

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Agriculture Profitability and Sustainability

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	0%	15%	0%	0%
102	Soil, Plant, Water, Nutrient Relationships	10%	20%	10%	0%
104	Protect Soil from Harmful Effects of Natural Elements	0%	15%	0%	0%
111	Conservation and Efficient Use of Water	8%	15%	0%	0%
133	Pollution Prevention and Mitigation	0%	8%	0%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	10%	0%
202	Plant Genetic Resources	2%	0%	10%	15%
204	Plant Product Quality and Utility (Preharvest)	10%	0%	0%	20%
205	Plant Management Systems	18%	27%	10%	0%
206	Basic Plant Biology	0%	0%	5%	0%
211	Insects, Mites, and Other Arthropods Affecting Plants	5%	0%	5%	10%
212	Pathogens and Nematodes Affecting Plants	0%	0%	5%	0%
215	Biological Control of Pests Affecting Plants	1%	0%	0%	10%
216	Integrated Pest Management Systems	13%	0%	15%	0%
301	Reproductive Performance of Animals	4%	0%	5%	15%
302	Nutrient Utilization in Animals	0%	0%	5%	15%
307	Animal Management Systems	15%	0%	5%	15%
315	Animal Welfare/Well-Being and Protection	8%	0%	0%	0%
601	Economics of Agricultural Production and Farm Management	5%	0%	5%	0%
606	International Trade and Development	1%	0%	10%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890

Actual Paid Professional	110.7	12.8	157.7	8.5
Actual Volunteer	3380.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
3433519	837058	2571544	1380232
1862 Matching	1890 Matching	1862 Matching	1890 Matching
3595681	1073452	6772207	1576441
1862 All Other	1890 All Other	1862 All Other	1890 All Other
8734068	1865551	34957845	648872

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct research experiments that educate and solve applied problems, establish partnerships to identify needs and develop solutions, conduct workshops, both traditional procedures and hands-on, and meetings to provide training for farmers and educators, organize and conduct state and regional conferences, establish on-farm demonstrations, develop enterprise budgets, develop products, curriculum, and resources for use by educators and directly by producers, and conduct assessments as needed to evaluate progress. Research-based information will be disseminated via media and informational meetings. Decision aids, workshops, detailed curriculum, and distance educational methods will be used to support change in the overall behavior of learners.

2. Brief description of the target audience

Commercial producers, 4-H youth, Master Gardeners, state and federal agency personnel, Extension educators, consumers, supermarket chain store buyers, animal owners, youth, allied industry personnel, consumers, policy-makers, academic colleagues, research scientists, government officials, high school teachers, general public, individuals, families, owners and managers of farms, and small businesses; local, state, and federal personnel, private sector service suppliers, advocacy and consumer protection groups and association, health/medical personnel.

3. How was eXtension used?

Specialists and agents participated in multiple communities of practice, including Corn and Soybean.

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	4884210	843906	144226	17274

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	660	258	324

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of Extension educational presentations in the form of workshops, field days, demonstrations, etc.

Year	Actual
2013	5114

Output #2

Output Measure

- The number of peer-reviewed research publications published

Year	Actual
2013	258

Output #3

Output Measure

- The number of Extension publications published

Year	Actual
2013	2339

Output #4

Output Measure

- The amount of competitive grant funding received.

Year	Actual
2013	18013548

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Beef Quality Assurance Program
2	Extension Master Gardeners Strengthen Environmental Stewardship
3	Double-Cropped Soybean Production: Increasing Early-Season Growth and Yield
4	Pesticide Safety Education
5	Soybean Insect Pest Surveillance Program: Brown Marmorated Stink Bug and Kudzu Bug
6	Addressing Strawberry Production Issues
7	Extension Master Gardeners Help Homeowners Improve Water Quality by Teaching Turf Best Management Practices
8	Agronomic Studies of Stinging Nettle (<i>Urtica dioica</i> L) in Southside Virginia
9	Development of high value specialty wheat varieties
10	Development of a vaccine against oricine reproductive and respiratory syndrome virus
11	Small Farm Customer Outreach through Social Media Awareness and Education

Outcome #1

1. Outcome Measures

Beef Quality Assurance Program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

At the beginning of 2012, Virginia is home to 1.49M head of cattle, with a \$1.42B value of inventory. More than 25,000 Virginia Farms have cattle. U.S. consumers are very concerned about the safety and wholesomeness of the food they eat. This safety and wholesomeness is tied to production and management decisions made on the farm, and consequently for beef to be competitive with other food choices producers must make choices at the farm level based on scientific knowledge and a commitment to produce a quality product.

What has been done

Virginia Beef Quality Assurance Program (BQA) educates and certifies beef producers in best management practices that improve the safety and quality of beef. Extramural funding of \$16,800 was secured to carry out the training efforts from the Virginia Beef Industry Council. The total number of certified producers in Virginia stands at over 5,000 which makes Virginia one of the national leaders in BQA activities. After assurance with the BQA programs the value of produce has a premium. Consequently, this expands marketing opportunities such as Virginia Tel-O-Auction sales in which cattle must be from BQA producers. BQA certified producers are able to consign their feeder cattle to make larger loads of around 50 head for sales which is more attractive to buyers and offers a price incentive.

Results

During 2013 there were 891 producers either certified or re-certified. These producers came from 50 counties and two surrounding states. We estimate that the certified producers represent over half of the cattle produced in Virginia. Added value of cattle produced on BQA certified farms is estimated to be \$1.5-2.0 million annually. Since the VQA Feeder Cattle Marketing Program was organized in 2005, producers have consistently added money. With 15,257 animals sold, producers have added over \$897,900 to the gross sales of their livestock (+\$58.86 per calf).

Reaching beyond the original four counties, participants are now drawn from 12 Virginia counties, Tennessee, and North Carolina. The VQA Program has become the premier method of marketing quality feeder cattle in Southwest Virginia.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
307	Animal Management Systems
315	Animal Welfare/Well-Being and Protection

Outcome #2

1. Outcome Measures

Extension Master Gardeners Strengthen Environmental Stewardship

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

For 34 years, Extension Master Gardeners have assisted state and county faculty in providing current, relevant, research-based, and timely responses to Virginia's homeowners who need assistance with their home landscapes. As personnel resources diminish, we rely more heavily on our volunteers to help deliver quality programming and services to our constituents. The work of Extension Master Gardeners is important in multiplying the efforts of our paid faculty as they impart best practices to homeowners wishing to manage their landscapes in sustainable and environmentally friendly ways.

What has been done

In 2013, more than 800 additional Extension Master Gardeners were trained and certified. Extension agents, specialists and veteran Master Gardeners all worked to provide quality training to this new cohort of volunteers. Once training was completed, opportunities to volunteer and employ their new training were provided to the new MG interns.

Results

More than 800 new Master Gardeners joined forces with more than 4,000 currently active Master Gardeners. In 2013, there were more than 5,000 volunteers total working on behalf of local extension offices providing service and educational programming to more than 430,000* constituents. In the course of working with Virginia's citizens, Extension Master Gardeners reported in excess of 365,000* volunteer hours. The volunteer time was equivalent to 182.5 full-time equivalents. This means that collectively, Virginia Cooperative Extension had an additional 182 full-time staff disseminating best practices. The economic value of the reported volunteer time is more than \$8.36 million (based on an hourly rate for Virginia of \$22.90 from the independent sector: http://www.independentsector.org/programs/research/volunteer_time.html). This is a tremendous in-kind contribution and return on investment to the Commonwealth of Virginia.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants
601	Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

Double-Cropped Soybean Production: Increasing Early-Season Growth and Yield

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Full-season soybean and double-cropped small grain-soybean are common cropping systems in the Mid-Atlantic USA. Full-season soybean is usually planted in May and is the only crop grown

during that calendar year. The small grain-soybean double-cropping system includes planting winter wheat in October through November, harvesting that crop in late-June, and planting soybean immediately following small grain harvest. Full-season soybean yields more than soybean double-cropped after wheat, but double-cropped small grain-soybean systems are generally more profitable. Yearly increases in soybean yield must be maintained if double-cropping systems are to remain productive and profitable. Lack of early-season growth is the main reason that double-cropped soybean yield less than full-season soybean. New ideas to increase crop growth rate in the vegetative stages and extend the seed filling period are needed to ensure adequate leaf area development and light capture. In addition, pest management practices for double-cropped soybean need re-evaluation since this crop will mature later in the year when incidence of insect pests and disease is greater.

What has been done

Research was conducted in 2012 and 2013 at three locations per year to address the following objectives: 1) Evaluate seeding rate, seed-applied inoculant, starter N applied at planting, cultivar growth habit, and foliar fungicide application on soybean vegetative response and seed yield in a wheat-soybean double-crop system in the Mid-Atlantic region; 2) Evaluate soybean vegetative growth response and seed yield with starter N at planting with or without seed-applied *Bradyrhizobia japonicum* inoculant in a wheat-soybean double-crop system; and 3) Evaluate the response and specific interaction between soybean cultivars and foliar fungicide application in a wheat-soybean double-crop system.

Results

Research was conducted in 2012 and 2013 at three locations per year to address the following objectives: 1) Evaluate seeding rate, seed-applied inoculant, starter N applied at planting, cultivar growth habit, and foliar fungicide application on soybean vegetative response and seed yield in a wheat-soybean double-crop system in the Mid-Atlantic region; 2) Evaluate soybean vegetative growth response and seed yield with starter nitrogen at planting with or without seed-applied *Bradyrhizobia japonicum* inoculant in a wheat-soybean double-crop system; and 3) Evaluate the response and specific interaction between soybean cultivars and foliar fungicide application in a wheat-soybean double-crop system. Yield responses to the five inputs varied depending on location and year. The early maturing, indeterminate variety generally yielded more than the later maturing determinate cultivar. Greater seeding rates resulted in greater yields in some instances when the early-maturing cultivar was used. Inoculant and starter nitrogen occasionally increased yields and interacted with cultivar. Foliar fungicides increased yield in half of the experiments. Although fungicides increased soybean yield, cultivar did not affect the results. These practices and results are disseminated in VCE workshops, publications, and webinars. If this research results in a 5% yield increase on only half of the Mid-Atlantic double-crop soybean acres, the value of these yield increases would exceed \$12 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
215	Biological Control of Pests Affecting Plants
601	Economics of Agricultural Production and Farm Management

Outcome #4

1. Outcome Measures

Pesticide Safety Education

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

USDA and EPA mandate the safe use of pesticides by commercial, private, and public applicators. USDA and EPA ask Cooperative Extension nationwide to address this mandate. The Virginia Tech College of Agriculture and Life Sciences has a key initiative in agricultural and environmental sustainability, and Virginia Cooperative Extension (VCE) has a planned program in pest management. In Virginia, most people who use pesticides "on the job" must be certified. Virginia Cooperative Extension provides most of the initial certification and continuing education (recertification) programs for growers who use restricted-use pesticides and, as a result, must have a Private Applicator certificate. VCE also offers a significant portion of such programs for Commercial Applicators and Registered Technicians -- people who use pesticides other than in agricultural production on private property. Last but not least, VCE ANR agents provide information about pesticides and pesticide management to a wide variety of clients who are not certified applicators, including farmworkers and home gardeners.

What has been done

Virginia Tech Pesticide Programs develops and/or acquires resources for ANR agents to use in pesticide safety programs--those for certified / professional applicators as well as for non-certified audiences. New materials and methods--along with updated information regarding laws, programs, and regulations that may impact them and their clients--are delivered to them at an annual Pesticide Safety Educators' Workshop. In addition, updates and additions are available throughout the year, via in-person communication, mail and e-mail, and postings on a resource website for VCE agents. Program evaluation data and Private Applicator Course credit requests document that agents use what they acquire from VTPP in their programs. In addition, most of the agents who complete a course evaluation at PSEW's cite a specific practice change they plan to implement as a result of attending this in-service program.

Results

Pesticide Safety Education program, commercial and private pesticide applicators were trained and certified according to state and federal requirements. The program enables over 20,000 agricultural producers and pest managers to maintain certification in 27 different categories of private and commercial pesticide application. This enabled these pesticide managers to legally use pesticides on their farms, in pest management businesses, and through public pest management programs throughout the commonwealth. Trainers are an important part of this effort. In 2013, 2 train-the-trainer workshops were conducted. The 21st annual Virginia Pesticide Safety Educators Workshop enrolled 115 Extension agents, specialists, and pesticide investigators. We also sponsored the 5th annual Vo-Ag Pesticide Safety Educators Institute for 22 Vo-Ag teachers. Four online courses helped commercial and private applicators, and registered technicians prepare for certification. Over 101 different companies, 45 government entities, 9 farms, and 5 schools resulted in 395 individuals enrolled in three courses. In addition, pesticide safety education information was provided to 542,012 unique visitors through the VTPP websites. Because of the program, the risks to public health and the environment were minimized while maintaining crop protection and effective pest control efforts. Providing high-quality pest and pesticide management programs to pesticide handlers safeguards both human and environmental health. In calendar year 2013, more than 2,000 VA-certified Private Applicators attended at least one of over 115 re-certification programs (168 sessions) organized by VCE-ANR agents. Participation in a re-certification (continuing education) session allows growers to keep their pesticide applicator certificates in force, which in turn enables producers to purchase and use restricted-use pesticides on their farms. Similarly, certification and re-certification programs enable commercial applicators to comply with state laws and work safely while they earn a living.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #5

1. Outcome Measures

Soybean Insect Pest Surveillance Program: Brown Marmorated Stink Bug and Kudzu Bug

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Virginia soybean crop is being attacked by two new invasive insect pests, the brown marmorated stink bug (BMSB) and the kudzu bug. Both species were introduced into the US from Asian sources and are rapidly spreading. Both species readily feed on soybean plants and have the potential to cause significant injury and crop loss. These new pests are now well established in Virginia. Growers are in need of information about these pests, when and where they occur in the state and the recommended management options. The Statewide Soybean Insect Pest Surveillance Program was initiated to accomplish these goals.

What has been done

In 2013 the surveillance program was conducted from mid-July through mid-October. Two field scouts (located in Goochland and Southampton Counties) were hired to cover most soybean growing counties; scouting was also done by the Entomology crew based at the Virginia Tech Tidewater AREC in Suffolk. VCE ANR Agents provided additional assistance with scouting and reporting these pests. Full season soybean was scouted from R-3 to R-7 or R-8 and double crop soybean was checked from R-3 until the end of scouting in October. Scouts traveled over 21,000 miles and made a total of 684 field visits to 54 Virginia counties. Additionally, scouts monitored 8 fields comprising over 600 soybean acres in 4 counties that received a VCE recommended field-edge-only insecticide treatment by local growers for controlling BMSB. Survey updates were issued via the Virginia Ag Pest Advisory, grower field days (including the Virginia Ag Expo), and in-field training sessions for agents and crop advisors.

Results

BMSB were recorded in soybean fields in 35 Virginia counties. In general, northern and central counties had the highest peak populations of BMSB, with lower numbers in southern and southeastern counties. Growers were alerted weekly to local infestation levels and were able to react according to the level of risk to their fields. Post treatment scouting showed that field-edge-only treatments by growers were successful in controlling BMSB populations on 2,500 soybean acres and preventing crop loss. They represented an estimated 30-40% reduction in insecticide use compared with if entire fields had been treated. The pest status of the kudzu bug in Virginia increased tremendously in just one year. In 2012 our surveillance program detected kudzu bug in 19 counties, mostly in low numbers in the southern part of the Virginia, and mostly all adults. In 2013, kudzu bugs were found in soybean fields in 47 counties and in non-crops (i.e., kudzu, figs) in 18 additional counties. Kudzu bugs were able to overwinter in Virginia in 2012/2013, and went through two generations in 2013. This was the first season in Virginia where kudzu bug populations reached economic threshold levels in soybean fields. Our surveillance program was successful in identifying infested fields, notifying growers and allowing them to make timely protective treatments and estimated 4,000 acres to prevent crop loss.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #6

1. Outcome Measures

Addressing Strawberry Production Issues

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In the Southeast region of the US, majority of our commercial strawberry production is done under the annual plasticulture system. All strawberry plants in this southeastern region can be trace back to two sources Prince Edward Isle (PEI) Canada, and Nova Scotia (NS) Canada. During the fall of 2012, it became apparent to some strawberry growers and Extension agents that the strawberry plants planted in Sept and Oct were not growing normally. At the point, symptoms were exhibited, and farmers were ready to apply every chemical under the sun to control aphids, over fertilize to make up for the lack of growth, and even talks of destroying this year's crop to replant with another crop to salvage some of their potential lost income.

What has been done

The NS plants showed symptoms that the PEI plants did not. Samples for disease, nutrient analysis, plant specific and field level soil samples were evaluated. Virus issues were detected and samples processed. Of 34 samples, 28 of them were from the NS sourced plants and were all positive with Strawberry Mild Yellow Edge Virus (SMYEV) and 25 positive with the Strawberry Mottled Virus (SMoV). Both viruses are aphid vectored. Recommendation were sent to growers about the symptoms and recommendations on how to manage the infested crops. During the Strawberry School, the 80 attendees focused on the situation and gathered samples. Seventy-four samples were analyzed and the results showed 35 samples were positive with virus complex (SMYEV and SMoV), 21 positive with one virus, and 12 samples were not viable. A Plant Health meeting discussed establishing testing protocols for the nurseries and methods to stop the host

cycle at the farm level. Information was disseminated to all strawberry growers about the protocol and how to prepare for the 2014 season.

Results

Through analysis of samples and identification of the virus, the major source came from NS plants. Growers without that specific source of plants did not enact control measures. Farms with infected plants used BMPs to bring their current crop to the full market potential, control methods to prevent the spread of the virus complex, and protocols were established to prevent this from being an issue in the future. The 2013 season ended with a majority of growers with infected plants having a yield of around 13,000 lbs per acre (average production is in the 14,000 to 18,000 pounds per acre range). In some areas of the state, 66% of the acres were infected and produced less than 66% of the potential crop if no BMPs were implemented. At a production rate of 13,000 lbs per acre and price of \$1.49/lb, the impact of this program would be over \$338,975. If complete crop destruction had occurred, an impact of over \$680,000 to the local economy would be seen. Through the Plant Health Meeting, nurseries implemented protocols to test for viruses before they are shipped, NS had a no-ship period to end the host cycle for the virus, and enacted a strong aphid IPM program. Through the VCE recommendations, growers determined the best way to manage the virus, and to ensure berry plants were free of virus. Currently, from field observation there has been no evidence of the virus.

4. Associated Knowledge Areas

KA Code	Knowledge Area
202	Plant Genetic Resources
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #7

1. Outcome Measures

Extension Master Gardeners Help Homeowners Improve Water Quality by Teaching Turf Best Management Practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Home lawns in Virginia comprise nearly 62% of the 1.7 million acres of managed turfgrass in the state and account for \$1.7 billion in annual expenditures. Many homeowners apply chemical fertilizers and pesticides to keep their lawns healthy and green. Without proper training, it is easy to over apply or inappropriately apply chemical inputs leading to run-off into local streams and waterways. Excessive use and misapplication of chemical fertilizer can lead to excess nitrogen and phosphorous which can potentially reach storm drains or sewers and ultimately compromise ground or surface waters. This trend paired with high levels of residential development dramatically increases the potential overall impact on water quality. Ultimately the water quality of the Chesapeake Bay is compromised.

What has been done

Since 1990, VCE-Prince William has used VCE Master Gardener volunteers to provide educational and technical services to homeowners with regard to home lawn management. VCE-Prince William created the BEST (Building Environmentally Sustainable Turf) Lawn Education program (formerly Great 'Scapes) to bring awareness to local water quality as it is impacted by residential lawn care practices. Local Master Gardener volunteers, under the guidance of the local Extension agent provided three best management information sessions for homeowners.

Results

Homeowners had their lawns soil tested and measured by Master Gardener Volunteers. 281 urban nutrient management plans were written. In 2013 a total of 60.4 acres (or 2,631,024 square feet) of turf in Prince William County, the cities of Manassas and Manassas Park were brought under a nutrient management plan which promotes best practices. Master Gardeners volunteered over 942 hours of their time to assist with this project. To date since 1990 when the program was initially started, MG's/staff have assisted in writing over 3,615 nutrient management plans for over 32 million square feet of turf or 689.5 acres within local watersheds.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
205	Plant Management Systems
302	Nutrient Utilization in Animals
601	Economics of Agricultural Production and Farm Management

Outcome #8

1. Outcome Measures

Agronomic Studies of Stinging Nettle (*Urtica dioica* L) in Southside Virginia

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The main objective of the project is to explore the potential for developing a closed-loop nutrient cycling (animal-plant-animal) system that would help cut back on out-of-state nutrient importation and reduce the levels of nitrogen (N) and phosphorus (P) reaching the Chesapeake bay and its tributaries. Such remedial action is urgently required to address agriculture-mediated pollution of the Bay.

What has been done

A study was commissioned to quantify nutrient (mainly N and P) recovery by stinging nettle from soils amended with poultry litter, and to determine biomass yield, forage quality, and palatability/digestibility of nettle forage in a goat diet. Alongside stinging nettle plots, switch grass (*Panicum virgatum*, L.), Bermuda grass [*Cynodon dactylon* (L.) Pers.] and fallow control were established.

Results

Preliminary results show that relative to the controls, stinging nettle recovers significantly higher N and P, and K, CA and Fe from soils amended with poultry litter. In feeding trials, nettle forage was found to be acceptable to goats with digestibility and nutrient retention levels comparable to alfalfa. The species is a promising nutrient dense forage crop that can be marketed as an organic alternative to alfalfa.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
302	Nutrient Utilization in Animals

Outcome #9

1. Outcome Measures

Development of high value specialty wheat varieties

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Most flour mills in this region utilize both SRW and HRW wheat and about one third of wheat milled in the eastern U.S. is HRW. Because a significant market exists for HRW and durum wheat in the eastern U.S., production of these specialty wheat crops in the eastern U.S. will provide producers and end-users with a significant economic advantage as grain of these crops is usually of higher value than soft wheat (\$0.40 per bushel or more) and currently must be imported over long distances to the region.

What has been done

Sustainable and economically viable production of specialty wheat, including HRW and winter durum wheat, in eastern regions of the U.S. and Canada is dependent on development of varieties adapted to diverse and local environments and having resistance to diseases prevalent in these unique areas. Diverse HRW and durum wheat germplasm from several regions in the U.S. and many different countries has and is currently being evaluated and used as parental material in our breeding program. The overall objective is to combine desirable traits from diverse germplasm and to develop superior specialty wheat varieties adapted to eastern regions of the U.S. and Canada.

Results

During the past 5 years, the program has released two winter durum wheat and six HRW wheat cultivars. Release of specialty wheat varieties is targeted at meeting the needs of current and new markets in the eastern U.S. as demands for ethnic and artisan foods and grain transportation costs increase. Over 55 million people live in the Mid-Atlantic region of the U.S. Most of the hard red winter and durum wheat milled and processed by eastern mills and food manufacturers must be imported at considerable cost from the Great Plains and western regions of the U.S. The mills in our region can utilize 2,900,000 tons of wheat per year.

4. Associated Knowledge Areas

KA Code	Knowledge Area
202	Plant Genetic Resources

Outcome #10

1. Outcome Measures

Development of a vaccine against oricine reproductive and respiratory syndrome virus

Not Reporting on this Outcome Measure

Outcome #11

1. Outcome Measures

Small Farm Customer Outreach through Social Media Awareness and Education

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Social media is a low investment form of marketing to new and existing customers. Small farm enterprises and value added food and cottage businesses can increase marketing impact by strategic use of social media applications such as Facebook, Instagram, and Pinterest.

What has been done

Easy to understand educational materials (presentation and handouts) were developed by the Virginia State University Cooperative Extension Marketing Program. Direct technical assistance to interested small businesses through hands-on classes on the Virginia State University Mobile Computer Lab or in collaboration with regional computer labs in public libraries and community colleges program took place.

Results

In 2013, 355 individuals learned about the basics of social media strategic marketing and how to set up a Facebook, Instagram, and Pinterest page. Returned evaluations indicated 173 individuals would set up a social media page on either Facebook, Instagram, or Pinterest to increase marketing outreach and customer service. Direct technical assistance in setting up a social media page was provided to 25 individuals who reported an increase of 50+ new customers (1,250 total new customer base) and a minimum sales increase of \$500 (\$12,500 total sales increase) after setting up a social media page.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

The gross income derived from farming could be affected by natural disasters, changes in the economy, government regulations and public policy changes. Disasters damage infrastructure and facilities while economic and governance changes influence profitability of production systems. The number of acres of land subject to nutrient management plans/best management practices/conservation plans affected by government regulations and changes in the economy. If greater emphasis is placed on water and environmental quality then even more widespread implementation of these practices will be encouraged. These factors may have immediate impact as they significantly influence items such as production economics, industry infrastructure, marketing systems, and consumer demand. Good economic conditions encourage consumption of value added products. In Virginia, increasing land values in traditional animal production areas around cities and growing towns are a significant challenge. The recent increase in ethanol production and anticipated future growth of this alternative fuel source will likely have major impacts on livestock production practices in Virginia. Scope of such impacts is unknown, but anticipated direction has influenced this planned program.

A recent challenge has been the change in demographics in Virginia. There is an increased demand to offer education resources in Spanish. Employers have a desire to employ non-English speaking workers. The prohibitive, besides the lack of resources to change the training materials and examinations, is that most materials use in Virginia (and most states) are written in English only. Changes in global food production capacity, energy costs, and epidemic diseases could have unpredictable effects. All external factors affecting

personal discretionary spending will affect the implementation of environmentally sound BMP's. Natural disasters may affect producers directly but also will affect ag producers, homeowner and commercial landscaping. The general economy, public policy and governmental regulations impact production and sales of horticultural products. Appropriations and competing programmatic challenges affect the dedication of personnel and programs to the described programs. Population changes affect supply and demand for horticultural products.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The long-term goal of the Virginia Beginning Farmer & Rancher Coalition Program (VBFRCP) is to improve opportunities for beginning farmers and ranchers (BFRs) to establish and sustain viable agricultural operations and communities in Virginia by providing BFRs with whole farm planning (WFP) education using experiential and classroom training methods while also enhancing collaboration and organizational capacity across the agriculture service provider sector for long-term training success. To reach our goal, the VBFRCP operates at the local and state-wide level to develop and launch WFP curriculum, regional training programs, supportive online resources and social networking, farmer mentoring, and an effective communication and referral system for service providers within and outside of the Extension system. Unique to this Virginia Cooperative Extension (VCE) program is its community-based participatory approach to program design and implementation whereby a state-wide coalition of 27 agricultural organizations and agencies work together to develop and implement programming with VCE providing programmatic and administrative leadership. The VBFRCP has several outcomes and impacts to report from program evaluations administered that measured 1) changes in beginning farmer knowledge, attitudes and behavior; 2) changes in knowledge, attitudes, and behavior of the service provider community that works with beginning farmers in Virginia:

- 1) Over 300 Coalition program partners participated in capacity building trainings whereby increasing knowledge of whole farm planning program application for beginning farmers/ranchers(BFRs);
- 2) significantly enhanced organizational capacity and communication of Virginia service providers to realize a state-wide referral system and coordination effort of whole farm planning programs and technical assistance for BFRs;
- 3) implemented first-ever state-wide assessment of program and delivery needs and preferences in Virginia that informed program and curricular design;
- 4) developed comprehensive WFP curriculum and resource tools for BFRs and service providers (8 modules, 25 resource tools & 1 training manual);
- 5) launched a resource intensive website, social media forums, and a WFP webinar series to complement face-to-face trainings and address distance learning and social networking preferences;
- 6) designed and implemented 7 regional WFP programs that trained 528 BFRs using WFP curriculum;
- 7) reached 445 additional participants through WFP webinar series (n=200), conference workshops (n=210, and self-study (n=35) of WFP curriculum;
- 8) facilitated farmer-farmer mentoring with over 30 farmers serving as mentors in their communities;
- 9) increased knowledge of Extension, USDA, and other Coalition member resources, services, and networking communities of at least 95% of reporting BFRs in WFP programs;
- 10) increased WFP skills, knowledge, and abilities of at least 90% of reporting BFRs to start and/or enhance new farm enterprises upon completion of WFP programs; and
- 11) assisted at least 60 reporting BFRs to become or improve market readiness upon completion of WFP programs.

Key Items of Evaluation

Key Items of the Evaluation(s) for NIFA Attention

- Virginia Cooperative Extension trainings of service providers increased networking and organizational capacity to realize a state-wide referral system and coordination effort of whole farm planning programs for beginning farmers. This resulted in more cross-sector collaboration to fill resource gaps using efficient resources.
- Using state-wide Extension system and coalition model for program development designed and implemented 7 Whole farm planning (WFP) programs that trained 528 BFRs in Virginia using WFP curriculum.
- Reached 445 additional participants through state-wide webinar series, conference workshops, and self-study by beginning farmers with WFP curriculum
- In a summative evaluation of providers and farmers, 90% of respondents reported that they were very satisfied or satisfied with online communication and networking options. Social marketing and learning opportunities include Facebook (n=558 Likes), YouTube (57 subscribers and 1350 views), & Blog. YouTube Channel was launched with 6 BFR cases (n=20 videos) designed for self-study application and WFP programming.
- A total of 310 participants were reached through webinar presentations. Webinar presenters were experts in marketing, land tenure and transition, financial planning, soil conservation, and GAP certification (e.g., Virginia Cooperative Extension specialists and agents; USDA FSA professionals; USDA NRCS professionals; Farm Credit professionals; Virginia Department of Agriculture and Consumer Services service providers). VCE agent application of VBFRCF webinars has been illustrated in other program areas.
- Ages of whole farm planning program & mentee participants ranged from 18-70 years old.
- Beginning farmer/rancher (BFR) enterprise interests of program participants mostly included: vegetables, fruit, cut flowers, row crops, beef, dairy, hay, and vineyards.
- The majority (60%) of reporting BFR participants classified themselves as male and at least 40% reported female.
- 65% of reporting participants labeled themselves as an explorer/beginning with 35% reported as a start-up, diversifying or transitioning farmer.
- 90% of reporting WFP program participants illustrated a positive change in WFP knowledge, skills, and abilities to start or sustain new enterprises.
- 95% of respondents reported new knowledge of Extension, USDA, and other Coalition organization resources, services, and networking communities.
- Nearly 90% participants who completed WFP program evaluations reported plans to start/stay farming, 10% were undecided or declined to begin farming.

- 32 mentors/16 mentees were recruited and trained, and 10 mentor/mentee pairings have been made and continue to succeed.
- Assisted at least 60 reporting BFRs to become or improve market readiness.

An advisory group (n=3 farmers & 5 service providers) was elected in 2013 to reflect the ongoing work of the Coalition program. The VBFRCPP is currently operating as a state-wide and coalition-based Extension program that has a sustainability plan to maintain the Coalition and subsequent WFP programs locally. This program enabled the first ever beginning farmer coalition in Virginia and the southern region.