Item No. 1 of 1

ACCESSION NO: 0410371 SUBFILE: CRIS
PROJ NO: 1915-62660-002-10R AGENCY: ARS 1915
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INVESTIGATOR: HALLORAN J M

PERFORMING INSTITUTION:
AGRICULTURAL RESEARCH SERVICE
ORONO, MAINE 04469

REDUCING OFF-FARM GRAIN INPUTS ON NORTHEAST ORGANIC DAIRY FARMS

CLASSIFICATION

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BASIC 0%  APPLIED 100%  DEVELOPMENTAL 0%

OBJECTIVES: The long term goal of this project is to reduce the reliance of New England organic dairy farms on imported grains. The objectives of the project are to: 1) evaluate the milk yield and forage quality of four contrasting cropping systems and to identify the level of grain importation needed for each system; 2) identify systems that reduce the importation of grain and prevent the accumulation of nutrient excesses to enhance the sustainability of organic dairies; 3) quantify the efficacy of direct weed control tactics in the cropping systems, and determine the effect of weeds on total yield, quality and net return; 4) quantify the net return and exposure to risk and identify the economies of scale for each system; and 5) host conferences, field days and on-farm trials that will be followed up with personal interviews with organic farmers to assess impact.

APPROACH: This project will contrast four cropping systems for supplying conserved forages and grains to an organic dairy herd. These systems were chosen by a team of organic dairy farmers, processors, and non-profit farm organizations to represent the cropping systems and rotation sequences typical in New England. An interdisciplinary team of farmers and researchers will analyze the systems for their impact on profitability, risk management, herd nutrition, nutrient cycling, and weed management. The cropping systems will be established at the University of
Maine and the University of New Hampshire. Both universities will host farm-scale, unreplicated plots of each cropping system. These multi-acre plots will allow for realistic assessments of labor demands and equipment time for each system and provide ample forage for feeding trials. Multi-acre plots also allow for larger scale ecological processes to operate as they would in a working organic system. The same cropping systems will also be planted on smaller plots in a randomized complete block design with four replications at the University of Maine. Feeding trials at New Hampshire and Maine will monitor the milk production of each system for three years. Herds at both locations will be divided into four treatment groups and fed rations based on each of the systems. During the course of the feeding trials, forages from each system will undergo the intensive and thorough analysis for nutrient composition and nutrient digestibility measurements as required for inclusion in the database of the newly created Ruminant Feed Analysis Consortium. Measurements will include a variety of chemical, in vitro, and in situ measurements.

**KEYWORDS:** MANURE DAIRY NUTRIENT USE EFFICIENCY WATER QUALITY NITROGEN ORGANIC AGRICULTURE PHOSPHORUS

**PROGRESS:** 2010/10 TO 2011/09

Progress Report Objectives (from AD-416) The long term goal of this project is to reduce the reliance of New England organic dairy farms on imported grains. The objectives of the project are to: 1) evaluate the milk yield and forage quality of four contrasting cropping systems and to identify the level of grain importation needed for each system; 2) identify systems that reduce the importation of grain and prevent the accumulation of nutrient excesses to enhance the sustainability of organic dairies; 3) quantify the efficacy of direct weed control tactics in the cropping systems, and determine the effect of weeds on total yield, quality and net return; 4) quantify the net return and exposure to risk and identify the economies of scale for each system; and 5) host conferences, field days and on-farm trials that will be followed up with personal interviews with organic farmers to assess impact. Approach (from AD-416) This project will contrast four cropping systems for supplying conserved forages and grains to an organic dairy herd. These systems were chosen by a team of organic dairy farmers, processors, and non-profit farm organizations to represent the cropping systems and rotation sequences typical in New England. An interdisciplinary team of farmers and researchers will analyze the systems for their impact on profitability, risk management, herd nutrition, nutrient cycling, and weed management. The cropping systems will be established at the University of Maine and the University of New Hampshire. Both universities will host farm-scale, unreplicated plots of each cropping system. These multi-acre plots will allow for realistic assessments of labor demands and equipment time for each system and provide ample forage for feeding trials. Multi-acre plots also allow for larger scale ecological processes to operate as they would in a working organic system. The same cropping systems will also be planted on smaller plots in a randomized complete block design with four replications at the University of Maine. Feeding trials at New Hampshire and Maine will monitor the milk production of each system for three years. Herds at both locations will be divided into four treatment groups and fed rations based on each of the systems. During the course of the feeding trials, forages from each system will undergo the intensive and thorough analysis for nutrient composition and nutrient digestibility measurements as required for inclusion in the database of the newly created Ruminant Feed Analysis Consortium. Measurements will include a variety of chemical, in vitro, and in situ measurements. Northern New England is a leader in the certification of organic dairy farms, with 20% of the dairy farms in Maine currently certified as organic. Feed is the single largest expense for these farmers. This dependence on imported feed also complicates nutrient management, making it a challenge to balance fertility needs with available manure. The USDA Organic Research and Education Initiative (OREI) provided $827,000 for a project entitled ?Reducing Off-Farm Grain Inputs on Northeast Organic Dairy Farms? (FY2005-2009), for research and
outreach conducted cooperatively by the University of Maine, University of New Hampshire, Maine Organic Milk Producers, and USDA-ARS New England Plant, Soil and Water Laboratory. The goal of this project, which was extended to FY2010, is to maximize on-farm production of energy and protein. In FY2010-11, research was conducted to modify an ARS developed model of conventional dairy farms to accommodate organic dairies. Detailed weather files for six National Climatic Data Center (NCDC) weather stations in Maine were constructed for use in the Integrated Farm Systems Model (IFSM). Information was gathered from organic dairy farmers to formulate economic comparisons among different production systems. Research information from this project is being transferred directly to organic dairy farmers in New England, and will help them develop economically viable production systems.

**PUBLICATIONS (not previously reported):** 2010/10 TO 2011/09
No publications reported this period.

**PROGRESS:** 2009/10/01 TO 2010/09/30
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Significant Activities that Support Special Target Populations Northern New England is a leader in the certification of organic dairy farms, with 20% of the dairy farms in Maine currently certified as organic. Feed is the single largest expense for these farmers. This dependence on imported feed also complicates nutrient management, making it a challenge to balance fertility needs with available manure. The USDA Organic Research and Education Initiative (OREI) provided $827,000 for a project entitled "Reducing Off-Farm Grain Inputs on Northeast Organic Dairy Farms? (FY2005-2009), for research and outreach conducted cooperatively by the University of Maine, University of New Hampshire, Maine Organic Milk Producers, and USDA-ARS
New England Plant, Soil and Water Laboratory. The goal of this project, which has recently been extended to FY2010, is to maximize on-farm production of energy and protein. In FY2009, cropping systems experiments were continued in Orono (Maine) to evaluate production systems that include grain and silage production options appropriate for Northeast organic dairy farms. Research was conducted to modify an ARS developed model of dairy farms to accommodate organic dairies. Additionally, feeding trials were conducted at the Universities of Maine and New Hampshire to provide production response data for grain and silage production options. USDA-ARS is coordinating nutrient cycling evaluations in these experiments, and collecting additional information to formulate economic comparisons between different production systems. Cooperating organic dairy farms in Maine are also evaluating grain production, processing and feeding options as part of this project. USDA-ARS is also conducting an intensive evaluation of nutrient distribution at the field and landscape scales on the organic dairy farm being developed at the University of New Hampshire. Monitoring activities for this project include an annual meeting of all project collaborators, quarterly meetings of collaborators at USDA-ARS and University of Maine, and frequent conference calls and other electronic communication. Research information from this project will be transferred directly to organic dairy farmers in New England, and will help them develop economically viable production systems.

PUBLICATIONS: 2008/10/01 TO 2009/09/30
No publications reported this period.

PROGRESS: 2007/10/01 TO 2008/09/30
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England is a leader in the certification of organic dairy farms; 20% of the dairy farms in Maine are currently certified as organic. Feed is the single largest expense for these farmers. This dependence on imported feed also complicates nutrient management, making it a challenge to balance fertility needs with available manure. The USDA Organic Research and Education Initiative (OREI) provided $827,000 for a project entitled ?Reducing Off-Farm Grain Inputs on Northeast Organic Dairy Farms? (FY2005-2009), for research and outreach conducted cooperatively by the University of Maine, University of New Hampshire, Maine Organic Milk Producers, and USDA-ARS New England Plant, Soil and Water Laboratory. The goal of this project is to maximize on-farm production of energy and protein. In FY2008, cropping systems experiments were continued in Orono (Maine) to evaluate production systems that include grain and silage production options appropriate for Northeast organic dairy farms. Additionally, feeding trials were conducted at the Universities of Maine and New Hampshire to provide production response data for grain and silage production options. USDA-ARS is coordinating nutrient cycling evaluations in these experiments, and collecting additional information to formulate economic comparisons between different production systems. Cooperating organic dairy farms in Maine are also evaluating grain production, processing and feeding options as part of this project. USDA-ARS is also conducting an intensive evaluation of nutrient distribution at the field and landscape scales on the organic dairy farm being developed at the University of New Hampshire. Monitoring activities for this project include an annual meeting of all project collaborators, quarterly meetings of collaborators at USDA-ARS and University of Maine, and frequent conference calls and other electronic communication. Research information from this project will be transferred directly to organic dairy farmers in New England, and will help them develop economically viable production systems. This research contributes to the NP206 Action Plan, Nutrient Management Component, Problem Area 1, Animal Feeding and Management; and Problem Area 4, Farming Systems and Practices for Efficient and Balanced Manure Nutrient Management.

PUBLICATIONS: 2007/10/01 TO 2008/09/30
No publications reported this period.

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PUBLICATIONS: 2006/10/01 TO 2007/09/30
No publications reported this period.

PROGRESS: 2005/10/01 TO 2006/09/30
Progress Report 4d Progress report. This report serves to document research conducted under a reimbursable agreement between USDA-ARS and the University of Maine. Additional details of research can be found in the report for parent Project 1915-12630-001-00D (Nutrient Cycling and Utilization on Organic Dairy Farms). Northern New England is a leader in the certification of organic dairy farms, with 20% of the dairy farms in Maine currently certified as organic. Feed is the single largest expense for these farmers. This dependence on imported feed also complicates nutrient management, making it a challenge to balance fertility needs with available manure. The USDA Organic Research and Education Initiative (OREI) provided $827,000 for a project entitled “Reducing Off-Farm Grain Inputs on Northeast Organic Dairy Farms” (FY2005-2009), for research and outreach conducted cooperatively by the University of Maine, University of New Hampshire, Maine Organic Milk Producers, and USDA-ARS New England Plant, Soil and Water Laboratory.
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**PUBLICATIONS:** 2005/10/01 TO 2006/09/30  
No publications reported this period.

**SUPPLEMENTARY DATA:**  
Institution Type: USDA  
Region: 1  
Process Date: 2007/04/16  
Progress Update: 2012/09/24