

Specialty Crop Competitive Grant  
Federal Fiscal Year 2015

Abstracts

**Robin Robbins**

**Making Food Safety Accessible and Affordable for Virginia Farmers  
Appalachian Sustainable Development**

Most wholesale produce buyers insist that the farmers who supply them hold some form of food safety certification. Good Agricultural Practices (GAP) certification is currently available from several sources (USDA GAP, GLOBAL GAP, Global Food Safety Initiative (GFSI) to name a few). A compromise effort between these many paths, the Harmonized Food Safety Audit, is gaining traction with many produce buyers.

Appalachian Sustainable Development (ASD), along with Virginia Cooperative Extension, has been at the forefront of working with wholesale buyers to accept GAP certification plans that are friendly to smaller-scale farmers. We have also worked with farmers to provide training in food safety principles and actions and assisted them with obtaining their GAP certifications so that they can have continued access to quality wholesale markets.

ASD, through this grant, will continue to spearhead these efforts throughout the State, providing:

- 1) Training and consultation to farmers to prepare them to be USDA GAP or Harmonized GAP certification-ready.
- 2) Assist farmers with obtaining USDA GAP or Harmonized GAP certification through audit coordination and technical assistance.

Expand the training to include direct-market farmers who may need the certification to sell to restaurants and/or institutions.

**Laura K. Strawn; Steven L. Rideout**

**Enhancing the Food Safety and Quality of Virginia Grown Cucurbits  
Virginia Polytechnic Institute and State University**

*Salmonella* is considered the leading cause of bacterial foodborne outbreaks in the US, which causes 1.4 million cases of illness and 500 deaths every year with total estimated costs of \$3.4 billion/year. At least three outbreaks of salmonellosis have been traced back to the Eastern Shore of Virginia (ESVA, part of Delmarva Peninsula). In 2014, a *Salmonella* Newport outbreak associated with cucumbers caused 275 illnesses and 1 death in 29 U.S. states and Washington DC. The source of the outbreak was traced back to cucumbers grown at a farm on the Delmarva Peninsula of Maryland. While not on the Delmarva Peninsula of VA, the industry suffered due to the stigma of Delmarva-grown produce being unsafe, subsequently impacting the VA agriculture economy. Little is known about the behavior of *Salmonella* or other foodborne pathogens on cucurbits, specifically cucumber and cantaloupe. Additionally, minimal data exist on how the cucurbit industry will be influenced by pending regulations of the Food Safety Modernization Act. This proposal describes a collaborative effort between faculty located on the ESVA with the goal to provide the scientific-basis for minimizing foodborne pathogen contamination of cucurbits during the growing and postharvest packing; and disseminating this information to VA cucurbit growers/packers.

**Lisa Horth**

**Old Dominion University Research Foundation**

**Sustainable Development of Native Mason Bee Populations for Berry Pollination**

The goal of this work is to improve Virginia specialty crop, small-farmer competitiveness by creating sustainable farm populations of native mason bees and monitoring pollination rates in greenhouses. Honeybees are dying from Colony Collapse Disorder. Farmers need sustainable options. We recently determined mason bees (*Osmia lignaria*) increase strawberry volume on farms. However when we stocked farms, the only data available for bee density estimates was from orchards. We request funding to stock eight farm plots at 'high' density (twice that used previously), to prepare permanent, optimized bee

Specialty Crop Competitive Grant  
Federal Fiscal Year 2015

Abstracts

homes to retain progeny bees on farms, and to monitor greenhouse pollination rates. Mason bees are effective early crop pollinators and we anticipate benefits to farmers through increased strawberry (and ultimately raspberry, blackberry and blueberry) crop yield, berry volume and symmetry, and pollination rate. Self-pollinating strawberries are poorer quality berries, least preferred by consumers. Funding is requested to stock eight small farm plots in southeast Virginia with mason bees and bee homes. We will monitor strawberry pollination rates, volume and symmetry on farms. We collaborate with Pungo famers, share results, and can benefit all berry farmers. We will educate consumers about strawberry nutrition and native bee pollination at Pungo Strawberry Festival (120,000+ attendees).

**Josephine Mooney**

**Eastern Shore Resource Conservation and Development Council  
Integrated Peer-to-Peer Training and Community Outreach to Improve Growing, Marketing and Consumption of Specialty Crops on Virginia's Eastern Shore**

The objective of this project is to enhance the competitiveness and profitability of specialty crops by meeting the growing demand by farmers for educational programs directed towards sustainably grown specialty crops. In a region that has lost most small farms in the past 80 years, our two-pronged approach includes Peer-to-Peer Training for growers and focused Community Outreach to disadvantaged farmers and consumers.

To accomplish this, we will present a series of on-farm/peer-to-peer educational programs around specialty-crop specifics, such as high-value crop selection, best practices, food safety, market access, and efficient distribution services. This will be accomplished with a series of 10 Small Farmer Classroom and Peer-to-Peer/On-Farm Workshops over two years applying the expertise of two of our partners, the Future Harvest Field School and Virginia State University's Small Farms Outreach Program.

As we promote the small farmer training, our Community Outreach, in partnership with the Eastern Shore Health District-Virginia Department of Health (ESHD) and the Eastern Shore Healthy Communities Coalition, will engage socially disadvantaged communities including African Americans, Hispanics and Veterans and provide training to them on a scholarship basis. Additionally, through the strength of our partnerships, we will reach out to local and regional consumers, especially women and children and promote the associated health and nutritional benefits with a goal of increasing consumption of fresh local fruits and vegetables.

**Kedong Da**

**Institute for Advanced Learning and Research  
Strengthen and Develop Asian Pear Market in Virginia**

Pears are one of the most popular and well-liked fruits in the world. Two types of pear are now grown in Virginia, the European type and the Asian type. European pears (*Pyrus communis*) are the variety most commonly seen in supermarkets today. The Asian pear, however, has rapidly increased its market share in the United States due to its attractive appearance and white, crisp, sweet, and juicy flesh. Hence, there exists the potential to increase Virginia-grown Asian pear production and market share. Farm size, soil type and climate differences have restricted technologies successfully applied in the Pacific Northwest from being applied to Virginia's small-to-medium sized farms; especially to Virginia organic farmers whose cultivation practice is quite different from commercial growers utilizing mechanical pruning and chemical thinning. Virginia Asian pear farmers need to develop Virginia Asian pear cultivation protocols to improve Asian pear quality and to strengthen the Virginia Asian pear market. This research will facilitate the study of tree training and pruning methodology and fruit bagging technology in Virginia Asian pear orchards to improve Asian pear yield and quality, and to develop a standard Asian pear training and pruning and bagging system for Virginia farmers, and strengthen Virginia Asian pear market.

**Laban K. Rutto**

**Virginia State University**

**Increasing Yield of Virginia-Grown Hops (*Humulus lupulus* L.): Nutrient Management and Selection for Disease Resistance**

Hops is an emerging specialty crop in Virginia and the Southeastern United States. The recent interest in the crop is driven largely by a burgeoning craft beer industry that continues to demand more of specialty ingredients including hops. However, Virginia farmers interested in growing hops are faced with a lack of critical information on variety selection, recommended cultural practices, and market conditions.

In this application, we propose to address two key research questions, the answers to which will make Virginia farmers better informed and prepared to grow hops as a cash crop.

- i.) We will conduct trials at two locations leading to selection of varieties tolerant to major fungal diseases under Virginia conditions. Hops as a crop is sensitive to fungal diseases, and Virginia's humid and hot summers will be a challenge to most hops varieties.
- ii.) Fertilizer application rates and timing will also be tested to identify a nutrient management plan for hops suited to Virginia soils and cropping seasons.

Information generated through this project will be disseminated to Virginia farmers at field days and through other media, and to a wide audience through online bulletins and a refereed manuscript.

**Kathlyn Terry**

**Appalachian Sustainable Development**

**Developing Markets and Processing Capacity for Specialty Crop Seconds & Value Added Products**

Most specialty crop farmers struggle to find viable markets for their seconds, particularly in rural areas of VA where there is little processing infrastructure that could be used to convert these low value crops into high value products. Appalachian Sustainable Development (ASD) has worked with a co-packer and Appalachian Harvest farmer to provide its wholesale and retail buyers with access to 11 value added products. These value added products represent a significant market opportunity for farmers in southwest VA. Unfortunately, few farmers in southwest VA are able to take advantage of this opportunity due to a lack of processing infrastructure.

This grant will demonstrate the viability of using value added products to increase farmer profitability in southwest VA by:

1. Increasing demand for value added products among retailers, wholesalers and end customers
2. Identifying the most efficient and cost effective means of processing seconds for small and medium scale farmers in southwest VA

**Laura K. Strawn; Steven L. Rideout**

**Virginia Polytechnic Institute and State University**

**Balancing Microbial Safety and Disease Management of Virginia Fresh Herbs**

The market for fresh herbs, such as cilantro, basil, and dill has been steadily increasing at a rate of 10% per year. Virginia is well suited for the production of fresh market herbs, and more farms have begun producing various herbs for commercial sale. Therefore, understanding the safety and quality of VA-grown herbs in fields and greenhouses is essential for the growth of the VA fresh market herb industry. While no outbreaks have been traced back to VA-grown herbs, several herbs (basil, cilantro) have been implicated in both *Salmonella* and *Escherichia coli* outbreaks elsewhere. Additionally, herbs (cilantro,

Specialty Crop Competitive Grant  
Federal Fiscal Year 2015

#### Abstracts

basil) can be affected by different plant pathogens that can have severe impacts on quality and result in substantial economic loss. Minimal research has been performed on the balance between microbial safety and disease management in VA, especially herbs. Thus, the proposed project will perform a series of both field and greenhouse experiments to assess the risk of (i) *Salmonella* and *Listeria monocytogenes* (human foodborne pathogens) contamination, (ii) basil downy mildew and septoria leaf spot (plant pathogens) infection, and (iii) the combined effect of such plant pathogen infections on foodborne pathogen contamination in fresh market herbs.

**Jeffrey Derr**

**Virginia Polytechnic Institute and State University**

#### **Injury Potential from 2,4-D and Dicamba Spray and Vapor Drift onto Vegetable and Nursery Crops**

The introduction of Roundup Ready crops have given producers of corn, soybeans and cotton better control of troublesome weeds. These genetically modified crops allow growers to control weeds, without crop damage. However, several key weed species have developed resistance to glyphosate, the active ingredient in Roundup. To address these herbicide-resistant weed species, chemical companies have developed through biotechnology varieties of soybean and cotton that are tolerant of 2,4-D and dicamba, two herbicides used for control of broadleaf weeds in grass crops. In 2015, these new genetically modified crops are slated to be released. With the release of this technology, increased use of 2,4-D and dicamba is inevitable, posing a significant hazard to vegetable, fruit, and nursery crops in Virginia. Companies are developing formulations of 2,4-D and dicamba that are supposed to pose less risk of drift onto vegetable and other specialty crops but research is needed to determine this. As the demand for locally produced food increases in Virginia, so has acreage of herbicide-sensitive crops such as tomatoes, snap beans and ornamentals. Tomatoes in particular are very sensitive to the phenoxy group of herbicides such as 2, 4-D. This new technology is cause for concern for all specialty crop growers in Virginia as well as other states where corn, soybeans and cotton are produced in proximity to herbicide-sensitive specialty crops. Proposed research will determine the potential for vapor and spray drift injury to specialty crops, along with a documentation of the injury symptoms. An Extension publication will be developed for vegetable, fruit, and nursery crop producers that can be shared with neighboring producers of agronomic crops on how to minimize the potential for millions of dollars in damages to specialty crops resulting from use of this new technology.

**Mizuho Nita**

**Virginia Polytechnic Institute and State University**

#### **Understanding Species Complex and Infection Process of Anthracnose and Ripe Rot Pathogens**

Two pathogen-complexes *Colletotrichum acutatum* and *C. gloeosporioides*, are resurging endemic pathogens for VA fruit crops. Between 2010-14, several growers in southern VA lost more than 30% of their potential crop due to ripe rot of grape caused by these pathogens. Also, a recent study found out that only 3% contamination of these pathogens could alter flavor of wine. Moreover, these pathogens can cause diseases on apple (bitter rot), strawberry (anthracnose and crown rot), and anthracnose on other fruits including peaches. Although there are extensive studies done on this pathogen, surprisingly, there is very limited information available for the interaction with grape. Our lab has been conducting experiments to understand biology of this pathogen on grapes, and in this proposal we would like to: 1) identify species of *Colletotrichum* isolated from grape, apple and strawberry, 2) screen for efficacy of fungicides among these species, 3) determine the effect of high relative humidity to the infection process, and 4) Determine cultivar susceptibility.

**Jayesh Samtani**

Specialty Crop Competitive Grant

Federal Fiscal Year 2015

Abstracts

**Virginia Polytechnic Institute and State University**

**Evaluating Foliar Nutrients Effects on Fruit Quality and Yield of Two New Blackberry Cultivars**

Blackberry (*Rubus* spp.) is a good choice for crop diversification, season extension, and agri-tourism in farms that grow other berries and vegetables. Observations from recent on-farm trials, indicated foliar applications of soluble potash with other micronutrients, prior to and at flowering, increased the sugar content in florican bearing blackberries. University of Arkansas released their first thornless, primocane blackberry cultivar: Prime Ark® Freedom (good for local markets) in 2013; and another: Prime Ark® Traveler (suitable for long distance shipment) in 2014. Goal of this project is to increase grower knowledge on these cultivars, make recommendations on performance of these two cultivars, and provide data supported recommendations for foliar nutrient applications. Performance will be measured by counting growers visiting the Agriculture Research and Extension Center to see performance of the new cultivars, making note of field day attendance, and counting the number of times the publication (to be compiled) pertaining to the study, will be downloaded. Count of growers adopting these cultivars and those making foliar nutrient applications will be noted through annual survey conducted with help from Virginia Cooperative Extension. The proposed study will increase farm revenues, crop diversity, consumer interest for tastier berries, and benefit human health.

**Danny Peek**

**Virginia Polytechnic Institute and State University**

**Bringing New Technology to Southwest Virginia Apple Producers: Establishing a High Density Demonstration Orchard**

In three counties in southwestern Virginia, all of the 57 apple growers are currently using traditional style and less efficient orchard planting systems. However, as apple production elsewhere in the United States moves towards high-density orchard systems producers must update their plantings in order to remain an economically viable enterprise in SW Virginia. This project will demonstrate the benefits of high-density apple systems to growers in southwest Virginia. I am requesting VDAS-SCBG funding to develop a high-density demonstration orchard that will serve as a foundation for my extension and research activities. The orchard would have 550 trees total, representing 10 cultivars, to also allow for a cultivar trial. The cultivar trial would allow for more in-depth demonstrations in pruning, training, and how the cultivars respond to the trellis. By utilizing a demonstration high-density orchard, producers in the area will have direct access to seeing the performance of highly productive orchard systems in their unique climate.

**Harbans Bhardwaj**

**Virginia State University**

**Facilitating Coriander Production in Virginia**

This effort will address the following three priorities of USDA and VDACS related to Coriander: (1) Development of new and improved seed varieties; (2) Development of organic and sustainable production practices; and (3) Development of “Good Agricultural Practices”. Considerable markets exist in metro areas around Washington, D.C. and New York for green leaf stages of coriander (Known as cilantro). Additional marketing avenues exist in smaller markets where considerable populations of Asian and South American immigrants exist. Seeds of both his crops are used in flavor and spice industries. Old Mansion Foods (Located in Petersburg, Virginia) is interested in purchasing 10-15 tons of coriander seed and 5-10 tons of dried cilantro per year. It is planned that an extensive germplasm (184 coriander lines) will be evaluated in the field to identify lines adapted to Virginia’s agro-climatic conditions. Additionally, field experiments will be conducted to identify optimal planting time and NPK fertilizer needs for production of coriander and foliage under both conventional and organic production systems.

**Mizuho Nita**

Specialty Crop Competitive Grant

Federal Fiscal Year 2015

Abstracts

**Virginia Polytechnic Institute and State University  
Establishment of Green Tea Production in Northern VA**

Tea is the world's most popular drink. In 2010, the world tea production increased annually by 2.6%. Tea tree cultivation does not require heavy equipment or specialized cropping systems; it is disease resistant and yields 300 to 1,740 lb. /acre, and it can sell for \$15 or more per oz. Having a major metropolitan area nearby, Virginia has a great opportunity to develop local tea production. The diverse population, an increase in specialized beverage consumption and the area's increasing affluence and educated public are now coupled with a desire to eat healthier and locally-grown products. Virginia is poised for its entry into this new area of agricultural affluence; however, a cogent plan and study is needed. Tea type, temperature, precipitation, and unknown pathogens are variables needing study to establish a viable tea cultivation culture. The objectives for the Green Tea project are to examine three cold hardy cultivars for their cropping potential under Northern Virginia conditions, the effect of two pesticide regimes, and the effect of high tunnel winds. The experiment will be conducted at four locations in Northern Virginia. Quality and quantity variables will be measured and chemically analyzed.

**Laurie Aldrich**

**Virginia Wineries Association Cooperative**

**The Vine to Wine Co-op**

The Vine to Wine Co-op will reduce overall grape and wine production costs and enhance the competitiveness of the Virginia Wine Industry by providing two cooperative endeavors - group purchasing and service provisions. 2015 Specialty Crop funding will finance to: 1) Further our progress of education to farm winery and vineyard owners about the benefits of cooperative membership, collective purchasing and services, and how involvement will decrease the cost of production; 2) Reduce production costs and improve profitability by further development of group purchasing by increased participation, expanded offerings, vendor development and coordinated logistics. The goal is to reach sustainable operations by September 2017.