

Graduate student grants mature

In the 1990s Southern SARE assistant director John Mayne saw a need within SARE for a graduate student grant program in sustainable agriculture. The Administrative Council agreed with him and the first set of grants were awarded in 2001.

After nearly a decade, 77 projects have been funded and more than 50 have been completed. Recently John conducted a survey of past graduate student project investigators to find out what they are doing now and how their lives and careers were impacted by their SARE graduate student projects. Here's a trio of stories from projects that took place at the Center for Environmental Farming Systems in North Carolina.

Emily Vollmer conducted her graduate project under the supervision of Nancy Creamer at the Center for Environmental Farming Systems in North Carolina. Vollmer has since returned to her home state of Oregon where she continues to build on what she learned in the South. Vollmer recalls that research came naturally to her.

"Before I was 15 years old I was already writing down and entering data. My mother worked in research as I was growing up so I was acquainted with its procedures, approach and methodologies early on. I started helping out when she was working in the Oregon State University forestry department, and then again when she worked for the USDA ARS on grass seed production research.

"I didn't grow up on a farm, but my first experience working on farm had me sold. While still in high school I volunteered a couple of weeks, full time, at a commercial organic vegetable farm. I think the combination of familiarity with research and the delight of farming had a large influence on my subsequent schooling and work choices."

Writing a proposal for a SARE graduate student grant for her master's thesis helped Vollmer focus.

"Through my thesis project I learned to fine tune my research approach, observation skills, and analytical process - each taken variously from the scope of the big picture down to the wee little details of my project," she says. "My thesis field work on cover crop mulches for organic no-till onions reinforced for me, that adjust-



Emily Vollmer carries a bucket of bolted onions to be weighed on the last day of field harvest for her SARE graduate Student Project in May 2008. Vollmer now researches organic blueberries at Oregon State University. Photo by Melissa Bell.

ing to the unexpected is inherent in both research and agriculture."

As for the grant writing and management process, Vollmer appreciates her early initiation.

"While writing grants isn't particularly fun, it's a good way to go about clarifying purpose, background information and reasoning," she says. "In terms of grant management, once funding has been obtained I'd recommend reviewing the list of expenditures to check where you're at since specific plans change. That kind of review helps even if you have enough funds to do all you asked for. Being a SARE project investigator gave me the resources to try and explore--oiled my research training wheels, if you will."

Her new job, post graduation, is with Oregon State University and entails continuing work on an organic blueberry production project looking at suitability for organic management. Her research team is comparing raised beds to flat plantings, different types of organic fertilizers and different blueberry varieties. They are

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also keeping track of the economics such as labor for weeding or picking. The fact that Oregon producers are eagerly awaiting the research results adds a greater sense of purpose to the work.

Chris Reberg-Horton

was awarded one of the first Southern SARE

Graduate Student grants in 2001, and he has succeeded in garnering two additional SARE grants. As a graduate student under the guidance of professor Nancy Creamer, he evaluated 268 accessions of rye germplasm for their ability to suppress weeds and scavenge residual nitrogen (project GS01-008). Seven years later he became the faculty leader for another graduate student, George Place, who was awarded a grant to evaluate soybean varieties for their own weed suppressive ability (project GS08-073). Reberg-Horton also heads up an On-Farm research project (OS08-042) on no-till organic soybeans and corn. He credits his initial experience as a graduate student with propelling him toward more on-farm research.

“First, the value of on-farm research was instilled in me by my advisor, Nancy Creamer,” he says. “She insisted that her graduate students write grant proposals. She connected me with farmers and county agents while I was a graduate student and working on my SARE proposal. I have tried to pass both these principles on to George Place. He was intimately involved with writing the on-farm research proposal. We started that process by sitting down with the farmer, county agent, and other specialists to develop the information they needed from the proposed research. George’s involvement with that process helped him to develop his own SARE graduate student proposal.”

Nancy Creamer is director of the Center for Environmental Farming Systems at North Carolina State University. She also has supervised more SARE graduate student research projects than any other professor.

“The graduate student awards are great from a number of perspectives,” she says. “I think the grants have been very influential in drawing in young researchers. Often the interest in sustainable agriculture is there, and the grant funding can allow the researcher to pursue that interest.”

She firmly believes that the work of proposal writing is important to a young researcher.



Chris Reberg-Horton and Nancy Creamer at the Center for Environmental Farming Systems. Photo by Andy Zieminski

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Research and Education Projects

Final Reports

LS04-158 N₂-Fixation and Weed Competition: Breaking the Connection Between Crops and Weeds, NCSU, NC, \$248,000, Tom Rufty, 919-515-3660, tom_rufty@ncsu.edu

Weed control is one of the biggest problems with low input sustainable systems and organic systems. In this project, we explored the possibility of controlling weeds through limiting N transfer from N₂-fixing soybean plants. Soybean varieties have different capabilities for N transfer, but this does not appear related to differences in mycorrhizal colonization – mycorrhizae act as the ‘bridge’ for N transfer into weeds plants. Low transfer seems to be an inherent trait of individual soybean genotypes. The results show that weed competitiveness and reproduction decrease greatly when N availability is limited.

LS04-159 Profitable Alternatives to Improve Water Quality from High Nutrient Status Farms, USDA-ARS, GA, \$288,000, Dorcas Franklin, 706-769-5631, dfrankln@uga.edu

The Southeastern Piedmont region of Georgia is a high nutrient status area for phosphorus (P) and nitrogen (N). Previous research indicates certain farm practices utilize more P and N from the soil and/or decrease P and N runoff. With the objective to improve water quality, six farm fields in the SEP modified their pasture systems to become crop/forage rotation management systems (CFS). Farm enterprise budget analysis and statistical methods were used to determine and rank the profitability of each CFS.

LS04-160 Using Parasitoids in an Integrated Pest Management Approach to Control Flies on Dairy Farms, University of Arkansas, AR, \$288,000, Kelly Loftin, Ph: 501-671-2361, kloftin@uaex.edu

Parasitoids were used to assist in fly control on southern dairy farms. Dairies using parasitoids in integrated pest management programs had similar fly numbers and parasitism as dairies not using parasitoids, emphasizing that sanitation and other methods of fly control are necessary when using parasitoids. Several naturally-occurring parasitoids were identified and this data increased the knowledge on diversity, abundance and seasonal distribution of parasitoids impacting flies in southern ecosystems. Deficiencies in quality assurance of commercial parasitoids that will impact the effectiveness of this approach were identified.



In 2003 Kelly Loftin was the entomologist cooperater on a Southern SARE On-Farm research grant with a budget of less than \$10,000 to evaluate integrated pest management on dairy farms. In 2004 he used the results of that research to propose a Research and Education project with a budget of \$288,000. Photo courtesy of project LS04-160.

fied. Producer adoptable approaches for monitoring parasitoid quality and general fly IPM methods were developed.

LS04-162 Developing Legume Shade Trees for Sustainable Coffee Production in Puerto Rico, University of Puerto Rico, PR, \$195,298, Eduardo Schroder, 787-832-3980 or 4040, eschroder@uprm.edu

Coffee production in Puerto Rico is located in the central mountain region, mostly on acid, highly erodible soils. To improve sustainable production of high quality coffee, we collected soil, weather, and biomass production potential for the whole island and generated the first coffee agro ecological map. Traditional farms producing shaded coffee in 20 municipalities were surveyed. In each farm, tree species were identified and data georeferenced with GPS and GIS. Soils of the coffee region were characterized. Nitrogen mineralization potential was measured, and with litter fall data, balance of N supplied for coffee estimated. Field sampling was performed to evaluate different sources of N fixation and the microbial soil population structure. Finally, the potential of more than 28 species of fast-growing nitrogen fixing trees was evaluated in two representative soils, with and without pH and nutrient supplements.

Research and Education Projects

LS04-163 Trade, Tenure and Tourism in the U.S. Virgin Islands, University of Arkansas, AR, \$280,000, Eric Wailes, Ph: 479-575-2278, ewailes@uark.edu

An analysis of policy constraints and barriers to enhance sustainable local food supply chain linkages to tourism in the U.S. Virgin Islands determined that inadequate access to land, irrigation, and credit were important production barriers. Critical supply chain barriers included inadequate linkages, including knowledge about availability, demand, price information, and coordination of quantity and quality of local foods. A pilot project to integrate local food producers and island restaurants and resorts was initiated. A directory of suppliers and restaurant/resorts was published. Key collaborators were appointed to policy decision-making positions to address production and marketing constraints.

LS04-213 (special project) Development and Integration of Sustainable Agriculture Core Curriculum Training into the Southern Region Extension Education System, Clemson, SC, \$241,000, Geoff Zehnder, Ph: (864)656-6644, zehnder@clemson.edu

The overall goal of this project was to achieve widespread incorporation of the principles and practices of sustainable agriculture in the training provided to agricultural professionals in the Southern Region. The project objectives were to:

- 1) Create 8 to 12 high quality, contemporary educational products that deliver state of the art knowledge about sustainable agriculture in the Southern Region, and
- 2) Integrate these products into the overall Extension education system in the southern region through the Cooperative Extension Curriculum Project (CECP) and Southern SARE. A pilot curriculum entitled "Pest Management in Organic Crops" was developed consisting of 11 modules on various topics related to disease, insect and weed management for organic farming systems. The modules have been incorporated into an on-line system called the Cooperative Extension Curriculum Project (CECP) at <http://srpln.msstate.edu/cecp/>

LS05-214 (special project shared with NCSARE) SARE Research & Education Program Impacts and Diffusion, Michigan State University, \$31,526, Murari Suvedi, Ph: 517-432-0265

This project was an evaluation to determine the quantifiable impacts of S-SARE R&E grants and the



Casey, Meredith and baby Cash McKissick of Crooked Creek Farm in North Carolina are the kind of family that can benefit immediately when project results are released. In 2008 they were awarded their own SARE Producer Grant to demonstrate to other farmers how small-scale pastured poultry can be integrated into a diversified family farm. Photo by Casey McKissick of project FS08-230.

reach or diffusion of the grantees' efforts to farmers, ranchers, and other pertinent user groups, particularly in the general locale of the funded project. A survey was administered to all 1994 to 2004 Southern Region SARE R&E grant recipients in winter and spring 2007. Results of the survey can be found at the project data base: www.sare.org

LS05-171 Certified Forests: Preparing Private Landowners for the Future, Mississippi State Univ, MS, \$102,000, H. Glenn Hughes, 601-794-0671, ghughes@ext.msstate.edu

We examined the potential for certified forest products in Louisiana and Mississippi. A mail survey of major home retail centers revealed that one-third sell certified wood, and the sale of certified wood is expected to increase. A mail survey of forest landowners revealed that landowners are concerned about certification costs and have distinct preferences about who they trust to administer a certification program. Landowner work-

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shops revealed that landowners are interested in having their land certified, and the Tree Farm System is the preferred system. Certification publications were developed for several audiences. This study better framed certification-related issues from various perspectives.

LS05-174 Understanding Plant-Soil-Livestock Interactions in Southern-Pine Silvopasture Systems, Auburn University, AL, \$120,000, Mary S. Miller-Goodman, 334-844-3936, goodmms@auburn.edu

Results from the three-year study of forage-soil relationships in developing longleaf pine-bahiagrass silvopasture on Coastal Plain soil at Americus GA indicate that forage productivity and quality can be enhanced, and N fertilizer additions replaced by introduction and maintenance of legumes. Results also support the beneficial effect of legume presence for soil quality (aggregate stability). Spatial differences in both forage productivity and soil quality (penetration resistance) were detected in silvopasture alleys positions relative to trees. Observations of cattle behavior in mature silvopasture versus open pasture in March, June and September at the Owen Farm in Chipley FL indicated that cattle spend significantly more time grazing in a silvopasture versus open pasture landscape.

LS06-189 Increasing Sustainability of Southern Great Plains' Agriculture Through No-till Production Systems, Oklahoma State University, \$183,000, Jeffrey T. Edwards, 405-744-9617, jeff.edwards@okstate.edu

A three-year study in Oklahoma and Texas revealed that no-till wheat is a viable option for Southern Great Plains' farmers and ranchers. Grain yield of no-till wheat plots were comparable to those of conventional-till plots, but fall forage yields were consistently lower in the no-till plots. Aphid numbers were lower in no-till wheat plots while Hessian fly numbers were higher than those in conventional till plots. Overall our research and extension efforts have resulted in increased acceptance of no-till production methods in integrated crop-livestock systems in the Southern Great Plains.



With 215 million acres of forests, the Southern Region is called the woodbasket of the nation. Most people don't realize that more than 70 percent of

Southern forests is owned by private, non-industrial landowners. The potential income from timber, pine straw, hunting leases and agroforestry products often are not realized due to poor management. John Kushla (wide shot) and Tony Howe (inset) conducted workshops for landowners about forest certification as part of a SARE project (LS08-171) that examined the potential for certified forest products in Mississippi. Photo courtesy of project investigator Glenn Hughes.

LS06-190, Perennial Legumes as a Sustainable Source of Soil Organic Matter in Southeastern Organic Farming Systems, Univ. of Georgia, \$190,000, Carl Jordan, 706-542-6019, cfjordan@uga.edu

The contribution of perennial leguminous shrubs in an alley cropping system to soil carbon and nutrients was measured in 36 experimental plots. Soils in plots with leguminous shrubs had approximately 100 % more carbon and 90% more nitrogen than in plots without the shrubs. Pot experiments in which the shrub was labeled with stable isotopes showed that root sloughing was the source of the increased carbon and nitrogen. An economic analysis of three different cash crops in an organic alley cropping system showed that only chili peppers were economically profitable, because of their relatively high market value.

Research and Education Projects

Continuing Projects

LS04-168 (planning grant) Development of Florida Native Plants as Farmscaping Cover Crops and Value-added Crops for Limited-Resource Farmers in Central Florida, FL, \$15,000, Robert A. Kluson, Ph: 941-232-3090, rkluson@earthlink.net

LS05-169 Exploiting the Organic Peanut Market: Design of Production Systems for the Southeast, Hebert Green Agroecology, NC, \$159,000, Mark A. Boudreau, Ph: 828-252-6943, markb@greenagroecology.com

LS05-172 Forage Systems for the Sustainable Production of Uniform Goat Carcasses, Univ of Tennessee at Martin, TN, \$200,000, Richard Joost, Ph: 731-587-7196, rjoost@utm.edu

LS05-173 Microarray Analysis and Functional Assays to Assess Microbial Ecology and Disease Suppression in Soils, NCSU, NC, \$250,000, Frank Louws, Ph: 919-515-6689, frank_louws@ncsu.edu

LS05-175 Sustainable and Profitable Control of Invasive Species by Small Ruminants, Texas A&M University, TX, \$178,000, James P. Muir, Ph: 254-968-4144, j-muir@tamu.edu

LS05-177 Sustainable Control of Gastro-intestinal Nematodes in Small Ruminants, Fort Valley State University, GA, \$250,000, Thomas Terrell, Ph: 478-825-6955, terrillt@fvsu.edu

LS05-178 Sustainability Indicators as Management Tools to Guide Farmers, Scientists, Policy Makers and the General Public, NCSU, NC, \$250,000, Jon A. Brandt, 919-5153107, Jon_Brandt@ncsu.edu

LS05-181 The Use of Renewable Energy to Improve the Sustainability of Southeastern U.S. Pond Aquaculture, Tuskegee University, AL, \$14,860, Barrett T. Vaughan, 334-727-8527, btvaughan@tuskegee.edu

LS06-185 Biofumigation for Soil Health in Organic High Tunnel and Conventional Field Vegetable Production Systems, Kentucky State Univ. \$170,000, Michael Bomford, Ph: 502-597-5752, mbomford@gmail.com



Silvopasture at Mac Evans farm in Jakin, GA. Project LS05-174.

LS06-186 Increasing Use of Sustainable Plants in Production and Landscape Design, Univ. of Georgia, \$180,000, Kris Braman, Ph: 770-228-7236, kbraman@uga.edu

LS06-187 Silicon Soil Amendments for Enhancing Disease Resistance While Improving Overall Crop Health for Cucurbits in Organic Farming Systems, Univ of Florida, \$180,000, Lawrence E. Datnoff, Ph:352-392-363, edatnoff@ifas.ufl.edu

LS06-188 Expanding the Grazing Season for Sustainable Year-round Forage-finished Beef Production, Clemson Univ., SC, \$163,000, Susan Duckett, Ph: 864-656-5151, sduckett@clemson.edu

LS06-191, Promoting the Development of Economically and Ecologically Sustainable Pasture-fed Beef Markets, Virginia PI&SU, \$198,652, Denise Mainville, Ph: 540-231-5774, mainvill@vt.edu

LS06-192 Biorational Approaches for Management of Bacterial Wilt and Bacterial Spot on Tomato, Univ. of Florida, \$150,000, Jeffrey B. Jones, Ph:352-392-3631, jbjonesl@ufl.edu

LS06-193 Grafting Rootstocks Onto Heirloom and Locally Adapted Tomato Selections to Confer Resistance to Root-knot Nematodes and Other Soil Borne Diseases, NCSU, \$193,000, Mary Peet, Ph: 919-515-5362, mary_peat@ncsu.edu

LS07-194 Labor Input Substitution Decisions and Business Sustainability Strategies Under Changing Farm Labor Market Conditions, University of Georgia, Ag and Applied Economics, GA, \$120,000, Cesar Escalante, Ph: 706 -542-0740, cescalante@uga.edu

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LS07-195 How Farmers Learn: Improving Sustainable Agriculture Education, Virginia Cooperative Extension, \$205,000, Nancy Franz, Ph: 540-231-1634, nfranz@vt.edu

LS07-196 Improved Efficiency of Grazing Dairies Using Complementary Pasture Species and Irrigation Scheduling, University of Georgia Dept Crop & Soil Sciences, GA, \$210,000, Nicholas Hill, Ph: 706-542-0923, nhill@uga.edu

LS07-197 Appalachian Grown: Farm to School Project, Appalachian Sustainable Agriculture Proj, NC, \$170,000, Emily Jackson, Ph: 828-236-1282, Emily@asapconnections.org

LS07-198 Transition Strategies For an Organic Peanut-grain Cropping System, University of Georgia NESPAL, GA, \$220,000, Craig Kvien, Ph: 229-386-7274, ckvien@uga

LS07-199 Integrating Plant Essential Oils and Kaolin for the Sustainable Management of Thrips and Tomato Spotted Wilt on Tomato, USDA-ARS, Center for Medical, Agri-cultural and Veterinary Entomology, FL, \$185,000, Stuart Reitz, Ph: 850-656-9870, sreitz@saa.ars.usda.gov

LS07-200 Selecting Cover Crops for Organic Strawberry Production in North Carolina, North Carolina State University, \$200,000, Michelle Schroeder, 919-513-0085, michelle_schroeder@ncsu.edu

LS07-201 Pigeon Pea: a Multipurpose, Drought Resistant Forage, Grain and Vegetable Crop for Sustainable Southern Farms, Texas AES - TAMU Dallas, TX, \$200,000, John Sloan, 972-231-5362, jsloan@tamu.edu

LS08-202 Crop-livestock Systems for Sustainable High Plains Agriculture, Texas Tech University, TX, \$200,000, Vivian Gore Allen, 806-742-1625, felician@ttu.edu

LS08-203 Exploiting the Organic Peanut Market: Refining Production Systems for the Southeast, Herbert Green Agroecology, Inc., NC, \$175,000, Mark Boudreau, 828-215-2093, markb@greenagroecology.com



Technician Jackie Cherry takes a fecal sample from a lamb in a study to compare forage systems for weight gain and parasite control. Photo of project LS08-204 by Joan Burke.

LS08-204 Sustainable Control of Gastro-intestinal Nematodes in Organic and Grass-fed Small Ruminant Production Systems, USDA, ARS, AR, \$230,000, Joan M. Burke, 479-675-3834, joan.burke@ars.usda.gov

LS08-205 Selecting a Sunn Hemp Cover Crop Genotype for Weed Suppression and Seed Production, University of Florida, FL, \$170,000, Carlene A. Chase, 352-392-1928, cachase@ufl.edu

LS08-206 Sustainable agriculture in Virginia and North Carolina: a multi-state assessment of the economic, social and political context, Virginia PI&SU, VA, \$160,000, Jonah Fogel, 804-527-4234, jfogel@vt.edu

LS08-207, Enhancing the long-term sustainability and profitability of small, limited resource farmers in the Black Belt South through marketing research & education, Tuskegee University, AL, \$122,000, Tasha M. Hargrove, 334-727-4524, tmhargrove@tuskegee.edu

LS08-208 Marketing of locally produced sustainable animal fiber products, Texas State Univ-San Marcos, TX, \$140,000, Gwendolyn Hustvedt, 512-245-4689, gh21@txstate.edu

Research and Education Projects

LS08-209 Producing, Processing and Marketing Forage-finished Beef for Consumers in the Southeastern United States, Auburn University, AL, \$151,000, Chris Kerth, 334-844-1503, kerthcr@auburn.edu

LS08-210 Reduced Tillage in Organic Systems: a Soil and Water Quality Imperative, North Carolina State University, NC, \$190,000, J. Paul, Mueller, 919-515-5825, Paul_Mueller@ncsu.edu

LS08-211 Improving the Environmental Performance of Niche Pork Production Systems and Marketability of Heritage Swine Breeds, North Carolina A&T State Univ., NC, \$175,000, Sang H., Oh, 336-334-7672, soh@ncat.edu

LS08-212 Integrating Tropical Legumes with Condensed Tannins into Ruminant Grass-based Diets for Sustainable Production, University of Puerto Rico-Mayaguez, PR, \$100,000, Elide Valencia, 787-265-3851, elideval@uprm.edu

LS09-215 Developing Low-cost Sustainable Sweetpotato Production Strategies to Facilitate Adoption in the Mid-south, Mississippi State University-MAFES, MS, \$18,5000, Ramon A. Arancibia, 662-489-4621, raa66@msstate.edu

LS09-216 Improving the Quality of Life for Southern Organic Farmers and Farm Workers, Florida Certified Organic Growers & Consumers, Inc. (FOG), FL, \$190,000, Leah Cohen, 352-377-6345, leah@foginfo.org

LS09-217 Improvement of the Safety of Food Handling Practices on Small Farms, Clemson University, SC, \$200,000, Paul Dawson, 864-656-1138, pdawson@clemson.edu

LS09-218 A Farmer-researcher Collaborative Effort to Design No-till Systems Appropriate for Small-scale Organic Producers in Alabama and the Deep South, Auburn University, AL, \$250,000, Joseph Kloepfer, 334-844-1950, kloepjw@auburn.edu

LS09-219 Development of Agroforest Systems for Bioenergy Crop Production and Ecosystem Services in the Lower Mississippi Alluvial Valley, University of Arkansas, AR, \$180,000, Hal O. Liechty, 870-460-1452, liechty@uamont.edu

LS09-220 Does Floral Farmscaping Really Improve Insect Biological Control in Vegetable Systems of the Coastal Plain?, University of Georgia, \$165,000, John R. Ruberson, 229-386-7251, ruberson@uga.edu

LS09-221 Maximizing Profitability, Sustainability, and Carbon Sequestration of No-till Forage Systems for Finishing Beef Cattle in the Gulf Coast Region, LSU AgCenter Iberia Research Station, LA, \$136,000, Guillermo Scaglia, 337-76-527, gscaglia@agcenter.lsu.edu

LS09-222 Fish Extracts for Integrated Disease, Insect and Fertility Management in Organic Blueberries, University of Georgia, \$119,000, Harold Scherm, 706-542-1258, scherm@uga.edu

LS09-223 Nutrient Optimization for Sustainable Goat Production Systems in the Southeastern U.S., Tuskegee University, AL, \$170,000, Sandra Solaiman, 334-727-8401, ssolaim@tuskegee.edu

LS09-224 Research and Educational Support for Organic Dairy Farming in the South, North Carolina State University, NC, \$250,000, Steven P. Washburn, 919-515-7726, Steve_Washburn@ncsu.edu



Youngsters learn about growing and preparing their own food in the Appalachian Grown Farm to School project LS07-197.

Professional Development Projects

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ES03-069 Training Educators to Protect Honey Bee Pollinators with Sustainable Pest Management, University of Tennessee Agricultural Extension Service, TN, \$126,648, John Skinner, 865-974-0209, jskinner@utk.edu

Nine workshops for 68 county extension agents and 83 beekeeping association representatives were conducted in Tennessee(3), Alabama(4) and Kentucky(2). Workshops started with three-hour classroom presentations with one hour on basic honey bee biology and pollination, followed by two hours on pest detection and integrated pest management. Workshops concluded with two-hour hands-on inspections of honey bee colonies. Two new publications and two Powerpoint presentations were produced for attendees. Post-session testing indicated agents' knowledge after classes improved by 31% on average. Six new beekeeping associations were started as a result of this training with two new ones in each state.



Honeybee on buckwheat

ES06-084, Smart Drenching and FAMACHA Integrated Training for Sustainable Control of Gastrointestinal Nematodes in Small Ruminants, Fort Valley State University, GA, \$72,955, Seyedmehdi Mobini, Ph: 478-825-6427, mobinis@fvsu.edu

A team of multidisciplinary professionals, extension specialists, and farmers from across the southern region (including 1890 and 1862 institutions), Denmark, and South Africa developed training materials, resource manual and curriculum on sustainable small ruminant GIN control based on information and strategies developed through a current SARE R&E Grant in Southern US, PR and USVI. A printed train the trainer curriculum and CD, along with a Powerpoint presentation has been completed and printed. Material is also posted at www.scsrpc.org

Continuing Projects

ES04-075 Regional Goat Production and Marketing Project: Phase 1, Kentucky State University, KY, \$84,550, Marion Simon, 502-597-6437, msimon@gwmail.kysu.edu

ES04-076 Putting It All Together: Using Livestock to Manage Natural Resources, NCAT/ATTRA, AR, \$80,187, Teresa Maurer, 479-442-9824, teresam@ncat.org

ES05-078 Sustainable Production Systems for Range-Reared Standard Turkeys, American Livestock Breeds Conservancy, NC, \$109,444, Marjorie Bender, 919-542-5704, mbender@albc-usa.org

ES05-079 Direct Market Training for Agricultural Professionals, North Carolina State University, NC, \$96,757, S. Gary Bullen, 919-515-6096, Gary_Bullen@ncsu.edu

ES05-081 Regional Meat Goat Production and Marketing Project: Phase 2 Kentucky State University, KY, \$9,578, Marion Simon, 502-597-6437, msimon@gwmail.kysu.edu

ES05-082 Regional Meat Goat Production and Marketing Project: Phase 1 Kentucky State University, KY, \$30,000, Marion Simon, 502-597-6437, msimon@gwmail.kysu.edu

ES06-083 Pasture Pork 101: Comprehensive Agent Training in Pasture-based Hog production, NCSU, \$62,500, Susan Melage, Ph: 919-515-7346, susan_melage@ncsu.edu

ES06-085 Sustainable Organic No-Till Systems: A Training Program for CES and NRCS Field Professionals, VPI & SU, \$104,623, Ronald D. Morse, 540-231-6724, morser@vt.edu

ES06-086 Trainings in Eight Farming Systems using unique tools and approaches, S-SAWG, TX, \$123,751, David Zodrow, 479-443-5127, davidzodrow@aol.com

ES07-087 Kentucky Sheep and Goat Herder Curriculum-Phase 1, University of Kentucky, \$90,000, Jimmy Henning, 859-257-1846, jimmy.henning@uky.edu

Professional Development Projects

ES07-088 Building Organic Agriculture Extension Training Capacity in the Southeast, University of Arkansas, \$195,000, Elena Garcia, 479-575-8619, megarcia@uark.edu

ES08-089 Toolbox for Small Ruminant Educators: Building on the Small Ruminant Resource Manual, NCAT, AR, \$61,523, Linda Coffey, 479-442-9824, lindac@ncat.org

ES08-090 An agent Training Program in Safe Food Handling & Legal Liability, North Carolina Cooperative Ext, NC, \$77,344, Diane Ducharme, 704-250-5402, Diane_Ducharme@ncsu.edu

ES08-091, Organic Dairy Training Conferences and Educational Materials for Professionals, Univ of Arkansas CES, AR, \$97,456, Jodie Pennington, 501-671-2190, jpennington@uaex.edu

ES08-092 Energy Training for Agricultural Professionals in the Southern SARE Regions, National Center for Appropriate Technology (NCAT), NC, \$97,684, Mike Morris, 406-533-6652, mikem@ncat.org

ES08-093 Agritourism Training for Agriculture Professionals, University of Georgia, GA, \$82,986, Kent Wolfe, 706-542-0752, kwolfe@uga.edu

ES08-094 Experiential Education to Form an Extension Organic Production Team in Georgia, University of Georgia, GA, \$18,692, Julia Gaskin, 706-542-1886, jgaskin@engr.uga.edu

ES09-095 Training the Trainers in Community-based Food Systems: a project-oriented case study team approach, North Carolina State University, Center for Environmental Farming Systems, NC, \$99,266, Nancy Creamer, 919-515-9447, Nancy_Creamer@ncsu.edu

ES09-096 Training Educators and Agricultural Professionals on Sustainable, Pasture-based Dairy Systems, University of Georgia, GA, \$89,321, Dennis Hancock, 706-654-21529, dhancock@uga.edu

ES09-097 Moving nursery producers toward sustainable production practices, University of Florida / IFAS, N. Florida R&E Center, FL, \$76,237, Gary Knox, 850-875-7162, gwknnox@ufl.edu



Fresh local food is a main ingredient for successful agritourism ventures. Agritourism workshop photo courtesy of Kent Wolfe and Project ES08-093.

ES09-098 Strengthening the Goat Industry: a national conference, Florida A&M, FL, \$80,000, Angela McKenzie-Jakes, 850-875-8557, Angela.McKenzieJakes@fam.u.edu

ES09-099 Developing successful organic horticulture farms: practical training for agricultural professionals, S-SAWG, AL, \$62,915, Jean Mills, 205-333-8504, jean@ssawg.org

ES09-100 Green Roof Technology as a Tool for Sustainable Cities: Food Production, Urban Heat Island Effect and Storm Water Runoff Reduction, University of Puerto Rico-Mayaguez, PR, \$20,000, Sally Gonzalez, 787-833-9350, sgonzalez@uprm.edu

Producer Grant Projects

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FS05-187 Soil Building and Fertility through Cover Cropping among Limited Resource Farmers, Selma-Dallas Small Farmers Association, AL, \$11,968, John Brown, Ph: 334-418-0584, johnb32001@yahoo.com

The increasing amounts of inorganic fertilizer, and their resultant expense, that many limited resource and minority farmers use has become a financial burden. They feel they must use these expensive inputs because they farm nutrient poor soils. Some of the producers in the Selma-Dallas Small Farmers Association believed that if they could reduce the amount of money spent on the purchase of chemical fertilizer, they would be able to earn more from their individual operations. They used cover crops to increase the fertility of the soil and to lower the cost incurred by the members in providing nutrients to the soil. Pest management and weed control were additional benefits derived from the cultivation of cover crops, and contributed to the reduction in the cost of producing the crops.

FS06-203 A Demand-Driven Approach to Specialty Crop Market Development, Appalachian Spring Cooperative, TN, 12324, Dianne Levy, Ph: 423-733-2095, mgr@apspringcoop.com

The growers involved in the "Growing Healthy Kids...Growing Healthy Sales" project workshops have—over the time of the project—been able to use the tools provided to make some inroads into the Hawkins County school food program. The use of locally grown foods from 2007 to 2009 more than doubled (and no doubt will be higher as the current school year is not concluded), but is still less than one tenth of one percent of the school food budget year-to-date. It has become obvious that in order to truly provide fresh, locally grown produce to schools to promote healthier eating for children, there must be pressure on the schools to use local farmers as purveyors.

FS07-214, Sustainable Low-Cost Heating for Season Extension Structures, TN, \$14,928, Steve Hodges, Ph: 423-733-4195, steveh@overhome.net

Clinch Appalachian Farm Enterprises set out to find low-cost of ways of heating season extension structures that would be an alternative to traditional



A toilet flange, dog tie-out stakes, rope, PVC pipe and fence posts form a maypole to accommodate the abundant growth of hops, an experimental crop that shows promise for high-end sales to microbreweries. Project FS07-220.

ways which are a barrier for some small-scale farmers. Though 22 farmers attended a workshop on using the heat from composting, an initial focus on this method did not result in significant adoption of the method by farmers. As a result, the project changed to focus on other methods and a workshop was held in January 2009. Six growers participating in that workshop agreed to monitor the impact of six different applications of alternative heating methods. The most significant results in raising low outside temperatures were found by constructing low tunnels within high tunnels.

FS07-216 Season Extension for Winter CSA and Restaurant Sales, NC, \$5,829, Annie Louise Perkinson, Ph: 828-628-3348, perkinsoni@bellsouth.net

The purpose of this project was to explore the possibilities of extending the farm season with storage crops and winter hardy greens to sell to our existing CSA customers, at farmer's markets, and to local restaurants. We grew different varieties of storage crops which are cured in different ways to see what grew, stored and sold the best. Various types of winter greens and root crops were also grown to test growing ability in cold weather with minimum protection and customer preference. Customer interest for these

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products was evident by their enthusiasm to receive CSA boxes for longer, come to market despite the cold weather, and for chefs to serve local food on their menus. This project proved the market wants more produce in the off season.

FS07-219 Treating Soil Compaction Using Woven Weed Fabric, TX, \$9,886, Roy Riddle, Ph: 806-35-4007, rcr1465@poka.com

The study revealed that formation of hardpans is greatly increased when using the woven fabric unless it is taken up and the soil cultivated annually. In addition a compaction of soil at the surface occurs when the woven fabric is used. The longer the fabric remains in place the tighter the soil is compacted at the surface and it limits vegetable plant growth and yield. Surface compaction even in no traffic areas was much greater than anticipated. These trials opened the door for additional research in weed and moisture control while growing vegetables.

FS07-220 Meeting the Needs of Microbreweries with Fresh Hops Production, NC, \$9,762, Linda Sakiewicz, Ph: 919-63-8993, Brackenbrae@mebtel.net

Over the past 20 years the microbrewery industry has boomed, and we wanted to establish hops as a new alternative crop on our farm with the primary aim of producing fresh hops for use by the local and regional microbrewery industry while following sustainable organic practices. We established plantings of six different varieties of female hops using materials that were inexpensive and easy to find and handle. We chose a Maypole design because it was simple and compact and could be used where there is limited space. Hops need time to establish themselves and each year production should increase when well managed. Our results prove to us that hops can be successfully grown in the Piedmont region of the U.S. South.

FS07-221 Natural Comb Management of Honey Bees for Varroa Control, TN, \$15,000, Michael Wilson, Ph: 865-63-9008, my4acres@bellsouth.net

We compared natural cell bee colonies with wooden starter strips to colonies on standard sized foundation. No significant difference in the population of the control and test group was recorded. *Varroa* mite populations did not differ in the first year of colonies,



This almond portobello mushroom is ready for harvesting. The fungi shows promise as a good short-term crop for small-farm compost management. Photo by project investigator Mark Jones of Project FS08-227. See more photos at <http://www.sharondalefarm.com/>

but in the second, significantly fewer mites were recorded in natural cell colonies. Still, natural cell and control colonies exceeded economic thresholds for *Varroa* and experienced colony death. We also tested the feasibility of drone comb trapping, a proven technique to control *Varroa* mites. Based on our results, we recommend drone comb trapping for organic *Varroa* mite control and do not recommend natural cell beekeeping for mite control or profitable beekeeping.

FS08-227 Optimizing Management of Manure Composts to Yield High Value Mushroom Crops and Soil Amendments, Sharondale Farm, VA, \$6,317, Mark Jones, 434-296-3301, info@sharondalefarm.com

The Almond Portobello mushroom (*Agaricus subrufescens*) was grown on composted poultry and leaf debris during summer outdoors in raised beds. The results of this work indicate that this could be an excellent short term crop for small farm compost management. The nutritional, medicinal and economic values of this mushroom are high and production methods to reduce production costs will continue to be developed at Sharondale Farm.

Producer Grant Projects

FS08-230 Building Capacity for Pastured Poultry in Western North Carolina, NC, \$7,755, Casey McKissick, Ph: 828-216-2966, casey@crookedcreekfarms.org

This project demonstrated the integration of small scale pastured poultry production on a diversified vegetable farm. Cornish Rock meat birds were raised in a vegetable field that was being intensively cover cropped as a means to manage nutrients. The birds were processed at 7 and 8 weeks for a target carcass weight of 4.5lbs. Two on-farm workshops were held covering all aspects of production and processing. Two workshops were offered at regional sustainable agriculture conferences. Over 125 producers and potential producers received outreach through the project. Approximately 480 birds (2,150 lbs. of meat) were produced on $\frac{3}{4}$ acre, netting over \$2,700 to the enterprise after labor cost were paid to the farmers and hired help.



Continuing Projects

FS08-222 Use of Crawfish and Crab Waste as an Organic Fertilizer and Protein Feed, LA, \$10,000, Shane Carmichael, 318-240-3134, shanecarmichael@Rogers.com

FS08-223 Promoting Sustainable Beekeeping Practices through local production of nucs and local queen honeybees, The Backyard Farm, VA, \$14,736, Karla Eisen, 703-753-9023, PWSBeekeepers@gmail.com

FS08-224 Organic Strawberry Production: Extending the Season with Low Tunnels, AL, \$10,000, Jan Garrett, 334-725-9272, garr6904@bellsouth.net

FS08-225 Improving Sustainability of A Long-term Certified Organic Cash Grain Production System, Hillsborough Farm, VA, \$8,828, W. Todd Henley, 804-769-2987, hills_wth@hotmail.com

FS08-226 Native-Grass Prairie Restoration and Soil Remediation Program, AL, \$9,995, Fitz Hudson, 334-279-3194, fitzhudson@charter.net

FS08-228 Sustainable Production and Niche Marketing of Pearl Millet, GA, \$9,911, Bryan Maw, 229-382-6832, maw.bryan@yahoo.com

FS08-229 Enhanced Genetic Selection of Dairy Sheep for the Southern US, VA, \$9,486, Marcia McDuffie, 434-277-9216, mjm7e@virginia.edu

FS08-231 Financial Analysis of Growing No-till Organic Field Corn and Wheat Using Cover Crops for Weed Suppression, VA, \$8,827, Joel Thomas Yowell, 540-923-4059, kdyowell@earthlink.net

FS09-232 Natural Controls for Honey Bee Pests, NC, \$10,000, Scott Barlow, 828-381-1790, scottlbarlow@charter.net

FS09-233 Dual-season Organic Asparagus Production, SC, \$9,995, Mary Connor, 843-757-2363, mconnor@hargray.com

FS09-234 "Sweet Petite" Value-Added Processing for Small Sized Shrimp, GA, \$9,932, James Dubberly, 912-925-6433, lindawhiddon@bellsouth.net

FS09-235 Water Catchment Systems for Mobile and Permanent Farm Structures, AL, \$9,970, Santiago Lima, 256-694-7810, sanylima@yahoo.com

FS09-236 Building a Market for Local Produce in the Foodservice Industry, Family Farmers Cooperative, MS, \$14,965, Andre Mathews, 901-690-2258, andremathews310@yahoo.com

FS09-237 Growing Organic Hops for the Local Market, NC, \$8,268, Rita Pelczar, 301-602-0722, pelczar@aol.com

FS09-238 Development of a Novel Grazing System for Sustainability of a Cow-calf Operation, VA, \$9,500, Joe Shomo, 540-886-7247, brjones8@vt.edu

FS09-239 Wasabi Production, NC, \$8,649, Deidra Smith, 828-964-5851, edistotoo@yahoo.com

FS09-240 Early Growing Season Strategy, NC, \$3,482, Hollis Wild, 336-982-2377, hwild@skybest.com

Graduate Student Projects

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GS05-049 Organic Mulches and High Residue No-till for Collard Production in Alabama, Auburn University, AL, \$10,000, Dennis Shannon & C. Wesley Wood, 334-844-3963, shannda@auburn.edu & woodcha@auburn.edu and Michael J. Mulvaney, mulvamj@auburn.edu

A comparison of various organic mulches in conjunction with winter and summer high biomass cover crops during herbicide-free no-till collard production found that mulches applied in the fall were effective in altering weed species composition away from broadleaves and sedges. Forage soybean as a summer cover crop was not effective, due to rapid decomposition. Persistence and nutrient release rates from organic residues result in slowly released nitrogen that may be available to subsequent crops. This study shows that it is possible to increase soil organic matter and nitrogen content while simultaneously keeping land productive.

GS06-053 Are Bluebirds Good for Farms, and are Farms Good for Bluebirds? University of Florida, FL, \$10,000, Kathryn Sieving, 352-846-0569, chucao@ufl.edu; John DeLuca, delucajj@gmail.com

We investigated reproduction and pest consumption by Eastern Bluebirds (*Sialia sialis*) on farms and natural open lands. Findings suggest that farms provide suboptimal but useful habitat for breeding bluebirds. Farmland bluebirds laid more eggs and raised more clutches than natural land bluebirds in 2007, yet birds from all treatments produced similar numbers of nestlings. In 2008, farmland bluebirds produced nearly half the number of nestlings in the first clutch than bluebirds on natural lands. Therefore, reproductive success did not differ but reproductive effort was higher on farms. Preliminary results concerning pest consumption suggest that breeding pairs on reduced-impact farms consume 76 to 174 arthropods per day when feeding nestlings; the most frequent prey types included grasshoppers, crickets, and larvae (Lepidoptera, Coleoptera).

GS07-058 Cover Crop Mulches for No-till Organic Onion Production, North Carolina State University Dept of Horticultural Science, NC, \$10,000, Nancy Creamer, 919-515-9447, nancy_creamer@ncsu.edu, Emily Vollmer, ervollme@ncsu.edu

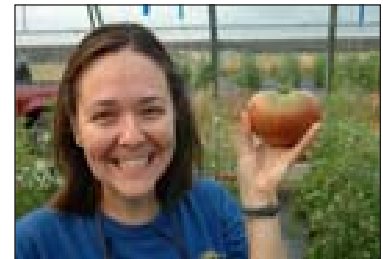
The purpose of this project was to expand the knowledge base informing sustainable agricultural practices. This project addressed three key challenges for organic, reduced-tillage vegetable production. First, selecting summer cover crops that winter kill elimi-

nates the challenge of mechanically killing the cover crop. Second, we evaluated quantity and timing of nitrogen release from both the cover crops and organic amendment nitrogen during over-wintered vegetable production. Third, we evaluated the weed control potential of the different cover crop residues.

GS07-060 Potential of Grafting to Improve Nutrient Management of Heirloom Tomatoes on Organic Farms, North Carolina State University, NC, \$10,000, Mary Peet/ Suzanne O'Connell, Ph:9195155362, mary_peet@ncsu.edu

The nutrient uptake and fruit yield of grafted tomatoes was evaluated in greenhouses and on farms in North Carolina. The

physical effects of grafting stimulated plant growth and nutrient accumulation in our greenhouse study, while utilization of commercial rootstocks increased the level of grafting effects. In our two-year systems comparison trial, the total fruit weight of the high tunnel system out-produced the field system by 12-30% and the heirloom tomato Cherokee Purple grafted onto the rootstock Maxifort produced 23% more fruit compared to non-grafted plants. All three collaborative farmers were enthusiastic about incorporating grafting into their future farm practices.



Suzanne O'Connell shows off a Cherokee Purple tomato from grafted stock.

GS07-061 Importance of Brassica Soil Amendments for Managing Soilborne Disease in Ornamentals and Vegetables, University of Arkansas, AR, \$9,944, Craig Rothrock, 479-601-7472, rothrock@uark.edu, Kimberly Brown Cochran, kab11@uark.edu

This study indicates that brassica selection has less effect than the amount of brassica amendment incorporated. Thus, selection should be based on biomass production and not glucosinolate levels produced by a cultivar. This holds great promise, as growers can make selections based on adaptation of the brassica species and cultivar. Also, this should reduce costs by allowing growers flexibility by purchasing the lowest priced cultivars. The study did document the

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suppression of the fungus *Rhizoctonia solani* on ornamentals and this should apply to vegetable crops where *Rhizoctonia solani* is an important pathogen. Management of soilborne pathogens for vegetable and ornamental crops using brassica amendments in both limited-resource farming operations and home production appears promising.

Continuing Projects

GS06-051, Effects of Management Practices and Plant Growth Regulators on the Allelopathic Potential of Rye, North Carolina State University, NC, \$9,780, James Burton, 919-515-1211, jim_burton@ncsu.edu; Christine Sickler, 919-515-3178, christine_sickler@ncsu.edu

GS06-054 Novel Methods for Sustainable Control of Gastrointestinal Nematodes in llamas and Alpacas in the Southeastern United States, Fort Valley State University AES, GA, \$10,000, Thomas Terrill, 478-825-6814, terrillt@fvsu.edu, Rose-Ann Gillespie, missanns@usa.net

GS07-056 Allelopathic Effects of Small Grain Cover Crops on Cotton Plant Growth and Yields, Texas Tech University, \$10,000, Vivien Allen, 806-742-1625, felician@ttu.edu, Yue li, yue.li@ttu.edu

GS07-057 Optimizing Buckwheat Use as a Weed Suppressive Cover Crop for Sustainable Cropping Systems in Florida, University of Florida, FL, \$10,000, Carlene Chase, 352-392-1928, cachase@ufl.edu, Pei-wen Huang, agnespei@ufl.edu

GS07-059 Effect of a Grazing Sericea Lespedeza as a Treatment Paddock for Controlling Natural Nematode Infection in Lambs, Louisiana State University, \$10,000, James Miller, 225-578-9652, jmille1@lsu.edu, Allyson Moscona, akinne2@lsu.edu

GS07-062 Omega-3 Purlane Eggs, North Carolina State University, NC, \$10,000, Thomas Rufty, Ph: 919-515-3660, tom_rufty@ncsu.edu, Laura Vance, livance@ncsu.edu

GS07-063 Reducing Nutrient Loss Below the Root Zone of Drip-irrigated Vegetables Using Low-pressure, Increased Irrigation Time, University of Florida, FL, \$9,966, Eric Simonne, 352-392-4711, esimonne@ufl.edu, Aparna Gazula, virgoinc@ufl.edu



Beetle CSI? Not quite, but close. After Sarah Donelson traps predatory beetles in the field, she dissects them and puts tissue samples from their gut on special cards that can be stored at room temperature. Using a stable carbon isotope process, she can then determine where each beetle grew up and what aphids were consumed. Check on her final report in next year's Index to find out whether the beetles are effective at managing aphids. Photos courtesy of Sarah Donelson, graduate student PI for project GS08-066



GS07-064 Cropping Systems for Sustainable Nutrient Management and Dairy Production, Texas A&M University, TX, \$10,000, Donald Viotor, 979-845-5357, dviotor@ag.tamu.edu, Ronnie Schnell, ronschnell@tamu.edu

3GS08-065 Effects of Organic Amendments on Aggregation and Microbial Community dynamics in Soils, University of Kentucky Plant and Soil Sciences, KY, \$10,000, Elisa D'Angelo, 859-257-8651, edangelo@uky.edu, Shawn Lucas, stluca2@uky.edu

Graduate Student Projects

GS08-066 Conservation of Predatory Carabid Beetles (Coleoptera: Carabidae) in agroecosystems of the Southern Great Plains, Oklahoma State University , OK, \$9,996, Kristopher Giles, 405-744-6298, kris.giles@okstate.edu, Sarah Donelson s.l.donelson@okstate.edu

GS08-067 Southeastern North Carolina Food Systems Project, University of North Carolina Wilmington, Dept of Sociology, NC, \$10,000, Leslie Hossfeld, 910-962-7849, HossfeldL@uncw.edu, H. Raven Bruno, hrb9594@uncw.edu

GS08-068 Elucidating the Role of Cellulases Involved in Biological Control of Phytophthora Root Rot, North Carolina State University Mountain Horticultural Crops Research & Extension Center , NC, \$9,931, Kelly Ivors, 828-684-3562, kelly_ivors@ncsu.edu, Brantlee Richter, brantlee_richter@ncsu.edu

GS08-069 Effects of Forage-finished Beef on Cool- or Warm-Season Forages, Auburn University , AL, \$9,685, Chris Kerth, 334-844-1503, kerthcr@auburn.edu, Clinton Rowe, cwr0002@auburn.edu

GS08-070 The Fate of the Finca: Smallholders in the Hispanic Caribbean, University of Texas at Austin , TX, \$10,000, Gregory Knapp, 512-282-1588, gwk@mail.utexas.edu , Katia Aviles-Vazquez, kr.avivaz@gmail.com

GS08-071 Effect of Sericea Lespedeza Leaf Meal Pellet Supplementation on Haemonchus Contortus Infection in Grazing Ewes, Louisiana State University Department of Pathobiological Sciences , LA, \$10,000, James Miller, 225-578-9652, jmille1@lsu.edu, Dana Pollard, dpollard@lsu.edu

GS08-072 Sustainable Management for Scarab Pests Impacting Grape Production in the Southern Region, University of Kentucky, KY, \$9,750, Daniel Potter, 859-257-7458, dapotter@uky.edu, Derrick Hammons, dlhamm3@uky.edu

GS08-073 Traits of Interest for Improving Weed Suppressive Ability in Soybean, North Carolina State University , NC, \$9,972, Chris Reberg-Horton, 919-515-7597, chris_reberg-horton@ncsu, George Place, george_place@ncsu.edu



A smallholder in Puerto Rico demonstrates how he reclaimed eroded hillside soil with cover crops. Photo by Katia Aviles-Vazquez of project GS08-070.

GS08-074 Seeds of Persistence: The Ethnoecology of Crop Agrobiodiversity Maintenance in the American Mountain South, University of Georgia , GA, \$10,000, Robert Rhoades, 706-542-1042, rrrhoades@uga.edu, James Veteto, jv61598@uga.edu

GS08-075 Comprehensive Evaluation of Wind-breaks of Fast-growing Trees, School of Forest Resources & Conservation University of Florida , FL, \$9191, Donald L Rockwood, 352-846-0897, dlock@ufl.edu, Bijay Tamang, bijay@ufl.edu

GS08-076 Chemistry and Biodegradability of Dissolved Soil Organic Matter in Diverse Farming Systems, North Carolina State University , NC, \$9,850, Wei Shi, 919-513-4641, wei_shi@ncsu.edu, Lei Tian, ltian@ncsu.edu

GS08-077 Providing Habitat for Native Pollinators at Farm Sites, University of Tennessee, Knoxville, \$10,000, John Skinner, 865-974-0209, jskinner@utk.edu, Michael Wilson, mwilso14@utk.edu

On-Farm Research Reports

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OS06-028 An Alternative Planting Strategy for Establishing Clover in Pastures, Univ of Arkansas CES, AR, \$14,992, John Jennings, Ph: 501-671-2350, jjennings@uaex.edu

A comparison of strip- and solid seeding of white clover initially indicates that better stands of clover can be obtained by strip-seeding clover at a higher than recommended seeding rate (4x on 25% of the field vs. 1x on 100% of the field). The stand percentage also remained higher throughout the growing season than clover planted at the recommended rate over the entire field. Strip-planting requires less time and fuel than conventional solid-seeding. Second-year data will determine if differences persist and if clover can spread from the planted strips into non-planted areas.

OS06-030 Reducing Soil Erosion and Nitrogen Leaching Through Sustainable Cropping Systems, Virginia Tech, VA \$6,271, Wade Thomason, Ph: 540-231-2988, wthomaso@vt.edu

A Virginia study evaluating cover crop species at three planting dates with or without winter nitrogen application determined that rye and rye + hairy vetch yielded significantly more biomass than other species. Rye nitrogen uptake was also greater than other cereals. Early planted rye reduced total soil profile NO₃⁻ (0-90 cm) by 15 kg ha⁻¹. Across species, early planting resulted in 21 kg ha⁻¹ less soil profile NO₃⁻ in May than late planting. Averaged over cereal cover crops, N applied at GS 25 resulted in 2.1 Mg ha⁻¹ more biomass and 26 kg ha⁻¹ more N uptake.

OS06-032 Opportunities for Pasture-raised Jersey Beef in the Southeast, NCSU, NC, \$14,952 Steve Washburn, Ph: 919-515-7726, Steve_Washburn@ncsu.edu

Jersey and Jersey-Holstein steers were finished on pasture or using concentrates for 84 days before harvest. Data were collected on 44 steers over 2 years. Steers were harvested at similar ages regardless of weight. Fatty acid profiles differed and concentrate-fed animals had more fat. Taste panel evaluations of loin samples included comparison with choice beef. Taste panel preferences averaged 39.6%, 37.5%, and 21.9% for choice beef, concentrate-fed Jersey beef, and pasture-fed Jersey beef, respectively. The cooperating farmer projected a net return of about \$1,000 per head for pasture-fed steers indicating potential for profitable beef enterprises using Jersey or Jersey-Holstein steers.

OS07-038 On-Farm Biofuel Production from Sweet Sorghum Juice, North Carolina State University Weaver Labs, NC, \$14,898, Matthew Veal, Ph: 919-515-6764, mwveal@ncsu.edu



Mathew Veal explains sweet sorghum production to producers who might be interested in growing the crop for biofuel.

Sweet sorghum varieties were grown at two locations in the eastern North Carolina and processed to determine their value as a sustainable bioenergy feedstock. Juice collected from the crushed sorghum stalks (1500 gal/ac yield) was successfully converted to ethanol using a 40 gallon mobile processing unit. Data collected during this project showed sweet sorghum is a promising source of cheap sugar for biofuel production, if additional mechanization is developed to offset high harvest costs.

OS07-039 The Use of Controlled Grazing and two Herbal Treatments to Prevent Parasitism in Sheep and Goats, Heifer

Ranch, AR, \$14,967, Ann Wells, 479-409-8772, annw@pgtc.com

Controlled grazing produced good results for prevention of parasites in small ruminants. For one goat producer, this management change was all that was needed to completely eliminate parasitism in his herd, which increased his profits. A liquid garlic preparation had less effect in two sheep flocks than chemical anthelmintics, but not by much. No treatment was very effective in these two flocks but this was due to excessively high rainfall. When controlled grazing was better implemented by these two producers, new cases of parasitism decreased. Papaya seeds had some positive effect but no decreased in fecal egg counts were seen. Chicory also showed some benefit but livestock were not on it long enough at one time to get definitive results. These two treatments need more research which will be carried out in Phase II.

On-Farm Research Projects

Continuing Projects

OS07-033 Precious Indigenous Woods For Coffee Shade, El Caribe Resource Conservation & Development, Inc., PR, \$14,967, Jose Aponte, Ph: 787-841-3136, jose.aponte@pr.usda.gov

OS07-034 Hydroseeded Mulch as an Alternative to Plastic Mulch Films, University of Georgia-Tifton Dept. of Biological and Agricultural Engineering, GA, \$14,000, Gary Hawkins, Ph: 229-386-3914, ghawkins@uga.edu

OS07-035 On-Farm Use of a Hybrid Vetch Cover Crop to Reduce Fusarium Wilt in Seedless Watermelon, Clemson University, SC, \$9,900, Anthony Keinath, Ph: 843-402-5390, tknth@clemson.edu

OS07-036 Sensory Evaluation of Alternative Turkey Genotypes, University of Arkansas Center of Excellence for Poultry Science, AR, \$14,962, Casey M. Owens, Ph: 479-575-4281, cmowens@uark.edu

OS07-037 Allelopathic Potential of a Biculture Cover Cropping System Utilizing Fabaceae and Brassicaceae Cover Crops, Virginia Tech-Virginia Cooperative Extension Tidewater AREC, VA, \$12,840, Janet Spencer, Ph: 757-657-6450, jaashle2@vt.edu

OS08-040 Sustainable Irrigation Methods for Alternative Crop Production, Auburn University, AL, \$15,000, Elina Coneva, 334-844-7230, edc0001@auburn.edu

OS08-041 Increasing the Sustainability of Oklahoma Cropping Systems Using Cover Crops, Oklahoma State University, OK, \$15,000, Chad Godsey, 405-744-3389, chad.godsey@okstate.edu

OS08-042 New Tools to Make Organic No-till Soybeans and Corn a Reality, North Carolina State University, NC, \$14,917, Chris Reberg-Horton, 919-515-7597, chris_reberg-horton@ncsu.edu

OS08-043 Monitoring Nutrient availability and leaching below the root zone in organic vegetable production, University of Florida, FL, \$14,900, Eric Simonne, 352-392-7928, esimonne@ufl.edu

OS08-044 The Use of Controlled Grazing, Chicory Pasture and Herbal Treatments to Prevent Parasitism in Sheep and Goats, Phase II, Heifer International, AR, \$14,941, Ann Wells, 479-409-8772, annw@pgtc.com



Project OS09-048 is evaluating the grain teff as an alternative crop in Oklahoma. This photo shows a teff seed experiment in a greenhouse prior to field trials. Photo by Kefyalew Desta.

OS09-045 Identifying Ewes Resistant to Gastrointestinal Parasitic Worms During Gestation and Lactation, USDA, Agricultural Research AR, \$14,866, Joan Burke, 479-675-3834, joan.burke@ars.usda.gov

OS09-046 Grafting Heirloom Tomatoes on Disease Resistant Rootstock in Western North Carolina, NC Cooperative Ext. Service- Henderson County, NC, \$4,960, Susan Colucci, 828-697-4891, sue_colucci@ncsu.edu

OS09-047 Sweetpotatoes: A Profitable Crop for Small Farms in Rural Eastern Kentucky, University of Kentucky, Department of Horticulture, KY, \$14,791, Timothy Coolong, 859-257-3374, timcoolong@uky.edu

OS09-048 Teff: An Alternative Crop for Oklahoma, Oklahoma State University Plant and Soil Sciences, OK, \$14,948, Kefyalew Desta, 405-744-4667, kefyalew.desta@okstate.edu

OS09-049 Creating, Planning, and Using Forage Quality Budgets to Optimize Milk Production on Grazing Dairies, University of Georgia Soil, Plant, Water Lab, GA, \$14,340, David Kissel, 706-542-5350, dkissel@uga.edu

OS09-050 Development and Implementation of On-Farm Biological Soil Disinfestation to Manage Soilborne Diseases In Organic Strawberry Production Systems, North Carolina State University, Plant Pathology, NC, \$15,000, Frank Louws, 919-515-6689, frank_louws@ncsu.edu

Sustainable Community Projects

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CS05-033 Women Farmers Building a Healthy Community and Economy in the High Country, Blue Ridge Women in Agriculture (BRWIA), NC, \$9,900, Shelly Connor, Ph: 828-297-7392, brwia@yahoo.co

An institutional food assessment gauged the interest and desires of institutions for local food procurement. It identified the specific barriers and recommendations of institutions on how to make purchasing local food easier. Institutional markets and suppliers were developed simultaneously. Information gathered by the assessment and input from participants can be used in trainings for local growers interested in selling to institutions. Institutional food purchasers and growers were brought together for a vendor fair.

CS06-040 Building Local Food & Local Communities in Western Oklahoma, Ogallala Commons, OK, \$10,000, Darryl Birkenfeld, Ph: 5806-945-2255, darrylb@amaonline.com

Through six training sessions, this project created a framework for revitalizing declining rural communities in three Western Oklahoma counties, melding together two educational components: a sustainable community development framework and entrepreneurship opportunities in a local & regional food system. Ogallala Commons provided 5 training workshops for community leaders and youth in asset mapping, community planning, youth engagement, and entrepreneurship in three Western Oklahoma counties: Woods, Major, and Roger Mills. For their part, Oklahoma Food Cooperative and Oklahoma Land Stewardship Alliance offered a workshop outlining marketing options for entrepreneurs seeking more sustainable agricultural enterprises.

CS06-043 Building sustainable communities through agricultural and food-based entrepreneurship, Institute for Advanced Learning & Research, VA, \$10,000, Elizabeth Nilsen, Ph: 434-766-6700, liz.nilsen@ialr.or

This project was designed to spur entrepreneurial development in the value-added agricultural sectors of a four-county rural area in Southside Virginia that is undergoing significant change both because of the national decrease in farm portion of consumer spending and because of a local transition away from tobacco farming to new crops and value-added products. Project activities included a series of 13 workshops, a food-tasting event, a mentorship pro-



A closed county landfill provides the space, and a low-tech subterranean heating/cooling system maintains the temperature in an experimental greenhouse for growing native azaleas from seed. This alternative crop has great potential for Appalachian farmers. Photos by project investigator John Jackson, project CS06-049

gram, and the launching of a network of producers/entrepreneurs to explore ongoing sustainability initiatives.

CS06-044 Florida Farm Link - building the foundation of a sustainable community food system by connecting sustainable agriculture to economic development initiatives, Florida West Coast RC&D Council, FL, \$9,521, John O'Connor, Ph: 941-723-3252, info@fwcrd.org

The Florida FarmLink Sustainable Community Project has been a successful project to date and will continue to be fruitful for the next several years. The Florida FarmLink website is currently operating at www.floridafarmlink.org and has been populated with 3 pages of entries to date. Most of the materials developed with this grant are being saved for a big statewide promotion in 2008-2009.

Sustainable Community Projects

CS06-045 Establishing Community and Business Partnerships to Build a Market Identity for Local Seafood, Carteret Community College, NC, \$9,950, Jennifer Ulz, Ph: 252-222-6190, jau@carteret.edu

Carteret county citizens established the Carteret Catch brand to increase the public's awareness of local seafood. The goal of the program is to sustain the livelihood and heritage of the Carteret County fishing industry through education and promotion. Since 2006, the program has grown to 21 commercial fishermen, four dealers, four retailers, 10 restaurants, 17 associate members and two corporate sponsors. Carteret Catch has demonstrated to coastal North Carolina fishermen that their seafood has great value to North Carolina consumers and gives fishermen a competitive advantage over imported seafood. Carteret Catch has enabled consumers to learn what businesses are selling local seafood and when popular commodities are seasonally available. This information has increased revenue for everyone in the distribution chain: fishermen, dealers, retailers and restaurants.

CS06-046 Training for Sustainable Community Development: Phase II, Tuskegee University G.W. Carver Agricultural Experiment Station, AL, \$10,000, Robert Zabawa, Ph: 334-727-8114, zabawar@tuskegee.edu

The project was centered on sustainable development activities for a set of Southern Black agricultural communities that were created during the Great Depression, initially under the direction of the Resettlement Administration and subsequently under the Farm Security Administration. Thirteen such all-Black communities were established, about half of which remain as viable communities--although they are "at risk." The others have faded, although both archival records and original residents remain to tell their story. Using nine of these communities (Sabine Farms, TX; Prairie Farms, AL; Gee's Bend, AL; Mileston, MS; Mound Farms, LA, Flint River Farms, GA; Allendale Farms, SC; Tillery, NC and Aberdeen Gardens, VA) a sustainable economic development strategy and training meeting was convened.

CS06-047 Value-added Sustainable Agriculture Initiative, Appalachian Sustainable Development, VA, \$40,000, Kathlyn Chupik, 276-623-1121, asd@eva.org



Clemson University Extension Agent Grady Sampson used collards to train local farmers in sustainable methods for a traditional crop. He also boosted sales at the Marlboro County Farmers Market by about \$20,000 in one season, involved students in learning nutrition facts and produced a fund-raising cookbook of healthy recipes. Project CS07-058

A two year education, training and marketing project focused on transitioning tobacco farmers to organic produce and free range eggs led to a near doubling in the number of farmers raising these products commercially, increased the involvement of Cooperative Extension in organic research and training activities, and substantially expanded sales to super-markets, small grocers and restaurants and college dining services. The project focused on farmers in the Appalachian region of Virginia and Tennessee, particularly limited resource farmers.

CS06-049 Appalachian Sustainable Agriculture and Energy Project, Appalachian Native Plants, Inc., TN, \$40,000, John Jackson, Ph: 423-727-6574, tennrose @ xtn.net, www.appalachiannativeplants.com

This innovative project has transformed a closed county landfill into a community asset. A production greenhouse with an amazingly low-tech subterranean heating and cooling system produces native azaleas

Sustainable Community Projects

from seed and serves as a training site for local growers. The project has attracted more producers to consider native azaleas as a viable alternative crop. With this foundation in place, the project is well positioned to include sustainable/organic food crops as the next step.

CS07-053 Youth and Agriculture: a Bridge to the Future (YABF) for From Tree to Table (FTT), Virgin Islands Farmers Cooperative, Inc., VI, \$10,000, Dale K.K. Browne, 340-277-6046, sejahfarm@unitedstates.vi

Almost every back yard on the island of St. Croix has one or more productive fruit trees such as mango and tamarind. Much of the fruit goes to waste because owners are not able to consume all that is produced and don't get their surplus fruits into the hands of those who can use it. This project used a local chef to teach low-income students to turn the excess produce into value-added products that could be marketed under the umbrella of the Virgin Islands Farmers cooperative. Food hygiene, industrial kitchen safety, business planning, marketing, and even running a fair election were some of the skills the students learned along with how to make such recipes as a mango-chocolate chip cookie-cheesecake dessert. For details about the grassroots effort to move the Virgin Islands from importing 98 percent of their food to reclaiming their old title of the breadbasket of the Caribbean see www.vifarmerscoop.org

CS07-055 Stecoah Kitchen Entrepreneurship & Agri-Tourism Project, Stecoah Valley Arts, Crafts & Educational Center, Inc., NC, \$10,000, Beth Fields, 828-479-3364, programs@stecoahvalleycenter.com

The project was successful as it accomplished the original goals identified. First, the project provided the tools necessary for food-entrepreneurship endeavors, including a commercial kitchen facility and technical training to assist in the production of value-added agricultural products. Secondly, the project offered educational opportunities through a series of "Heritage Foods" classes. Finally, the project offered experiential learning opportunities through special events, including a dinner series and festivals. The overall effect was to help sustain the agricultural community by creating an awareness of and demand for their farm-fresh products whether used for value-added products, retail sale or in the dining experience.

CS07-058 Farmers Market Support Activities, Clemson University, SC, \$2,570, Grady Sampson, 843-479-6851, gsampso@clemson.edu

The promotion of collard greens in Marlboro County has brought publicity as well as more customers to the Farmers Market. The collard IPM demo plots provided experience to help the small farmers to continue using IPM. Other small farmers have expressed an interest in the IPM program and the farmers market to sell their locally grown produce. The increase in sales depleted the local collard crop to a sell-out before January 1 which is traditionally a collard eating day.

CS07-059 Chicora Farmers Market, Metanoia Community Development Corporation, SC, \$6,300, Bill Stanfield, (843) 529-3014, bill@pushingforward.org

A pilot program began in 2007 to bring a farmers' market to a low income neighborhood through the use of food stamps. The Chicora Farmer's market operated with three farmers at varying levels of participation through the end of August. The market became a good place for community residents to meet one another and shop for locally grown produce. In addition the farmers themselves were able to benefit from EBT (food stamps) revenue they would not otherwise have gotten. Despite these benefits to the community and farmers we did have to end the market a few weeks early due to several factors.

1. The increasingly difficult economic situation was causing farmers to have to spend more in fuel costs to get their produce to the market and at the same time it was limiting the amount of money spent at the market. Eventually, the benefits to the farmers did not match the resources they had to put in to get their produce to market.

2. We had a very wet late summer in the South Carolina Low Country and this affected farmers' ability to leave their farms and get produce to market.

In the end we were grateful for the opportunity to host the market in our community. In post-market discussions with our farmers they have expressed a willingness to return next spring if economic factors improve.

Continuing Projects

CS06-042 Sustainable Farming: Wedding Regional Agriculture and Community Development in Coastal Georgia, McIntosh Sustainable Environment & Economic Dev., GA, \$10,000, John Littles, Ph: 912-437-7821, mcseed@darientel.net

CS06-048 Schools + Potatoes Upper East Tennessee Development System (SPUDS), Jubilee Project, TN, \$39,762, Steve Hodges, Ph: 423-733-4195, stevoh@overhome.net

Sustainable Community Projects

CS06-050 Getting Your Small-Farm Products to Market, NC Cooperative Extension, NC, \$40,000, David Kendall, Ph: 828-649-2411, David_Kendall@ncsu.edu

CS06-051 The Clean Food Network, Alabama Sustainable Agriculture Network, AL, \$40,000, Dove Stackhouse, Ph: 256-891-9856, fastflyer4@bellsouth.net

CS07-052 Growing Healthy Markets: Healthy Farms, Healthy Food Project, Community Farm Alliance, KY, \$10,000, Nathan Brown, 502-223-3655, nathanca@bellsouth.net

CS07-054 Something's Cooking in the Kitchen, Pike Co. Agribusiness Authority, GA, \$8,400, Christine Curry, 770-567-3600, billchrisfarm@hughes.net

CS07-056 "Gathering" of Homestead Economic and Entrepreneurs of Food Based, Organic Foods and Other Related Businesses, University of Tennessee Extension of Montgomery County, TN, \$10,000, Martha Pile, 931-648-5725, mmpile@utk.edu

CS07-057 Integrating Nature into Agri-tourism, Phillips Community College of the University of Arkansas, AR, \$9,950, Katherine Radomski, 870-946-3506, kradomski@pccua.edu

CS07-060 Training for Sustainable Community Development: Phase III, Tuskegee University G.W. Carver Agricultural Experiment Station, AL, 10,000, Robert Zabawa, 334-727-8114, zabawar@tuskegee.edu

CS08-061 Mentoring Today for Tomorrow, Indian Springs Farmers Association, MS, \$10,000, Ben F. Burkett, 601-543-0900, benburkett@earthlink.net

CS08-062 Building Sustainable Agriculture and Community Development along the Coastal Plain regions of Georgia and South Carolina, McIntosh Sustainable Environment and Economic Development, GA, \$10,000, John Littles, 912-437-7821, mcseed@darientel.net

CS08-063 SNAP! A Sustainable Network at Polk From Farm to Fork and back to Farm again, EarthSong Rising LLC dba Giardini Gardens, Giardini Catering Co., NC, \$10,000, Mary Lyth, 828-817-3727, mdlyth@aol.com



Tim Cross, University of Tennessee Dean of Extension and a Southern SARE Administrative Council member, attends the debut of The Gathering's community banners at the University of Tennessee Small Farm Expo. With him are Martha Pile, Karla Kean and Thelma Sander-Hunter. Project CS07-056

CS08-064 Growing the Manning Farmer's Market, City of Manning, SC, \$5,050, Jan McNair, 803-435-8477, manningadministrator@sc.rr.com

CS08-065 Marshview Community Organic Farms - Young Farmers of the Lowcountry, Marshview Community Organic Farms Community Supported Agriculture, SC, \$9,700, Sara Reynolds, 84-381-20202, svreynolds@earthlink.net

CS08-066 Growing Food & Community: 2009 Initiatives, Growing Food & Community, VA, \$10,000, Dawn Story, 540-718-3200, dawn@newmoonnaturals.com

CS08-067 The Alabama Blackbelt Community Food System Project, The United Christian Community Association (TUCCA), AL, \$10,000, Andrew Williams, 334-627-3970, unitedchristiancommunity@frontiernet.net

CS08-068 Training for Sustainable Community Development: Phase IIIb, Tuskegee University, AL, \$5,000, Robert Zabawa, 334-727-7114, zabawar@tuskegee.edu

Which SARE grant program for you?

The SSARE web site www.southernsare.org is the quickest way to receive the calls for proposals as soon as they are released. All proposals must be submitted through an online template. For more information contact Paige Patton at (770) 412-4787 or info@southernsare.org

Research and Education Projects address agricultural systems and generally are conducted by multi-disciplinary, multi-institutional, and often, multi-state research teams coordinated by a principal investigator from a university, governmental agency, or non-governmental organization. These projects include farmers as participants.

2008

March Call for R&E preproposals
June R&E Preproposals due
August Full R&E proposals requested
November Full R&E proposals due

2009

February Administrative Council announces

Researchers not yet ready to submit a Research and Education systems proposal can apply to one of the entry-level grants : **Research and Education Planning Grants** or **Research and Education Preliminary Grants**. Calls were released in June, and proposals are due August 15. See www.southernsare.org for details.

Graduate Student Awards are intended for full-time graduate students (masters or Ph.D.) enrolled at accredited colleges and universities in the Southern Region. Up to \$10,000 will be awarded to each successful applicant for up to three years of project activities. The funds are paid directly to the university for use on the graduate student's project.

2008

March Call for proposals released
June Proposals due

2009

August Administrative Council announces awards

Professional Development Program Projects train agricultural information providers in sustainable agriculture techniques and concepts.

2008

March Call for preproposals released
June Preproposals due
November Full proposals due

2009

February Administrative Council announces awards

Producer Grant Projects are developed, coordinated and conducted by producers or producer organizations. These projects are generally located in one state, often on one farm. There is a \$10,000 limit for funding proposals submitted by an individual producer and a \$15,000-limit on proposals submitted by producer organizations.

2008

September Call for proposals released
November Proposals due

2009

February Administrative Council announces awards

On-Farm Research Projects are conducted by agricultural professionals such as extension agents, NRCS and/or NGO personnel who currently work with farmers and ranchers. Cooperators must include at least one producer at all stages of the project. Funded for a maximum of \$15,000 for up to two years of activities.

2008

September Call for proposals released
November Proposals due

2009

February Administrative Council announces awards

Sustainable Community Innovation Projects link community development with sustainable agriculture. Funded for a project maximum of \$10,000 anywhere in the Southern Region to farmers, ranchers, researchers, community organizations, environmentalists, ag and community development professionals, entrepreneurs, governmental and non-governmental organizations.

2008

August Call for proposals released
October Proposals due
December Administrative Council announces awards

Continued from page 2

“I don’t ever write graduate student proposals in anticipation of having a student,” she says, “I always allow a first-year student to take the lead as they are determining and honing down their research interests. SARE’s graduate student application is a reasonable process for a student’s first experience at grant writing, experience very worthwhile to their future. Usually, they are in the difficult process of narrowing down their huge ideas to a researchable topic, so it is a good mechanism for forcing that to happen in a reasonable timeframe.”

She sees the management of grant funds as a separate beneficial experience for the student.

“The funds are very helpful to the student’s research, and I generally let the student manage the grant so they gain that experience as well. It’s wonderful from an experiential learning perspective and resume building. This grant program allows me to often take on students, knowing if they design a good project, there is a source of grant money available to fund their work. The research these students do has been exceptional and contributed significantly to the growing knowledge base in sustainable agriculture. “

Professional Development Projects and more



John Skinner at the University of Tennessee uses SARE grants to educate people at all levels about the importance

of pollinators. He recently completed a PDP grant (ES03-069) that trained extension agents and beekeepers in several states about managing pests of honey bees. He is currently supervising Michael Wilson’s graduate student research on habitat for native pollinators at farm sites. (GS08-077). (Left and below) Michael Wilson photographed a native squash bee pollinating a summer squash blossom.

