



Agricultural Systems

UVM research and outreach projects are aimed at ensuring the profitability of Vermont's agricultural enterprises.

UVM faculty and staff are ...

- increasing decision makers' knowledge of dairy profitability, sustainability, and water quality to achieve informed, state-wide agricultural policy
- addressing and reducing the barriers faced by new farmers, especially women, in accessing USDA programs
- helping new farmers succeed by connecting them to appropriate training and information resources
- demonstrating how modern dairy farms can be operated in financially and environmentally sound ways
- facilitating farm transitions, and providing training and support for new farmers to help keep farmland in production
- assessing dairy community members' perceptions and needs to more effectively deliver educational programs to this clientele

DAIRY (17 projects)

- providing agricultural engineering expertise to Vermont dairy farmers to increase farm efficiency and profitability
- collecting information on Vermont dairy farm production practices to make recommendations on model farm operations: use of VT-DHIA (Dairy Herd Improvement Association), rBST, computers, manure storage mechanisms, and debt structuring
- correlating colostrum quality with herd management practices to control Johne's Disease

- teaching and demonstrating calf management skills to improve the health and performance of dairy calves
- evaluating whether inclusion of the iron-binding protein, lactoferrin, in calf diets improves calf health, development, and later milk production
- understanding the mechanisms and regulation of glucose transport process in bovine mammary gland to improve nutrient utilization and increase milk production efficiency
- identifying genes that control mammary development, colostrum formation, and milk yield to enhance the efficiency of milk production and improve calf health
- raising biosecurity awareness and promoting adoption of management practices to prevent the introduction of diseases onto livestock farms
- developing, applying, and evaluating novel genes designed to enhance mastitis resistance in cows
- developing new genes that enable cows to prevent bacterial growth in milk
- studying how bovine mammary cells respond to infection by mastitis-causing pathogens
- developing new methods for estrus (heat) detection in dairy cows
- developing a practical method for predicting forage quality of the first harvest

- developing alternative cropping systems to decrease the potential for phosphorus buildup and runoff
- demonstrating how management-intensive grazing can help reduce costs and environmental impacts on livestock farms
- evaluating the performance of the forage, fenugreek, as an annual rotation crop

MAPLE (8 projects)

- determining nutrient status of sugar maple stands and the role of fertilization and liming on sugar production
- determining the biochemical changes that occur during maple syrup processing that contribute to off-flavors
- developing methods to detect adulterants and contaminants of maple syrup
- aiding maple sugarmakers and forest managers to reduce the impact of forest insects and diseases on stands used for maple syrup production
- developing educational materials for the general public, landscapers, and sugarmakers to promote awareness about the Asian Longhorned Beetle and enhance detection of infestations



Research at UVM's Proctor Maple Research Center helps sugarmakers assure a top-quality product.

- monitoring and evaluating pear thrips levels across the state to aid maple sugarmakers in making decisions regarding sugarbush tapping and management
- providing research-based information to maple producers through regional conferences

LIVESTOCK (OTHER THAN DAIRY COWS) AND POULTRY (14 projects)

- providing technical information about dairy goats (such as nutritional requirements) to lower feed costs, improve milk production, and engage more feed companies to provide this service
- establishing how hormones (such as prolactin) regulate mammary gland growth and physiology in swine
- educating producers of existing value-added markets and practices that improve sustainability of small beef herds
- determining nutritional effects on hormone secretion and growth in chicks
- conducting applied research and sharing results with the equine industry to demonstrate that different breeds do not have the same growth rates and nutritional needs

- demonstrating methods and techniques for equine land management to maintain water and pasture quality
- providing education on various equine topics including economics, safety, and disease prevention

FRUITS AND VEGETABLES (12 projects)

- providing the scientific and technical expertise necessary to help apple growers remain competitive while maintaining a sustainable agriculture system
- encouraging growers to plant the apple cultivar Honeycrisp because of its adaptability, fruit quality, and high farm-gate value
- researching and communicating how cold-tolerant apple and grape cultivars can present value-added economic opportunities
- promoting sustainable production practices that improve soil stewardship and pest management to enhance the long-term viability of Vermont's vegetable and berry farms
- verifying the absence of quarantined pests to certify Vermont plant products free of exotic pests
- providing commercial growers and home gardeners with science-based pest and disease information and management strategies that employ Integrated Pest Management techniques, and determining the value and impact of that information
- determining the most effective uses of compost for vegetable production in a horticultural setting



At a cover crop workshop in Brattleboro, Vern Grubinger (left), Extension vegetable and berry specialist, discusses legumes that fix nitrogen for use by subsequent vegetable crops.

ORNAMENTAL HORTICULTURE (10 projects)

- demonstrating improved methods of pest and disease management for the greenhouse industry in northern New England
- developing cultural techniques for elimination of overwintering thrips and plant viruses from greenhouses
- determining effects of fall acclimation on perennials to increase survival and decrease losses
- implementing the Master Gardener Program to educate Vermont gardeners about the benefits of low-impact gardening
- creating an Internet resource for greenhouse science educators
- developing salt-tolerant, grafted sugar maples for ornamental use in urban locations of northern states
- evaluating the effectiveness of different mulches as a top-dress application to control growth of liverworts