

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Global Food Security and Hunger

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	0%		2%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		2%	
202	Plant Genetic Resources	4%		4%	
205	Plant Management Systems	29%		9%	
206	Basic Plant Biology	4%		2%	
216	Integrated Pest Management Systems	4%		2%	
301	Reproductive Performance of Animals	0%		4%	
303	Genetic Improvement of Animals	0%		6%	
304	Animal Genome	0%		4%	
305	Animal Physiological Processes	4%		11%	
306	Environmental Stress in Animals	4%		4%	
307	Animal Management Systems	8%		7%	
311	Animal Diseases	0%		2%	
315	Animal Welfare/Well-Being and Protection	4%		7%	
503	Quality Maintenance in Storing and Marketing Food Products	0%		4%	
601	Economics of Agricultural Production and Farm Management	17%		9%	
604	Marketing and Distribution Practices	0%		2%	
605	Natural Resource and Environmental Economics	4%		11%	
607	Consumer Economics	14%		4%	
704	Nutrition and Hunger in the Population	4%		4%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

	Extension	Research

Year: 2012	1862		1890	
	1862	1890	1862	1890
Plan	13.0	0.0	29.3	0.0
Actual Paid Professional	5.5	0.0	0.8	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
426369	0	288013	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
426369	0	288013	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
571866	0	1144981	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Food security begins at the local level. UCONN research and extension activities in the College of Agriculture and Natural Resources are tackling the problems of food security and hunger head-on in Connecticut. The Governor's Council for Agricultural Development has set a goal of increasing the amount of locally grown food consumed in Connecticut from 1% to 5%. Achieving this goal requires improvements and expansion in food production, greater connection between local production and availability/consumption, and improvements in food distribution.

Currently, UCONN research and extension programs are addressing these issues through community food security (CFS): a relatively new concept with roots in such disciplines as community nutrition, nutrition education, public health, sustainable agriculture, hunger prevention and community development. In the broadest terms, community food security supports the development and enhancement of sustainable, community-based strategies to improve access of low-income households to healthful nutritious food, to increase the self-reliance of communities in providing for their own food needs and to promote comprehensive responses to local food, farm and nutrition issues. Specific efforts address topics such as sustainable food production in greenhouses, the cost of production of milk in Connecticut, farm risk management tools and training, and deep zone tillage technology to enhance sustainable production.

Overall, UCONN has more than 30 research and extension programs focused on food security and hunger. In this report, we highlight six Extension efforts related to these topics in the state defined outcomes section. In addition, 2 research projects are summarized below.

Consumer demand for local, sustainably produced food and ornamental plants has led to increased interest in certified organic production for greenhouse crops. Hatch research project, "Organic fertilization for greenhouse crops," compared the effect of different organic fertilizer formulations on growth of

seedlings of lettuce, tomato and mizuna. The results support several noteworthy conclusions. Fertilizer sources affected both growth and appearance of seedlings. In general, seedling growth did not respond to preplant incorporated fertilizers (PPIF) rates greater than about 0.3 g/L. Combinations of PPIF and liquid fertilizers (LF) were superior to either alone. The leaching trials showed that organic PPIF did support sustained release of nutrients, as EC, ammonium-N and phosphate-P were rapidly depleted. Study results will be used to provide a basis for recommendations for fertilization of plants grown in greenhouse production systems compliant with the USDA National Organic Program.

Greenhouse growers in the northeast identified water issues, including concern over water use restrictions and regulations, as one of the greatest challenges to grower expansion, yet only 6% currently recycle irrigation water, due to concerns over the spread of disease. The Hatch Multistate project, "Commercial greenhouse production: component and system development," studied water use efficiency (WUE) of containerized greenhouse crops. WUE under closed, sub-irrigation improves when containers are only partially saturated (PS) at each irrigation rather than fully saturated (FS). Management challenges in sub-irrigation include controlling media saturation, and managing water-borne disease and ion accumulation especially when raw water is of poor quality such as high salinity. Research shows that PS management suppresses root-rot disease even when disease titer is high and restricts plant growth. Results from these studies contribute to more efficient water and nutrient management practices for greenhouse crops.

2. Brief description of the target audience

Producers, researchers, consumers, agencies and organizations dealing with the food supply, meat science community, poultry producers and researchers, animal reproductive scientists, government officials, dairy farmers, stem cell research community, and students in agriculture fields of study.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	18711	488633	255	10

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

Patent Applications Submitted

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	16	58	74

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Face to face general group education sessions (workshops, etc.)

Year	Actual
2012	1095

Output #2

Output Measure

- New or updated web page(s)

Year	Actual
2012	36

Output #3

Output Measure

- Individual consultations (in person, via e-mail, etc.)

Year	Actual
2012	10191

Output #4

Output Measure

- Training conferences or sessions hosted or conducted.
Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Fact sheets, bulletins and newsletters written or edited.

Year	Actual
2012	173

Output #6

Output Measure

- Undergraduate and Graduate Students Supervised

Year	Actual
2012	139

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased adoption (%) of recommended BMP by growers or producers.
2	New understanding of animal growth processes developed.
3	Increased understanding (%) of food management practices by consumers.
4	Adoption of recommended food management practices by consumers.
5	Number of new or strengthened partnerships with governmental agencies, NGOs or corporations resulting from Extension programmatic activities in the area of economics, marketing and policy.
6	Adoption of recommended risk management strategies
7	Number of growers made aware of deep zone tillage crop yield advantages
8	Increased understanding of proper poultry management

Outcome #1

1. Outcome Measures

Increased adoption (%) of recommended BMP by growers or producers.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	30

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Greenhouses are an important part of diversified farms in CT. In addition, many farmers in southern New England have added greenhouse crops and or structures to their businesses to increase income and year round cash flow. Farmers wishing to adopt sustainable greenhouse productions face many critical issue such as prevention of cultural pest problems, early diagnosis, early intervention and crop production issues including energy conservation, labor management, nutrient management and business competitiveness.

What has been done

The Extension Sustainable Greenhouse Integrated Pest Management Program provided intensive hands on educational training at participating greenhouse growers and retailers. Additional growers were reached via email, and on site trouble shooting visits to their operation. Information was also disseminated to growers by presentations, twilight meetings, conferences, articles in national trade journals and posts on the New England Greenhouse Update website (www.negreenhouseupdate.info) and the UCONN IPM website (www.hort.uconn.edu/ipm)

Results

Seven out of the nine businesses (77%) in the Sustainable Greenhouse IPM training program used biological controls such as beneficial nematodes, biological fungicides, and biological control agents thereby reducing pesticide use, improving worker safety, increasing plant quality and reducing environmental pollution. Twenty seven acres of intensive production were directly impacted. Six hundred growers and retailers increased their knowledge on the use of biological controls, and best management practices. And 30% report adopting recommended BMP approaches.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
206	Basic Plant Biology
216	Integrated Pest Management Systems
315	Animal Welfare/Well-Being and Protection
601	Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Measures

New understanding of animal growth processes developed.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	800

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Farmers of small ruminant animals produce meat, dairy and fiber products. Overuse of chemical de-wormers is causing worm resistance to the de-wormers, exposing small ruminants to the dangers of the barberpole worm (internal parasite). Poor animal performance and mortality of susceptible animals may cause Farmers to abandon the production of lamb, goat meat and fiber products.

What has been done

The Improving Parasite Control in Small Ruminants program conducted 11 workshops and 100 one-on-one consultations to educate over 800 farmers about the presence of the barber pole worm. Farmers were instructed on scoring their animals for body conditions as well as anemia to determine which animals to treat for barber pole worm. Fecal samples were collected before and 14 days after deworming to test for resistance to the de-wormer used by the farmer.

Results

In 2012, ten sheep and goat farmers in Connecticut learned how to score their 118 animals for condition and anemia (FAMACHA). Accurate body weights were measured before deworming and fecal sampling for future egg counting and parasite culture to confirm the worm species. One farm resampled for fecal eggs after 10 days, discovered that the dewormer only reduced the egg count by 43%, therefore labeled as ineffective in controlling the parasites. In a one year follow up survey, 78% of respondents reported adopting IPM practices towards control of the barber pole worm, including FAMACHA and body condition scoring, fecal egg counts, drug resistance testing, quarantining of new animals, oral dosing of dewormer rather than injection.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
304	Animal Genome
305	Animal Physiological Processes
311	Animal Diseases
315	Animal Welfare/Well-Being and Protection

Outcome #3

1. Outcome Measures

Increased understanding (%) of food management practices by consumers.

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Adoption of recommended food management practices by consumers.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of new or strengthened partnerships with governmental agencies, NGOs or corporations resulting from Extension programmatic activities in the area of economics, marketing and policy.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Connecticut Public Act 09-229 directs the Commissioner of Agriculture to provide payments to farmers when the federal milk pay price drops below a sustainable monthly cost of production (COP).

What has been done

Production and cost data for 2011 was collected from 39 CT dairy farms in order to produce a representative estimate of CT COP for milk in 2011. The average COP for CT milk in 2011 was estimated at \$31.52/cwt. This estimate was then used to provide monthly estimates of the CT COP for milk in 2012.

Results

The average COP for milk is observed to increase with farm-size signaling the importance of economies of scale in dairy production. Data and analysis were generated to aid in the implementation of Connecticut Public Act 09-229 that directs the Commissioner of Agriculture to provide payments to farmers when the federal milk pay price drops below a sustainable monthly cost of production (COP).

4. Associated Knowledge Areas

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

Outcome #6

1. Outcome Measures

Adoption of recommended risk management strategies

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	109

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Risk Management is an often overlooked strategy that can be the difference between success and failure of farm businesses. Like all successful businesses, farmers should develop goals to guide and expand their farm businesses. Developing a set of business goals and a strategy to attain those goals is the first step in any farm risk management plan.

What has been done

The Connecticut Farm Risk Management and Crop Insurance Program, a cooperative effort between the University of Connecticut and the CT Department of Agriculture conducted 5 one-on-one advising sessions and 3 farm tours. In collaboration with the CT Farm Bureau, CT WAgN, CT Greenhouse Growers Assoc., CT Nursery and Landscape Assoc., City Seed, American Farmland Trust, CT NOFA and the Community Farm of Simsbury, crop insurance and risk management programs were developed to provide farmers and agribusinesses information to improve farm financial management and reduce risk.

Results

Approximately 4,400 participants learned about and understood the applicability of risk management tools; 2,260 participants evaluated crop insurance and other risk management tools for implementation in specific situations; 381 participants reported developing crop insurance and risk management strategies; 2,168 participants checked for new risk management information on the CT Risk Management website (www.ctfarmrisk.uconn.edu); and 109 participants report that they plan to implement one or more risk management strategies.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
607	Consumer Economics

Outcome #7

1. Outcome Measures

Number of growers made aware of deep zone tillage crop yield advantages

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	6513

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Reduced-tillage systems, such as deep zone tillage (DZT), help to minimize field preparation costs; reduce energy use; eliminate soil, nutrient and pesticide runoff; help restore soil health and fertility; provide farmers access to open space; reduce irrigation demands. DZT provides the ultimate climate change tool for a region that is forecast to become warmer and wetter.

What has been done

In an effort to spread the word about deep zone tillage (DZT), reduced-tillage, soil health, cover crops, and crop rotation, Extension educators partnered with growers/educators to conduct 9 DZT presentations in 4 states (CT, ME, MA, NH) and Nova Scotia, and published 1 magazine, 3 proceedings and 3 newsletter articles (1 DZT farm case study). One Extension Fact Sheet, "Getting Started with DZT," was written and published, and a technical report to the CT legislature highlighted progress on DZT adoption was published.

Results

In 2012, 8 growers (1 CT, 3 MA, 1 NH, 2 ME, 1 VT) purchased new DZT machines, while 2 CT vegetable growers modified existing machines to achieve DZT on their farms, bringing the total number of New England growers using this technology to 31. DZT in an extremely wet season (2011) favorably influenced crop earliness and ear size for sweet corn, and fruit size, handle quality and marketable yield for pumpkins. One CT grower measured the time and fuel it took to prepare and plant a measured acre using both conventional methods and DZT. Prep time was reduced 66-83%, depending upon whether the planter was attached to the zone tiller, and fuel

consumption was reduced by 72-77%. A NY grower confirmed the calculations on over 1,500 acres of sweet corn, and also reduced his nitrogen application costs by 79%.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
206	Basic Plant Biology
601	Economics of Agricultural Production and Farm Management

Outcome #8

1. Outcome Measures

Increased understanding of proper poultry management

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	580

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In the past few years more youth and families are choosing to rear poultry, including chickens, ducks, turkeys, game birds and other fowl, for personal use and as a source of supplemental income in New England. In 2011, more than 90,000 chicks, and adult birds were purchased by small flock owners throughout New England. Many small flock owners are less experienced in the management of poultry relative to proper nutrition and health care. The threat of Avian Influenza and Salmonella has increased awareness of the need for proper biosecurity in rearing poultry.

What has been done

The UCONN Extension program, Youth Poultry Projects and Small Poultry Flock Rearing focuses on educating small poultry flock owners about the proper management and health care of their poultry. Over 320 people attended 11 small flock workshops. They learned the basics of choosing birds, housing, nutrition and basic health care of poultry. In addition, 50 adult volunteers worked with 4-H youth on poultry projects, 124 youth participating in the 17th Annual Southern New England 4-H Poultry Show and Showmanship contest held at UCONN.

Results

Through Youth and Small Poultry Flock Programs, over 320 people attended various workshops during this reporting period seeking advice on purchasing, rearing, managing, etc. of small egg, meat or show bird flocks. This information helped decrease the incidence of disease and other welfare problems with small poultry flocks. Of the 260 plus contacts by phone or email, about 63 of these are new to poultry within the past year. The economic impact on CT and New England is considerable. Small flock owners purchase 50lb bags of feed at \$15 to \$20+ per bag. This is equivalent to about \$600 - \$800 per ton of feed, which in bulk sells for about \$420 - 480 per ton. This increased profitability to businesses carries through to other products for poultry rearing.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
315	Animal Welfare/Well-Being and Protection

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Through a variety of evaluation tools including pre-testing, time series and post-testing Extension Educators surveyed participants utilizing both written and internet based methods. Participants reported changed in attitude and increased knowledge following completion of programs.

Key Items of Evaluation

Team leaders reviewed programs for educational value to ensure programs were relevant to the planned program goals.