PLAN OF WORK

NEW HAMPSHIRE AGRICULTURAL EXPERIMENT STATION

COLLEGE OF LIFE SCIENCES AND AGRICULTURE

UNIVERSITY OF NEW HAMPSHIRE
DURHAM, NEW HAMPSHIRE

Federal Fiscal Years 2000 through 2004

NEW HAMPSHIRE AGRICULTURAL EXPERIMENT STATION
PLAN OF WORK
1999
for Fiscal Year 2000 - 2004

INTRODUCTION

The New Hampshire Agricultural Experiment Station resides within the College of Life Sciences and Agriculture at the University of New Hampshire. It has the responsibility for the Hatch, McIntire - Stennis, Animal Health, and Multi - State Research Programs. The Experiment Station has a Director and an Associate Director and reports to the Vice President for Research and Public Service while the College of Life Sciences and Agriculture reports to the Vice President (Provost) for Academic Affai rs. The Director of the Agricultural Experiment Station is also the dean of the College. This plan does not include New Hampshire Cooperative Extension which is a separate unit in New Hampshire and also reports to the Vice President for Research and Public Service. Although the two are separate reporting entities there is coordination of appropriate programs with one another.

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. See II for stakeholders input.

Program Duration

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

Allocated Resources

A) Present

Fund Source	Total Expended	FTE Faculty	FTE Staff	FTE Graduate Students
Federal Funds	$759,189	5.04	1.74	3.52
State Funds	$966,620	6.80	15.00	11.66

In fiscal year 1999 the New Hampshire Agricultural Experiment Station has 11.84 full time equivalents of scientists time assigned to Goal 1. Their research was funded with $759,189 of federal funds from the Hatch, MacIntire-Stennis, and Multi-State Research Programs. There were 16.74 full-time equivalents of technical staff attached to these projects. Professional help in the form of graduate students doing research on these projects amounts to 15.18 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 any change in federal funding in the next five years would significantly alter the spectrum of key program components for Goal 1.

B) Future (in thousands (faculty FTE))

FY 99 (FTE)	FY00	FY01	FY02	FY03	FY04
$1,726(11.04)	$1,755(10.00)	$1,785(10.80)	$1,815(11.84)	$1,847(11.82)	$1,880(11.84)

Based on the assumption of a 3% increase of State of NH funds and no increase in 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

Outcome Indicators

a decrease in the bacterial contamination of foods
increase is successful treatment of individuals who are exposed to microorganisms

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 serv es all consumers. See II for stakeholders input.

Program Duration

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

Allocated Resources

A) Present

Fund Source	Total Expended	FTE Faculty	FTE Staff	FTE Graduate Students
Federal Funds	$62,876	0.41	0.15	0.48
State Funds	$67,671	0.91	0.56	1.59

In fiscal year 1999 the New Hampshire Agricultural Experiment Station has 1.32 full time equivalents of scientists time assigned to Goal 2. Their research was funded with $62,876 of federal funds from the Hatch, MacIntire-Stennis, and Multi-State Research Programs. There were 0.71 full-time equivalents of technical staff attached t o these projects. Professional help in the form of graduate students doing research on these projects amounts to 2.07 students. For this goal, as well as

all subsequent goals, there are matching funds from the State of New Hampshire through a budget lin e 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 2.

B) Future (in thousands (FTE))

FY 99 (FTE)	FY00	FY01	FY02	FY03	FY04
$131 (1.32)	$133 (1.28)	$135 (1.32)	$137 (1.32)	$139 (1.32)	$141 (1.32)

Based on the assumption of a 3% increase of State of NH funds and no increase in 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. See II for stakeholders input.

Program Duration

The research projects (5) which contribute to this goal are generally of three to five years duration. All projects are targeted for mid and long term problems.

Allocated Resources

A) Present

Fund Source	Total Expended	FTE Faculty	FTE Staff	FTE Graduate Students
Federal Funds	$74,780	0.24	0.15	0.48
State Funds	$179,219	1.67	2.46	1.59

In fiscal year 1999 the New Hampshire Agricultural Experiment Station has 1.91 full time equivalents of scientists time assigned to Goal 3. Their research was funded with $74,780 of federal funds from the Hatch, MacIntire-Stennis, and Multi-State Research Programs. There were 2.61 full-time equivalents of technical staff attached to these projects. Professional help in the form of graduate students doing research on these projects amounts to 2.07 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 any change in federal funding in the next five years would significantly alter the spectrum of key program components for Goal 3.

B) Future (in thousands (FTE))

FY 99 (FTE)	FY00	FY01	FY02	FY03	FY04
$254 (1.91)	$259 (1.91)	$265 (1.91)	$271 (1.91)	$277 (1.91)	$283 (1.91)

Based on the assumption of a 3% increase of State of NH funds and no increase in Federal funds.

Goal 4 An Agricultural system which 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. See II for stakeholders input.

Program Duration

The research projects (21) which contribute to this goal are generally of three to five years duration. All projects are targeted for mid and long term problems.

Allocated Resources

A) Present

Fund Source	Total Expended	FTE Faculty	FTE Staff	Graduate Students
Federal Funds	$495,730	5.07	0.85	2.65
State Funds	$432,864	4.06	3.78	8.75

In fiscal year 1999 the New Hampshire Agricultural Experiment Station has 9.13 full time equivalents of scientists time assigned to Goal 4. Their research was funded with $495,730 of federal funds from the Hatch, MacIntire-Stennis, and Multi-State Research Programs. There were 4.63 full-time equivalents of technical staff attached to these projects. Professional help in the form of graduate students doing research on these projects amounts to 11.40 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 any change in federal funding in the next five years would significantly alter the spectrum of key program components for Goal 4.

B) Future (in thousands (FTE))

FY 99 (FTE)	FY00	FY01	FY02	FY03	FY04
$929 (9.13)	$942 (8.33)	$955 (8.73)	$969 (8.33)	$983 (8.13)	$998 (9.13)

Based on the assumption of a 3% increase of State of NH funds and no increase in 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 and

at what 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. See II for stakeholders input.

Program Duration

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

Allocated Resources

A) Present

Fund Source	Total Expended	FTE Faculty	FTE Staff	Graduate Students
Federal Funds	$113,581	1.02	0.31	0.96
State Funds	$203,629	2.18	1.24	3.18

In fiscal year 1999 the New Hampshire Agricultural Experiment Station has 3.20 full time equivalents of scientists time assigned to Goal 5. Their research was funded with $113,581 of

federal funds from the Hatch, MacIntire-Stennis, and Multi-State Research Programs. There were 1.55 full-time equivalents of technical staff attached to these projects. Professional help in the form of graduate students doing research on these projects amounts to 4.14 students. For this goal, as well as all subsequent goals, there are matching funds from the State of New Hampshire through a budget li ne 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.

B) Future (in thousands (FTE))

FY 99 (FTE)	FY00	FY01	FY02	FY03	FY04
$317 (3.20)	323 (3.20)	$330 (3.20)	$336 (3.20)	$343 (3.2)	$350 (3.20)

Based on the assumption of a 3% increase of State of NH funds and no increase in Federal funds..

II Stakeholders Input

A letter was sent to a group of people and organizations identified potential New Hampshire stakeholders (listed below) as the targeted audience for our research. Each one was asked to identify the areas that they viewed as most important for the continuing prosperity of their industry. Replies were received from the New Hampshire-Vermont Christmas Tree Association, New Hampshire Horse Council, North Country Resource Conservation Development Area, New Hampshire Department of Agriculture, Markets and Food, Society for the Protection of New Hampshire Forests, New Hampshire State Conservation Commission, and the New Hampshire Fruit Growers Association.

These priority issues will be used when proposals are requested from UNH faculty (vide infra). The issues identified by stakeholders as being most important will be provided to all faculty developing a project.

POTENTIAL STAKEHOLDERS
Opinion Invited

Stephen H. Taylor, Commissioner
New Hampshire Department of Agriculture, Markets, & Food

Clifford W. McGinnis, D.V.M.
New Hampshire Department of Agriculture, Markets, & Food
Division of Animal Industry

Richard Uncles, Supervisor
New Hampshire Department of Agriculture, Markets, & Food
Bureau of Markets

Dr. Siegfried Thewke
New Hampshire Department of Agriculture, Markets, & Food
Division of Plant Industry

John Hodsdon, President
N.H. Association of Conservation Districts
Mr. Rick Demark
North Country Resource Conservation &
Development Project

Mr. Rick DeMark
Southern N.H. Resource Conservation &
Development Project

Ms. Joanna Pellerin, Coordinator
State Conservation Committee

Mr. Keith Farrell, Credit Manager
Farm Service Agency

Roberta A. Harold, Acting Director
Rural Economic & Community Development

Dr. William Lord
N.H. Blueberry Growers Association

Mr. Erick Leadbeater, President
N.H. Horticulture Society

Mr. Chris Robarge, Secretary
N.H. Plant Growers Association

N. H. Fruit Growers Association

Mr. Robert Harrington, President
N.H. Small Fruit Growers Association

Mr. Phil Ferdinando, President
N.H. Vegetable Growers Association

Mr. Alden Marshall, President
N.H. Beekeepers Association

Ms. Wendy Benedict, President
N.H. Specialty Food Association

Ms. Pam Dwyer, Executive Secretary
NH/VT Christmas Tree Association

Mr. Glen Bohanan
Granite State Dairymen's Association

Ms. Jane W. Cappannelli
N.E. Dairy & Food Council

Ms. Jan Brown

N.H. Lama Association

Mr. Norman Duchano, President
N.H. Poultry Fanciers Association

Ms. Lisa Derby Oden, Presidenet
N.H. Horse Council

Mr. Berrie Donovan, Program Director
N.H. Farm Museum

New England Agricultural Statistics Service
22 Bridge Street

USDA Natural Resources Conservation Service
Federal Building

Ms. Lisa Oden, Educational Director
Ag in the Classroom

Granite State Dairy Promotion

N.H. Farm Bureau Federation
295 Sheep Davis Road

Mr. Chuck Bagley, Executive Director
N.H. Rural Development Council

Mr. Eric Kingsley, Executive Director
N.H. Timberland Owners Association

Ms. Jane Diffley, President
Society for the Protection of N.H. Forests

N. H. Aquaculture Association

Mr. Ron Panneton
N.H. Beekeepers Association

Mr. Nigel Manley, Chairman
N.H. Christmas Tree Promotion Board

Ms. Pam Dwyer, Executive Secretary
NH/VT Christmas Tree Association

Mr. Garth Witty
N.H. Dairy Goat Association

Mr. Clark Lindley, President
N.H. Game Farmers Association

Ms. Lisa Derby Oden, President

N. H. Horse Council

N. H. Maple Producers Association

Ms. Linda Lucas, Director
N. H. Pork Producers Association

Mr. William Merrill, President
N. H. Poultry Growers Association

Ms. Ronda Geisler, President
N. H. Sheep & Wool Growers Association

Northeast Organic Farming Association

III Merit and Peer Review

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

Each August a letter is sent to all 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 Associate 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 Associate Director obtains two anonymous reviews. The reviews are given to the faculty member and they have the opportuni ty 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. This is done by an internal committee of four or five

faculty members who are experienced in research. They review all proposals, the external reviewer's evaluations and the faculty member's response. From this they make a recommendation for priority for funding. The Director and Associate Director use this recommendation and their own evaluatio n 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, how ever, 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.

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

The projects participating in multi - institutional, mult - state, multidisciplinary and integrated activities are indicated under each program goal.

Allocated Resources

	FY 99	FY00	FY01	FY02	FY03	FY04
Federal	$573,030	$573,030	$573,030	$573,030	$573,030	$573,030
State	$532,306	$548,275	$564,723	$581,665	$599,115	$617,088
Total	$1,105,336	$1,121,305	$1,137,753	$1,154,695	$1,172,451	$1,190,118

Based on the assumption of a 3% increase of State of NH funds and no increase in Federal funds.

certified by:

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William W. Mautz, Director Date
New hampshire Agricultural Experiment Station