for mid and long term problems.

In fiscal year 2003 the New Hampshire Agricultural Experiment Station had 3.1 full time equivalents of scientists time assigned to Goal 3. Their research was funded with \$210,824 of federal funds from the Hatch, MacIntire-Stennis, and Multi-State Research Programs and State appropriations of \$525,467. There were 3.1 full-time equivalents of technical staff attached to these projects. Professional and technical doing research on these projects amounted to 3.7 FTEs. For this goal, as well as all subsequent goals, there are matching funds from the State of New Hampshire through a budget line within the University of New Hampshire's budget. It is not anticipated that any change in federal funding in the next five years would significantly alter the spectrum of key program components for Goal 3.

During FY 05 and 06, it is anticipated that expenditures in Goal 3 will increase by 3% from state funds with no increase from federal funds.

Goal 4: An Agricultural system that Protects Natural Resources and the Environment

Issue Agriculture is a human activity and as such goes on within a larger environment. Agriculture and forestry activity can have major impacts on soil and water and land ecology and its environment because of their direct links to soil, water, air, and biological resources.

Performance Goals

Output Indicator

Research activity that deals with the problems associated with agricultural and forestry practices as related to the environment.

Outcome Indicators

An agricultural and forestry industry that causes minimal changes and produces very minor alterations to the environment yet is productive.

Key Program Components

- endocrine control of reproduction in lamprey eel
- genetic diversity of northeastern conifer species
- developing genetic systems for Frankia
- distribution of algae in the Great Bay estuary
- national atmospheric deposition program*
- white-tail deer and wild turkey energetics
- models of gypsy moth infestations
- herbivore foraging and forest diversity
- organic matter supply effects on forest soils
- nutrient dynamics and forest succession
- NH forest ecological reserves*

soil quality and forest stress related to radium availability
genetic control of stress response of trees
horticultural plant growth in soil-less media
engineering greenhouses for horticultural plant growth*#
role of fungi in forest floor nutrient availability
forest management and plant biodiversity
benefit and cost of natural resource planning*
detection of cyanobacteria in water supplies
predicting range expansion in the Gulf of Maine for introduced species
small mammal populations and forests

Internal and External Linkages

* Identifies projects under this goal that are multi-disciplinary, multi-institutional and/or multi-state projects. # Identifies integrated activity projects.

Targeted Audience

The natural resource base and the environment of New Hampshire are the focus of this goal. However, many findings will be applicable to other regions/states in the U.S.

Program Duration

The research projects that contribute to this goal are generally of three to five years duration. All projects are targeted for mid and long term problems.

In fiscal year 2003 the New Hampshire Agricultural Experiment Station had 9.4 full time equivalents of scientists time assigned to Goal 4. Their research was funded with \$630,759 of federal funds from the Hatch, MacIntire-Stennis, and Multi-State Research Programs and State appropriations of \$1,206,682. Professional help doing research on these projects amounted to 8.5 FTEs. For this goal, as well as all subsequent goals, there are matching funds from the State of New Hampshire through a budget line within the University of New Hampshire's budget. It is not anticipated that small changes in federal funding in the next five years would significantly alter the spectrum of key program components for Goal 4.

During FY 05 and 06, it is anticipated that expenditures in Goal 4 will increase by 3% from state funds with no increase from federal funds.

Goal 5: Enhanced Economic Opportunity and Quality of Life for Americans

Issue

Research is necessary to help people improve their economic status in order to improve their perceived quality of life.

Performance Goals

Output Indicator

Increased applied and basic research to define the issues that improve quality of life, determine the expense, and to improve the chances that rural communities can provide these

opportunities.

Outcome Indicators

More rural communities capable of providing employment opportunities to their residents.

Rural communities better able to adjust and adapt to structural changes in agriculture and forestry so that they remain viable and exciting places for families to reside in.

Key Program Components

private industry and the log export market for the northeast*#

GIS satellite mapping and accuracy issues

rural economic development alternatives in the northeast*

Public policies and food system performance*#

benefits and costs in natural resource planning*

economic considerations for municipal solid waste disposal

welfare reform and the well-being of rural low-income families*#

Internal and External Linkages

* Identifies projects under this goal that are multi-disciplinary, multi-institutional and/or multi-state projects. # Identifies integrated activity projects.

Targeted Audience

Rural communities of New Hampshire are the major benefactors of this research.

Program Duration

The research projects that contribute to this goal are generally of three to five years duration. All projects are targeted for mid and long term problems.

In fiscal year 2003 the New Hampshire Agricultural Experiment Station had 2.1 full time equivalents of scientists time assigned to Goal 5. Their research was funded with \$158,754 of federal funds from the Hatch, MacIntire-Stennis, and Multi-State Research Programs and State appropriations of \$310,247. Professional help doing research on these projects amounted to 1.8 FTEs. For this goal, as well as all subsequent goals, there are matching funds from the State of New Hampshire through a budget line within the University of New Hampshire's budget. It is not anticipated that any change in federal funding in the next five years would significantly alter the spectrum of key program components for Goal 5.

During FY 05 and 06, it is anticipated that expenditures in Goal 5 will increase by 3% from state funds with no increase from federal funds.

II Stakeholders Input

The N. H. Agricultural Experiment Station has developed an Advisory Committee, **representing a diverse group of stakeholders**. The group will meet about twice per year to exchange ideas for increasing this station's effectiveness in serving stakeholders and the citizens of our state. The station welcomes stakeholder input through this committee as well as individually. The Advisory Committee is comprised of

the following members:

David Babson

N. H. State Representative

Bill Berndtson

UNH Animal Sciences

Bruce Clement

UNH Cooperative Extension

Deanna Howard

Dartmouth-Hitchcock Medical Center

Barry Kelley

Forest industry

Peter Lamb

New Hampshire Charitable Foundation

John McLean

UNH Farm Manager

Anne Sprague

Edgewater Farm

Edith Tucker

The Coos County Democrat

Nancy Berliner

N. H. Rural Development Council

Hal Bodwell

Dairy producer

Sharon Francis

Connecticut River Joint Commission

Jeff Huntington

Pleasant View Gardens

Tom Kelly

UNH Sustainability Program

Jeanie McIntyre

Upper Valley Land Trust

Dean Moreau

Yankee Farm Credit

Chris Streeter

Blue Seal Feeds

N. H. CARET representative

Other efforts to reach and interact with a cross-section of stakeholders will include the following:

1. Two publications targeted largely to stakeholders have been produced and each sent to an audience of approximately 10,000 per issue. Twice yearly issues of "INSIGHTS" address events, people and contributions from the College of Life Sciences and Agriculture (COLSA) and the NH AES. Separate issues of "Research Highlights" will emphasize the contributions and impacts of research sponsored by the NH AES and COLSA. Constituent reaction to these NH AES publications is encouraged.
2. The Research Advisory Committee will continue to assist the Agricultural Experiment Station administration in AES proposal reviews and to recommend research areas of State and regional importance for particular AES focus.
3. The NH AES Director continues engagement with the State of NH Agricultural Advisory committee to inform them of NH AES activities and to request input.

4. The NH AES Director serves on the NH Current Use Board, attended community fact-finding meetings and serves on the State Conservation committee to obtain stakeholder input.
5. The NH AES has been a participant in several State Fairs as well as the NH Farm and Forest Exposition. These activities facilitate direct stakeholder input.
6. The NH AES Director attends meetings with NH Vegetable Growers, the Farm Bureau, and representatives of the NH Horticulture Association.
7. Representatives of the NH AES will visit NH farms, orchards, greenhouses and extension twilight meetings to speak directly with constituents.
8. The Director attends the annual N.H. Farm Bureau meeting and the Farm and Forest Exposition.

III Merit and Peer Review

The New Hampshire Agricultural Experiment Station has had a peer review process for projects for over twenty years. The proposal-process applies to all Goals and is as follows.

Each August a letter is sent to faculty in the College of Life Sciences and Agriculture and to Deans of other Colleges that there will be a competition for Hatch and MacIntire-Stennis funds. Faculty must submit a one page description of the project they are interested in performing. They meet with the Director to discuss the project and a decision is made as to whether this can be supported with either of these two funds, i.e., does it fit within the guidelines for them. If so, the faculty member develops a full proposal using the CSREES/USDA format. Faculty must also suggest five or six potential external (non-UNH) peer reviewers. From this list the Director obtains two anonymous reviews. These reviews are given to the faculty member and they have the opportunity to revise the proposal or rebut the reviewers comments if they wish. The next step in the review process is an evaluation of priority for funding projects. An internal committee of four or five faculty members, each experienced in research, conduct the review. They review all proposals, the external reviewer's evaluations, progress reports and the faculty member's response. From this they make a recommendation for priority for funding. The Director uses this recommendation and his own evaluation to make the final decision as to which projects will be funded with Experiment Station funds. Usually about 75% of the proposals submitted are forwarded to CSREES/USDA for their approval for funding. We will continue this process in New Hampshire, however, we will modify it to utilize the results of stakeholders input. When the call for proposals is sent out each year we will include a listing of the areas of concern of stakeholders, as a means of encouraging research project submission related to these problems. During FY 05 and 06 we expect to migrate more AES resources to the support of multi-investigator projects (from single investigator projects) that are focused to specific theme areas.

IV Multi-Institutional, Multi-Disciplinary, Multi-State, and Integrated Activities

From the table of integrated projects below, one may see that the NH AES spent at least \$363,482 of a combined Federal allocation for Hatch and Multistate of \$ 1,366,688. This represents a 26.6% integrated portfolio, in excess of the 20% agreed to in FY 2000. Pertinent information is included in the table below.

Integrated Projects

Name	Project Number	Project description	FY 2003
Loy J. Brent	H-074	Genetics, breeding and physiology of yield in cucurbits	Federal \$ 16,279
	H-387	Conservation and utilization of plant genetic resources	Federal \$ 13,868
Lord William	H-375	Multidisciplinary evaluation of new apple cultivars	Federal \$ 7,568
	H-436	Intensive Management systems for small fruits in New Hampshire	Federal \$ 23,269
Fisher Paul	H-394	Quantifying pH and plant nutrition relationships in soilless media	Federal \$ 12,223
	H-396	Decision support for design and control of plant growth systems	Federal \$ 8,946
Knight Suzann	H-402	Rural low-income families: tracking their well-being and functioning in the context of welfare reform	Federal \$ 10,100
Neal Cathy	H-413	Nutrient management for production and maintenance of ornamental plants	Federal \$ 11,715
Margolin Aaron	H-414	Application of sewage biosolids to agricultural soils in the Northeast: Long-term impacts and beneficial uses	Federal \$ 9,297
	H-441	Evaluation of adenovirus and astrovirus persistence in Class B limed sludge	Federal \$ 14,796
McDowell William	H-415	Application of sewage biosolids to agricultural soils in the Northeast: Long-term impacts and beneficial uses	Federal \$ 12,987
Stephan Seiter	H-419	Nutrient management on organic farms	Federal \$ 15,290
Giraud Kelly	H-442	Rural communities, rural labor markets and public policy	Federal \$ 10,222
	H-443	Benefits and costs of natural resources policies affecting public and private lands	Federal \$ 14,555
Schwab Charles	H-447	Metabolic relationships in supply of nutrients for lactating cows	Federal \$ 27,557
	H-448	Management systems to improve the economic and environmental sustainability of dairy enterprises	Federal \$ 25,529
Morris Douglas	H-449	Rural communities, rural labor markets and public policy	Federal \$ 19,341
Erickson Peter	H-450	Management systems to improve the economic and environmental sustainability of dairy enterprises	Federal \$ 20,933

Alberto Manalo	H-452	Rural communities, rural labor markets and public policy	Federal \$	26,560
Trumble, William		Director, NH-AES	Federal \$	52,698
Assessments				\$ 9,749
TOTAL				\$ 363,482

New Hampshire intends to continue to increase its integrated activities. This will be facilitated as we move to multi-investigator projects in which Cooperative Extension personnel are encouraged to participate.