

FFY 2011 Specialty Crop Block Grant Project Abstracts

Virginia Polytechnic Institute and State University Research-Based Response to the Invasion of Mid-Atlantic Tree Fruit Orchards by the Brown Marmorated Stink Bug

Following several years of gradual increases in the size and geographic range of brown marmorated stink bug (BMSB) populations, this invasive pest reached epidemic status in mid-Atlantic states in 2010. Efforts to combat it were adversely impacted by a pronounced lack of information on the effectiveness of individual insecticides or management programs, and many tree fruit growers suffered 5% to 100% crop loss in individual peach or apple orchard blocks. Counties in eastern MD and WV and in northern and central VA are currently considered BMSB epicenters, with no apparent, near-term relief from natural causes of population suppression. A collaborative project involving Virginia Tech and USDA entomologists seeks to provide, 1) a response to the immediate needs of tree fruit producers and 2) long-term, sustainable solutions to this unprecedented threat. Seasonal management programs in commercial apple and peach orchards and in small research plots will be evaluated and refined. Tools for monitoring BMSB will be compared and refined, in anticipation of the identification of the specific BMSB pheromone. Aspects of BMSB biology and behavior will be investigated, including its seasonal phenology and response to visual and olfactory stimuli, toward the development and validation of behaviorally-based management and monitoring tactics.

Virginia Polytechnic Institute and State University Sustainable Nitrogen Management for Fresh Market Tomato Production

Tomato production systems drastically changed in recent years by the additions of plastic mulch, drip irrigation, cover crops, and hybrid varieties that have resulted in substantial yield increases. Therefore, current fertilizer needs are different than traditional bare-ground and processing tomato systems that are currently recommended. The project will be established as a factorial arrangement of two nitrogen application practices and five nitrogen rates replicated four times. One application practice includes 50% of the fertilizer incorporated into soil under the plastic mulch and the remaining 50% applied via fertigation. The second practice will have 30% of the nitrogen soil incorporated, 20% placed in a band on top of the bed, and remaining 50% applied via fertigation. Both practices will be applied at 0, 100, 200, 300, and 400 pounds of total nitrogen per acre. Plant tissue, petiole nitrate, NDVI, and yield will be used to determine nitrogen uptake and fertilizer use efficiency. Suction cup lysimeters and incremental soil sampling will be used to test groundwater nitrate concentrations below the tomato root zone. All data will be analyzed using the SAS software and either regressed against nitrogen rates or means will be separated using least significant difference tests at $\alpha = 0.10$.

Virginia Polytechnic Institute and State University

Year-round sustainable approach to weed control, nutrient uptake, and water management for nursery production

Currently, there are no adopted sustainable practices to control broadleaf and grassy weeds in nursery production, especially for production of perennials. We would like to propose a mulch system, where the cover crop species is grown along with the cultivated plant and then selectively controlled at an optimum growth stage. This mulch system would provide weed control and decrease herbicide usage and irrigation volume, while improving nutrient management and grower profitability. Results from these trials will determine which mulch species is most effective for weed control and what seeding rate affords the greatest efficacy without negatively impacting the nursery crop. This project will accomplish the following: 1) develop a sustainable weed control system for broadleaf and grassy weeds that reduces annual herbicide applications and is economically beneficial to the grower, 2) determine which mulch species helps retain pot moisture and reduce evaporation losses, thus decreasing required irrigation volumes, 3) determine potential for reduced pesticide leaching and off-site movement in the mulch system, 4) quantitatively measure and document reductions in herbicide use due to mulch use, and 5) improve fertilizer uptake efficiencies and reduce nutrient loss by using the mulch system.

Mt. Rogers Area Christmas Tree Growers Association Genetically Improved Seed Orchard

The Mount Rogers Area Christmas Tree Growers Association (MRACTGA) has been actively involved in the management of and production of Fraser fir seed from a seed orchard on the property of the Grayson Highlands State Park for 31 years. This activity has involved the maintenance of the orchard and the supply of seed to growers of Fraser fir in Grayson county Virginia and surrounding areas. This activity has helped preserve the unique strain of Mount Rogers Fraser fir as the native stands have been decimated by the balsam woolly adelgid. An initial grant from the Virginia Department of Agriculture and Consumer Services was used to prepare a site on Mount Rogers controlled by the Virginia Department of Forestry. There is now a need to identify genetically superior trees, collect scion material from these trees and graft it on to the root stock. Long term fertility work and the establishment of a protective tree border of Red spruce is also needed.

This grant requests \$29,400 to help continue work in establishing the genetically improved Fraser fir orchard. This grant will help support the only work currently being done in Virginia to help preserve this unique strain of Fraser fir once prevalent on Whitetop and Mount Rogers mountains...

Virginia Tech

Understanding the biology of the invasive brown marmorated stink bug and management strategies for vegetables

The brown marmorated stink bug (BMSB) was introduced from Asia into Pennsylvania in the late 1990s. Since then, BMSB populations have spread rapidly and grown exponentially. By fall 2010, the pest was found throughout most of the Commonwealth of Virginia and had become a serious nuisance in households. In some areas of the state, this pest also caused unprecedented damage to tree fruit and vegetables such as peppers, tomatoes, beans, and sweetcorn. There is much that we do not know about this invasive stink bug species, and entomologists are scrambling to understand its ecology and find effective management strategies. However, there

is no doubt that this bug has a major significance to the long term sustainability and profitability of specialty crops in Mid-Atlantic U.S.

The overarching goals of this project are to determine the role of winter climate and surrounding habitat on the population ecology of BMSB, and to develop management strategies to minimize crop losses in vegetables. Specific objectives are to:

1. Examine the overwintering physiology of BMSB and determine the critical freezing point temperatures so that we may better understand the impact of winter climate on bug populations.
2. Quantify BMSB abundance, phenology, and natural enemy complex in different managed and unmanaged habitats throughout the season.
3. Determine effects of different insecticides on BMSB, and develop use guidelines for vegetable crops.

VSU ARS & VT AHS AREC

Establishment of Virginia wine grape vineyards using organic production methods.

The feasibility of organic viticulture in Virginia will be assessed using recently developed organic pesticides and grape varieties. A vineyard will be established at the Winchester Agricultural Research and Extension Center to analyze fungal disease resistance of new varieties as well as the potential for established varieties to be managed utilizing organic fungicides. A second vineyard will be established in Chesterfield County at Virginia State University's Randolph Farm to conduct a general trial of new disease resistant varieties comparing standard industry practices and organic management. The Winchester AREC vineyard will evaluate two new releases (Corot Noir and NY95.0301.01) from Cornell University's Grape Breeding Program at Geneva, NY and the well established vinifera Cabernet Franc and hybrids Vidal blanc and Traminette. The Chesterfield County vineyard has set a target to achieve organic certification and will be restricted to the varieties Corot Noir and NY95.0301.01. Organic pesticides will be compared against a conventional spray program recommended by the Virginia Cooperative Extension. Vine management will consist of cane pruned vertical shoot positioning system. Daily records of local weather data will be maintained and pest and disease incidence will be monitored and documented on a weekly basis.

Virginia Polytechnic Institute and State University

Collection and validation of environmental data for grape and apple disease risk assessment system

This project is a subset of currently on-going project that is to establish an online, map-based disease risk assessment system for major fungal and bacterial diseases of grape and apple in Virginia. Currently, we have established: i) the database for weather data from local Ag weather stations (VES mesonet), FAA stations, and the national weather service (NOAA); ii) translated several candidate disease models into ArcGIS modules for map display; and currently working on the development of a web-interface. The objectives of this proposed study is to evaluate the quality of data from the NOAA, and to develop a model to substitute leaf wetness measurement, which is often used in plant disease models, but not available in regular weather data. In order to achieve these objectives, we propose to place weather stations with several leaf wetness sensors (to measure different part of the canopy) in four geographically separated vineyard and apple orchard locations in VA. Hourly observation of temperature, relative humidity, precipitation,

wind direction, and leaf wetness will be made, and these data will be compared against observed weather data from NOAA, and also will be used to either validate a model to estimate leaf wetness period.

Virginia Pumpkin Growers Association Profitable Cilantro Production in Virginia

There is a new crop on the horizon in Southwest Virginia that appears to have significant potential to be an excellent money making crop for our producers. That crop is cilantro. We have a reputable company willing to purchase 3,000 to 5,000 boxes per week from the region. This crop has been grown on a limited scale over the last two years. One of the biggest problems encountered to date has been having an adequate planter. Seeds for this crop need to be placed 24 to 30 seed per foot. Due to the coarseness of our soils as well as rocks, it has been almost impossible to accomplish this requirement with an economic mechanical planter. In order to properly plant the crop, a five row vacuum system is badly needed. These types of planters are very expensive for small growers especially when a five row unit is required. We are looking to lease such a machine for two growing seasons.

If we can get the crop planted properly, we believe that producers can see net returns in the \$2,500 to \$5,000 per acre range. However, producers need access to such a planter to make this happen.

Appalachian Sustainable Development Facilitating the adoption of GAP, GHP and GMP plans in Virginia through the development of planning tools and the coordination of outreach education

In 2010 Appalachian Sustainable Development (ASD) was provided with a one year grant from VDACS that aided ASD in its work to support (among other things) the dissemination of Good Agricultural Practices (GAP) training to area farmers. The purpose of this current request is to continue this project for another year in order to provide GAP training for new and transitioning farmers. The project would leverage the success we have had in providing 12 hour GAP training sessions (including take home notebooks and DVDs and an on-farm session) to growers in our region. As a part of this project the Appalachian Harvest enterprise, run by ASD, will obtain GMP and GHP certification with the goal of documenting processes and standard operating procedures, resulting in a manual to be used in training sessions for regional efforts to certify packing sheds, medium and large scale farms, etc. ASD will also set up a Post Harvest Training Site that will be used to conduct hands-on training sessions with AH and other growers in the region. Finally, ASD will provide technical support and area consultants, networking with VA Cooperative Extension, to assist local and regional farmers with on-farm washing and packing of local produce.

VA Foundation for Ag, Innovation & Rural Sustainability (VA FAIRS) Determining the Feasibility of Designing and Operating a Multi-use Food Processing Facility in Central Virginia

The Bountiful Blue Ridge Planning Group seeks a Specialty Crop Competitive Grant to determine the feasibility of designing, developing and operating a multi-use cannery/food

processing facility in Central Virginia. This study will help determine whether a food processing center will be a valuable, sustainable infrastructure component of Central Virginia's local food/agriculture network – whether it can become economically viable, strengthen the local food system, help address the needs of food insecure families, create jobs, inform and encourage healthier food choices, and especially whether it can provide Virginia's farmers with a fair, local market for specialty and other crops. Many residents, farmers/growers, social service organizations, and potential business entrepreneurs have told us the capabilities they desire in a center. A feasibility study will allow us to examine their vision against the realities of local conditions and needs. The Virginia Foundation for Agriculture, Innovation and Rural Sustainability (VAFAIRS) has submitted this application on our behalf.

Nelson County

Cider Apple and Cider Production Feasibility Study

Production of hard cider (fermented apple juice) in the US is expanding rapidly. Virginia currently has two commercial cideries, with many more expected. This new industry could provide apple growers a profitable opportunity growing specialized, hard-cider apple varieties. Currently, little acreage in Virginia is dedicated to them. Hard cider apples are a specialized market and take several years to become productive. Also, being relatively new, with production costs and horticulture issues unknown, most apple growers are reluctant to plant them. The current low production, combined with growers reluctant to enter the market, could hamper this new industry.

This project can overcome the limited availability of hard cider apples in Virginia by 1) improving understanding of the market demand for hard cider and hard cider apples, 2) exploring the economics of producing hard cider and hard cider apples, and 3) assembling valuable technical information relating to producing this specialty crop. Ultimately, project will increase acreage of specialized hard cider apple varieties used for hard cider. Project also lays groundwork for Phase II, which will focus on providing cost share to farmers for planting these hard cider apple varieties.

Eastern Mennonite University

Sustaining Organic Blueberry Production: Analysis of Practices and Assessing Outcomes

This project proposal further develops a model system of quantifying sustainable organic blueberry production as a specialty crop in the Shenandoah Valley of Virginia by building on a prior project that focused on creating conditions for an organic blueberry operation at Knoll Acres. By integrating academic discovery through collaborative research experiences of faculty and undergraduate students from Eastern Mennonite University, this project seeks to document best organic agricultural practices that enhance sustainable profitable blueberry production. Optimal blueberry growth will be determined via foliar analyses of plant nutrients, plant vigor characteristics—growth measurements, photosynthesis and respiration, and ultimately through the quality and quantity of produced berries. Cost-benefit of organic versus conventional blueberry production on this small commercial scale will be assessed. An economically sustainable organic blueberry production model system will motivate area farmers, looking to diversify their current agricultural systems. Project participants will communicate the benefits and best practices of organic blueberry production to a larger audience through a website, varied

publications, and presentations. Area farmers and horticulturalists will be informed and motivated via a planned March 2013 regional mini-conference on “organic horticulture” hosted at the university and co-sponsored by area agricultural extension agents and Virginia Association for Biological Farming.

Local Food Hub, Inc.

Developing, Teaching and Promoting Sustainable and Organic Growing Practices at Maple Hill Educational Farm

Local Food Hub is a Virginia-based nonprofit that has been granted use of a 75-acre, certified organic educational farm. Through programs offered at this facility, as well through our distribution warehouse, Local Food Hub provides small and beginning farmers with concrete services and hands-on educational opportunities to advance economic vitality, increase production of specialty crops and promote responsible land stewardship.

In the current season, we are refining our programs to better meet the expressed needs of our producers. We will be maintaining a SPIN (“Small Plot Intensive”) plot to demonstrate how to yield a large volume of organically grown produce on very little land. We will offer hands-on workshops with topics like sustainable crop planning, organic pest management and season extension. Finally, we will refine our Farm Site Visit Program, through which we provide our partnering farmers with personalized consultations about growing, conservation and business practices. These programs will help Specialty Crop Producers implement organic and sustainable farming practices and increase production of specialty crops, thereby becoming more profitable and competitive.

Local Food Hub will also develop the next generation of Specialty Crop Producers through apprenticeships and internships that pass on skills necessary to operate a sustainable and/or organic farm.

Patrick Henry Community College

Commercial Green Production in Underused Industrial Sites in Martinsville, Va.

The Horticulture and Agribusiness departments of Patrick Henry Community College will investigate the suitability of a hydroponic production of various greens that include lettuces, garlic chives, and cilantro in an underused commercial manufacturing structure that has been vacated by the loss of the many textile and furniture industries in the Martinsville and Henry County, Virginia area. Studies will involve the use of various types of LED lighting as sources of illumination for the selected plants and their growth rates evaluated as to the suitability for a commercial production system. Efforts will be made to determine the best selection of the hydroponic systems to be used under these conditions. The primary goal of this study is to develop a sustainable system in existing vacated buildings that is capable of producing a product that meets consumer demands of a high quality fresh vegetable to be marketed into a local food network of markets and restaurants. The result of this study may provide an industry evolution using agriculture production to provide employment for growers, packers, salespersons, and distributors from a population of extremely high unemployed residents.

Northern Neck Vegetable Growers Assoc.

Ensuring Future Farm Profits with Innovative Specialty Crop Education Opportunities

The Northern Neck Vegetable Growers Association (NNVGA) is a regional vegetable producer organization of 50 family owned farms serving the Northern Neck and Middle Peninsula of Virginia. The NNVGA has tirelessly served the local produce farming community for nearly a quarter of a century with progressive education and technical outreach tailored to improve member profitability. This project proposes continuing education and networking for NNVGA producer members to increase future profitability. NNVGA members will travel nationally to experience production, processing and marketing of specialty crops they can consider adding to their operations. Host producers and processors will be selected by product and process applicability to producers in the NNVGA. NNVGA members will gain knowledge, skills, and abilities through experiential learning from proven farm experts. First-hand exposure to on-farm operations, as well as networking opportunities will boost producer confidence to grow and market new specialty crops increasing future profitability and competitive advantage for Virginia specialty crop industry.

The Farmers Market.Co / Quin Rivers, Inc.

Promoting Specialty Crops in VA: Increasing Fresh Food Access and Sales of Fruits and Vegetables to SNAP Clients at Fredericksburg Area Farmers Markets

This project's goal is to increase sales of fresh, local specialty crops to low-income populations in the Fredericksburg region, improving food access to underserved communities. It will promote the competitiveness of specialty crops sold at the Fredericksburg, Spotsylvania and King George Farmers Markets and benefit 65 specialty crop producers.

The proposed one-year program creates a model for SNAP redemption that is replicable by other VA Farmers Markets. In addition, this program provides an incentive to encourage use of the three farmers markets by matching use of SNAP benefits with bonus tokens.

Objectives include:

- (1) Create a targeted, multilingual community marketing plan and materials to increase awareness and consumption of specialty crops by SNAP clients;
- (2) Provide on site staff resources and program oversight for SNAP redemption at three Farmers Markets;
- (3) Demonstrate the effectiveness of "matching incentives" or bonus tokens at driving SNAP shoppers to use the farmers markets.

The proposed project is a collaboration of Quin Rivers, Inc. and the Fredericksburg Region Farmers Market Coalition. Total funds requested from the VDACS Specialty Crop Program are \$30,000.

Virginia Christmas Tree Growers Association

"Phase II, Marketing Expansion Initiative Promoting Virginia Grown Christmas Trees"

The Virginia Christmas Tree Growers Association is seeking to build upon our successes as we implement those actions described in the FY2010 USDA Specialty Crop Competitive Grant (MOU Agreement #2010- 442 Between VDACS and VCTGA). That project, Marketing

Expansion Initiative Promoting Virginia Grown Christmas Trees, funds marketing expos in each region of the state that bring growers and buyers face-to-face in order to increase sales of Virginia grown Christmas trees within the Commonwealth..

The project proposed herein, Phase II, Marketing Expansion Initiative Promoting Virginia Grown Christmas Trees, consists of three mutually supporting activities that will expand the relationships between growers and buyers, further educate both groups and promote the sales of not only Christmas trees, but other Virginia grown and/or produced specialty products.

We annually hold a summer meeting. We are proposing to add winter meetings to our annual calendar in order to share, on a timelier basis, marketing experiences from the most recent holiday season. Secondly, we are seeking the opportunity to update and upgrade the Association website. And lastly, we propose to purchase banners and static displays that identify and promote our Virginia grown products at expos, annual meetings, and points of sale.

Piedmont Environmental Council

Buying Virginia Grown Produce: Workshops for Private Schools, Senior Centers, and other Community Institutions

There is growing momentum among both producers and buyers to incorporate Virginia grown specialty crops into meals offered by private schools, senior nutrition centers, independent living communities, food service contractors, and others. Yet there are comparatively few examples of Virginia specialty crop producers who are tapping into this market. One reason is that institutions have adapted their food procurement and preparation practices to a national and international food distribution system. PEC proposes to host a series of four workshops for organizational administrators in 2012. Through examples of institutions that have incorporated Virginia grown specialty crops, review of participants' procurement and preparation practices, and introduction to local producers, the workshops will help participants identify opportunities to incorporate Virginia grown fruits and vegetables. We will survey participants twice after the workshop series to determine if purchases of local fruits and vegetables are increasing. PEC will also share the curriculum with other organizations that want to purchase more Virginia Grown specialty crops.