

## CURRICULUM VITAE

Charles F. Schuster

Notarization. I have read the following and certify that this curriculum vitae is a current and accurate statement of my professional record.

Signature Charles F. Schuster Date July 09, 2020

### 1. Personal Information

A.  
Schuster, Charles Frederick  
Extension Educator, Commercial Horticulture  
College of Agriculture and Natural Resources  
University of Maryland Extension  
Montgomery County Office

B.  
Appointed-June 10, 2001  
Senior Agent – tenured- July 2007  
Senior Agent Emeritus - Appointed – July 9, 2020

### C. Employment History

October 1977 - June 1996                      Vocational Agriculture Instructor  
FFA Advisor

January 1997 - June 2001                      Production Coordinator, Inventory Manager, M56  
Program, General Dynamics Robotic Systems  
Westminster, Maryland

October 1998 - January 2004                      Licensed Professional Driver Trainer  
Classroom and Laboratory Certified  
Westminster, Maryland

D.

### Education Background

1977 Bachelor of Science, University of Maryland, Agriculture and Extension Education, College Park, Maryland.

1990 Master of Liberal Arts, McDaniel College, Westminster, Maryland.

E.

### Professional Certifications

Maryland Pesticide Applicator Certificate, Public Agency Permit (2001- Present). Six hours of continuing education required annually.

Maryland Nutrient Management Consultant Certificate (2001- Present). Six hours of continuing education required annually.

Certified Crop Advisor (2006- Present). American Society of Agronomy certification program. Twenty hours of continuing education required annually.

Professional Fertilizer Applicator Certificate (for urban turf management) (2013- Present) Two hours of continuing education required annually.

### **Position Description:**

The Commercial Horticulture Extension Educator in the Central Maryland Cluster is responsible for providing research based educational outreach programs for the University of Maryland System (UMS) as part of the Land Grant mission to individuals, groups, and businesses in the horticultural industry using formal and informal settings. These programs are also affiliated with the United States Department of Agriculture (USDA) and the Maryland Department of Agriculture (MDA). This Extension Educator works specifically with the commercial landscape, nursery, greenhouse, turf, and garden center industries and commercial fruit and vegetable producers using a regional or UME Cluster focus with Montgomery County, a state leader in nursery and greenhouse production and in Howard and Frederick County's in Maryland which also has an active commercial horticulture industry. In this role, the educator serves as an educational facilitator for topics related to the Green Industry; a resource for problem solving for business, industry and government; and as an applied researcher in areas related to the commercial horticultural industry. This Extension Educator will participate in planning and implementing programs with other Extension Educators from the University of Maryland and other agencies. The educator serves on committees within UME and with local NGO's that serve the needs of the agricultural community to promote a strong and viable agriculture in the region and state. The Educator will work with local, state and federal agencies to provide support on projects as needed. This Extension Educator also collaborated with partners from other Universities and USDA to provide an extension program and presence in Pakistan with members of the Afghan Extension program participating. This outreach allows for sharing of valuable resources and knowledge to promote agriculture profitability, and Extensions international programming.

## II. Research, Scholarly, and Creative Activities

### a. Monographs, Reports, and Extension Publications

Gill, S.A., Schuster, C.F., et al. (May 2003) *Integrated Pest Management (IPM) for School Greenhouse Operations* (text and CD). This Educator wrote eleven units (of 50 units), including Power Point presentations. Externally reviewed. A Maryland Cooperative Extension Publication funded through the Maryland Department of Agriculture (MDA) and the United States Environmental Protection Agency (EPA). Distributed to seventy-four Maryland high school horticultural teachers and sixteen IPM Coordinators' in the Northeast (U.S.) region; requested by Pesticide Safety Education Coordinators in four states.

Gill, S.A., Dutky, E., Schuster, C.F., Klick, S, Wadkins, S., (2006) *Production of Hybrid Lilies as Cut Flowers*. Fact Sheet 687. Maryland Cooperative Extension: College Park, MD. 15pp. Update of original, used by cut flower producers. In process of being printed.

Gill, S.A., Schuster, C.F. et al. (August 2011 revision) *Total Crop Management for Greenhouse Production Extension Bulletin 363*. University of Maryland Extension: College Park, MD 320pp. This educator authored two chapters, Greenhouse System Maintenance, and Care and Calibration of Injector Pumps, and co-authored one chapter, Fertilizer Injector or Fertigation. Peer reviewed.

Gill, S.A., Schuster, C.F. et al. (2012) *Total Plant Management of Herbaceous Perennials Bulletin 359*. University of Maryland Extension: College Park, MD 346pp. This educator authored one chapter, Invasive Weeds. Peer Reviewed

### b. Book Reviews, Other Articles, and Notes

#### i. Articles in Trade Publication

Schuster, C.F., Author. (October 2002) *Can This Be the Planting Season with the Drought? Groundwork* (official monthly publication of the Maryland, D.C. & Virginia Landscape Contractors Association), p. 14. Circulation of 500 monthly. Invited by magazine editor.

Schuster, C.F., Author. (June 2003) *Spring and Summer Fungal Diseases. Groundwork* (official monthly publication of the Maryland, D.C. & Virginia Landscape Contractors Association), p. 10. Circulation of 500 monthly. Invited by magazine editor.

Gill, S.A. Shrewsbury, P., Schuster, C.F., (Co-Author) *Fertilizer Effects on Ilex. American Nurseryman* pp 24-30. Circulation of 6, 641 monthly. Invited by magazine editor.

#### ii. Publication Reviewed

Steinhilber, P. and Salak, J. (2005) *Soil Fertility Guide: Plant Analysis*. Fact Sheet. Maryland Cooperative Extension: College Park, MD. 9 pp. This fact sheet provides basic information on tissue analysis for farmers and professionals learning how to write nutrient management plans.

c. Talks, Abstracts, and Other Professional Papers Presented

i. Invited talks- International

Schuster, C.F. (2013) *S.M.A.R.T. Goals* Workshop on Strengthening Extension Skills of Young Professionals in Afghanistan and Pakistan University of Agriculture Faisalabad, Faisalabad Pakistan. Workshop 5. This Educator was invited to provide a presentation to sixty-six Afghan and Pakistani Extension Professionals as part of this USDA sponsored and funded workshop.

Schuster, C.F. (2013) *Sharing Knowledge, Improving Extension Participatory Skills*. Workshop on Strengthening Extension Skills of Young Professionals in Afghanistan and Pakistan University of Agriculture Faisalabad, Faisalabad Pakistan. Workshop 5. This Educator was invited to provide a presentation to sixty-six Afghan and Pakistani Extension Professionals as part of this USDA sponsored and funded workshop.

Schuster, C.F. (2013) *Vegetable Integrated Pest Management*. Workshop on Strengthening Extension Skills of Young Professionals in Afghanistan and Pakistan University of Agriculture Faisalabad, Faisalabad Pakistan. Workshop 4. This Educator was invited to provide a presentation to fifty-six Afghan and Pakistani Extension Professionals as part of this USDA sponsored and funded workshop.

Schuster, C.F. (2014) Vegetable Production, Integrated Pest Management. HasNa – Turkey program to help farmers in Turkey learn new IPM skills for vegetable production. This educator was invited to present two- one hour workshops completed through video conferencing to eighteen famers in turkey as part of a UME IPAN program.

Schuster, C.F. (2017) Drip Irrigation Design, Layout, Installation and Management. International Orthodox Christian Charities (IOCC) program in conjunction with International Programs in Agriculture and Natural Resources (IPAN) program in Uganda to provide new and innovative methods of irrigation for vegetable production. This educator was invited to provide presentations and hands on activities to a group of 22 Ugandan farmers and local leaders in Lwemiyaga utilizing a local school as a pilot farm.

Schuster, C.F. (2021) Horticultural Principles, Roots Africa. This educator provided several educational programs to Liberia (Liberia International Christian College), and Uganda (Uganda Martyrs University and Bukalasa Agricultural College) as part of an outreach program utilizing Zoom. Over 150 students participated in these programs.

ii. Invited talks - National

Schuster, C.F. (2003) *Fresh Market Produce, Vegetables that Bring in the Customers*. FreshNLocal Produce, Leesburg, VA. This Educator was invited to provide a marketing seminar to twenty-five farmers in Loudoun County Virginia to increase farm market sales. Invited by seminar coordinator.

Schuster, C.F. and Jefferson, D., Co-Presenters. (2003; 2005) *Pesticide Applicator Safety Training*. Smithsonian National Zoological Park: United States Botanic Garden, Washington D.C. This Educator was invited to co-teach a program on safe pesticide use and proper Integrated Pest Management (IPM) as professional development training for fifteen National Zoological Staff and ten United States Botanic Garden staff. Invited by in-service coordinators.

Schuster, C.F. (2005) *Disease Identification and Control for Tomatoes and Cucurbits*. Mid Winter Meeting Series. Mineral County, WV. Educator presented timely cultural and pesticide management solutions to fifty-six vegetable producers. Invited by series coordinator.

Schuster, C.F. (2006) *Techniques for Growing Fruit*. United States National Arboretum, Washington D.C. This Educator taught a seventy-minute program on fruit production in garden settings to twenty individuals. Invited by program sponsor.

Schuster, C.F. (2006) *Effect of Nitrogen Fertilization on Tree Growth and Insect Populations of Selected Nursery Trees*. National Association of County Agricultural Agents (NACAA) Annual Meeting and Professional Improvement Conference, Cincinnati, OH. This Educator taught a fifteen-minute horticultural seminar on his applied research results to approximately 30 extension professionals. Invited by conference horticultural chairperson.

Schuster, C.F. (2009) *Using Hot Water to Control Insects and Mites on Nursery Propagation Plants*. National Association of County Agricultural Agents (NACAA) Annual Meeting and Professional Improvement Conference, Portland Oregon. This educator taught a thirty minute horticultural seminar on applied research to approximately 45 extension professionals. Invited by conference horticultural chairperson. Will also be found under Conference Proceedings.

iii                      Invited talks – State

Schuster, C. F. (2003) *Kudzu and other Invasive Weeds*. Maryland National Capital Park and Planning Commission (MNCPPC), Silver Spring, MD. This Educator was invited to present a program on low toxicity herbicides and other methods of weed control at a regional meeting of MNCPPC staff and “Weed Warriors”, MNCPPC volunteers. Invited by meeting coordinator.

Schuster, C.F. (2004) *Selection and Calibration of Pesticide Application Equipment*. United States Department of Agriculture, Agriculture Research Service, Beltsville, MD. This Educator taught pesticide applicator recertification training for seventy-five staff with system-wide responsibilities. Invited by in-service coordinator.

Schuster, C.F. (2004) *Fertilizer Injector Calibration, It Makes Cents*. Maryland Greenhouse Growers Association, Baltimore, MD. This Educator taught the program to thirty professionals and grower representatives. Invited by seminar coordinator.

Schuster, C.F. (2005) *Calibration of Equipment Used in the Vegetable Industry*. Central Maryland Vegetable Growers Conference, Upperco, MD. Educator taught pesticide recertification topics to forty-two attendees at the annual winter conference. Invited by program coordinator.

Schuster, C.F. (2005) *How Lawns Grow, Providing Nutrients to the Turf*. Maryland Department of Agriculture, Urban Nutrient Management Professional In-service, Havre de Grace, MD. Educator presented turfgrass-related nutrient management topics to fifteen industry professionals. Invited by in-service coordinator.

Schuster, C.F. (2006) *Lawn Power Equipment Safety*. Ridgeview Elementary School, Denton, MD. Taught five twenty-minute sessions on lawn power equipment safety to 165 fourth and fifth grade students. Invited by program coordinator.

Schuster, C.F. (2006) *Planting Standards in the Landscape Industry*. American University, Washington, D.C. Taught one 60 minute program on use of planting standards for reading contracts, selection of plant material, and landscape planting for landscape businesses to 25 Professional Grounds Management Society (PGMS) members during the Annual PGMS Field Day. Invited by the program chairperson.

Schuster, C.F. (2007, 2009) *Source Reduction, Reducing the Need for Pesticides*. United States National Arboretum, Washington D.C. This Educator taught one ninety-minute program on selection of plant material to reduce the need for pesticide applications when used with appropriate IPM to twenty-five individuals. (Twenty-two individuals in 2009) Invited by program sponsor.

Schuster, C.F. (2009) *Earth Stewardship*. United States National Arboretum, Washington D.C. This educator taught one sixty minute program on care of earth through utilization of less toxic pest control measure, nature soil amendments, and native plant selection. Twenty-two individuals participated in this program. Invited by program sponsor.

Schuster, C. F. (2015, Revised 2016)) *Using Compost in Turf Management*. Annapolis MD and other locations. This educator taught twelve programs on use of organic compost as a nutrient source for turf management. 621 individuals participated in these programs. Invited by Maryland Department of Agriculture, Urban Nutrient Management program.

Schuster, C. F. (2015, Revised 2016) *How to Comply with the Maryland Urban Nutrient Management Regulations*. Annapolis MD and other locations. This educator taught six programs on recordkeeping, calibration of equipment and needed information as part of the Annual Fertilizer Applicators Report as part of the Urban Nutrient Management Program. 1,389 individuals participated in these programs. Invited by Maryland Department of Agriculture, Urban Nutrient Management program.

Schuster, C. F. (2016, 2017 revised) *Urban Land Managers Recertification; Compost: Understanding the Analysis and Doing Effective Applications*. Annapolis MD and other locations. This educator taught four programs to 111 individuals and has been adapted by two UME Educators.

Rosenkranz, V.L., Schuster, C.F. (2017) *Turf grass weed control options including Cultural, Low Risk Herbicides and Conventional Herbicides*. December Pest Management Conference, Howard County Community College, Columbia, MD. Educators gave a 55 minute 49 slide power point presentation on turf grass weed control. Both educators contributed to the program and answered questions from the attendees. 36 Commercial Applicators attended.

Schuster, C.F. (2017) *Small Farm Programs to New Audiences*. Sharing progress with international clients. This educator taught two programs to 14 members of Cultivating New Frontiers in Agriculture (CFNA). This group's works with foreign countries that have interest in new technologies in agriculture. One program was on small scale agriculture programs done both locally and internationally, one program dealt with small scale irrigation in vegetables.

Schuster, C.F. (2018) *Equipment for Small Vegetable Farmers*. CASA, Future Harvest, College Park Maryland. This educator provided four pieces of equipment for attendees to review, discussed cost, durability, and demonstrated use. 19 individuals attended.

Schuster, C. F. (2018) *Utilizing Enhanced Efficiency Controlled Release Fertilizer in Turf Management*. Annapolis MD and other locations. This educator taught nine programs on recordkeeping, calibration of equipment and needed information as part of the Annual Fertilizer Applicators Report as part of the Urban Nutrient Management Program. 919 individuals participated in these programs. Invited by Maryland Department of Agriculture, Urban Nutrient Management program. Adopted by two UME Educators.

Schuster, C. F. (2018) *Understanding the Regulation Changes in Turfgrass Management*, Annapolis MD and other locations. This educator taught three programs on recent regulation changes and how they will impact turf managers and applicators as part of the Urban Nutrient Management Program. 147 individuals participated in these programs. Invited by Maryland Department of Agriculture, Urban Nutrient Management program. Adopted by one UME Educator.

iv. Refereed conference proceedings.

Schuster, C.F. (2003) *Preventing Accidental Pesticide Exposure in Households*. Educational Poster abstract, National Association of County Agricultural Agents Annual Meeting and Professional Improvement Conference Proceedings, Green Bay, WI. p. 70. Distributed to 3,485 members. Poster noted under Poster Sessions, pages 5 and 6.

Schuster, C.F. (2004) *Calibrate Application Equipment, It Makes Cents!* Educational Poster abstract, National Association of County Agricultural Agents Annual Meeting and Professional Improvement Conference Proceedings, Orlando, FL. p. 65. Distributed to 3,485 members. Poster noted under Poster Sessions, pages 5 and 6.

Schuster, C.F. (2005) *Effect of Nitrogen Fertilizer on Tree Growth, Insect Populations, of Selected Nursery Trees*. Research Abstract, National Association of County Agricultural Agents Annual Meeting and Professional Improvement Conference Proceedings, Buffalo, NY. p. 52. Distributed to 3,485 members. Poster noted under Poster Sessions, pages 5 and 6.

Schuster, C.F. (2006) *Effect of Nitrogen Fertilization on Tree Growth and Insect Populations of Selected Nursery Trees*. Horticultural Presentation Abstract, National Association of County Agricultural Agents (NACAA) Annual Meeting and Professional Improvement Conference, Cincinnati, OH. p 179. Distributed to 3,485 members. Presentation noted under Invited Talks-National page 4.

Gill, S.A., Schuster, C.F. (2008) *Effect of Nitrogen Fertilizer on Tree Growth of Selected Nursery and Landscape Trees*. Electronic Journal Papers, National Association of County Agricultural Agents (NACAA) Annual Meeting and Professional Improvement Conference, Greensboro, North Carolina. p 289. Distributed to 3, 485 members.  
<http://www.nacaa.com/ampic/2008/proceedings.pdf>

Schuster, C.F. (2009) *Using Hot Water to Control Insects and Mites on Nursery Propagation Plants*. National Association of County Agricultural Agents (NACAA) Annual Meeting and Professional Improvement Conference, p 198 for presentation and p 58 for poster. Noted also under Invited Talks-National and Poster Sessions.

Schuster, C.F., Rosenkranz, G., Gill, S.A., Rane, K., Ristvey, A . (2010) *Weekly Electronic Pest Alert Newsletter of TP/IPM for Arborist, Landscape & Nursery Managers*. Abstract, National Association of County Agricultural Agents (NACAA) Annual Meeting and Professional Improvement Conference, p126 for Team Newsletter, National Finalist.

d. Computer Slide Programs

Schuster, C.F., Designer and Photographer. (2002) *How Not To Make Mistakes with Pesticides and What to Do If You Do*. Thirty-nine slide Power Point talk viewed by 600 individuals in the landscape, nursery and greenhouse industries in seven programs. Adopted by two University of Maryland Extension (UME) Educators and one Florida Extension Educator.

Schuster, C.F., Designer. (2005) *Pesticide Labels, Reading the Fine Print*. Thirty-five slide Power Point talk and script for pre-certification and re-certification training of pesticide applicators. Viewed by 340 horticultural professionals; adopted by three MCE Educators. Peer reviewed (state and national) and posted on the American Association of Pesticide Safety Educators website for national access. Selected as National Finalist Communications Award, Computer Generated Graphics, National Association of County Agricultural Agents (NACAA) (2008) Adopted by two UME educators.

Schuster, C.F., Designer. (2005) *Insects and Diseases of Tomatoes and Cucurbits*. Thirty-nine slide Power Point talk viewed by fifty-six vegetable producers in two Vegetable Production Workshops. Requested and adopted by West Virginia Cooperative Extension.

Schuster, C. F., Designer. (2005) *How Lawns Grow, revised 2006*. Twenty-one slide Power Point presentation viewed by 240 landscape professionals in seven programs. Adopted by two UME Educators, the Maryland Department of Agriculture and one professional organization.

Schuster, C.F. Designer. (2008) (Updated 2010, 2012) *Setting the Stage for Success, Understanding the Importance of pH and Lime*. Thirty-four slide Power Point presentation presented to one hundred twenty four nutrient managers in the agriculture industry. (55 in 2012). Adopted by two UME Educators in 2010. (2012) Regional Finalist, Computer Generated Graphics Presentations, National Association of County Agriculture Agents (NACAA). pp133, <http://www.nacaa.com/ampic/2012/2012%20Proceedings%20low%20res.pdf>

Schuster, C.F. Designer.(2013) *S.M.A.R.T. Goals* Twenty-four slide Power Point presentation presented to sixty-six Afghan and Pakistani Extension Professionals.

Schuster, C.F. Designer. (2013) *Sharing Knowledge, Improving Extension Participatory Skills*. Twenty-four slide Power Point presentation presented to sixty-six Afghan and Pakistani Extension Professionals.

Schuster, C. F. Designer (2015)(revised in 2017) *Using Compost in Turf Management*. Fifty-two slide Power Point presentation presented to 1,723 (1,102 in 2017) individuals participated in thirty-one programs (nineteen in 2017). Adapted by three Extension Educator and MDA Urban Nutrient Management Program.



Schuster, C. F. (2015) *How to Comply with the Maryland Urban Nutrient Management Regulations*. Forty-eight slide Power Point presentation presented to 1,389 individuals in six programs. Adapted by one Extension Educator.

Schuster, C. F. Designer (2017) *Nitrogen Release from Fertilizers, Enhanced Efficiency Controlled Release Fertilizers*. 212 turf managers in 5 programs. Adapted by one UME Educator and MDA Urban Nutrient Management Program.

e. Exhibits, Performances, Demonstrations, and Other Creative Activities

i. Poster Sessions

Schuster, C.F., Designer. (2003) *Preventing Accidental Pesticide Exposure in Households*. National Association of County Agricultural Agents Annual Meeting and Professional Improvement Conference, Green Bay, WI. Educational poster presented on the importance of washing pesticide exposed clothing separately from other household laundry. Reviewed by approximately 745 participants.

Schuster, C.F., Designer. (2004) *Calibrate Application Equipment- It Makes Cents!* National Association of County Agricultural Agents Annual Meeting and Professional Improvement Conference, Orlando, FL. Educational poster presented on calibration of agriculture chemical application equipment used in the horticulture industry. Reviewed by approximately 730 participants. Requested and adopted by three out-of-state Extension Educators (FL, OH, WV).

Schuster, C.F., Designer. (2005) *Effect of Nitrogen Fertilizer on Tree Growth and Insect Populations, of Selected Nursery Trees*. National Association of County Agricultural Agents Annual Meeting and Professional Improvement Conference, Buffalo, NY. Research-based poster displaying results of three-year study on two species of nursery trees. Northeast Regional winner, Applied Research Poster. Reviewed by approximately 765 participants.

Schuster, C.F., Designer. (2009) *Using Hot Water to Control Insects and Mites on Nursery Propagation Plants*. Portland, Oregon. Research-based poster displaying results of a multi-year study on ten different species of plant material tested in the Hot Water Bath System built by UME educators C.F. Schuster and S.A. Gill. Reviewed by approximately 745 member participants.

Gill, Stanton A., B. Kunkel, D. Smith, C. Schuster, G. Rosenkranz, K. Rane, S. Klick. January 3 – 7, 2016. *How Destructive is Brown Marmorated Stink Bug to Herbaceous Perennial Plant Nurseries?* Poster presented at the Northeastern Plant Pest and Soil Conference, Philadelphia, PA.

ii. Demonstrations-Applied Research, Field Demonstrations

Gill, S.A., Klick, S., Martin, D., and Schuster, C.F. (2002) *The Effects of Color Plastic Sheet Mulches on Stem Length, Number of Blooms and Insect Activity of Two Species of Flowers*. This trial investigated the effects of colored plastic mulch for use in the cut flower industry. Results showed that through the use of certain colors of plastic film mulch, soil temperature could be lowered, as compared to bare soil and other colors (white); maturity dates on flowers could be changed (red) and that certain colors (yellow) could not be used, as it does not suppress the weeds. Role: Collaborator and team member.

Schuster, C.F., Gill, S.A., and Raupp, M. (2002-2006) *The Effects of Nitrogen Fertilization on Tree Growth and Herbivore Insect Activity of Selected Nursery Trees*. As part of The Clean Water Act of 1998, nursery producers and landscapers are required to apply nutrients at rates established by the University of Maryland or other research institutions. The establishment of these rates provide guidelines that will prevent the over application of nitrogen while promoting tree growth and vigor. The purpose of the research project was to establish nitrogen fertilization rates for trees grown in nursery and landscape settings to promote appropriate tree growth and not increase herbivore insect activity. The research site is located at the Maryland Experiment Station, Central Maryland Research and Education Center, Clarksville facility. Results of this trial have shown that the amount of nitrogen fertilizer needed for optimum growth is between two and four pounds of actual nitrogen per 1000 square feet of soil area. Use of greater amounts does not increase tree growth. Role: Principal Investigator; this Educator's responsibility included the establishment and maintenance of a tree nursery, data collection and analysis.

Shrewsbury, P. M., Gill, S.A., and Schuster, C. F. (2004-2006) *Efficacy and Cost Comparison of Low Toxicity Pesticides for Controlling Leafhopper in Maryland Nurseries*. This project focuses on a comparison of different pesticide materials and application methods for the control of Potato Leafhoppers in nurseries. Role: Secondary Investigator; this Educator's involvement included data collection.

Butler, Sr., B.R., Gill, S.A., and Schuster, C. F. (2005-2006) *Potential Opportunities to Expand High Tunnel Lisianthus Production in the Mid Atlantic through Season Extension and Overwintering*. This research trial will investigate the potential of season extension and overwintering of Lisianthus in the Cut Flower Industry. Thus far, results of this trial show that some Lisianthus varieties will survive in a high tunnel structure and produce the second year, thus increasing the grower's profitability on this crop. The cost of the high tunnel structure can be repaid in less than three years. Role: Secondary Investigator; this Educator's involvement included planting of plant material, data collection and analysis.

Gill, S. A., Ross, D., Shrewsbury, P. M., and Schuster, C. F. (2003-2009) *A Non-Chemical Control of Insects and Mites on Nursery Propagation Plants Using a Hot Water Bath Systems*. This research project is intended to determine alternative methods of insect and mite control for nurseries that propagate cuttings without the use of pesticides. Results of this trial have shown that insects can be controlled on woody cuttings without the use of pesticides. Different temperatures and times in the hot water bath are used for different plant materials and to control different insects. Project results are included in a fact sheet that is in the editing stage. Role: Co-Investigator; this Educator's involvement included hot water bath system construction, operation and data collection.

Gill, S.A., Schuster, C.F. (2006-2007) *The Effects of Nitrogen Fertilization on Holly Growth*. This research project is intended to determine the short term effect of nitrogen fertilizer on the growth of three varieties of holly grown in Maryland nurseries to guide nursery managers in determining proper fertilization protocols. The purpose of the research project is to establish nitrogen fertilization rates for hollies grown in nursery and landscape settings to promote appropriate growth and as part of the Clean Water Act of 1998 provide data to guide growers. This trial is being conducted at Waverly Farms, Adamstown, MD. Role: This educator is responsible for data collection and preparation of data for release.

Lea-Cox, J. D., Principal Investigator, Ristvey, A. G., and Schuster, C. F. Secondary Investigators, (2007). *Slow-Release Fertilizer Experimentation*. This research project is part of a multi site project to evaluate different slow release fertilizer products for use in annual and woody plants. This project was conducted at the University of Maryland Research Greenhouse Complex, College Park, MD. Role: This educator conducted data collection, planting of plant material and assisted in mixing of soilless substrate.

Schuster, C.F., Principal Investigator, Gill, S.A., Shrewsbury, P.M., Secondary Investigators. (2010) *Nursery Tree Harvest Soil Loss Trial*. This research project evaluates different mechanical tree harvesting methods for soil loss. Role: This educator is the primary grant writer, determined the methodology of the research and worked with the team on this ongoing trial.

Hooks, C., Gill, S.A., Principal Investigators, Rane, K., Clement, D., Schuster, C.F., Secondary Investigators. (2011). *Brown Marmorated Stink Bug and It's Impact on Commercial Greenhouse and Herbaceous Perennial Nurseries*. This research project establish which species of herbaceous plants are fed on by BMSB and what diseases are potentially transmitted to these plants by BMSB. Role: This educator conducted data collection (insect counts) at different sites and took site specific information of plants and damage. Also noted in section g. i. Contracts and Grants.

Schuster, C.F., Principal Investigator. (2011) *Use of Raised Beds for Disease Control in Vegetable Production*. This demonstration project utilized two Montgomery County vegetable farms. Both traditional and raised bed production were used at both sites to compare moisture management, disease pressure and yields for tomato crops during the 2011 season. Four producers were educated on the benefits of raised beds to decrease plant loss from disease and increase yields by forty-eight percent.

Gill, S.A., Kunkel, B., Principal Investigators; Schuster, C.F., Klick, S. Co-Investigators (2015-2016) *Field Trials to Evaluate Low-Risk Pesticides for Adult Japanese beetles, Popillia japonica Newman, in Commercial Nurseries*. Evaluate 4 treatment options for control of Japanese beetle in three tree species known to have significant defoliation by Japanese beetle. This educator conducted data collection (insect counts) at different sites and applied products to the trees in the nursery using appropriate protocol.

Schuster, C.F. (2017) *Applying Compost to Established Turfgrass utilizing Commercial Equipment*. Demonstrated to established turfgrass at American University to forty turfgrass managers. Utilized locally produced compost, nutrient analysis, and Maryland Regulations to demonstrate how products can be properly utilized.

f. Mass Media

i. Radio

Schuster, C.F. (guest) and Curtis, B.H. (Producer). (December 12, 2001) *Protecting Your Ornamentals from Winter Damage*. United States Department of Agriculture Radio, Washington, D.C. Three-minute radio spot sent to 675 subscriber radio stations and the Voice of America.

Schuster, C.F. (guest) and Curtis, B.H. (Producer). (December 12, 2001) *Tunnel Houses to Extend the Growing Season*. United States Department of Agriculture Radio, Washington, D.C.

Schuster, C.F. (guest) and Curtis, B.H. (Producer). (September 24, 2001) *Cover Crops to Manage Plant Nutrients*. United States Department of Agriculture Radio, Washington, D.C. Three-minute radio spot sent to 675 subscriber radio stations and the Voice of America.

Schuster, C.F. (guest) and Curtis, B.H. (Producer). (September 24, 2001) *Wise Nutrient Management*. United States Department of Agriculture Radio, Washington, D.C. Three-minute radio spot sent to 675 subscriber radio stations and the Voice of America.

Schuster, C.F. (guest) and Curtis, B.H. (Producer). (November 7, 2006) *Let's Talk About Lawn Care: Nutrient Application, Mowing and Weed Control*. United States Department of Agriculture Radio, Washington, D.C. Three-minute radio spot provided to 375 subscriber radio stations and the Voice of America. Also available as direct downloads from the USDA.gov website.

ii. Television

Schuster, C.F. (host), Carrier, C., (guest) and Palmer, L.L., (producer). (October 19, 2002) *Alternative Agriculture that Provides an Income*. 30 Minutes: A News Program, Montgomery Community Television, Rockville, MD. Estimated potential audience: 235,000 subscribers.

Schuster, C.F. (April 16, 2018) Spotted Lantern Fly, What to Look For, What to Do If Found, 5 minute news update. Montgomery Community Television, Rockville, MD. Estimated Audience: 480,000.

g. Contracts and Grants.

i. **Grants (Total: \$ 1,023,041.90 )**

Schuster, C.F., Principal Investigator; Gill, S.A., and Raupp, M., Secondary Investigators. (2002-2006) *The Effect of Nitrogen Fertilization on Tree Growth and Herbivore Insect Activity of Selected Nursery Trees*. Role: This Educator was the principal investigator; managed grant funds and research data for this ongoing trial. Source: The International Society of Arboriculture, John Z. Duling Grant. Amount: \$4,900.

Gill, S.A., Principal Investigator; Klick, S., Martin, D., and Schuster, C.F., Secondary Investigators. (2002) *The Effects of Color Plastic Sheet Mulches on Stem Length, Number of Blooms and Insect Activity of Two Species of Flowers*. Role: This Educator was a collaborator and team member on this research trial. Source: The Association of Specialty Cut Flower Growers. Amount: \$2,000.

Gill, S.A., Ross, D., Shrewsbury, P.M., and Schuster, C.F. (2003-2006) *A Non-Chemical Control of Insects and Mites on Nursery Propagation Plants Using a Hot Water Bath System*. Role: This Educator was a co-investigator and team member in the construction and data gathering for this trial. Source: Maryland Nursery Landscape Association and Cooperative State Research, Education and Extension Service (CSREES). Amount: \$6,970.

Shrewsbury, P. M., Principal Investigator; Gill, S.A. and Schuster, C.F., Secondary Investigators. (2004-2006) *Efficacy and Cost Comparison of Low Toxicity Pesticides for Controlling Leafhopper in Maryland Nurseries*. Role: This Educator's involvement included data collection for this research trial. Source: Maryland Nurserymen's Association Horticulture Research Foundation, Inc. Amount: \$6,950.

Butler, Sr., B.R., Principal Investigator; Gill, S.A. and Schuster, C.F., Secondary Investigators. (2005-2007) *Potential Opportunities to Expand High Tunnel Lisianthus Production in the Mid Atlantic through Season Extension and Overwintering*. Role: This Educator served as a team member, data gathering and data preparation member for research to construct a high tunnel structure to investigate the potential of season extension and overwintering of Lisianthus. Source: Maryland Specialty Cut Flower Growers Association. Amount: \$2,840.

Schuster, C.F., Principal Investigator, (2007-2009). *Delaware-Maryland AgriAbility Project (DMAP) Outreach in Southern Maryland*. Role: This educator is serves as the coordinator for the Maryland AgriAbility contract providing overall Western Chesapeake Watershed Branch of the Quality Deer Management Association, approval authority and monitoring of resources for this multi-year grant. Source: University of Delaware. Amount: \$41,440.00

Lea-Cox, J. D., Principal Investigator, Ristvey, A. G., and Schuster, C. F., Secondary Investigators, (2007). *Slow-Release Fertilizer Experimentation*. Role: This educator conducted data collection, planting of plant material and assisted in mixing of soilless substrate. Source: The Scotts Company, OH. Amount: \$7,750.

Schuster, C.F. Principal Investigator, Gill, S.A., Shrewsbury, P.M., Secondary Investigators, (2008) *Evaluation of Soil Loss from Standard Harvesting Methods of Field Grown Nursery Plants*. Role: This educator is primary writer of the grant, methodology of the research and will work with the team on the actual data collection. Source: Maryland Nursery and Landscape Association. Amount: \$5,000.00.

Gill, S.A. Principle Investigator, Clark, B.P., Klick, S., Schuster, C.F., Secondary Investigators, (2008) *Using Trap Plants to Attract Plant Damaging Insects Away from Cut Flowers to Plants Treated with Systemic Insecticides*. Role: This educator was a collaborator and team member on this research trial managing one research trial site. . Source: The Association of Specialty Cut Flower Growers. Amount: \$3,400.00

Gill, S.A., Principal Investigator, Klick, S., Rosenkranz, V., Schuster, C.F., Shrewsbury, P.M, Secondary Investigators, (2008-2009) *A Non-Chemical Control of Insects and Mites on Nursery Propagation Plants Using a Hot Water Bath System*. Role: This educator was a collaborator on this research trial managing equipment modification and conduct plant trials. Source: University of Maryland Cooperative Extension. Amount: \$6,000.00.

Schuster, C.F. Principal Investigator. (2011) *University of Maryland Extension Senior Health Insurance Program*. Senior citizens learned about Medicare, Medicaid, long term care options, prescription drug benefits and other senior citizens healthcare related issues. Role: This educator is the grant administrator. Source: Montgomery County Department of Health and Human Services. Amount \$196,062.00.

Hooks, C.R., Gill, S.A. Principal Investigators, Schuster, C.F., Rane, K, Clement, D., et. al. (2011) *Dealing with an Invasive Species in Maryland: Brown Marmorated Stink Bug and It's Impact on- Commercial Greenhouse and Herbaceous Perennial Nurseries*. Role: This educator provided data collection at sites in Montgomery County. Source Maryland Nursery and Landscape Association (\$5,000.00) and USDA (\$15,200.00). Amount: \$20,200.00

Schuster, C.F. Principal Investigator. (2012-June 30-2016) *Senior Health Insurance Program*, This educator provides oversight to, and supervises one full time and two part time employs that provide outreach education to senior citizens on Medicare, Medicaid, long term care options, prescription drug benefits and other senior citizens healthcare related issues. Source: Montgomery County Department Health and Human Services. Amount: \$88,037.00

Schuster, C.F. *Close Encounters with Agriculture Program Grant* (2011-2018) Principal author in securing competitive grant to fund the program which provides outreach education to 3,500-4,000 fourth grade students each year. Source: Maryland Grain Producers Utilization Board. Amount: \$5,000.00

ii. **Solicited and In-Kind Donations (Total: \$63,820.00)**

Schuster, C.F., Gill, S.A., and Shrewsbury, P.M. (2002-2003) *The Effect of Nitrogen Fertilization on Tree Growth and Herbivore Insect Activity of Selected Nursery Trees*. Role: Principal Investigator; solicited donations. Source: Ruppert Nurseries, Laytonsville, MD, provided fertilizer and 240 trees planted in their nursery for this trial. Value: The total in-kind contribution from Ruppert Nurseries is estimated at \$7,200.

Schuster, C.F., Gill, S.A., and Raupp, M. (2002-2006) *The Effect of Nitrogen Fertilization on Tree Growth and Herbivore Insect Activity of Selected Nursery Trees*. Role: Principal Investigator; solicited donations. Source: Bartlett Tree Experts provided fertilizer, bio stimulant and labor each year for this trial located at the Central Maryland Research and Education Center, Ellicott City Maryland. Value: The total in-kind contribution from Bartlett Tree Experts is estimated at \$1,625.

Schuster, C.F., Gill, S.A. and Shrewsbury, P.M. (2004-2006) *The Effect of Nitrogen Fertilization on Tree Growth and Herbivore Insect Activity of Selected Nursery Trees*. Role: Principal Investigator; solicited donations. Source: Ruppert Nurseries, Laytonsville, MD. Value: The total in-kind contributions of fertilizer and 120 trees planted in their nursery for this trial are estimated at \$7,200.

Schuster, C.F. (2003-2013, 2015-2018) *Close Encounters with Agriculture Program*. Role: Team member; solicited donations. Source: Heyser's Fruit Market. Value: The total in-kind contribution of 25 bushels of apples per year for participants' lunches is estimated at \$1,890.00. (\$290.00 in 2018)

Schuster, C.F. (2014) *Close Encounters with Agriculture Program*. Role: Team member; solicited donations. Source: Butler's Orchard. Value: The total in-kind contribution of 24 bushels of apples \$175.00

Schuster, C.F. (2012- 2018) *Close Encounters with Agriculture Program*. Role: Team member; solicited donations. Source: Montgomery County Agricultural Center. Donation; \$12,250. (\$3,000 in 2018)

Schuster, C.F. (2003-2018) *Close Encounters with Agriculture Program*. Role: Team member; solicited donations. Source: Montgomery County Farm Bureau. Value:. \$28,500.00. (\$3,000.00 in 2018)

Schuster, C., Tregoning, D. 2017. Tri-County Agronomy Update. 2017. \$2,460 in registration and exhibitor fees. (25% or \$615.00 for this educator)

Schuster, C.F. (2003-2018) *Close Encounters with Agriculture* Program. Role: Team member; solicited donations. Source: Montgomery County Soil Conservation District Value: \$1,000.00 in 2018

h. Fellowships, Prizes, and Awards

2003 *Rookie of the Year Award*, Epsilon Sigma Phi, Tau Chapter. This award is given by the Maryland Tau Chapter to one new outstanding UME Educator each year.

2004 *Regional Finalist, Team Newsletter* (Ludwig, D., Schuster, C. F. and Tregoning, D.), National Association of County Agricultural Agents (NACAA).

2005 *Regional Finalist, Team Newsletter* (Schuster, C. F. and Tregoning, D.), National Association of County Agricultural Agents (NACAA).

2005 *Regional Winner, Achievement Award (Research Based Poster)*, National Association of County Agricultural Agents (NACAA).

2006 *National Achievement Award* (presented annually to an Educator from each state, with less than 10 years of service, who is recognized by peers for early career achievement in teaching, scholarship, and service), National Association of County Agricultural Agents.

2006 *Regional Finalist, Team Newsletter* (Schuster, C. F., Gordon, D.G., and Tregoning, D.) National Association of County Agricultural Agents (NACAA).

2006 *Excellence in Teamwork Award "Close Encounters with Agriculture"*, S. Morris, D. Miiller, C.F. Schuster, and D. W. Tregoning. Joint Council of Extension Professionals (JCEP). This educator is a team member and provides educational support for the Close Encounters with Agriculture program.

2008 *Distinguished Early Career Award* Epsilon Sigma Phi Northeast Regional Award winner as chosen by ESP Tau Chapter members.

2008 *Regional Finalist, Team Newsletter* (Schuster, C. F., Gordon, D.G., and Tregoning, D.) National Association of County Agricultural Agents (NACAA).

2008 *National Finalist, Communications Award, Computer Generated Graphics. "The Pesticide Label, Reading the Fine Print"* National Association of County Agricultural Agents (NACAA)

2010 *National Finalist, Communications Award, Team Newsletter*, (Schuster, C.F., Rosenkranz, V., Gill, S. A., Rane, K., Ristvey, A.) National Association of County Agricultural Agents (NACAA).

2012 *Regional Finalist, Computer Generated Graphics Presentation. "Setting the Stage for Success, Understanding the Importance of pH and Lime"* National Association of County Agricultural Agents (NACAA)

- 2014 *Northeast Region Recipient, International Service*. Epsilon Sigma Phi, Tau Chapter, as selected by the National Selection committee for educational programs in Pakistan.
- 2014 Educational Institution & Federal Laboratory Partnership Award, Federal Laboratory Consortium for Technology Transfer, Mid-Atlantic Region, USDA- ARS. Program planner, presenter and facilitator.
- 2015 North East Regional Award winner, Video Presentation. “Delmarva Gardens, “Calibrating a Fertilizer Spreader” by Ginny Rosenkranz and Charles Schuster. (<http://extension.umd.edu/gardening/DelmarvaGardens/index.cfm>). National Association of County Agricultural Agents (NACAA)
- 2018 Northeast Region Recipient, *Mid Career Service Award*, Epsilon Sigma Phi, Tau Chapter, as selected by the National Selection for overall educational programs and outreach.

i. Other

i. Newsletters

Schuster, C.F., Contributor. (December 2001) *Selection of Deer Resistant Ornamental Landscape*. Green Industry News (a statewide Maryland Cooperative Extension newsletter distributed to 960 subscribers).

Schuster, C.F., Contributor. (May 2002) *A Spring Safety Checkup for Pesticide Applicators*. Green Industry News (a statewide Maryland Cooperative Extension newsletter distributed to 960 subscribers).

Schuster, C.F., Contributor. (May 2002) *Irrigation Ideas*. Green Industry News (a statewide Maryland Cooperative Extension newsletter distributed to 960 subscribers).

Schuster, C.F., Contributor. (August 2002) *Landscape Weed Control Planning*. Green Industry News (a statewide Maryland Cooperative Extension newsletter distributed to 960 subscribers).

Schuster, C.F., Contributor. (September 2002) *Can This Be The Planting Season With the Drought?* Nursery News (a statewide Maryland Cooperative Extension newsletter distributed to 960 subscribers).

ii. Books

Whipp, Roscoe N. (2007) *Montgomery County Agricultural Center, INC., The First 50 Years*. National Geographic Press. 250 pages. This educator edited this hardcover book prior to publishing.

### III. Teaching and Advising

Charles Schuster is the Extension Educator for Agriculture and Natural Resources in Montgomery County, and also provides educational programming for Howard and Frederick Counties as part of the Central Maryland Cluster for UME. Educator’s time is allotted in University of Maryland Extension’s impact teams as follows:

70% - Agriculture and Natural Resource Profitability (ANRP)



Charles Schuster is a Core Member of the ANRP Impact Team, serving specifically on the Horticulture and Integrated Pest Management Action Teams.

Commercial horticultural businesses in Montgomery County, MD generate over \$128 million annually. Horticulture is the leading agricultural business for the county and is ranked second in the state, slightly behind Baltimore County. Commercial horticultural businesses are comprised of fruit and vegetable production, nursery, greenhouse, landscape construction and maintenance, and sod. Montgomery County currently has one third of the total county land, or 93,000 acres, in the agricultural preserve. Wide spread development continues to be a major issue as land becomes more and more valuable. The current Montgomery County population, based on the 2010 census, is 975,000 residents. Commercial horticultural businesses provide a greater return per acre than traditional agriculture and are the focus of this Educator's program planning. These University of Maryland Extension programs focus on:

- Greenhouse production
- Nursery management
- Alternative agricultural enterprises, including specialty crops, consumer supported agriculture(CSA), and agritourism
- New forms of farm marketing, including consumer supported agriculture, farm markets, and pick-your-own fruit and vegetable operations
- Training of new farmers
- Integrated plant health care guidance for horticultural producers

This Extension Educator collaborates with fellow Extension Educators, as part of the Commercial Horticulture Action Team and the Agriculture and Natural Resources Profitability Impact Team, in developing and providing educational programs for the horticultural industry. While the Impact Team gathers input from industry groups to help guide statewide program planning, this Extension Educator meets with the Montgomery County Extension Advisory Committee to determine county program needs.

Programs are presented throughout the year utilizing data gathered from both ongoing and completed research. During this last twelve months insect pests were a major topic of discussion and this educator provided Spotted Wing Drosophila scouting and control measures as one form of outreach to local producers.

This Extension Educator provides educational and technical support to youth-oriented programs in Montgomery County, including but not limited to: 4-H, Close Encounters with Agriculture, Envirothon, and other public school programs. As a University of Maryland faculty member, this Extension Educator uses unbiased, applied research as a teaching tool to continue to provide new and innovative methods to improve Commercial Horticulture management and production.

a. Courses taught in the last five years.

Total: **65,990** direct teaching contacts through presentations

**11,713** presentations

**6,831** direct teaching contacts through presentations in 2018

**105** presentations in 2018

Average length of presentation: 60 minutes

<b>Program Area</b>	<b>Number of Classes</b>	<b>Number of Participants</b>	<b>Number of Classes in 2018</b>	<b>Number of 2018 Participants</b>
<b>Integrated Plant Health Education</b>				
Abiotic Tree Problems, How to Avoid Them	1	121		
Bah HumBUG, A Look at Insects that Infest our Christmas Trees	5	175	1	49
Botany	1	22		
Bramble Production and Weed Control	1	2		
Chemical Applications in Landscapes	14	311		
Commercial Pesticide Applicator Training	17	317		
Composting Yard and Garden Waste	2	44		
Cut Flower Weed Control Options	7	335		
Fertilizer Injector Calibration	12	403	1	20
Fruit Integrated Pest Management	7	96		
From the Soil Test to the Application of the Fertilizer	1	45		
Farmer Training and Certification	2	46	1	9
Going Green in the Greenhouse Industry	2	193		
Going Green with Turf Management	3	95		
Greenhouse Pesticide Application Equipment	1	129		
Greenhouse Nutrient Management	2	105		
Interiorscape Pesticide Safety	2	65		
Improving Pesticide Performance with Surfactants and Water Quality	3	174		
Integrated Pest Management- Horticulture	7	252		
How Lawns Grow	52	1182	3	70
How Not To Make Mistakes with Pesticides	7	622		
How Does Your Company Comply with Urban Nutrient Management Regulations?	36	1472		
Japanese Beetle Control Options	1	193		
Nitrate Testing for Tomato Production	1	5	1	5
Nursery and Landscape Tree Fertilization	2	166		
Nutrient Management for the Farmer and Consultant	3	101		
Nutrient Management for Landscape Managers	4	341		
Nutrient Management in Vegetable Production	4	68		
Nutrient Voucher Training	21	246	1	12
Organic Production	6	146		
Pest Control Options in the Garden and Landscape	3	102		
Pesticide Applicator Equipment Cleaning to Prevent Carryover	3	312		
Pesticide Spill Response	8	427		
Private Pesticide Applicators Training	29	171	3	13
Private Pesticide Applicator Recertification	30	641	3	40
Personal Protective Equipment (PPE) for Commercial Applicators	3	277		
Pesticide Use and Safety for Homeowners	15	663	2	72
Pesticide Community Education	4	189	1	140

<b>Integrated Plant Health Education, continued</b>	<b>Number of Classes</b>	<b>Number of Participants</b>	<b>Number of Classes in 2018</b>	<b>Number of 2018 Participants</b>
Pest Issues to Watch in Christmas Tree Production	6	196	1	22
Pesticide Applicator Training for Fruit Producers	1	5		
Pesticide Use and Safety Training	34	1021		
Reading the Fine Print of Pesticide Labels	7	884		
Reducing Drift with Sprayer Nozzle Selection	7	496		
Right of Way Weed Control	10	1245	1	298
Source Reduction, Reducing the Need for Pesticides	2	47		
Safe and Effective IPM for the Home Landscape	11	164		
Soil Fertility	1	6		
Soils and the Environment They Create	10	250	1	26
Utilizing Compost in Nursery Settings	1	180		
Sprayer Calibration	11	807		
Techniques for Growing Fruit	4	32		
Transportation and Storage of Ag Chemicals	1	15		
Turfgrass Selection and Care	46	896		
Using Hot Water To Control Insect Pests	4	295		
Weed Control in Nursery Settings	2	251		
Weed Control in the Landscape and Turf	33	3,035		
Wildlife Friendly Urban Spaces	1	32		
Total Integrated Plant Health Education	514	20,111		
Total Integrated Plant Health Education for 2018			20	776
<b>Turf Nutrient Management for Professionals</b>				
Calibration of Nutrient Application Equipment	39	1059	3	111
Professional Turfgrass Nutrient Applicator Certification Training	45	1755	6	173
Utilizing Enhanced Efficiency Controlled Release Fertilizer in Turf Management	14	1124	9	917
Utilizing Compost and Other Organic Materials in Turfgrass	18	921		
Understanding the Regulation Changes in Turfgrass Management.	3	147	3	147
Total Turf Nutrient Management for Professionals	119	5,006		
Total Turf Nutrient Management for Professionals for 2018			21	1348
<b>Small and Beginning Farm Program</b>				
Controlling Weeds, Steel in the Field and Other Options	1	14	1	14
Cover Crops – Planning and Rotation	9	95	1	14
Basic Mechanics, Hand and Power Tools, Welding	1	14	1	14
Banking and Loan Options	1	14	1	14
Hops Production	1	30	1	30
Laws and Regulations in Agriculture	1	14	1	14
Nutrient Management for Vegetable Production	7	124	1	14

<b>Small and Beginning Farm Program- continued</b>	<b>Number of Classes</b>	<b>Number of Participants</b>	<b>Number of Classes in 2018</b>	<b>Number of 2018 Participants</b>
Season Extension, High Tunnels, Low Tunnels and Row Cover	1	14	1	14
Vegetable Production Infrastructure- Equipment	10	196	1	14
Vegetable IPM	15	139		
Vegetable Production	8	169		
Vegetable Production for Community Gardens	1	9		
Pest of Tomatoes and Cucurbits	2	56		
Vegetable Crop Planting Succession	6	147		
Good Agricultural Practices for Vegetable Production	10	161	2	30
Fruit and Vegetable Enterprises- Marketing	14	117		
Alternative/ Ethnic Vegetable Crops	8	72	1	14
<b>Total Small and Beginning Farm Program</b>	<b>96</b>	<b>1385</b>		
<b>Total Small and Beginning Farm Program for 2018</b>			<b>12</b>	<b>186</b>
<b>Engaging the Hispanic Workforce</b>				
Pesticide Safety For Hispanic Agricultural Workers	15	121		
Calibration of Nutrient Application Equipment	10	187	1	48
Chemical Application in Landscapes	5	119	1	48
Soil Testing, Doing it Right	6	67		
Soils and the Environment They Create	2	25		
Turf Management, Understanding the Fertilizer Label	3	83	1	40
Worker Protection Standard Training	4	58		
<b>Total Engaging the Hispanic Workforce</b>	<b>45</b>	<b>660</b>		
<b>Total Engaging the Hispanic Workforce for 2018</b>			<b>3</b>	<b>136</b>
<b>Agriculture Business Management</b>				
Agriculture Technology	4	46		
Agricultural Equipment Safety	4	100	1	14
Montgomery County Agriculture	2	39	1	14
Computers in Agriculture	3	27		
Cut Flower Production Equipment Options	5	132	1	20
Deer Management	2	32		
Equipment for High Tunnel Cut Flower Growers	3	55		
Equipment Fuel Efficiency, Getting the Most from the Fuel Costs	5	234		
Farm Business Planning	6	28		
Pot in Pot Production Workshop	2	15		
Christmas Tree Production	2	172		
Getting Wet, Getting the Most From The Irrigation System	7	77		
Equipment for the Nursery Industry	3	56		
Agriculture Business Management				
Planting Standards for the Landscape Industry	1	25		
Poultry Breeding and Incubation	3	175	1	81

<b>Agriculture Business Management- continued</b>	<b>Number of Classes</b>	<b>Number of Participants</b>	<b>Number of Classes in 2018</b>	<b>Number of 2018 Participants</b>
Poultry Production Basics	3	200		
Preparing the Cut Flower Bed	1	43		
Setting the Stage for Success, Understanding the Importance of pH and Lime	24	295	1	9
Small Equipment for Farmers	3	66	1	14
Sod Production Economic Impact in Maryland	3	130		
Sustainable Agriculture	3	112		
Tightening Up the Greenhouse, Look at Energy Savings	3	77		
Vehicles of Change, Looking at New Engine Design	1	71		
Total Agriculture Business Management	93	2207		
Total Agriculture Business Management for 2018			6	152
<b>Close Encounters with Agriculture</b>				
Close Encounters with Agriculture	710	33,679	42	4154
Close Encounters with Agriculture 2018			42	4154
<b>International Extension Programming</b>				
Sharing Knowledge, Improving Extension Participatory Skills	6	123		
Vegetable Production	2	95		
S.M.A.R.T. Goals	1	73		
Vegetable IPM	3	73		
Nutrient Management – Using Soil Testing	1	51		
Vegetable Irrigation Design	1	22		
Vegetable Production Irrigation Components	1	22		
Irrigation Troubleshooting	1	22		
Vegetable Production, Integrated Pest Management Video Conference	2	18		
Total Agriculture International Extension Program	18	499		
Total International Extension Programming for 2018				
<b>Other Programs</b>				
Faculty Meeting	19	207		
Extension in the Community	99	2,236	1	79
Total Other Programs	118	2443		
Total Other Programs for 2018			1	79
Total All Programs	1,713	65,990	105	6,831

b. Course and Curriculum Development

Schuster, C.F. and D.K. Jefferson, Co-Authors. (2006) (2008) *Pesticide Use and Safety*.

Derwood, MD: University of Maryland Cooperative Extension. Twelve-part classroom and laboratory curriculum that provides six months of experience towards pesticide licensing of commercial and public agency pesticide technicians in MD, VA and Washington, D.C. This Educator developed fourteen of twenty-five modules, including Power Point presentations, handouts and applied labs. The modules were taught by the co-authors and two guest speakers. Twenty-three individuals have completed this class.

Schuster, C.F. (2007) Arboriculture. College Park, MD: University of Maryland, Institute of Applied Agriculture. One semester, three credit class for both traditional students in the Plant Science Department and Institute of Applied Agriculture. This educator developed the course material, including 22 PowerPoint modules, handouts and labs. Seventeen individuals completed this course

c. Supervision, Administration and Advising

- i. Supervision of Others - This Extension Educator provides ongoing supervision of Nutrient Management Consultants, Administrative Assistants and MCE Volunteers which includes semi-annual Performance Review and Development (PRD) appraisals.

Nutrient Management Consultants:

Cindy Smith - April 2002 – July 2002

Krista Mitchell - July 2002 – November 2002, 2015-2019

Amanda Laudwein – November 2002 – 2018

Eric Conley June – December 2016

Administrative Assistants:

Linda Waters - June 2001 – September 2002

Judy Hanson - November 2002 – August 2003

Jenna Caruthers - October 2003 – January 2005

Lauren Sinay - July 2005 – October 2007

Holly Fellows- February 2008- May 2008

Cathy Yingling- May 2008 – October 2008, May 2011- 2019

Beth Canetti- November 2008 – August 2010

UME Close Encounters with Agriculture Program Volunteers:

153 Master Gardeners – 2002 – present, 17 annually

- ii. Advising- This Extension Educator provided an internship for a distance learning student attempting to earn a Masters of Agriculture Education.

Intern- Colorado State University

Pofinima M. Gweama - 2007

d. Extension Activities

**Major Successful Programs**

This Extension Educator provides unbiased, research-based Commercial Horticulture educational programs in Montgomery County and surrounding counties for the horticultural  
Schuster, C.F.

industry. These major programs include *Integrated Plant or Crop Management Education*, which addresses nutrient management, pesticide use and licensing, and Integrated Pest Management (IPM); *Agriculture Business Management, Vegetable Production and Marketing, Engaging the Hispanic Workforce, Close Encounters with Agriculture and International Extension Programs*. The Educator works with other agencies in Montgomery County and throughout the state to provide new and timely programs to allow the industry to remain on the cutting edge and be sustainable. These programs are evaluated to insure that high quality information is provided in a timely fashion and the needs of the producers throughout the region are met.

#### **i. Integrated Plant Health Education**

The following programs were developed to meet the needs of Initiative 1: LOCAL FOOD & AGRICULTURE SYSTEMS from the University of Maryland Extension Strategic Plan 2009-2014. The Key Outcome: Agriculture and food production will be sustainable and profitable and produce a safe, abundant, affordable, and accessible food supply. Agriculture and Natural Resource Profitability Impact Team provides support and framework to this program. To address this initiative and provide educational leadership for the commercial horticulture industry, the following major programs were developed.

#### **Situation/Need:**

The horticulture industry in Montgomery County generates in excess of \$128 million annually. This industry employs many individuals and grows and provides plant material for home landscapes, business properties, and interiorscapes, manages the lawns and landscapes, as well as grows fruits and vegetables for both wholesale and retail sales. The appropriate use of agricultural chemicals (i.e., pesticides, fertilizers) is important to the property owner, the business owner, the residents of the Chesapeake Bay catch basin and the environment. As the Environmental Protection Agency reviews the overall health of the Chesapeake Bay greater emphasis will be placed on Extension to provide educational programs to keep agriculture informed.

#### **Objective:**

To provide research-based information on the appropriate use of agricultural chemicals and satisfy license certification and recertification continuing education, as required by the Environmental Protection Agency regulations (pesticides) and the Clean Water Act of 1998 (nutrient management), and as regulated by state laws.

#### **Program Inputs:**

- ◆ Taught initial pesticide certification training classes for 210 individuals seeking Private Applicator licenses. One hundred thirty-five have obtained licenses. (Thirteen individuals in 2018 participated in class)
  - ◆ Taught twenty Private Pesticide Applicator Recertification programs to 759 individuals in Carroll, Howard and Montgomery Counties. (Forty individuals in three programs in 2018).
  - ◆ Taught three eight-hour pesticide applicator classes for fifty-eight individuals seeking Commercial Applicator or Public Agency pesticide applicator licenses. Thirty-four obtained licenses.
  - ◆ Co-taught pesticide applicator recertification programs to 8,305 licensed commercial applicators as required by Maryland, Virginia and the District of Columbia. (346 in 2018)
- Schuster, C.F.

- ◆ Provided 855 one-to-one contacts regarding appropriate pesticide selection and use. (135 in 2018).
- ◆ Taught Nutrient Management recertification programs, in cooperation with Maryland Department of Agriculture (MDA), to 3,560 individuals in the Turf and Landscape industries. (34 programs to 1,175 individuals in 2018)
- ◆ Taught Nutrient Management training programs for individuals seeking the Professional Fertilizer Applicator (PFA) license, in cooperation with Maryland Department of Agriculture (MDA), to 1,573 individuals in the Turf and Landscape industries. (3 programs to 173 individuals in 2018)
- ◆ Reviewed 958 nutrient management plans, written by Nutrient Management Advisor, covering 101,453.6 acres. (94 plans, 7,894 Acres in 2018).
- ◆ Provided 90+ on-site direct contacts relating to appropriate nutrient selection and use.
- ◆ Taught thirteen programs on Fertilizer Injector Calibration for 460 greenhouse and nursery workers and managers. (1 programs for 20 individuals in 2018)
- ◆ Taught fifteen, two-hour Nutrient Applicator classes which provided 251 farmers with their Nutrient Applicator's voucher or recertification. (Two direct program for 41 individuals in 2016)
- ◆ Coordinated and taught three Farmer Training and Certification programs which, upon completion, allowed twenty one individuals to receive a Nutrient Management Consultant license so they could write their own nutrient management plans.
- ◆ Write a weekly (March through November) insert, titled "Weed of the Week", for the Electronic Integrated Pest Management Newsletter for Nursery and Landscape Managers, read by 2,892 landscape and nursery managers, arborist, twenty-eight extension educators, and fifty-three professional IPM scouts in Maryland, Virginia and the District of Columbia.  
<http://ipmnet.umd.edu/monitor1.htm>

### **Digital Slide Programs to Support this Major Program:**

- ◆ Schuster, C.F., Designer and Photographer. (2002) *Calibration of Fertilizer Injectors*. Thirty-one slide Power Point talk viewed by more than 270 individuals in the greenhouse and nursery industries in six programs. Adopted by three UME Educators.
- ◆ Schuster, C.F., Designer. (2002) *The Basics of Fertilizer and Amendments*. Forty-five slide Power Point presentation viewed by 125 individuals in the landscape industry in five programs.
- ◆ Schuster, C.F., Designer. (2003) *Calibration of Pesticide Application Equipment*. Thirty-three slide Power Point program viewed by 400 individuals in the greenhouse, nursery and production agriculture industries in eight programs. Adopted by two UME Educators and viewed by 74 additional horticultural professionals.
- ◆ Schuster, C.F., Designer. (2003) *Weed Identification*. Twenty-one slide Power Point talk viewed by 115 individuals in the landscape industry in five programs.
- ◆ Schuster, C.F., Designer. (2003) *Weed Control in Landscapes*. Twenty-five slide Power Point presentation viewed by 470 individuals in the landscape industry in four programs.
- ◆ Schuster, C.F., Designer. (2003) *Light Evaluation in the Greenhouse*. Thirty slide Power Point program viewed by twenty-eight individuals in the greenhouse and IPM scouting industry.
- ◆ Schuster, C.F., Designer. (2004) *Soil Testing, Doing it Right*. Twenty-three slide Power Point talk viewed by 140 individuals in the landscape industry in three programs.



- ◆ Schuster, C.F., Designer. (2004) *Doing a Site Analysis*. Thirty-nine slide Power Point talk viewed by forty-five individuals in the landscape industry in two programs. Adopted by two UME Educators.
- ◆ Schuster, C.F., Designer. (2005) *Landscape Chemical Application*. Fifty-five slide Power Point program for landscape managers and technicians. Viewed by 120 landscape professionals in two programs.
- ◆ Schuster, C.F., Designer. (2006) (Revised 2014) *Bah HumBUG, A Look at Insects that Infest our Christmas Trees*. Fifty-six slide Power Point presentation viewed by eight-six Christmas tree producers during annual Christmas Tree Grower Meeting. (one program for forty-five individuals in 2014)
- ◆ Schuster, C.F., Designer. (2006) *Techniques for Growing Fruit*. Fifty-five slide Power Point presentation viewed by twenty individuals attending a United States Botanical Garden professional in-service.
- ◆ Schuster, C.F., Designer. (2006) *Integrated Pest Management*. Seventy-one slide Power Point presentation viewed by fifteen individuals attending an introductory garden program.
- ◆ Schuster, C.F. Designer. (2007) *How Does Going Green Effect Greenhouse Pests*. Thirty-six slide Power Point presentation viewed by 110 greenhouse professionals.
- ◆ Schuster, C.F. Designer. (2007) *Weed Control in the Landscape, Keeping the Tough Weeds Under Control*. Thirty-eight slide Power Point presentation viewed by thirty landscape professionals.
- ◆ Schuster, C.F. Designer. (2007) *Weed Control Options for Use in the Landscape, Methods to Control the Tough Weeds*. Forty slide Power Point presentation viewed by 185 landscape professionals.
- ◆ Schuster, C.F. Designer. (2008) *Ash Trees, What is the Future?* Twenty slide Power Point presentation viewed by 20 landscape professionals.
- ◆ Schuster, C.F. Designer. (2008) (Updated 2010) *Setting the Stage for Success, Understanding the Importance of pH and Lime*. Thirty-four slide Power Point presentation presented to one hundred twenty four nutrient managers in the agriculture industry. (68 in 2010)
- ◆ Schuster, C.F. Designer. (2011) *Botany*. This Fifty-six slide Power Point presentation presented to twenty-two individuals attending the Environmental Studies School of the National Capitol Area Garden Clubs.
- ◆ Schuster, C.F. Designer. (2012, 2013, 2015) *Right of Way Weed Control, What Are the Options?* This Fifty-seven slide Power Point presentation was presented to ninety-one individuals attending the Maryland Arborist Association and Frederick Area Landscape Contractors and Nurserymen (FALCAN). Revised 2015, viewed by two-hundred sixty-four individuals in 2 programs in 2015.
- ◆ Schuster, C.F. Designer (2012) *The Fertilizer Use Act of 2011* This Fifty-nine slide Power Point presentation was presented to One hundred sixty-seven individuals in two programs. Revised, two programs to twenty individuals in 2015

◆ Schuster, C.F. Designer (2013, 2018 revision) *Professional Turfgrass Fertilizer Applicator Certification Training* This ninety slide Power Point presentation was presented forty-five times to one thousand seven hundred and fifty five participants. Adapted by two Extension Educator, one state agency and one private training program. (Six programs for 173 individuals in 2018)

Schuster, C.F. Designer (2014, revised 2015) *Going Green in Turfgrass, Using Compost as a Nutrient Source*. This Eighty slide Power Point presentation was presented ten times to four hundred three individuals as part of the Professional Fertilizer Applicator recertification program. Adapted by one Extension Educator and one state agency. Eight programs to 308 participants in 2015

Schuster, C. F. (2015 revised 2016) *How to Comply with the Maryland Urban Nutrient Management Regulations*. Forty-eight slide Power Point presentation presented to 1,389 individuals (1,081 in 2016) in six programs. Adapted by two Extension Educator.

Schuster, C. F. (2016) Urban Land Managers Recertification; Compost: Understanding the Analysis and Doing Effective Applications. Annapolis MD and other locations. Sixty-one slide Power Point presentation presented 111 individuals in four programs. Adapted by two UME Educators.

Schuster, C. F. (2017) Urban Land Managers Recertification; Compost: Understanding the Analysis and Doing Effective Applications. Annapolis MD and other locations. Sixty-one slide Power Point presentation presented 1,102 individuals in nineteen programs. Adapted by two UME Educators.

Schuster, C. F. (2018) *Utilizing Enhanced Efficiency Controlled Release Fertilizer in Turf Management*. Annapolis MD and other locations. This educator taught nine programs on recordkeeping, calibration of equipment and needed information as part of the Annual Fertilizer Applicators Report as part of the Urban Nutrient Management Program. 919 individuals participated in these programs. Invited by Maryland Department of Agriculture, Urban Nutrient Management program. Adopted by two UME Educators.

Schuster, C. F. (2018) *Understanding the Regulation Changes in Turfgrass Management*, Annapolis MD and other locations. This educator taught three programs on recent regulation changes and how they will impact turf managers and applicators as part of the Urban Nutrient Management Program. 147 individuals participated in these programs. Invited by Maryland Department of Agriculture, Urban Nutrient Management program. Adopted by one UME Educator.

Schuster, C. F. (2015 revised 2018) *Calibration of Nutrient Application Equipment*, Derwood and other MD locations.. Forty-eight slide Power Point presentation presented to 1,059 individuals (111 in 2018) in thirty-nine programs. Adapted by two Extension Educator.

### **Program Outcomes:**

Conducted End-of-Program and Delayed Program Evaluations which provided the following data:

◆ Twelve percent indicated an increased use of lower toxicity pesticides, coupled with the use of Schuster, C.F.

beneficial insects.

- ◆ Twenty-five percent indicated a reduced use of phosphorus-based fertilizers, except where soil tests indicated a need.
- ◆ Using a six-month post class survey (n=75), with a return of sixty-four percent (n=48), thirty-five percent indicated an increase in calibration of nutrient applicator equipment in the greenhouse and nursery industry.
- ◆ Fifty percent indicated they will calibrate pesticide application equipment using handouts developed and provided by this Educator.
- ◆ Using a six-month post class survey (n=100), with a return of sixty-five percent (n=65), forty-two percent indicated a use in the calibration of pesticide application equipment using techniques taught in the programs.
- ◆ Using an end of season survey (n=2,892), with a return of eight percent (n=224) ninety-three percent indicated the “Weed of the Week” helped them in weed identification and management. (2018)
- ◆ Using an end of season survey (n=2,892), with a return of eight percent (n=242) 100 percent indicated the color photos were useful. (2016)
- ◆ Using a pre-post program evaluation survey (n=40) with 100 percent utilizing Turning Point program evaluation, ninety-six percent will review “Drift Reduction Technology” directions of pesticide labels. (2018)
- ◆ This Educator has, since 2003, been responsible for the review, revision and approval of over 958 certified nutrient management plans for over 400 clients and 101,453.6 acres (saving farmers an estimated \$507,268.00 (101,453.6 acres \* \$5.00 per acre) for the cost of a plan. (\$39,470 in 2018)
- ◆ This Educator has provided trainings for the turf management industry to meet new licensing regulations for all commercial urban turf managers. Without this license businesses cannot apply soil nutrients. 1,755 have taken the exam, and eighty-two percent passed the certification exam following training. (173 in 2018)
- ◆ This Educator has provided continuing education credits as part of the Urban Nutrient Management Professional Fertilizer Applicator program for 3,382 individuals. This has a value of \$4,000 per applicator in income enhancements. (1,175 individuals in 2018)
- ◆ Using an end of season survey (n=2,892), (2018) with a return of eight percent (n=275) sixty-eight percent indicated the Electronic Integrated Management indicated they will consider using “alternative” control methods as compared to conventional pesticides.
- ◆ Using an end of season survey (n=2,892), (2018) with a return of fifteen percent (n=242) ninety-two percent indicated the Electronic Integrated Management the Pest Alerts help to effectively identify and control major weeds.
- ◆ Using an end of season survey, (n=2,892), (2018) with a return of fifteen percent (n=275) sixty-eight percent indicated the Electronic Integrated Management the Pest Alerts help to making fewer more accurate and effective pesticide applications as a result of the Pest Alerts?
- ◆ Using an end of season survey, (n=2,892), (2018) with a return of fifteen percent (n=275) seventy-two percent indicated the Electronic Integrated Management the Pest Alerts help to select pesticides that are less toxic and or are bio rational as a result of the Pest Alerts?

The Vegetable Production and Management program is part of Initiative 1: LOCAL FOOD & AGRICULTURE SYSTEMS from the University Of Maryland Extension Strategic Plan 2009-2014. The Key Outcome: Agriculture and food production will be sustainable and profitable and produce a safe, abundant, affordable, and accessible food supply. Agriculture and Natural Resource Profitability Impact Team provides support and framework to this program.

## **Situation/ Need:**

Local food has become a major interest of many local consumers in recent years. Fruit and vegetable production was not meeting the need and interest developed in the community to have more farmers markets, but producers were not available. This program provides needed information on many areas of this growing agricultural venture for new potential growers and marketers. This program is designed to provide the structure for new and enterprise changing farmers that have an interest in table food production and marketing.

## **Objective:**

Programs developed for this new emerging issue provide the framework for new producers to use as one assesses the potential in this potential business enterprise.

## **Program Inputs:**

- ◆ Facilitated/taught forty three hour programs. (Twelve in 2018)
- ◆ Coordinated with Maryland Department of Agriculture and UME Educators to provide follow-up materials and consulting.
- ◆ Purchased two different pipe benders for demonstration of small and medium size season extension tunnels.
- ◆ Coordinated with Montgomery County Department of Economic Development to provide educational training for the Beginning Farmer Program. Taught sixty-four programs for one hundred eight-six individuals. (twelve in 2018)
- ◆ Managed mentorship program for Small Farm Pilot Program.

## **Digital Slide Programs to Support this Major Program:**

- ◆ Schuster, C.F., Designer. (2012, revised 2016) *Cover Crops-Planning and Rotation* Seventy-five slide Power Point viewed by nineteen individuals.
- ◆ Schuster, C.F., Designer. (2012) *Timing of Crop Planting, Planting Succession*. Thirty-seven slide Power Point viewed by nineteen individuals.
- ◆ Schuster, C.F., Designer. (2012) *Soils and Soils Management* Seventy-two slide Power Point viewed by twenty-two individuals.
- ◆ Schuster, C.F., Designer. (2012) *Good Agricultural Practices- Production and Post Harvest Handling* Forty-five slide power Point viewed by sixteen individuals. Revised in 2013, viewed by twenty-six individuals.
- ◆ Schuster, C.F., Designer. (2013, Revised 2018) *Nutrient Management for Vegetable Production*. Seventy-one slide Power Point viewed by thirty-six individuals. (14 in 2018)
- ◆ Schuster, C.F., Designer. (2013) *Vegetable Production Infrastructure- Equipment*. Ninety slide Power Point viewed by twenty-two individuals.
- ◆ Schuster, C.F., Designer. (2018) *Food Safety Modernization Act, What Does It Mean To Me?* Forty-five slide Power Point viewed by twenty-three individuals.

## **Program Outcomes:**

- ◆ Four individuals started small scale vegetable production enterprises, all will continue in 2013.
  - ◆ Three individual modified his production methods to include season extension using high tunnels.
  - ◆ One individuals built and is currently using three high tunnels in a previously operational
- Schuster, C.F.

business.

- ◆ Three individuals started an agricultural enterprise before the end of 2013, four individuals started farming and marketing in 2015 on property leased with a five year term.
- ◆ Three high tunnels were built, grew and marketed vegetables in 2015. One high tunnels was built and produced products in 2018.
- ◆ Mentors provided 120 hours of volunteer time to provide direct one on one assistance to new farmers. Valued at \$1800.00.
- ◆ One farmer was able to purchase his own property, 29 acres, in 2018.

## ii. **Engaging the Hispanic Workforce**

The following programs were developed to meet the need of Initiative 2: ENVIRONMENT AND NATURAL RESOURCES focusing on Key Outcome: Individuals and communities will become stewards to manage the environment for the mutual benefit of people, ecosystems, wildlife, natural resources, and economic interests to address this initiative and provide educational opportunities and leadership for the Hispanic workforce, this Extension Educator developed and provided the following programs.

### **Situation/ Need:**

Spanish-speaking professionals in the horticultural industry need educational opportunities to provide them with knowledge regarding issues in Integrated Plant Health Care. The Hispanic population in Montgomery County has increased by 80 percent since the 1990 census, with an estimated 110,000 county residents, as of 2004.

### **Objective:**

Programs developed for the Hispanic workforce allow these individuals to work and advance in the horticultural industry. They provide basic skills in safe use of pesticides, scouting fruit, landscape, nursery and vegetable sites for pests and qualify the employees under the Worker Protection Standard of the Environmental Protection Agency, Pesticide Regulations. In addition, this segment of the workforce completes soil testing and nutrient applications in the many commercial horticultural industries regulated by the Clean Water Act of 1998 and the Maryland Department of Agriculture, Nutrient Management division. Regulations require businesses to complete soil testing, and apply nutrients to turf and landscapes in accordance with University of Maryland Cooperative Extension recommendations.

### **Program Inputs:**

- ◆ Coordinated with Maryland Department of Agriculture to plan programs geared toward non-English-speaking horticultural professionals.
- ◆ Organized and taught calibration of nutrient application equipment to five Hispanic trainees.
- ◆ Organized and taught six pesticide use and safety programs to twenty Hispanic workers in the fruit, vegetable and greenhouse industry. This program was designed to satisfy the Worker Protection Standard Training requirements.
- ◆ Taught Chemical Application Equipment Use and Calibration program, as part of a Landscape Contractors Association Certification and Testing program. (12 Hispanic individuals participated in 2010)
- ◆ Taught Nutrient Applicator Training as part of Maryland Department of Agriculture Turf Technicians Training.
- ◆ Organized coordinated and taught Worker Protection Standard and Pesticide Safety Training to Schuster, C.F.

Hispanic agricultural workers. (2014, 1 Program with 18 Hispanic individuals participated)

- ◆ Facilitated educational leadership on programs translated for Spanish-speaking horticultural professionals.

- ◆ Facilitated one program for nutrient calibration of turf application equipment for 28 Spanish-speaking horticultural professionals.

- ◆ This educator designed, had translated and taught with translator two programs for eight-eight individuals as part of the Certified Landscape Technician program. Seventy percent obtain certification.

### **Digital Slide Programs to Support this Major Program:**

- ◆ Schuster, C.F., Designer. (2004) *Soil Testing, Doing it Right*. Twenty-three slide Power Point program, translated into Spanish, and viewed by eighteen individuals in the landscape industry in three programs.

- ◆ Schuster, C.F., Designer. (2001) *Pesticide Safety for Hispanic Workers*, Forty slide Power Point presentation, translated into Spanish with English sub-titles, viewed by twenty individuals in six programs.

- ◆ Schuster, C.F. (2006) *Understanding the Fertilizer Label*, Forty-five slide Power Point program, translated into Spanish, and viewed by eighteen individuals in the turf management industry.

- ◆ Schuster, C.F. Designer. (2008) *Landscape Math, Important Math Formulas and Calculations*.

Thirty-two slide Power Point presentation viewed by sixty landscape professionals attending a Landscape Contractors Association educational seminar.

- ◆ Schuster, C.F. Designer. (2013, Revised 2016) *Turfgrass Nutrient Management certification training for the Professional Nutrient Applicator License*. Sixty-four slide program viewed by 163 individuals.

### **Program Outcomes:**

Conducted End-of-Program and Delayed Program Evaluations which provided the following data:

- ◆ Using a six-month post program survey (n=16), with a return of fifty-six percent (n=9), seventy-five percent of participants that had not previously calibrated nutrient application equipment will now use techniques taught in the program. 2010 survey was 5 months post program, (n=12) with a return rate of forty-two percent (n=5), eighty of participants that had not previously calibrated nutrient application equipment will now use techniques taught in the program.

- ◆ Using a twelve-month post program survey (n=20), with a return of seventy-five percent (n=15), sixty percent understood the laws governing use and safety of pesticides. 2009 four months post program survey (n=8) with a return rate of eight-eight percent (n=7) one hundred percent were able to answer questions related to pesticide safety correctly.

- ◆ Two Hispanic professionals obtained a Commercial Pesticide Applicator's license.

- ◆ Using a three month post program survey (n=18) with a return of sixty-six percent (n=12) Hispanic fruit and vegetable workers look for pesticide information and field history each day prior to starting work.

### iii. **Agriculture Business Management**

The following program was developed to meet the needs of Initiative 1: LOCAL FOOD & AGRICULTURE SYSTEMS with Key Outcome: Agriculture and food production will be sustainable and profitable and produce a safe, abundant, affordable, and accessible food supply. To address this initiative and provide educational leadership for the commercial horticulture industry, the following major programs were developed and implemented.

#### **Situation/ Need:**

Appropriate financial decisions play an important role in keeping businesses viable and profitable. According to a USDA study, in the last ten years, agricultural expenses have increased more than twenty-five percent, while many prices paid to agricultural producers have not kept pace.

#### **Objective:**

UME provides decision-making models that allow business decision makers to select from options they may or may not have been considering. Keeping business operators current with the ever-changing regulations that deal with zoning, licenses, nutrient application, water use, pesticides, business direction and other issues are all part of this program. Laws dealing with taxation and other governmental regulations change, and thus affect business and business profitability.

#### **Program Inputs:**

- ◆ Hosted small group meetings with fruit, vegetable and organic producers to look at marketing needs.
- ◆ Hosted two agritourism tours for groups from Mineral County, WV and the University of Delaware.
- ◆ Worked with the Montgomery County Office of Agriculture, to certify county producers for energy tax incentives.
- ◆ Worked one-on-one with two landscape contractors and the Montgomery County Department of Zoning on Special Exception issues.
- ◆ Met one-on-one with forty-two individuals to evaluate business plans, marketing options and modifications to business enterprises. (Fourteen in 2016)
- ◆ Work with Montgomery County producers to review programs that may reduce local energy tax rates from commercial to residential rates, thus reducing the local tax by fifty percent.
- ◆ Hosted Extension Educators from Turkey to review commercial horticulture and agritourism in Maryland.
- ◆ Provided two, 2 hour computer literacy programs which included, Microsoft Word and Excel, and basics of establishing an email address.
- ◆ Hosted Extension Educators from Russia to review commercial horticulture and agritourism in Maryland.
- ◆ Worked with the Montgomery County Department of Economic Development, Agricultural Services Division, on Emergency Assistance Program for drought relief.
- ◆ Held family planning meetings (3) with one family to discuss adding next generation to the agribusiness enterprise.
- ◆ Procured equipment for demonstration at High Tunnel Cut Flower program.
- ◆ Hosted a United States Department of Commerce, International Trade Exchange Program with a local farm to promote “Pick Your Own” production and marketing. Twenty individuals participated in this program. (2008)

## Digital Slide Programs to Support this Major Program:

- ◆Schuster, C.F., Designer. (2005) *Equipment for the Nursery Industry*. Forty-eight slide Power Point presentation for nursery managers and owners. Viewed by forty-six horticulture professionals in two programs: Introduction to Nursery Management, Part II and Nursery Management. Adopted by two UME Educators.
- ◆Schuster, C.F., Designer. (2005) *Pot in Pot Mechanics, a Method of Raising Trees*. Thirty slide Power Point talk for nursery managers and owners. Viewed by fifteen horticulture professionals.
- ◆Schuster, C. F., and Ross, D. (2006) *Getting Wet, Getting the Most from the Irrigation System*. Twenty-six slide Power Point presentation viewed by eighteen vegetable producers attending a regional training seminar.
- ◆Schuster, C.F. (2006) *Preparing the Cut Flower Bed*. Twenty Nine slide Power Point presentation viewed by 43 commercial cut flower producers attending the Cut Flower Growers Summer Conference.
- ◆Schuster, C.F. (2007) *Small Equipment for the Farmer*. Forty-two slide Power Point presentation viewed by 18 farmers and potential farmers attending Future Harvest, the Chesapeake Alliance for Sustainable Agriculture Conference.
- ◆Schuster, C.F. Designer. (2008) *Equipment Fuel Efficiency, Getting the Most from the Fuel Dollar*. Twenty-two slide Power Point presentation viewed by 103 landscape, nursery and arborist professionals.
- ◆Schuster, C.F. Designer. (2008) *Tightening Up the Greenhouse, Alternative Fuels and Energy to Remain Efficient*. Fifty-two slide Power Point presentation viewed by 25 greenhouse producers attending a greenhouse grower's production seminar.
- ◆Schuster, C.F. Designer. (2009) *Vehicles of Change, What is New in the Larger Truck Arena*. Forty slide Power Point presentation viewed by seventy-one individuals.
- ◆Schuster, C.F. Designer. (2009) *Technology in Agriculture- Beyond the Tractor*. Forty-eight slide Power Point presentation viewed by twenty-six individuals.
- ◆Schuster, C.F., Designer. (2010) *Christmas Tree Production- Pest Management*. Thirty-eight slide Power Point presentation viewed by seventy-five individuals.
- ◆ Schuster, C.F., Designer. (2012) (revised 2013) *Poultry Production Basics* Forty-four slide Power Point viewed by ninety-nine individuals. (Eighty-seven in 2013)
- ◆ Schuster, C.F., Designer. (2012) (revised 2018) *Breeding and Egg Incubation Do Your Poultry Rock and Roll?* Thirty-five slide Power Point viewed by One hundred fifteen individuals. (Forty-five in 2018)

## Program Outcomes:

Conducted End-of-Program and Delayed Program Evaluations which provided the following data:

- ◆ Seven producers added or modified an enterprise based upon ideas and models from these UME programs.
- ◆ Seventy-five percent of attendees indicated they will change a portion of the business enterprise they are currently engaged or managing.
- ◆ One producer modified the irrigation system used from overhead irrigation to drip irrigation to reduce energy costs and water used.
- ◆ Poultry Production Basics- End of Class survey ranked this program with a 4.35/5.00 overall with ninety-nine responding.
- ◆ Breeding and Incubation- Do your Eggs Rock and Roll, End of program survey ranked this program with a 4.87/5.00 with fourteen responding (2016).



#### iv. **Close Encounters with Agriculture**

The following program was developed to meet the needs of Initiative 2: ENVIRONMENT AND NATURAL RESOURCES focusing on Key Outcome: Individuals and communities will become stewards to manage the environment for the mutual benefit of people, ecosystems, wildlife, natural resources, and economic interests. This work uses the framework of the Natural Resources Conservation and Sustainability Impact Team. To address these themes, this Extension Educator participated in the following major program.

##### **Situation/ Need:**

Knowledge and appreciation of production agriculture by the general population declines each year as the public becomes more detached from the actual food producers. To understand where the food we eat, materials for clothing and plant materials (flowers, shrubs, and trees) come from is important as we better understand the relationship of environmental stewardship and economic prosperity.

##### **Objective:**

The Close Encounters with Agriculture is a program designed for Montgomery County fourth grade students to provide educational programs in Nutrition, Soils and the Environment, and Production Agriculture. Each year approximately 2,500 fourth grade students and teachers attend this multi-week program at the Agriculture History Farm Park. Notebooks are provided to each attending teacher to help prepare the students for the field trip. This Educator provides training and coordination of the horticultural segment of the food and Nutrition Track, as well as is an educator in the Environmental Track. He designed and implemented the *Parts of the Plant We Eat* program, in which the students are taught about the different plant parts which make up the traditional vegetables used in our diets. In the Environmental Track he provides the overview on the importance of Best Management Practices that agriculture utilizes to protect the environment, as well as defines the relationship.

##### **Program Inputs:**

- ◆ Taught 710, five-to-ten minute segments on the “Parts of the Plants We Eat” to 33,679 fourth grade students. (42 segments to 4,154 youth and adults in 2018)
- ◆ Taught 30, 3 to five minute segments in the Environment Track of Close Encounters to 2,466 fourth grade students in 2011
- ◆ Train seventeen Master Gardener volunteers annually to provide assistance in teaching this program.

##### **Program Outcomes:**

Students complete a Pre Test and Post Test which are randomly summarized for knowledge gained. Teachers submit an End-of-Program Evaluation. Pre and Post-Test results indicated the following.

- ◆ Twenty-four percent answered pretest questions dealing with horticulture correctly in 2018.
- ◆ Ninety-one percent answered post-test questions dealing with horticulture correctly in 2018.
- ◆ Seventeen percent answered environmental track questions correctly on pretest.
- ◆ Seventy-nine percent answered environmental track questions correctly on post-test in 2014.

The following program was developed to meet the needs of the *UNIVERSITY OF MARYLAND EXTENSION STRATEGIC PLAN 2009-2014*, as noted in the Vision statement; The University of Maryland Extension is Maryland's premier outreach network, with expertise as near as residents' county and city Extension offices. The University of Maryland Extension is recognized locally, nationally, and internationally for providing accessible, unbiased expert knowledge that people can use to improve their economic stability, their quality of life and community, and the environment in which they live. The mission of International Programs in Agriculture and Natural Resources (IPAN) states: IPAN's mission is to promote and facilitate international activities in the College through collaboration with educational institutions, organizations and agencies throughout the world. This Extension Educators programs meet both of these.

### **Situation/ Need:**

International programs provide an opportunity for UME Extension Educators to share unbiased research based information with individuals that in many ways need it most. Many foreign Extension programs

Extension Development is an important part of International Programs. The need to help improve not only the ability to produce crops, but also to provide Extension Educators the tools to meet the needs of global changes in agriculture and demonstrate the need for additional educational resources to be shared. Maryland is a leader in Extension programming, and fits well in collaborations with other Universities in the United States to sharing both Extension skills and knowledge to improve agriculture systems; and Educators with the knowledge and expertise can provide the needed opportunities.

### **Objective:**

International Extension Programs provide both agricultural producers as well as Extension Educators programmatic information of cropping as well as delivery methodology. Food production in many counties does not meet the needs of the population, and Extension outreach often does not have the appropriate knowledge nor tools to meet this void. These programs offer opportunities for this Educator to provide knowledge to teach others skill sets that are necessary to keep pace with agriculture and societal needs.

### **Program Inputs:**

- ◆ Hosted an International Programs in Agriculture and Natural Resources (IPAN) with eight farmers from the Republic of Georgia. (2010)
- ◆ Hosted an International Programs in Agriculture and Natural Resources (IPAN) with six Department of Agriculture professionals reviewing Extension from the Republic of Georgia. (2011)
- ◆ Traveled to Faisalabad Pakistan (two trips) as part of the University of Maryland International Program to provide educational support to seventy Afghan and Pakistani Extension Educators. Funded by USDA and partnered with UC-Davis, Purdue, Washington State University and Iowa State University.
- ◆ Taught daylong workshop for International Programs in Agriculture and Natural Resources (IPAN) to eleven Department of Agriculture professionals reviewing Extension from the Turkey. (2013)
- ◆ Taught three Improving Extension Participatory Skills workshop segments to fifty-five Afghan and Pakistani Extension professionals.

- ◆ Taught three workshop sessions on Integrated Pest Management segments to fifty-five Afghan and Pakistani Extension professionals.
- ◆ Trained fifty-five Afghan and Pakistani Extension Professionals to train others in Participatory Extension Methods.
- ◆ Provided S.M.A.R.T. Goal training as a method for program planning to sixty-six Afghan and Pakistani Extension Professionals.
- ◆ Traveled to Faisalabad Pakistan as part of the University of Maryland International Program to provide educational support to seventy Afghan and Pakistani Extension Educators. Funded by USDA and partnered with UC-Davis, Purdue, Washington State University and Iowa State University.
- ◆ Provided two one hour programs via Skype to eighteen farmers in Turkey on vegetable production.
- ◆ Provided one day of in-service to eighteen farmers and governmental officials during exchange program visit to United States.
- ◆ Taught three irrigation related programs to twenty-two farmers and local leaders as part of a program in Lwemiyaga Uganda with the International Orthodox Christian Charities (IOCC) as part of a two week on site program.

### **Digital Slide Programs to Support this Major Program:**

Schuster, C.F. Designer.(2013) *S.M.A.R.T. Goals* Twenty-four slide Power Point presentation presented to sixty-six Afghan and Pakistani Extension Professionals.

Schuster, C.F. Designer. (2013) *Sharing Knowledge, Improving Extension Participatory Skills*. Twenty-four slide Power Point presentation presented to sixty-six Afghan and Pakistani Extension Professionals.

Schuster, C.F. (2017) Drip Irrigation Design and Layout. International Orthodox Christian Charities (IOCC) program in conjunction with International Programs in Agriculture and Natural Resources (IPAN) program in Uganda to provide new and innovative methods of irrigation for vegetable production. This educator was invited to provide presentations and hands on activities to a group of 22 Ugandan farmers and local leaders in Lwemiyaga utilizing a local school as a pilot farm.

Schuster, C.F. (2017) Small Farm Programs to New Audiences. Sharing progress with international clients. This educator taught two programs to 14 members of Cultivating New Frontiers in Agriculture (CFNA). This group's works with foreign countries that have interest in new technologies in agriculture. One program was on small scale agriculture programs done both locally and internationally, one program dealt with small scale irrigation in vegetables.

### **Program Outcomes:**

- ◆ Eighty-five percent of respondents (n=61) indicated that they will use S.M.A.R.T. Goal outline in program planning.
- ◆ Sixteen Extension professionals were trained and then trained sixteen additional Extension professionals that provided educational programs for our review.
- ◆ Ninety percent of respondents (n=61) indicated that they will use Integrated Pest Management as part of problem solving with farmers where they had not before.

e. Presentations

Dyson, K., and Schuster, C.F. (2006) Core Competencies for Maryland Cooperative Extension, Maryland Cooperative Extension Annual Faculty-Staff Conference, Greenbelt, MD. Represented the Core Competencies Task Force in presenting a concurrent session outlining the rationale and purpose for developing core competencies for Extension faculty and staff and invited input from participants.

f. Media Activities

i. Newsletters

Schuster, C.F., Author. *Cover Crops for Fruits and Vegetables*. (August 2001), *High Tunnels to Extend the Growing Season*. (December 2001), *Disposing of Nursery Waste*. (March 2002), *Spring Pesticide Safety Review*. (April 2002), *Landscape Weed Control Planning*. (August 2002), *This Fall Be the Planting Season with the Drought?* (November 2002), *Disease Problems to be on the Lookout for This Spring and Summer*. (May 2003), *Harvest Your Pumpkins to Prevent Field Losses*. (September 2003), *Are Your Trucks Ready to Roll?*, (March 2004), *Bugged About Bugs*. (August 2004), *National Farm Safety and Health Week*. (September 2004), *Invasive Insects*, (January 2005), *Japanese Beetles*. (May 2005), *Pruning Trees and Shrubs*. (November 2005), *Summer Lawn Tool Safety*. (May 2006), *Emerald Ash Borer*. (December 2006), *Fuel Saving Tips*. (December 2006), *Are We Through the Drought Yet?*. (September 2007), *Vegetable Safety, From the Source to the Table*. (July 2008), *Emerald Ash Borer*. (September 2008), *Fuel Energy Improvements*. (December 2008) Gardening in Small Places, Pesticide Records and Recordkeeping, (April 2009) *Summer Harvest*, (June 2009). *Making the Most From Your Fertilizer Investment*. (February 2010), *Brown Marmorated Stink Bug, A New Pest to Combat*. (August 2010), Back Forty (Montgomery County Extension newsletter mailed or emailed to 560 subscribers in Maryland, Virginia, Pennsylvania, and Washington DC. Montgomery County and surrounding region, and placed on Montgomery County Extension website).

Schuster, C.F. Author. *Brown Marmorated Stink Bug Strategies in the Garden*, Summer 2011, Montgomery County Farm Agencies joint newsletter. Distributed to 500 commercial producers.

IV. Service

a. Professional Service

2001- Present	Member, National Association of County Agricultural Agents (NACAA)
2001- Present	Member, Maryland Association of County Agricultural Agents (MACAA)

Offices

Secretary (2008-2009)  
Vice President (2009-2010)  
President Elect (2010-2011)  
President (2011-2012)

2002- Present UME Representative, Montgomery County Farm Bureau, Board of Directors

2004- 2014 Chair, Recognition and Awards Committee, MACAA  
 2003- 2009 Member, Commercial Horticulture Planning Committee for University of District of Columbia  
 2003- Present Member, Maryland Arborist Association  
 2003- Present Member, Epsilon Sigma Phi, Tau Chapter (ESP)

Offices

Secretary (2006-2007)  
 Vice President (2007-2008)  
 President (2008-2009)(2015-2016)

2006- Present Member, Professional Grounds Management Society  
 2008, 2012 Judge, Research Based Posters, National Association of County Agricultural Agents Annual Meeting and Professional Improvement Conference. Greensboro, North Carolina, Charleston, South Carolina

b. Campus Service

i Department- UME

2009-2010 Agriculture and Natural Resources Profitability Impact Team Co-Leader  
 2010 Assistant Director, Agriculture Program Leader Search Committee, Member  
 2012, 2015, 2017 Chair- Search Committee- Frederick County Nutrient Management Advisor  
 2012 Chair- Search Committee- Howard County Family and Consumer Science Faculty Extension Assistant – FSNE  
 2013 Chair- Search Committee- UME Agriculture and Natural Resources Sustainability Coordinator.  
 2016 Chair- Search Committee, Nutrient Management Specialist, College of Agriculture and Natural Resources  
 2016 Member- Search Committee, Small Farms Educator, Carroll County UME office.  
 2018 Member- Search Committee, Assistant Clinical Professor, Director of the Agriculture Nutrient Management Program, ENST Department.  
 2018 Member- State Search Committee for Nutrient Management Advisor, Baltimore County Position.  
 2018 Chair-Search Committee, Nutrient Management Advisor, Anne Arundel County.

ii. College

2004 - 2009 Member, Commercial Horticulture Focus Team  
 2004 - 2005 Chair, Montgomery County Volunteer Recognition Committee  
 2005- 2008 Member, MCE Core Competencies Committee  
 2005- 2010 Member, Central MD Research & Education Center (CMREC) Open House Committee  
 2006- 2009 Co-Chair, CMREC Open House Committee  
 2007-Present Member and Team Leader, Internal Compliance Review Team  
 2008- 2009 Chairperson, Maryland Cooperative Extension Plan of Organization Committee

2010- Present            Member, Agriculture and Natural Resources Profitability Impact Team

iii.     University

2006-2008            At Large Member, University Senate, College of Agriculture and Natural Resources.

c.     Community, State, and National Service

1998 - 2011            Member and Elder, New Windsor Presbyterian Church

2004 - Present            Judge, Maryland Envirothon, sponsored by Natural Resources Conservation Service (NRCS). **Invited.**

2004 - Present            Judge, Maryland State Fair 4-H Bicycle Contest. **Invited.**

2004 – Present            Chair, 4-H Electricity and Small Engines Department, Montgomery County Agricultural Fair. **Invited.**

2004 - Present            UME representative, Board of Directors, Green Industry Association

2004 - Present            Editor, Back Forty Newsletter

2009- Present            Judge, Maryland State Fair 4H Learn to Earn Contest. **Invited**

d.     Service Awards and Honors

2004                    Certificate of Appreciation, Montgomery Soil Conservation District

2005                    Service Award, Maryland Farm Bureau

2007                    Service Award, Maryland Farm Bureau