

**POW Logic Model Name:** Agricultural Resources (2010)

**Reporting years:** 2010,2010,2011,2012, 2013, 2014

### **Logic Model Overview:**

Over the past few decades, New Hampshire's agriculture industry has evolved into a diverse, vibrant sector of the state's economy. Agricultural firms produce a wide variety of crops, plants, livestock products, and specialty foods for sale directly to consumers and through a variety of intermediate markets. Annual sales of agricultural products nears \$750 million, but that's only part of the industry's economic impact. The 3,100 individual firms manage over 150,000 acres of cropland with an additional 250,000 acres devoted to pasture, Christmas trees, maple syrup production, and similar uses. This open space buffers residential and commercial development and provides the working landscape that makes New Hampshire attractive to visitors worldwide.

In order for the farming community to thrive, it must continue to be economically and environmentally sustainable while meeting societal obligations. University of New Hampshire Cooperative Extension is uniquely positioned to provide educational and research-based programs to assist agricultural businesses and related natural resource firms in meeting these goals. UNH Cooperative Extension professionals understand the challenges and opportunities faced by the state's farms and have forged important partnerships within the state and region as well as nationally.

### **Situation:**

#### Dairy/Livestock/Equine Programming

The New Hampshire livestock industry is diverse and scattered throughout the state. The state's livestock industry is important to maintaining open space and the rural setting enjoyed by its residents. Each aspect of the industry is important in maintaining the overall infrastructure needed for animal production.

The livestock industry has changed over the years and so has how it makes use of Extension. Many of the things traditionally assumed by Extension have been taken over by agribusinesses such as: forage testing, ration balancing, production testing, etc. Now more than ever the livestock industry is looking to Extension as a source of non-biased, researched-based information to make informed decisions. They are looking for help in holistic management, business management, facilitating family communication, and the practical application of current research findings.

#### Dairy

There are currently 140 commercial dairy cattle farms and seven licensed goat dairies in New Hampshire. New Hampshire's dairy industry is primarily located along the Connecticut River Valley on the western side of the state and the Merrimack River Valley in the central region.

The trend appears to continue towards fewer and larger farms, but New Hampshire's geography doesn't lend itself to the development of the large 1,000-cow mega farms of the west. There are not large, contiguous parcels of land available to support these numbers of animals or the disposal of their manure. New Hampshire dairy farmers are staying competitive by being efficient and starting creative enterprises. These include: manufacturing of value-added dairy products, organic dairy production, utilizing forest resources, raising heifers on a contract basis, selling compost, and doing custom work among other alternatives.

#### Sheep

The 2004 Agricultural Statistical Report shows that there are 380 sheep operations in New Hampshire with a total of about 7,600 head of sheep and lambs. These are mostly part-time operations that raise breeding stock or cater to an ethnic meat market. Wool prices have been depressed and many producers convert their wool into value-added products such as yarn.

## Beef

There's about 8,000 head of beef cattle in New Hampshire on 600 farms. These are primarily part-time operations raising breeding stock, show animals or animals for meat. The lack of slaughter facilities limits the growth of the industry and many operations do direct freezer beef sales to local customers.

## Swine

The total inventory of breeding and market hogs is about 3,600 head on 220 operations. A lot of the pork is raised for home consumption or local freezer trade. Every spring there is a shortage of feeder pigs, but the lack of a fall feeder pig market limits the number of sows raised to meet the demand.

## Equine

A 2002-2003 survey of the New Hampshire equine industry (41% response rate) showed a total of 7,888 horses owned, however extrapolating the numbers state wide may show a number in excess of 38,000 equines. The equine industry spends in excess of \$100 million per year on operating expenditures. This industry consists predominantly of individual horse owners as well as a growing number of commercial stables that board, offer riding lessons and train horses. The equine industry is a large consumer of hay that supports haying enterprises which maintain open space.

## Farm Management

Over 3,100 agricultural firms in New Hampshire generate nearly \$750 million in annual product value and manage approximately 445,000 acres in farm land. New Hampshire's agricultural industry is principally comprised of small family farms offering a diverse selection of crop, livestock and specialty products. These family businesses are an integral part of the local community maintaining a working landscape and providing citizens with superior products as well as connections to farming and "rural" New Hampshire.

About half of State's farmers consider farming their principal occupation. For these and many of the part-time farms, the family relies on agricultural activities to provide money for an adequate standard of living. New Hampshire's farms need to be profitable if they are to continue to exist.

Farm management efforts enhance farm profitability by providing programs in agricultural finance, record keeping, enterprise analysis, business and estate planning, direct marketing and merchandising, and risk management. Each of these program areas address the unique needs of farmers to keep their operations viable.

## Ornamental Horticulture

Ornamental horticulture contributes to the economy and environmental quality of the state, where quality of life is of utmost importance to residents and tourists. Horticulture keeps 21,000 acres in agriculture, over 14,000 of which is open space, helping to preserve the state's rural character. The ornamental horticulture industry includes at least 935 businesses in New Hampshire that generate \$438 million or more annually in sales and services, according to a recent New England survey. Greenhouse and nursery crops are the fastest growing component of agriculture in this state, having increased by 87% between 1992 and 1997 (USDA Agricultural Census, 1997). Over half the firms identified landscape and tree services as an important part of their business. Over 80% of the income comes from sales and services within the state, making horticulture an integral and important part of the state's economy.

In addition, turf grass provides recreational areas and playing fields which serve as functional community centers and enhance community pride. Golf course turf also provides significant economic income in the state.

New products, technologies, and growing systems are continually needed in order to sustain the growth and profitability of the industry. Management of nutrients, water, and pests are key components to profitability; as plant size, quality, and time to saleable product are dependent on appropriate nutrition, irrigation and pest control. Because of high capital operating costs, as well as increasing competition, quantifying the fixed and variable costs of production is also key to ensuring profitability.

## Fruit and Vegetable Production

The commercial vegetable industry in New Hampshire is made up of about 313 farms with approximately 3,400 acres of mixed vegetables. The top grossing vegetable commodities are sweet corn, pumpkins, and tomatoes, with many others grown in smaller amounts. The NH commercial small fruit industry is made up of about 203 growers that harvest approximately 543 acres of small fruit. The top grossing small fruit commodities are strawberries, blueberries (highbush and lowbush), and raspberries. The NH commercial tree fruit industry comprises approximately 204 growers that farm approximately 2,650 acres of orchards. The majority of these are apple orchards, but peaches and pears are produced in small amounts. The farm gate value of all commercial vegetable, small fruits, and tree fruits in NH is approximately \$23 million dollars. Roughly 95% of the total sales are through pick-your-own, roadside stands and farmers' markets, thus direct marketing is a major focus of educational efforts.

Both ecological and economic sustainability are needed to ensure long-term viability of New Hampshire farms. A short growing season, along with high labor costs and land values make fruit and vegetable production far more costly in NH than in other parts of the U.S. and world. Further, an extremely variable and humid climate means that disease and insect pests are a constant threat to the profitability of NH farms. To compete with west coast and international food producers, NH vegetable and fruit growers must produce unique and high-value products. Consumer awareness of the value of local agriculture and fresh locally grown fruits and vegetables will ensure that a market for high-quality NH produce exists.

To attain ecological and economic sustainability, NH fruit and vegetable growers must 1) make judicious use of farm inputs, 2) minimize crop production costs, 3) maintain high crop quality and yields, and 4) have reliable and consistent markets for their products. UNHCE will provide research-based information on technologies, production practices, and pest management strategies that will increase profitability and minimize ecological impact of fruit and vegetable production. UNHCE will undertake collaborative applied research to develop the needed information where it does not already exist.

## Home Horticulture

New Hampshire's population now exceeds 1,288,000. Each year UNHCE receives thousands of requests from New Hampshire citizens for education on a wide range of topics including home gardening, wildlife, water quality, household pests, backyard livestock, food preparation and food safety, urban forestry and many other topics. UNHCE has developed a variety of methods to simultaneously meet this need and reduce the burden on staff. Utilizing over 500 Master Gardeners (who volunteered 11,000 hours in 100 communities last year) UNHCE expanded its impact by responding to over 10,000 phone inquiries, conducting more than 50 workshops in schools and communities and working on a diverse range projects that resulted in aesthetic, environmental and economic benefits for both NH citizens and volunteers. Each contact with the general public, homeowners, gardeners and municipalities provides the opportunity to teach people how to make changes to their surroundings that optimize the safe use of their properties while protecting the environment.

## Grass Farming & Forage Crop Production

Forage crops, including hay, pastures, and silage corn, account for over 100,000 acres statewide and are valued at approximately \$28 million. These crops support a \$116 million animal industry, since most of New Hampshire's dairy, livestock, and equine operations rely heavily on forage crops. Cattle, sheep, and horses have the ability to utilize forages efficiently; producers work towards harvesting quality forages that can support animal production while minimizing the need to purchase off-farm feed which can significantly enhance farm profitability.

Because of the acreage involved, forage crop production has the potential to affect soil and water quality in the state. By focusing educational programming on optimizing the use of on-farm and imported nutrients and taking an integrated approach to pest management, we hope to minimize or eliminate detrimental effects on environmental quality. In addition, production and use of high-quality perennial forages in a livestock system has the potential to garner new markets for the producer who wishes to engage that market segment looking for grass-based meats, milk and poultry products.

## Promoting Local Agriculture

Direct marketing to consumers in NH has increased significantly, as evidenced by the rise in the total number of farmers' markets which now stands at 55 up from fewer than 30 five years ago. In addition Rockingham County now ranks 34th in the country in direct purchase of food items by consumers and Hillsborough County ranks 37th. Needs assessments have identified that NH producers seek to build their skills in direct marketing and seek to augment their farm profitability through the sale of their products and services directly to consumers. Two additional factors dictate an increase in programming in this area: 1) the loss of wholesale markets for specialty crops as evidenced by the loss of the wholesale apple market and the impact this had on NH apple growers; 2) the rise in the "so called lifestyle farmers" who have chosen farming as a second occupation yet often have little farming background. These constituents need to earn a premium price with limited production and need assistance with marketing plans.

### **Assumptions:**

The sustainability of agriculture in NH requires a holistic approach that interfaces production, human resource, economic, and environmental issues, and civic policies. All must be addressed at some level.

County Extension Agricultural Educators will be conversant and responsible for conducting programs in all aspects of agriculture in their respective counties. They will be encouraged and supported to develop one or more specialty areas for state-wide programming, i.e. fruits & vegetables, agronomic crops, holistic farm management, nutrient management, greenhouse production.

Specialists will continue to provide leadership and support in their specialties to county staff. They will provide leadership to both "commodity" and "issue" programming teams.

### **External Factors:**

Funding sources are requesting or requiring the following: an articulated strategic plan/vision, documented impacts and achievements, an understanding of the interconnectedness of the elements in a long term program, and illustrations of grass roots participation in the development and implementation of Cooperative Extension programs.

Outputs/Activities	Outcomes/Impact		
	Learning Outcomes	Action Outcomes	Condition Outcomes
<p>Educational Workshops - Single &amp; multi-day educational events such as grower schools, state-wide grazing events, etc.</p> <p>Conferences: Farm &amp; Forest, Producer Association Meetings</p> <p>Pasture Walks</p> <p>Twilight Meetings</p> <p>Farm/Site Visits – includes kitchen table meetings &amp; private consultations</p> <p>Research – on farm and university-based</p> <p>Phone Consultations</p> <p>Miscellaneous Public Events: Agricultural festivals, county fairs, road fairs, other public events.</p> <p>Publications &amp; News: fact sheets, news releases, newsletters, web page, TV &amp; radio spots</p> <p>Grants – Development &amp; administration</p>	<p>Farmers build their capacity to analyze economic and production data from their agricultural enterprises in order to determine the best levels of production and mix of products.</p> <p>Farmers are able to develop farm transfer and estate plans to insure the continuation of the family farm through the orderly transfer of farm and family assets between generations, adequate retirement planning, and identification of long-term goals.</p> <p>Farmers increase their understanding of how to manage and reduce risks in their production, marketing, financial, labor, environmental and legal areas on their farms.</p> <p>Farmers increase their abilities in financial record keeping, financial analysis, and income tax management.</p> <p>Participants learn to utilize financial management tools.</p> <p>NH producers learn how to develop whole farm plans that integrate economic, environmental and quality of life parameters.</p> <p>Producers increase their ability to develop and implement business plans that identify goals, alternative markets, potential profits, sources of capital, and business structure.</p>	<p>Farmers analyze economic and production data of their enterprises in order to determine the mix of products, production levels, and use of resources that will help them meet their farm and financial goals.</p> <p>Farmers develop farm transfer and estate plans to insure the continuation of the family farm through the orderly transfer of farm and family assets between generations, adequate retirement planning, and identification of long-term goals.</p> <p>Farmers develop strategies to manage farm risk in the following areas: production, marketing, farm finances, labor/human resources, environmental preservation and legal issues.</p> <p>Farmers expand sales and profitability through direct marketing, determining appropriate prices, using effective merchandising and advertising techniques, promoting their farm image, assessing consumer demand, evaluating new products, markets, production techniques and addressing regulations.</p> <p>Farmers maintain financial records and use these for financial analysis and income tax management.</p> <p>NH producers develop whole farm plans that integrate economic, environmental and quality of life parameters for farms and farmers. Also included are farm succession plans, tax planning and record keeping.</p>	<p><b>Enhance farm profitability by providing programs in agricultural finance, record keeping, enterprise analysis, business and estate planning, direct marketing and merchandising, and risk management.</b></p>
	<p>AG2- 30% of participants formulate a plan to guide their crop production, pest management, nutrient allocation, animal health, or farm management decisions. (Relates to L&amp;W7 and L&amp;W8)</p> <p>AG3- # of growers who adopt practices that improve farm productivity, quality of life, environmental conditions, and/or profitability. (Relates to NRBI3)(Statewide target is 50 growers)</p> <p>AG08-4 - # of growers who increase their skills, knowledge, and/or awareness of farm management techniques, risk management programs, or marketing practices. (Statewide target is 50 growers).</p>		

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<p>Publications &amp; News: fact sheets, news releases, newsletters, web page, TV &amp; radio spots</p> <p>Plant Diagnostic Lab</p> <p>Arthropod Identification</p> <p>Grants – Development &amp; administration</p>	<p>AG1- # of participants who use soil and/or tissue test results to determine crop nutrient needs. (Statewide target is 50% or 250 participants) (Relates to L&amp;W8)</p> <p>AG3- # of growers who adopt practices that improve farm productivity, quality of life, environmental conditions, and/or profitability. (Relates to NRBI3)(Statewide target is 50 growers)</p> <p>AG08-5 - # of growers who increase their knowledge, awareness, and/or skills in crop production practices. (Statewide target is 50 growers).</p> <p>AG08-6 - # of NH growers who increase knowledge, awareness, and/or skills in pest management practices and technologies. (Statewide target is 50 growers).</p> <p>AG08-8 - # of participants who increase their knowledge, awareness and/or skills in practices and technologies to increase the quality of athletic fields, public spaces and/or golf course conditions. (Statewide target is 30 participants)</p>		

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	<p>AG08-6 - # of NH growers who increase knowledge, awareness, and/or skills in pest management practices and technologies. (Statewide target is 50 growers).</p> <p>AG9- # of participants in home horticulture programs that gain skills that improve self-esteem, enable them to grow and preserve crops, adopt IPM practices, and protect and enhance their environment. (Statewide target is 50 participants).</p>		

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<p>Phone Consultations</p> <p>Plant Diagnostic Lab</p> <p>Arthropod Identification</p> <p>Miscellaneous Public Events: Agricultural festivals, county fairs, road faces, other public events.</p> <p>Publications &amp; News: fact sheets, news releases, newsletters, web page, TV &amp; radio spots</p>	<p>AG3- # of growers who adopt practices that improve farm productivity, quality of life, environmental conditions, and/or profitability. (Relates to NRBI3)(Statewide target is 50 growers)</p> <p>AG08-4 - # of growers who increase their skills, knowledge, and/or awareness of farm management techniques, risk management programs, or marketing practices. (Statewide target is 50 growers).</p>		

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<p>Miscellaneous Public Events: Agricultural festivals, county fairs, road fairs, other public events.</p> <p>Publications &amp; News: fact sheets, news releases, newsletters, web page, TV &amp; radio spots</p>	<p>AG1- # of participants who use soil and/or tissue test results to determine crop nutrient needs. (Statewide target is 50% or 250 participants) (Relates to L&amp;W8)</p> <p>AG2- 30% of participants formulate a plan to guide their crop production, pest management, nutrient allocation, animal health, or farm management decisions. (Relates to L&amp;W7 and L&amp;W8)</p> <p>AG3- # of growers who adopt practices that improve farm productivity, quality of life, environmental conditions, and/or profitability. (Relates to NRBI3)(Statewide target is 50 growers)</p> <p>AG08-5 - # of growers who increase their knowledge, awareness, and/or skills in crop production practices. (Statewide target is 50 growers).</p> <p>AG08-6 - # of NH growers who increase knowledge, awareness, and/or skills in pest management practices and technologies. (Statewide target is 50 growers).</p> <p>AG08-10- # of NH growers who increase their skills, knowledge or awareness in practices or methods related to dairy, livestock or equine production methods. (Target is 30 growers)</p>		

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	<p>AG2- 30% of participants formulate a plan to guide their crop production, pest management, nutrient allocation, animal health, or farm management decisions. (Relates to L&amp;W7 and L&amp;W8)</p>		

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<p>Educational Workshops - Single &amp; multi-day educational events such as grower schools, state-wide grazing events, etc.</p> <p>Conferences: Farm &amp; Forest, Producer Association Meetings</p> <p>Pasture Walks</p> <p>Twilight Meetings</p> <p>Farm/Site Visits – includes kitchen table meetings &amp; private consultations</p> <p>Research – on farm and university-based</p> <p>Phone Consultations</p> <p>Plant Diagnostic Lab</p> <p>Arthropod Identification</p> <p>Pesticide Applicator Training</p>	<p>NH fruit and vegetable producers increase their knowledge of new university and on-farm research that can enhance fruit and vegetable quality including; biorational/reduced-risk pesticides, new propagation techniques, season extension techniques, lighting, new pest and disease management practices, shipping methods, new crops and new cultivars for NH production conditions and markets.</p> <p>NH fruit and vegetable producers increase their skills in conducting on-farm research.</p> <p>Participants increase their ability to develop nutrient management plans by understanding new research, nutrient cycles, soil and tissue testing procedures and results, nutrient export channels, and crop utilization.</p> <p>Participants increase their knowledge of alternative nutrient cropping systems suitable to NH growing conditions.</p> <p>NH fruit and vegetable producers learn how to monitor their crops, determine acceptable levels of pest injury and employ combinations of mechanical, cultural, and chemical techniques to control problem weeds, insects, or diseases.</p>	<p>NH fruit and vegetable producers are using university and on-farm research to enhance fruit and vegetable quality including; biorational/reduced-risk pesticides, new propagation techniques, season extension techniques, lighting, new pest and disease management practices, shipping methods, new crops and new cultivars for NH production conditions and markets.</p> <p>NH fruit and vegetable producers conduct research on their farms to evaluate the suitability of alternative cropping practices.</p> <p>NH fruit and vegetable producers develop and implement nutrient management plans for their fruit and vegetable cropping systems.</p> <p>NH fruit and vegetable producers monitor their crops to decide upon an acceptable level of pest injury and then employ a combination of mechanical, cultural, and chemical techniques to control problem weeds, insects, or diseases.</p>	<p><b>Increase the sustainability of the NH fruit and vegetable industries.</b></p>
<p>Miscellaneous Public Events: Agricultural festivals, county fairs, road faces, other public events.</p> <p>Publications &amp; News: fact sheets, news releases, newsletters, web page, TV &amp; radio spots</p>	<p>AG1- # of participants who use soil and/or tissue test results to determine crop nutrient needs. (Statewide target is 50% or 250 participants) (Relates to L&amp;W8)</p> <p>AG2- 30% of participants formulate a plan to guide their crop production, pest management, nutrient allocation, animal health, or farm management decisions. (Relates to L&amp;W7 and L&amp;W8)</p> <p>AG3- # of growers who adopt practices that improve farm productivity, quality of life, environmental conditions, and/or profitability. (Relates to NRBI3)(Statewide target is 50 growers)</p> <p>AG08-5 - # of growers who increase their knowledge, awareness, and/or skills in crop production practices. (Statewide target is 50 growers).</p> <p>AG08-6 - # of NH growers who increase knowledge, awareness, and/or skills in pest management practices and technologies. (Statewide target is 50 growers).</p>		

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<p>Educational Workshops - Single &amp; multi-day educational events such as grower schools, state-wide grazing events, etc.</p> <p>Conferences: Farm &amp; Forest, Producer Association Meetings</p> <p>Pasture Walks</p> <p>Twilight Meetings</p> <p>Farm/Site Visits – includes kitchen table meetings &amp; private consultations</p> <p>Research – on farm and university-based</p> <p>Phone Consultations</p> <p>Plant Diagnostic Lab</p> <p>Arthropod Identification</p> <p>Pesticide Applicator Training</p> <p>Miscellaneous Public Events: Agricultural festivals, county fairs, road faces, other public events.</p> <p>Publications &amp; News: fact sheets, news releases, newsletters, web page, TV &amp; radio spots</p>	<p>NH Extension and other agricultural educators increase their knowledge of SARE, sustainable agricultural practices, technologies, and resource materials, increase their awareness, knowledge and/or skills in educational methods relevant to sustainable agricultural practices and principles, increase their acceptance of sustainable agricultural practices and principles, and increase their awareness of local farmer knowledge in sustainable agriculture.</p> <p>NH growers increase their knowledge of sustainable agriculture research, practices, and skills as a result of their utilization of SARE programs, resources, and materials.</p>	<p>NH Extension and other agricultural educators implement high quality programming and outreach in sustainable agriculture. This is achieved by using SAN/SARE results and products, including R&amp;E and producer grants, developing and participating in on-farm participatory research, and participating in SARE activities.</p> <p>NH growers are researching and implementing sustainable agricultural practices as a result of their utilization of SARE programs, resources, and materials.</p>	<p>NH Agricultural Educators and farmers teach and implement sustainable agriculture practices as a result of their utilization of SARE programs, resources, and materials.</p>
	<p>AG11 - #of UNHCE staff, NRCS staff, and agricultural professionals who increase their knowledge and skills in sustainable agriculture through participation in SARE workshops or grants (target is 30).</p>		