2008 Rutgers Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

Executive Summary

The New Jersey Annual Report of Accomplishments and Results is an integrated report reflecting Cooperative Research and Cooperative Extension programs. The report addresses all of the requirements regarding the use of Hatch Funds, Smith-Lever 3 (b) and (c) and required non federal funds. As recommended we have streamlined our report to focus on significant qualitative outcomes.

The report reflects the work of the New Jersey Agricultural Experiment Station (NJAES). The mission of NJAES is to enhance the vitality, health, sustainability, and overall quality of the life in New Jersey by developing and delivering practical effective solutions to current and future challenges relating to agriculture; fisheries; food; natural resources; environments; public health; and economic, community, and youth development.

NJAES through station supported Cooperative Research and Cooperative Extension focuses on innovative approaches to applying the land grant model to address the diverse needs of a highly urbanized state. Stakeholders have been active partners in identifying critical issues to be addressed. NJAES values the contributions that stakeholders make to ensure that all research and extension projects and programs are relevant and responsive to the needs of New Jersey residents. Cooperative Extension continues to expand its programmatic outreach to fully engage new audiences with a special focus on reaching those who have traditionally been under represented and/or underserved. Emphasis is given to increasing our urban audience base and to deliver programs which are culturally appropriate to meet the diverse needs of our many publics.

The programmatic focus areas for NJAES are :
Water Quality & Quantity
Youth/Adult Obesity
Indoor Air Quality
4-H Youth Development
Agricultural Viability
Sustainability of the NJ Equine Industry and its Impact on Agriculture and Open Space
Home, Garden and Environment
Integrated Pest Management
Marine Fisheries and Aquaculture

These strategic foci were identified as critical issues that should be addressed by Cooperative Research solutions and Cooperative Extension programming.

As a result of NJAES outreach, the percentage of municipalities developing storm water regulations increased from 15% to 75%. Municipal officials and homeowners have plans and preparations for demonstration rain gardens throughout the state to divert, recharge and conserve storm water. Best Management Practices (BMPs) have been implemented that build soil fertility, improve water infiltration, re-charge aquifers, provide streamside buffering and/or aid flood control. In one county, soil analysis recommendations have reduced excessive phosphorus fertilization by 65,000 pounds.

Through the Get Moving-Get Healthy New Jersey initiative, more than 100,000 children and adults are reached. FCHS has implemented seminars covering topics such as: Add Color to your Plate...And Move More; Lighten Up the Fat; Living Well: It's a Family Affair; Building Your Family Health History: An Important Legacy; Small Steps to Health and Wealth; Supersize America; and School Wellness. Communities have developed committees to assess community health indexes for health and well being of residents. Strategic partnerships have been developed between 4-H Agents, Food and Fitness Ambassadors (4-H teens) school districts and YMCAS to provide multi-faceted school interventions to encourage healthy lifestyles for students, their families and school staff. Over 90% of the participants in Get Moving - Get Healthy New Jersey initiatives report that they will change the way they think, act or behave as a result of participation in programs.

The Crimson Queen, a new hybrid developed by NJAES researchers, delivers higher yields, ripens earlier, grows faster and is resistant to weeds and disease. This hardier plant is an economic boon to New Jersey’s cranberry growers, and higher yields mean that fewer new acres of environmentally sensitive wetlands have to be developed to meet increased demand. With 3,600 acres devoted to cranberry fields, New Jersey is the third- largest cranberry producer in the United States, behind Wisconsin and Massachusetts.

NJAES funding sources are diverse and are reflective of the cooperative support of programmatic and research efforts as well as the level of scholarship of our faculty.

Thirty seven percent (37%) of funding is from federal grants and contracts;Thirty percent (30%) state appropriations;16.1% other sources; 8.9% county appropriations and 7.3% federal appropriations.

New Jersey's integrated annual report is a reflection of our commitment to multidisciplinary / integrated work across departments and centers to meet the varied and critical needs of our diverse clientele.

Total Actual Amount of professional FTEs/SYs for this State

Year:2008	Extension		Research	
	1862	1890	1862	1890
Plan	156.0	0.0	65.0	0.0
Actual	70.6	0.0	55.5	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- Combined External and Internal University External Non-University Panel

2. Brief Explanation

Peer institutions in the Northeast had an opportunity to review the 2008-2012 Plan of Work. They are asked to comment on the merit and scientific quality of the plan. In addition to the peer review, both the extension and research committees of the New Jersey Agricultural Experiment Station Board of Managers serve as internal reviewers. They had an opportunity to review and comment on the plan.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of the general public
- Other (focus group sessions)

Brief Explanation

A variety of methods were utilized to engage our many publics in the program planning and budget process. During 2008 county stakeholder meetings were held throughout the state. The Director and Associate Director of Extension attended a selected number of these meetings. These meeting served as an open forum for state residents to identify critical issues and needs. Attendees of stakeholder meetings were representative of the diversity of the state's population. Efforts are made to ensure that underserved and/or non-traditional groups and individuals were activey engaged. These meetings also engaged strategic collaborative partners in identifying research needs and extension program direction. Input from these meetings was used to identify emerging issues and guide the program and the budget process.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief Explanation

At the county and state levels faculty and staff engage partners and potential clientele in a variety of processes to collect input. Individuals who participate in these processes are those who serve on advisory boards, special research and extension committees, leaders of commodity groups, partners who participate on government and service related boards, and individuals who participant in programs. Opportunities to participant in the process of gathering input are widely publicized through newsletters, websites, mass media and word of mouth. Engagement of input from groups and individuals who are under repesented is proactively done to ensure that extension programs and research initiatives are relevant, responsive and address the diverse needs of our many publics.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Survey of the general public
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

Brief Explanation

Through our county stakeholder meetings individuals participate in open forums where current issues and concerns which impact the county are identified. Stakeholders are active participants in strategic planning processes conducted to identify priority needs which guide research and extension programming. Surveys sent to a variety of different audiences are also utilized to gather data.

3. A statement of how the input was considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief Explanation

Stakeholder meetings and other processes result in the identification of priority needs on the local and state levels that could benefit from Cooperative Extension programs and/or Cooperative Research solutions. The public tasting efforts and utilization of the data gathered by the Rediscovering the Jersey Tomato Team is a prime example of how stakeholders become a partner in driving NJAES research.

Brief Explanation of what you learned from your Stakeholders

NJAES truly values the input of our stakholders. We have created welcoming environments where stakeholders feel comfortable and trust what is shared will be carerfully considered and as policies are set, programs are developed, research dierction is set and buget priorites are identified. Stakeholders are critical partners and their input is necessary to ensure that the work we engage in is relevant and responsive.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2414432	0	2845599	0

2. Totaled Actual dollars from Planned Programs Inputs

	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	2079950	0	2470688	0
Actual Matching	4724638	0	11167778	0
Actual All Other	956132	0	5953532	0
Total Actual Expended	7760720	0	19591998	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous years

Carryover	0	0	0	0

V. Planned Program Table of Content

Program #1

V(A). Planned Program (Summary)

1. Name of the Planned Program

Water Quality & Quantity

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
111	Conservation and Efficient Use of Water	20%		20%	
112	Watershed Protection and Management	50%		50%	
133	Pollution Prevention and Mitigation	20%		20%	
605	Natural Resource and Environmental Economics	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	5.7	0.0	4.0	0.0
Actual	5.9	0.0	5.0	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**
160883	0	126816	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
435273	0	1378547	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
110771	0	779970	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Work with municipalities to help them meet their regulatory responsibilities on stormwater management and watershed restoration •Perform experiments to investigate what the current nutrient loads are in NJ water •Determine the best methodologies for developing Total Maximum Daily Load (TMDL) values for NJ waterways •Examine the effectiveness of alternative onsite wastewater treatment systems •Provide scientifically sound advice to state regulatory bodies on water quality issues •Math modeling of contamination transport in surface and groundwaters •Create a program comprising of faculty, staff, volunteers, industry partners and government officials.

2. Brief description of the target audience

•Municipalities •State Dept. of Environmental Protection •Staff and students who gain valuable scientific experience •Industry partners who learn ways to meet water quality standards •Communities who learn watershed restoration methods •NJAES Faculty and Staff involved in water research/outreach •School age youth •Residents

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	2500	40000	800	2000
2008	2190	28000	600	1800

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	5	0	
2008	4	32	36

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Will not report Output Measures on Water Quality programs. See Outcome Measures.

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Short term Knowledge of nutrient loads in various NJ waterways Find the best methodologies for determining TDMLs
2	Medium term To identify representative pollutants and aquifer systems in New Jersey. To develop equilibrium isotherms to quantify the adsorption/desorption kinetics for the pollutant/soil/water systems. To develop breakthrough and leaching data for the pollutant/soil/water systems.
3	Long Term A safe and secure water supply for all communities and industries in the state An effective and efficient nutrient-trading program that meets the needs of industry and meets the standards set by the state regulatory bodies.

Outcome #1

1. Outcome Measures

Short term Knowledge of nutrient loads in various NJ waterways Find the best methodologies for determining TDMLs

Not reporting on this Outcome for this Annual Report

Outcome #2

1. Outcome Measures

Medium term To identify representative pollutants and aquifer systems in New Jersey. To develop equilibrium isotherms to quantify the adsorption/desorption kinetics for the pollutant/soil/water systems. To develop breakthrough and leaching data for the pollutant/soil/water systems.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	19000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Water Quality - Animal Waste/Nutrient Management
Environmental issues related to water quality/quantity are among the most serious problems faced statewide. These issues included but are not limited to residential, industrial and open space needs, water quantity/quality for irrigation and recreation, non-point source pollutants, stormwater runoff, healthy food and drinking water supplies. Many of the states watersheds and streams are rated as moderately to severely impaired by the NJ Department of Environmental Protection. Stresses related to the urbanization of the state diversity of the agricultural industry and the various systems of production impact water quality/quantity.

What has been done

Research and extension faculty and staff have initiated studies educational meetings/seminars, authored publications and partnered with others to determine the impact of agricultural production on surface water quality.

Results

Modeling information and research results determined the impact of agricultural production on surface water. Agricultural Management Plans have been implemented statewide to optimize production systems in ways that maximize output while minimizing environmental impact. Research and Extension efforts have positively affected the restoration and remediation of water ways contaminated by sediment and feral coliform.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
133	Pollution Prevention and Mitigation
112	Watershed Protection and Management
605	Natural Resource and Environmental Economics

Outcome #3

1. Outcome Measures

Long Term A safe and secure water supply for all communities and industries in the state An effective and efficient nutrient-trading program that meets the needs of industry and meets the standards set by the state regulatory bodies.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	21000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Stormwater Management and Environmental Protection
Water resources are stressed to the maximum due to development in rural/urban areas. Non-point sources of pollution such as fertilizers, pesticides, and other motor oil often contaminate stormwater run-off which ultimately flows directly into water bodies.

What has been done

A multistate team of Extension professionals from Rutgers, Virginia Tech, and Cornell developed and implemented the Stormwater Management in Your Backyard program. Landscape professionals, Master Gardeners and farmers were trained to design, install and maintain rain gardens. In Monmouth County, NJ raingarden seminars, town meetings and community sessions were provided to municipal officials, landscapers, environmental organizations, homeowners and the general public.

Results

Five demonstrations rain gardens were created to capture runoff from parking lots, rooftops, and a horse paddock. The rain gardens filtered and recharged 175,000 gallons of water a year. The work in Monmouth County resulted in the establishment of eleven public rain gardens and over twenty more planned for 2009. Over 1 million gallons of rainfall were recaptured to groundwater and aquifers by these small bio-detention basins.

As a result of NJAES outreach, the percentage of municipalities developing storm water regulations increased from 15% to 75%. Municipal officials and homeowners have plans and preparations for demonstratin rain gardens throughout the state to divert, recharge and conserve storm water. Best Management Practices (BMPs) have been implemented that build soil fertility, improve water infiltration, re-charge aquifers, provide streamside buffering and/or aid flood control. In one county, soil analysis recommendations have reduced excessive phosphorus fertilization by 65,000 pounds.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
112	Watershed Protection and Management
111	Conservation and Efficient Use of Water
605	Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation

Program #2

V(A). Planned Program (Summary)

1. Name of the Planned Program

Youth/Adult Obesity

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
701	Nutrient Composition of Food	10%		10%	
702	Requirements and Function of Nutrients and Other Food Components	25%		25%	
703	Nutrition Education and Behavior	25%		25%	
724	Healthy Lifestyle	40%		40%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	5.0	0.0
Actual	16.0	0.0	5.3	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
367356	0	82883	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
887258	0	1205120	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
233206	0	911727	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Identify the factors that promote excessive weight gain as well as protect against childhood obesity

- Measure how children born small for age are different with respect to body composition and risk for diabetes prior to developing diabetes or obesity.
- Investigate how perilipin A works in adipocytes to control fat storage and fat breakdown.
- Collect and analyze data on obesity-related measures (i.e., BMI) in adults and children
- Examine how weight loss affects calcium absorption and bone mass
- Creat a multidisciplinary program comprising of faculty, staff, the medical community, industry partners and government officials
- Conduct adult/youth education and deliver targeted messages on healthy food choices and increased physical activity education using the following strategies:

Direct Methods: Educate Youth

- Educate Parents
- Educate Volunteers
- Food and Fitness Ambassadors
- Educate Professionals

Child Health Summit

- Educate Teachers/School Nurses
- Educate Communities

Indirect Methods:

- Website

2. Brief description of the target audience

- Clinicians and Physicians Nurses School
- Health Care Professionals
- Hospitals (including teaching hospitals)
- Staff and students who gain valuable scientific experience
- Industry partners that benefit from fundamental and applied research in obesity and related chronic diseases
- Communities that benefit from increased knowledge about the mechanisms involved in obesity
- Other faculty and staff working on similar research
- Health-related organizations and foundations interested in obesity/nutrition issues
- School Age Youth
- Teens
- Teachers
- After School Providers
- Parents
- Volunteers
- Extension Professionals
- State and County Agencies and Organizations

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	3500	20000	1500	1000
2008	21451	31440	116	800

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	5	22	
2008	10	21	31

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Will not report Output Measures on Youth/Adult Obesity programs. See Outcome Measures.

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Short Term Individuals gain awareness, knowledge, skills related to: Attitudes about healthy eating for adults/youth Healthy food choices for adults/youth Selection of healthy foods for adults/youth Benefits of physical activity (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer) Physical activity recommendations for health for adults/youth Identify factors that promote excessive weight gain as protect against childhood obesity Understand the molecular mechanisms of lipid transport in the intestinal cell Demonstrate the affects on calcium absorbtion and bone mass by weight loss
2	Medium Term Individuals incorporate skills/Change behaviors related to: Increased adoption of healthy food practices Increased consumption of fruits, vegetables, whole grains and low-fat dairy Increased participation in family meals Increased participation in physical activity Increased participation in family-related physical activity Increased use of new "campaign" website Improved understanding of the relationship between early nutrition and later risk for chronic disease Understand the process by which perilipins at the surface of lipid droplets control how much energy is released from the adipocyte at times of need Understanding how the intestines and body uptake and process dairy fat Identify genes, their protein product and how the proteins influence the way the body processes fat.
3	Long Term Individuals experience: Decreased overweight and obesity for youth/adults Decreased risk factors for nutrition-related health problems and chronic diseases that are affected by diet and physical activity for youth/adults A clear and comprehensive understanding of the genetic and physiological mechanisms of obesity and related chronic diseases Pharmacological and/or medical treatments to alleviate the effects of obesity and related diseases

Outcome #1

1. Outcome Measures

Short Term Individuals gain awareness, knowledge, skills related to: Attitudes about healthy eating for adults/youth Healthy food choices for adults/youth Selection of healthy foods for adults/youth Benefits of physical activity (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer) Physical activity recommendations for health for adults/youth Identify factors that promote excessive weight gain as protect against childhood obesity Understand the molecular mechanisms of lipid transport in the intestinal cell Demonstrate the affects on calcium absorbtion and bone mass by weight loss

Not reporting on this Outcome for this Annual Report

Outcome #2

1. Outcome Measures

Medium Term Individuals incorporate skills/Change behaviors related to: Increased adoption of healthy food practices Increased consumption of fruits, vegetables, whole grains and low-fat dairy Increased participation in family meals Increased participation in physical activity Increased participation in family-related physical activity Increased use of new "campaign" website Improved understanding of the relationship between early nutrition and later risk for chronic disease Understand the process by which perilipins at the surface of lipid droplets control how much energy is released from the adipocyte at times of need Understanding how the intestines and body uptake and process dairy fat Identify genes, their protein product and how the proteins influence the way the body processes fat.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	13500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Youth/Adult Obesity

Obesity rates in New Jersey have increased significantly for the third consecutive year as reported in the fifth annual F as in Fat:How Obesity Policies Are Failing in American, 2008 report from the Trust for America's Health (TFAH) and the Robert Wood Johnson Foundation (RWJF).

What has been done

NJAES through research and extension are engaged in efforts to combat the obesity epidemic affecting our state. The New Jersey Obesity Group conducts research projects that include the investigation of genetic differences in taste and the effect on weight, nutrient absorption during dieting and after gastric bypass surgery, and the biology of how the fat cell is regulated and distributes fat throughout the body. Extension faculty and staff in the Family and Community Health Services and 4-H Youth Development Departments have implemented educational programs and campaigns to encourage youth and adults to change dietary behaviors and increase physical activity.

Results

Through the Get Moving-Get Healthy New Jersey initiative, more than 100,000 children and adults are reached. FCHS has implemented seminars covering topics such as:Add Color to your Plate...And Move More; Lighten Up the Fat; Living Well: It's a Family Affair; Building Your Family Health History: An Important Legacy; Small Steps to Health and Wealth; Supersize America; and School Wellness. Communities have developed committees to assess community health indexes for health and well being of residents. Strategic partnerships have been developed between 4-H Agents, Food and Fitness Ambassadors (4-H teens) and school districts and YMCAS to provide multi-faceted school interventions to encourage healthy lifestyles for students, their families and school staff. Over 90% of the participants in Get Moving - Get Healthy New Jersey initiatives report that they will change the way they think, act or behave as a result of participation in programs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle
703	Nutrition Education and Behavior

Outcome #3

1. Outcome Measures

Long Term Individuals experience: Decreased overweight and obesity for youth/adults Decreased risk factors for nutrition-related health problems and chronic diseases that are affected by diet and physical activity for youth/adults A clear and comprehensive understanding of the genetic and physiological mechanisms of obesity and related chronic diseases Pharmacological and/or medical treatments to alleviate the effects of obesity and related diseases

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	17000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle
703	Nutrition Education and Behavior

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation

Program #3

V(A). Planned Program (Summary)

1. Name of the Planned Program

Indoor Air Quality

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
723	Hazards to Human Health and Safety	50%		50%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	50%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	2.0	0.0
Actual	0.0	0.0	1.5	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
0	0	20750	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	275843	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	60564	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct quality & quantity of data on statewide asthma prevalence

- Organize network for developing and assessing asthma prevention and intervention efforts
- Provide in service training on air pollutants
- Provide educational programs for consumers
- Train public health workforce and healthcare providers on the dangers of environmental hazards of the home environment
- Promote and partner with initiative to improve numbers of children screened for elevated blood lead

2. Brief description of the target audience

Residents/Families

- Healthcare and Child Care Providers
- Healthcare professionals
- Policymakers
- Profit/Non-Profit organizations
- Businesses
- Schools
- Communities
- Home Owners
- Landlords/Tenants
- Housing Authority
- Health Agencies
- State/Local Government
- Building/Housing Inspectors
- Local Health Departments
- Environmental Association
- Media
- Agencies that collect data

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	2000	20000	0	0
2008	0	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	3	10	
2008	0	4	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- No Output Measures to report on Indoor Air Quality program.

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Short Term Increased recognition of environmental respiratory disease hazards in the residential dwelling service (realtors, lenders, inspectors, construction trades) Increased awareness of policies related to indoor air Established a comprehensive asthma surveillance program Individuals have fewer emergency room and acute care visits related to asthma and other respiratory disease Health professionals have increased continuing professional development on environmental respiratory disease Families with children at-risk for lead poisoning have their children tested Public health work force and healthcare providers have knowledge of environmental hazards in the home
2	Medium Term Increased number of buildings constructed to meet indoor air quality guidelines Increased awareness of environmental respiratory disease among communities, healthcare providers and individuals Increased access to knowledgeable healthcare providers and information sources Increased use of uniform case definition and diagnostic protocols for respiratory disease Increased ability to respond to indoor air problems by public health agencies Increased number of homes at-risk that have participated in the NJ "Lead-Safe" or "Lead-Free" Registry
3	Long Term Residents have reduced exposure to environmental determinants that contribute to respiratory disease Residents with respiratory disease successfully manage their disease in accordance with recommended practices Accurate diagnosis of environmental respiratory disease New construction meets the criteria to have good indoor air quality The best available technology is used to remediate homes for lead or radon

Outcome #1

1. **Outcome Measures**

Short Term Increased recognition of environmental respiratory disease hazards in the residential dwelling service (realtors, lenders, inspectors, construction trades) Increased awareness of policies related to indoor air Established a comprehensive asthma surveillance program Individuals have fewer emergency room and acute care visits related to asthma and other respiratory disease Health professionals have increased continuing professional development on environmental respiratory disease Families with children at-risk for lead poisoning have their children tested Public health work force and healthcare providers have knowledge of environmental hazards in the home

Not reporting on this Outcome for this Annual Report

Outcome #2

1. **Outcome Measures**

Medium Term Increased number of buildings constructed to meet indoor air quality guidelines Increased awareness of environmental respiratory disease among communities, healthcare providers and individuals Increased access to knowledgeable healthcare providers and information sources Increased use of uniform case definition and diagnostic protocols for respiratory disease Increased ability to respond to indoor air problems by public health agencies Increased number of homes at-risk that have participated in the NJ "Lead-Safe" or "Lead-Free" Registry

Not reporting on this Outcome for this Annual Report

Outcome #3

1. **Outcome Measures**

Long Term Residents have reduced exposure to environmental determinants that contribute to respiratory disease Residents with respiratory disease successfully manage their disease in accordance with recommended practices Accurate diagnosis of environmental respiratory disease New construction meets the criteria to have good indoor air quality The best available technology is used to remediate homes for lead or radon

Not reporting on this Outcome for this Annual Report

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. **Evaluation Studies Planned**

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation

Program #4

V(A). Planned Program (Summary)

1. Name of the Planned Program

4-H Youth Development

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
806	Youth Development	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	30.0	0.0	1.0	0.0
Actual	4.8	0.0	0.3	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
216196	0	7096	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
549466	0	54018	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
185237	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Positive Youth Development:
- Employ Essential Elements (belonging, independence, mastery and generosity) as the basis for life skill development and related workforce development skills.
- Utilize Experiential Education Model (Experience, Share, Process, Generalize, Apply)

Provide opportunities for youth to:
- feel and believe that they are cared about by others (Attachment, Belonging, Connection)
- feel and believe they are capable and successful (Achievement, Mastery, Competence)
- know they are able to influence people and events (Autonomy, Power, Confidence)
- practice helping others through youth's own generosity (Altruism, Purpose, Contribution)

Subject matter:
(USDA/CSREES Mission Mandates)
Science, Engineering, Technology (includes:science literacy, animal science, plant science, environmental science, life sciences, etc) Citizenship (includes youth engagement, community youth development, community service, character development, civic engagement, etc) Healthy Lifestyles (includes chemical health, mental and emotional health, foods & nutrition, physical health and safety, etc)

2. Brief description of the target audience

- School Age youth (K – 13, one year out of high school) and their parents
- 4-H Volunteers (adult and youth)
- Teachers/Educators/other youth development educators
- School Age Child Care Providers
- College Students (interns, collegiate 4-H)
- Clubs and related activities
- Other Extension Professionals and university partners
- Communities: stakeholders and non-profit, social service, government agencies •

Under-served and under-represented audiences
Delivery modes:

- 4-H
- 4-H Afterschool (clubs and short-term programs)
- 4-H School Enrichment
- 4-H Special Interest
- 4-H Camping (day camps and overnight camping)
- 4-H Mentoring and Individual Study

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	2250	10500	45500	20500
2008	2190	11813	44260	40408

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	6	0	
2008	4	0	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Will not report Output Measures on 4-H Youth Development programs. See Outcome Measures.

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Short Term Youth increase awareness, knowledge, attitudes, and skills related to essential elements, workforce development, life skill development, and relevant subject matter. Volunteers increase knowledge and awareness of practices fostering positive youth development, including youth/adult partnerships. Youth development professionals and stakeholders increase awareness and knowledge of problems and solutions supporting positive youth development, including: • policies that need to be addressed. • community resources and support.
2	Medium Term Youth apply knowledge, attitudes, skills, and behaviors needed to become competent, caring and contributing citizens by: • taking on leadership roles in their youth organizations and schools. • working in partnership with adults in a variety of settings. Youth and adults demonstrate effective partnerships through increased youth participation on advisory committees and other governing bodies. Volunteers and youth development professionals apply practices fostering positive youth development.
3	Long Term Youth demonstrate mastery and competencies needed to become engaged citizens by • assuming leadership positions in communities. • developing and implementing action plans to address community needs. • becoming productive members of the workforce. 4-H youth are engaged partners in decision making regarding RCE programming including but not limited to 4-Hyouth development programming. 4-H alumni and volunteers become engaged citizens by assuming leadership positions in communities. Youth development professionals and stakeholders influence decision makers in policy development related to youth development needs and issues.

Outcome #1

1. Outcome Measures

Short Term Youth increase awareness, knowledge, attitudes, and skills related to essential elements, workforce development, life skill development, and relevant subject matter. Volunteers increase knowledge and awareness of practices fostering positive youth development, including youth/adult partnerships. Youth development professionals and stakeholders increase awareness and knowledge of problems and solutions supporting positive youth development, including:

- policies that need to be addressed.
- community resources and support.

Not reporting on this Outcome for this Annual Report

Outcome #2

1. Outcome Measures

Medium Term Youth apply knowledge, attitudes, skills, and behaviors needed to become competent, caring and contributing citizens by:

- taking on leadership roles in their youth organizations and schools.
- working in partnership with adults in a variety of settings. Youth and adults demonstrate effective partnerships through increased youth participation on advisory committees and other governing bodies. Volunteers and youth development professionals apply practices fostering positive youth development.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	36000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Youth Development - Science, Engineering and Technology (SET)

School test results indicated that a large number of youth in New Jersey are not proficient in science and technology.

What has been done

4-H Science programs such as the 'Robotics Explorer', 'Advanced Robotics' 4-H Summer Enrichment Program 'science Adventures', 4-H Science -sational Day, Family Astro-Making Science Fun for the Whole Family and 4-H Summer Science Program are examples of county based programs to introduce youth to science programming.

Results

28,914 4-Hers have participated in science engineering and technology programming. Evaluation results from pre-post testing and end of program instruments reveal that over 80% of those who participated in the Summer Science Program could better solve a problem, observe things and do an experiment. Over 70% of participants increased their scores by 10% from pre to post test. Those participating in the robotics programs reported that they learned to work together, analyze information and solve problems. All reported an increase in scores from pre to post test and that they learned the elements and functions of NXT and how to program a robot.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Long Term Youth demonstrate mastery and competencies needed to become engaged citizens by

- assuming leadership positions in communities.
- developing and implementing action plans to address community needs.
- becoming productive members of the workforce. 4-H youth are engaged partners in decision making regarding RCE programming including but not limited to 4-Hyouth development programming. 4-H alumni and volunteers become engaged citizens by assuming leadership positions in communities. Youth development professionals and stakeholders influence decision makers in policy development related to youth development needs and issues.

Not reporting on this Outcome for this Annual Report

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Evaluation Results

Key Items of Evaluation

Program #5

V(A). Planned Program (Summary)

1. Name of the Planned Program

Agricultural Viability

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
215	Biological Control of Pests Affecting Plants	20%		20%	
601	Economics of Agricultural Production and Farm Management	50%		50%	
604	Marketing and Distribution Practices	30%		30%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	75.0	0.0	36.0	0.0
Actual	20.0	0.0	34.0	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
751055	0	1979614	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1479266	0	7187969	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
210390	0	3889862	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Identify critical programmatic foci/needs based on Extension and stakeholder assessment. These can be broadly defined under three areas:

- Production BMPs (nutrient, pest, waste/by-products management, water quality and quantity, energy)
- Financial BMPs (marketing, labor, risk management, policy e.g. farmland preservation)
- Ag Systems (sustainable ag, organic ag, new crops and use/alternative)
- Develop an inventory of local (county based), regional and statewide programs designed to meet these needs; identify team members and their roles.
- Create a multi-task effort to generate and share research-based information with clientele through demonstrations, educational meetings and workshops, certification programs, trainings, development of recommendation and decision making guides, etc.

2. Brief description of the target audience

Stakeholders (broadly defined to include producers, processors, marketers, end-users, policymakers, legislators)
Commercial agriculture producers and end-users (such as marketers, processors, consumers, etc.)
Municipalities and other governmental and non-governmental agencies, etc.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	8600	1115000	90	150
2008	25523	2255643	85	350

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

Patent Applications Submitted

Year	Target
Plan:	2
2008 :	3

Patents listed
US PP19,434 PC 11/08
US PP18252 P3 11/07
US PP18,911 P2

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	55	20	
2008	16	71	87

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Will not report Output Measures on Agricultural Viability programs. See Outcome Measures.

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Short Term Increases in knowledge and skills of agricultural and horticultural industry professionals will occur. • Nutrient management • Pest management • Waste/by-products management and utilization • improving water quality and conserving water • conserving energy • marketing skills • labor management • risk management • policy e.g. farmland preservation • sustainable ag and organic ag production methods • new crops and use/alternative crops
2	Medium Term Productive agricultural land is stabilized to meet the needs of the agricultural industry and the "open space" needs of people of NJ. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.
3	Long Term New Jersey's agriculture will remain a viable and important industry. New Jersey residents will recognize the importance of agriculture's contributions to societal well being (open space, quality of life) and will support the agricultural industry socially, politically and economically.
4	Medium Term - Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams).
5	Long Term - Agriculture remains a relevant and viable economic sector as profits increase through reduced cost and/or increased or new sales or revenue streams.
6	Medium Term - The products of NJ agriculture will add to the nutritional quality of New Jerseyans food. Agriculture remains a relevant and viable economic sector as profits increase through new sales and revenue streams.
7	Long Term - New Jersey's agriculture will remain a viable and important industry. New Jersey residents will recognize the importance of contributions to societal well being and health.

Outcome #1

1. Outcome Measures

Short Term Increases in knowledge and skills of agricultural and horticultural industry professionals will occur.

- Nutrient management
- Pest management
- Waste/by-products management and utilization
- improving water quality and conserving water
- conserving energy
- marketing skills
- labor management
- risk management
- policy e.g. farmland preservation
- sustainable ag and organic ag production methods
- new crops and use/alternative crops

Not reporting on this Outcome for this Annual Report

Outcome #2

1. Outcome Measures

Medium Term Productive agricultural land is stabilized to meet the needs of the agricultural industry and the "open space" needs of people of NJ. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	45000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Anthracnose Research on Turfgrass
The Northeast Region is negatively impacted by anthracnose on golf turf.

What has been done

Extension Specialists have been engaged in applied multistate research trials that focused on understanding and improving stress tolerance on turf particularly those related to the edaphic environment and cultural management practices. The foci of this research include(1) cultural practices associated with anthracnose disease on annual bluegrass,(2)physical and chemical properties of high traffic root zones, (3) traffic stress tolerance of turf grasses, and (4) management practices that affect earthworn casting activity. The objectives of this work are to improve understanding of the biology and ecology of anthracnose (Colletotrichum cereale) and to develop cultural, biological, chemical and genetic control options for the suppression of this pest on golf courses in the Northeast and Mid-Atlantic. A broad survey of 347 golf course superintendents across the United States, Canada and New Zealand indicated that 72% had trouble with anthracnose of those, 67% indicated they had moderate to severe levels of anthracnose. 41% of this group spent between $20,001 and $60,000 annually to manage the pest, while 8% indicated that annual costs was in excess of $60,000 over year.

Results

Research results have enhanced the understanding and the management of anthracnose disease on annual bluegrass. Adoption and implementation by practitioners will result in improved management practices that are sustainable, cost-effective, and provide excellent control of anthracnose with reduced pesticide inputs. 74% of golf course superintendents were somewhat aware of or followed closely the anthracnose research, of those 85% said that the information obtained was helpful or changed their management practices. And 52% and 46% said these changes in management practices were somewhat to very helpful in reducing the severity of anthracnose on their golf course.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
215	Biological Control of Pests Affecting Plants
601	Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

Long Term New Jersey's agriculture will remain a viable and important industry. New Jersey residents will recognize the importance of agriculture's contributions to societal well being (open space, quality of life) and will support the agricultural industry socially, politically and economically.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	50000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ag Viability - The IR-4 Project
To maintain agricultural viability, speciality crop growers need safe and effective pest management solutions to economically produce crops that enhance the diet and lifestyle of the public, whiled respecting the environment.

What has been done

Under the IR-4 Food Use Program, EPA reviewed 41chemistries for the IR-4 Food Use program. EPA established 241 permanent pesticide tolerances on these chemicals that could result in 999 new specialty crop use registrations. IR-4 Ornamental Horticulture Program data supported 7 new registrations and 1 registration amendment from EPA as well as 4 California registrations. These successes impacted 3,095 ornamental plant species. The Biopesticide Program funded 29 research projects to provide data to support expansions on biopesticide registrations. IR-4 efforts supported 18 new or modified products which could provide 128 new biopesticide uses.

Results

The value of the IR-4 Project was highlighted through an economic analysis of the program. The Center for Economic Analysis at Michigan State University has published two reports. In 2007, they reported that the IR-4 Food Use Program contributes $7.7 billion annually to the US Gross Domestic Product (GDP). A 2008 report found the IR-4 Ornamental Program provides an additional $1.2 billion to the US GDP. This data helped to reinforce the value of IR-4 to the US Congress and IR-4 was appropriated an additional $700,000 in 2008.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
215	Biological Control of Pests Affecting Plants
601	Economics of Agricultural Production and Farm Management

Outcome #4

1. Outcome Measures

Medium Term - Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Peach Production
The six county area in South Jersey produces approximately 7,000 acres of peaches and nectarines with a production value of $33,000,000 and a tree value of $135,000,000. Approximately 42 commercial peach growers grow and market peaches for the wholesale and retail market. In 2008 New Jersey was number 4 in the nation in peach production. We have a wide range of insects, diseases, nematodes, weeds and wild life that reduce peach tree health and also blemish and damage fruit. To sustain profitability and viability the industry must address these problems.

What has been done

Extension Specialists have conducted applied peach research in weed science, tree fruit pathology, and fruit entomology to effectively combat pest problems. In addition, the IPM fruit agent and program associate have worked on diagnosing pest problems, reading and making fertilizer recommendations to growers.

Results

There has not been significant change in production from 2007 to 2008. We continue to be successful in evaluating and introducing new cultures. We have also made major impacts in researching novel and other types of peach varieties recommended to our growers. The peach research program on pest management has a major impact on peach plantings and sustainability in southern New Jersey. The 'Production Guide' is the main source of peach information and is utilized as a best management practice document by the State Agricultural Development Committee. Ninety percent of our growers follow weed management programs utilizing the herbicides we evaluate and recommend. Approximately 25% of them follow our ground cover management recommendations with sod centers. Because of the high incidence of pest pressure 99% follow ongoing pest management recommendations for disease and insects. We have improved the control of diseases like brown spot, peach scab, rusty spot and bacterial spot resulting in better fruit quality and tree health. We have improved the identification of varieties with natural tolerance, or susceptibility to rusty spot and bacterial spot. We have developed many alternatives in insect management through the use of better ground cover management, and insect pheromones and mating description to reduce insecticide applications. All of these have helped the viability and sustainability of the peach industry. Targeted and integrated pest management practices and recommending less fertilizer usage have reduced cost and non-point source pollution in soils and waters.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices
215	Biological Control of Pests Affecting Plants

Outcome #5

1. Outcome Measures

Long Term - Agriculture remains a relevant and viable economic sector as profits increase through reduced cost and/or increased or new sales or revenue streams.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Turfgrass Breeding and Evaluation

The turf industry is a component part of New Jersey agriculture. Diseases that impact this industry and the need to breed varieties is critical to the future viability of Rutgers leadership in this area.

What has been done

During 2008, 9,434 new turf grass plots were established with over 92,000 plants spaced plant nurseries and 30 mowed single clone selections. Major field days displaying 10 different cool season turf grass species in turf trials. Lectures were presented at local, national and international meetings.

During the year, 21 US Plant Variety Protection (PVP) applications were made and 28 US PVP certifications were issued on NJAES turf grass cultivars. There were 10 new Kentucky bluegrasses, 13 new perennial ryegrasses, 12 new tall fescues and 2 new find fiscues named in 2008.

Results

New germplasm sources collected from Europe have contributed over 50% of the genetic resistance to gray leaf spot in the new perennial ryegrasses released to date. These can be used in turf with reduced fungicide requirements. New colonial bentgrass has been used to develop new cultivars with improved brown patch resistance that has not been reported in the past require less fungicide. New Kentucky bluegrass from Finland and Lithuania have a combination of improved heat tolerance and leaf spot resistance. Kentucky bluegrass from Bulgaria has shown the highest resistance to stem and stripe rust. These are being used to generate new rust resistant Kentucky bluegrass. The Rutgers Novel Wear simulator is being used to apply uniform wear treatments on simple plot progenies of perennial ryegrass and tall fescues. These wear tolerant cultivars will create safer playgrounds for athletes and children. Widely adapted turfgrass cultivars are being accepted in Europe and have helped the US seed industry to maintain a healthy export business.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
601	Economics of Agricultural Production and Farm Management
215	Biological Control of Pests Affecting Plants

Outcome #6

1. Outcome Measures

Medium Term - The products of NJ agriculture will add to the nutritional quality of New Jerseyans food. Agriculture remains a relevant and viable economic sector as profits increase through new sales and revenue streams.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Rediscovering the Jersey Tomato - Revitalizing a Signature Crop for New Jersey Agriculture

New Jersey was recognizably famous for producing the 'Jersey Tomato' in decades past, the definition of a great fresh market tomato that satisfies consumers drifted. What is a 'Jersey Tomato' became lost in a sea of commercial varieties with excellent horticultural production traits, but poor consumer acceptance and loyalty. Field research, demonstrations, and extension education toward improving fresh market tomatoes had not restored to our public stakeholders, nor to commercial vegetable growers, a great tasting, and reliable field round tomato qualifying as a memorable 'Jersey Tomato' experience.

What has been done

NJAES faculty and staff changed direction in field studies, and while easier said than done, decided to reintroduce a proven cultivar over which we retained proprietary control to address the public dissatisfaction with fresh market tomato flavor quality. The Rediscovering the Jersey Tomato team addressed problems simultaneously with a combination of extensive multi-year tomato field trial tests, consumer taste panels, public events, and reintroducing lost tomato varieties with superior horticultural traits. Work for 2008 included research in tomato breeding for flavor in open-pollinated varieties, variety trials on alternative hybrids to establish culinary appeal variety benchmarks, formal sensory analysis, informal public tomato taste tastings, and field research on effects of salinity and tomato flavor. These projects expanded the team's base, but the component most noteworthy for public outreach was the reintroduction of the Ramapo F-1 Tomato. A $8,000 investment of operating funds was redirected to support the work of the team.

Results

Project outcomes inspired passion among Jersey Tomato consumers, supported the state's principal market tomato crop ($20-$30 million revenues at $6,500 - $8,300 per acre), and brought renewed prestige to Rutgers NJAES as a leader in tomatoes.

Commencing with $8,000 of NJAES operating funds, 11,793 Ramapo tomato seed packets were sold from January through December 2008 to over 4,300 individuals from 43 different States, with the largest portion from New Jersey. Foreign sales include Poland, Virgin Islands, Australia, Canada, India and Italy. Revenue recovery from seed sales in 2008 was $54,924.

The work of this project brought back to market a well-adapted tomato identified with Rutgers research achievements and Jersey flavor. We created a NJ 'Signature Crop' opportunity; increasing wholesale and retail sales of tomato and other Jersey farm products.

The team is most proud of the tremendous positive public relations impacts the Rediscovering the Jersey Tomato team has brought to NJAES/RCE units, and the wider University community. While not quantified, these benefits are more valuable than seed sales, worth hundreds of thousands of dollars, as Rutgers NJAES existing research is positively identified with restoring great tomato flavor to the public. The public tasting efforts empowered the public as critical stakeholders and partners in driving the state's agricultural agenda.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
215	Biological Control of Pests Affecting Plants
601	Economics of Agricultural Production and Farm Management

Outcome #7

1. Outcome Measures

Long Term - New Jersey's agriculture will remain a viable and important industry. New Jersey residents will recognize the importance of contributions to societal well being and health.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Rutgers' NJAES Cranberry Breeding Program

Currently grown cranberry varieties are either selections from wild bogs or first generation hybrids developed in the 1940s and 1950s representing minimal genetic improvement.

What has been done

Rutgers researchers initiated a breeding program to further advance the yield, fruit quality and genetic diversity of the crop. Rutgers breeding program was able to take advantage of the unique conditions found in New Jersey including severe disease pressure and heat stress for selection of hardy types.

Results

As a result of the breeding program three new patents were awarded:

(1) Patent # USPP19,434 PC November 2008 Mullic Queen Cranberry Plant Named CNJ97-105-4
New cranberry variety distinguished by significantly higher yields, higher anthocyanin content (red pigment), higher stolon vigor, and earlier flowering phenology.

(2) Patent# USPP18,252 P3 November 2007
New cranberry variety distinguished by significantly higher yields, higher anthocyanin content (red pigment) as compared to the currently cultivated commercial varieties.

(3) Patent# USPP18,911 P2
New cranberry variety distinguished by significantly higher yields, anthocyanin content(red pigment)/lower titratable acidity, and larger fruit size. In addition, higher TAcy values in September provide for an earlier harvest window for processed fruit, especially related to 'Stevens' (unpatented) a primary commercial variety.
Cranberries have one of the highest anti-oxidant contents and are important for urinary tract health.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
601	Economics of Agricultural Production and Farm Management
215	Biological Control of Pests Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation

Program #6

V(A). Planned Program (Summary)

1. Name of the Planned Program

Sustainability of NJ Equine Industry and Its Impact on Agriculture and Open Space

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	20%		20%	
302	Nutrient Utilization in Animals	20%		20%	
303	Genetic Improvement of Animals	20%		20%	
312	External Parasites and Pests of Animals	20%		20%	
315	Animal Welfare/Well-Being and Protection	20%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	0.0	3.0	0.0
Actual	4.1	0.0	1.7	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
123131	0	40681	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
380777	0	334228	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
42488	0	182093	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct 2006 Economic Impact Study

Horse Management seminars and Equine Science Update – county and statewide
Public relations and promotions
Actively engaged as outside speakers for the industry State 4-H horse program
Perform consultations to individuals and agricultural organizations

Maintain Research-based website

Conduct research to impact policy decisions for industry

Conduct Roundtables

Produce research based materials

Hold Annual Stakeholder meeting to Identify issues of importance

RUBEA – advisory committee

Facilitate the opportunity to network within the industry

2. Brief description of the target audience

Equine users – including, students/youth, equestrians, owners

Equine professionals: veterinarians, researchers, industry leaders, farmers, service providers, trainers, breeders, stable managers

Legislators/Government Officials/Industry Officials e.g. Racing Commission, Sport and Competition Officials (FEI, USEF)

Educators

General public

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	5000	35000	3000	10000
2008	4500	55000	4000	40600

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

Patent Applications Submitted

Year	Target
Plan:	1
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	6	20	
2008	2	9	11

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Will not report Output Measures on Sustainability of NJ Equine Industry programs. See Outcome Measures.

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Short Term New Jersey residents and government officials will be made aware of the importance of the equine industry Equine enthusiasts take leadership roles to unify the industry and will acquire knowledge to support the industry's sustainability Equine industry segments will learn the importance and benefits of speaking in one voice
2	Medium Term Diverse equine-related units are organized into one voice Misperceptions by the general public re: the segments of equine industry are corrected All uses of the horse are recognized as agricultural by local and state government officials
3	Long Term Equine industry is unified and is economically sustainable Equine industry is recognized as a critical component of the economic development, of traditional agriculture, and the preservation of open space

Outcome #1

1. Outcome Measures

Short Term New Jersey residents and government officials will be made aware of the importance of the equine industry Equine enthusiasts take leadership roles to unify the industry and will acquire knowledge to support the industry's sustainability Equine industry segments will learn the importance and benefits of speaking in one voice

Not reporting on this Outcome for this Annual Report

Outcome #2

1. Outcome Measures

Medium Term Diverse equine-related units are organized into one voice Misperceptions by the general public re: the segments of equine industry are corrected All uses of the horse are recognized as agricultural by local and state government officials

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	30000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Physiology Response to Exercise Following Various Management and Pharmacological Manipulations in Horses

What has been done

NJAES researchers in collaboraion with multi-departmental and multi-institutional faculty, graduate students and undergraduates have conducted several key experiments and analyzed data. Presentation of data has been shared a national and international meetings, seminars, invited talks and RCE sponsored updates. Data has also been used to support the mission of the NJ and NY Racing Commissions.

Results

Information gathered have allowed horse owners, veterinarians and racing officials to adjust recommendations concerning medications and management practices. The work of this project has influenced the formation of new regulations in NJ and other states. Studies of the effects of nutraceuticals have led to increased funding from the Department of Defense (DOD) to use the horse as an animal model for intermediate studies with data benefiting both humans and horses.

4. Associated Knowledge Areas

KA Code	Knowledge Area
315	Animal Welfare/Well-Being and Protection

Outcome #3

1. Outcome Measures

Long Term Equine industry is unified and is economically sustainable Equine industry is recognized as a critical component of the economic development, of traditional agriculture, and the preservation of open space

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	35000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation

Program #7

V(A). Planned Program (Summary)

1. Name of the Planned Program

Home, Garden and Environment

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
205	Plant Management Systems	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	0.0	0.0
Actual	9.4	0.0	0.1	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
310763	0	93770	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
613292	0	37799	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
131832	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Identify critical programmatic foci/needs based on Extension and stakeholder assessment broadly defined under two areas:

Environmentally sound gardening/lawn care:

- Home horticulture – lawn, garden and grounds management
- Commercial horticulture - professional management and maintenance

Environmentally sound household, structural pest control

- Home pest control – termites, carpenter ants, etc.
- Human-heath related pest control – mosquitoes, ticks, etc.
- A school IPM program will be developed to train end-users sound management techniques
- Develop an inventory of local (county based) and regional and statewide programs designed to meet these needs.
- Identify team members and their roles.
- Create a multi-task effort to generate and share research-based information with clientele, including research, demonstrations, educational meetings and workshops, certification programs, trainings, etc.

2. Brief description of the target audience

Stakeholders:

- Homeowners and residential clientele
- Commercial horticulture professionals (management and maintenance)
- Commercial pest control operators
- Public health officials
- Municipalities and other governmental and non-governmental agencies, including Parks Commission, Public Health, Mosquito Commission, schools, etc.
- Local environmental commissions or others that have interest in these areas
- Volunteers (trained via Master Gardener Program, Environmental Stewards Program), youth and others who can support and benefit from these efforts
- Underserved and underrepresented audiences

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	21000	6800	210	70
2008	22500	1591	840	150

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	6	0	
2008	6	2	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Will not report Output Measures on Home, Garden and Environment programs. See Outcome Measures.

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Short Term Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards) working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele. Increased number of certified pest control operators. Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.
2	Medium Term Educated youth and adult clientele, both professional and residential, utilize their newly gained knowledge and skills to implement and make changes such as: • Efficient and effective pest control techniques • Proper utilization of fertilizers and other soil amendments as needed based on soil testing • Proper selection of plant materials to reduce need for chemical inputs • Reduction in the damage caused by structural pests • Reduction in health related incidents and costs association with human health vectors (ticks, mosquitoes). • Protect health and safety of school children. • Enhance or maintain environmental quality
3	Long Term New Jersey's residents will reside, work and play in a healthy, safe, and sound environment -- in their homes, gardens, schools, parks and workplaces.
4	Medium Term - Educated individuals will implement home gardens and environmental practices learned via media and web technology to enhance or maintain environmental quality.

Outcome #1

1. Outcome Measures

Short Term Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards) working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele. Increased number of certified pest control operators. Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.

Not reporting on this Outcome for this Annual Report

Outcome #2

1. Outcome Measures

Medium Term Educated youth and adult clientele, both professional and residential, utilize their newly gained knowledge and skills to implement and make changes such as:

- Efficient and effective pest control techniques
- Proper utilization of fertilizers and other soil amendments as needed based on soil testing
- Proper selection of plant materials to reduce need for chemical inputs
- Reduction in the damage caused by structural pests
- Reduction in health related incidents and costs association with human health vectors (ticks, mosquitoes).
- Protect health and safety of school children.
- Enhance or maintain environmental quality

2. Associated Institution Types

•1862 Extension
•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	40000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Home, Garden and Environment -Statewide Environmental Stewardship Certificate Program

Environmental issues are among the most serious problems faced statewide and nationally. The top four environmental issues in New Jersey were: 1)land use change, 2)indoor air pollution, 3)invasive species, and 4)outdoor air pollution. Millions of dollars have been spent preserving open space and public land, however, little or no public funding has been provided for the management of preserved lands.

What has been done

A structured volunteer training and management program focused on the environment was developed. This environmental outreach program formed by Rutgers Cooperative Extension in partnership with Duke Farms targets people interested in environmental issues who wish to learn more about the underlying science and gain skills necessary for effective action in their community.

Results

As of 2008 the Statewide Environmental Stewardship Certificate Program regional classes have been conducted for four years providing 660 hours of training to 178 students. These students complete a 60 hour volunteer internship, use their knowledge to format positive change in the community to become Certified Rutgers Environmental Stewards. 54% are engaged in an intern project, 25% have completed intern projects and 10% are representatives on environmental commissions throughout the state. Patterned after the Master Gardener Program, the Environmental Stewardship Program has proven to be a valuable educational resource.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #3

1. Outcome Measures

Long Term New Jersey's residents will reside, work and play in a healthy, safe, and sound environment -- in their homes, gardens, schools, parks and workplaces.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	45000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Life in Extreme Environments: Research, Commercial Product Development and Innovative Education Initiatives

Humane diseases and their cure continues to present challenges to researchers.

What has been done

Over 300 deep sea microoganisms which live in the most extreme environments on the planet have been collected by Rutgers NJAES researchers. This collection has been screened for a variety of bioactive compounds and fractionated to identify the structure of bioactive compounds that are synthesized for potential commercial development development of pharmaceuticals, particularly those with anti-cancer activity.

Results

Rutgers research scientists have been invited to share results of their latest research at the American Chemical Society's Annual Meeting (Presentation Title: 'Bioprospecting in Extreme Deep-Sea Environments'). The IMAX film 'Volcanoes of the Deep Sea' integrally tied to this research is continuing to be shown at museums and science centers throughout the world.

A Rutgers/NJAES website http://deepseacenter.rutgers.edu featuring the ongoing efforts associated with this project was created and featured November 2008 on a nationally-televised broadcast of the Today Show. Ongoing marine natural product discovery efforts have profound implications for potential development of commercial pharmaceuticals for the treatment of a wide variety of cancers. Images,film clips and results from our ongoing studies will be featured in an exhibit in the new Hall of Ocean Sciences at the Smithsonian Institute in Washington, DC; it is anticipated that this exhibit will run for a period of approximately 20 years and will be viewed by millions of visitors over this period of time. The Discovery Channel's program entitles 'The Deep,' which is part of the 'Blue Planet' series and features images and results from our project continues to expose millions of viewers to our ongoing efforts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #4

1. Outcome Measures

Medium Term - Educated individuals will implement home gardens and environmental practices learned via media and web technology to enhance or maintain environmental quality.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Utilizing Diverse Media and Hands-On Education to Enhance Local Agricultural Viability and Practical Environmental Stewardship

Current economic situations, energy costs, environmental regulation and restrictions, water quality and use restrictions, and food safety and security issues are all of concerned for agriproducers, consumers and others.

What has been done

Newspaper articles written weekly in the papers with the largest circulation throughtout the state focus on gardening and environmental issues of concern. They include links to the Cooperative Extension website for 'If Plants Could Talk' and the NJAES site. Three 30 minute television programs for five Central New Jersey Cable TV stations were created and aired. Twilight meetings and Master Gardener classes emphasizing environmental stewardship in landscapes and gardens were conducted and Earthwise Lawn and Landscape Care sessions were conducted for school administrators and maintenance personnel throughtout New Jersey.

Results

Master Gardener classes report a decrease in water, fertilizer and pesticide use. Gardeners have begun planting low maintenance turf type tall fescue grasses. In addition, 30% of participants are now using some form of IPM on over 30 acres of land. It is estimated that there is a 70% reduction in unnecessary or excessive pesticide and water use in landscapes through proper management techniques. Water use on lawns has decreased by over 1.5 million gallons per year.

As a result of the training and legislative mandates, school administrators and maintenance personnel who received training on earth-wise lawn and landscape care and other school IPM principles, 100% have initiated a school based IPM program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation

Program #8

V(A). Planned Program (Summary)

1. Name of the Planned Program

Integrated Pest Management

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
216	Integrated Pest Management Systems	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	24.0	0.0	13.0	0.0
Actual	0.0	0.0	2.6	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
134595	0	119078	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
316116	0	694254	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
42208	0	129316	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research

- Develop new and novel techniques for pest management and pest detection

Delivery

- Provide IPM information to a wide variety of stakeholders
- Employ new methods for delivery IPM information

Education

- Conduct IPM educational programs for stakeholders
- Conduct IPM educational training for university students
- Conduct IPM educational training for Vo-Ag and FFA students
- Conduct IPM public awareness campaign
- Work with communities, schools, businesses to help them meet their regulatory responsibilities on pesticide application
- Help growers develop scouting programs to identify pest populations before significant plant damage occurs.
- Develop pest management options to be used in an integrated or rotational program.
- Identify indicators to help growers anticipate pest problems.
- Develop monitoring techniques and population damage thresholds for selected pests.
- Provide scientifically sound advice to state regulatory bodies on pest management and pesticide issues
- Create a multidisciplinary program comprising of faculty, staff, volunteers, industry partners and government officials
- Investigate IPM methods to help growers produce top quality crops, limiting or reducing production costs.
- Evaluate all pest and crop management practices into a set of commercially used methods. These include the use of: pesticides, economic/aesthetic threshold levels, resistant cultivars, optimum horticultural practices, environmental monitoring, pest scouting, and fertility

2. Brief description of the target audience

Municipalities, Pesticide applicators and their employers , Commercial pesticide applicators,State Dept. of Environmental Protection, Staff and students who gain valuable scientific experience, Industry partners in agriculture and related commodities, Consumers, NJAES Faculty and Staff involved in pest management research/outreach Farmers, Commodity groups, School faculty, staff and children, NJAES researchers, Secondary and university students, Governmental agencies, Environmental organizations, Agricultural, landscape, fine turf and other related industries, and New Jersey citizens.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	350	1500	15	150
2008	1857	12979	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	24	2	
2008	2	3	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Will not report Output Measures on Integrated Pest Management programs. See Outcome Measures.

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Short Term • Develop improved IPM delivery methods • Develop detection, monitoring and sampling methods that reliably predict pest levels • Develop novel management methods for a wide variety of pests • Develop IPM training for secondary and university students • Improve public awareness about IPM • Determine the effectiveness of pheromones for mating disruption of pests • Greater understanding of entomopathogenic nematode species' effects on pests • Evaluation of the effectiveness of natural pesticides and crop management to reduce pests • Determine which types of plants attract pests to be used as a pest control method
2	Medium Term • Research and educational programs, and public awareness campaign increased adoption of IPM in traditional and non-traditional systems • Research findings used to develop new projects • IPM training of students creates new IPM interns, professionals and researchers • Knowledge of various natural insecticides and their effectiveness on pests • Determining the best time and application method for IPM products • Greater understanding of pest biology and ecology • Greater understanding of entomopathogenic species biology and ecology
3	Long Term • Protect commodities, homes and communities from pests • Increased abundance of high quality food and fiber products • Increased acreage in New Jersey grown under IPM practices • Reduced environmental problems associated with current pest management practices • A comprehensive understanding of best management practices for IPM that are economically viable and environmentally safe
4	Medium Term - Agriculture remains a relevant and viable economic sector as profits increase through reduced costs and improved IMP practices, resulting in increased or new sales.
5	Medium Term - Measurable reductions in the environmental impact will occur through the adoption of improved soound management practices.
6	Medium Term - Horticultural turf management will be enhanced by the reduction in non-point source pollution and implementation of sound management practices.

Outcome #1

1. Outcome Measures

Short Term

- Develop improved IPM delivery methods
- Develop detection, monitoring and sampling methods that reliably predict pest levels
- Develop novel management methods for a wide variety of pests
- Develop IPM training for secondary and university students
- Improve public awareness about IPM
- Determine the effectiveness of pheromones for mating disruption of pests
- Greater understanding of entomopathogenic nematode species' effects on pests
- Evaluation of the effectiveness of natural pesticides and crop management to reduce pests
- Determine which types of plants attract pests to be used as a pest control method

Not reporting on this Outcome for this Annual Report

Outcome #2

1. Outcome Measures

Medium Term

- Research and educational programs, and public awareness campaign increased adoption of IPM in traditional and non-traditional systems
- Research findings used to develop new projects
- IPM training of students creates new IPM interns, professionals and researchers
- Knowledge of various natural insecticides and their effectiveness on pests
- Determining the best time and application method for IPM products
- Greater understanding of pest biology and ecology
- Greater understanding of entomopathogenic species biology and ecology

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Blueberry Integrated Pest Management

Blueberries are a unique agricultural commodity, since they are one of only several native foods in commercial production in the U.S. In New Jersey most blueberries are grown in the ecologically sensitive 'New Jersey Pinelands,' which is characterized by porous soils with high water tables, which are subject to vertical movement of a number of agricultural chemicals. the pest complex on blueberries is extensive, with pests attacking virtually all parts of the plant (e.g., fruit, buds, leaves, roots, stems, flowers) and pest management requiring up to 12 pesticide sprays per year. The vast majority of these sprays are high risk organophosphate and carbamate materials, which are likely to adversely affect the myriad number of farm workers present during harvest. At present the blueberry industry is seeing a per capita increase in consumption of fruit, often by children, which may in part be from the many health benefits derived from the antioxidants contained in the berries.

What has been done

An integrated pest management (IPM) program was delivered to commercial blueberry growers. A research/demonstration component demonstrated and refined the use of alternative pest management practices such as the use of trapping methods for determining treatment timings for blueberry maggot, and mating disruption for Oriental beetle. A GIS based management program was started that demonstrated the effectiveness of farmwide spatial management for blueberry maggot.

Results

Growers participated in an IPM program, and maintained high fruit quality while minimizing pesticide use. In 2008, this included 40 growers who grew 4500 acres of blueberries or about 60% of the state acreage, and about 70% of the state production.

Growers managing blueberry maggot under IPM methods reduced insecticide use on average from 6 applications to 1-2 applications, or over 66%.

Pesticide use for OP and carbamate pesticides was reduced. Overall pesticide use was minimized. Using the results from a previous USDA/RAMP project, growers following this program had between 45% and 58% lower amounts of insecticide active ingredient applied than those grown using grower standard programs, with even greater reductions in the total amount of insecticide residue detected on leaves and fruit at harvest. Overall, growers who practiced IPM at high levels, used from 6-8 lb ai of pesticide per acre, while growers treating on a pure calendar schedule, used up to 34 lb ai per acre.

Growers minimized on farm pest management costs. Some growers spent as much as $235/A for pesticides while the average IPM participant spent $132/A. The average grower using IPM practices saved about $100/A.

New pest management practices such as mating disruption and whole farm GIS based monitoring were used. Small plot research/demonstration trials for Oriental beetle mating disruption showed that Oriental beetle could be managed with mating disruption in place of soil applied insecticide. Based on our research and demonstration work, a registration package is currently being submitted to EPA for registration and commercial use starting in 2010.

Fertility monitoring leads to recommendation of lower fertilizer use. During 2008, 470 samples were taken for combined monitoring of plant fertility and nematode levels. Soil and plant fertility tests demonstrated that about 75% of fields sampled had sufficient to high levels of soil phosphorous.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

Long Term

- Protect commodities, homes and communities from pests
- Increased abundance of high quality food and fiber products
- Increased acreage in New Jersey grown under IPM practices
- Reduced environmental problems associated with current pest management practices
- A comprehensive understanding of best management practices for IPM that are economically viable and environmentally safe

2. Associated Institution Types

•1862 Extension
•1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	2000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #4

1. Outcome Measures

Medium Term - Agriculture remains a relevant and viable economic sector as profits increase through reduced costs and improved IMP practices, resulting in increased or new sales.

2. Associated Institution Types

•1862 Extension
•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Tree Fruit Integrated Pest Management

Statewide in 2008, tree fruit was valued at $11.3 million for apples and $223.9 million for peaches. The industry in southern counties is heavily oriented towards wholesale markets and peach production, while the industry in northern counties is heavily dependent on direct markets and apple production. Retail market fruit production in northern counties is valued at approx. $10-15 million. New Jersey fruit growers produce commodities that are susceptible to more than two dozen arthropod and disease pests. Management of this pest complex can cost producers up to $500 or more per acre.

What has been done

An integrated crop management (ICM) program was delivered to commercial fruit growers who produced apples, peaches, and nectarines. The program reached both primary and secondary participants. Secondary participants attend extension update meetings, and receive other IPM/ICM information through personal visits, fax broadcasts, articles, newsletters and the Internet. Primary participants are those growers who access all the above information and participate in a field scouting program.

Results

Fourteen (14) growers used mating disruptions for Oriental fruit moth and codling moth. Since each grower who uses mating disruption in peaches eliminates 5-7 insecticide applications, about one third of IPM participants reduced insecticide use by 12 lb/acre. This is a 40% increase over 2007. In southern counties, where the bulk of commercial peaches are produced, 44% of growers are now using mating disruption in place of calendar spraying of pesticides. 62% of growers used alternative, 'reduced risk' insecticides, and 80% of growers used reduced risk fungicides.

In total, program participants reduced pesticide use by 26-80% compared to standard spray schedules, depending on the practices used. Other IPM practices included grower use of degree day based pest models, reducing insecticide use by 40% compared to standard calendar spray methods. Weekly pest management recommendations to growers led to pest free fruit valued at $37 million throughout the state.

Laboratory tests were completed in 2008 as part of the fertility component. Over 75% of areas samples were shown to have sufficient to excessive phosphorous levels, which led to decreased phosphorous use on these sites.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #5

1. Outcome Measures

Medium Term - Measurable reductions in the environmental impact will occur through the adoption of improved soound management practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Online Pesticide Safety Training and Recertification for Licensed Professionals

There is an overwhelming need to provide quality research-based information to help resolve critical issues facing agriculture, urban and rural communities, and the environment. Distance education efforts utilizing enhanced communication linkages reach existing and under-served clientele groups by facilitating distribution of research-based findings, educational opportunities, and regulatory updates. Issues such as capacity building, career development, and environmental justice must be addressed through interactive capabilities to inform a potentially unlimited general audience, while also providing specific educational opportunities for agricultural producers and licensed clientele groups.

What has been done

This project team developed a web site, www.recert.rutgers.edu dedicated to training and providing continuing education credits on the proper use and storage of pesticides and the selection, use and storage of personal protective equipment. In so doing, this site provides 2 (two) license recertification credits for commercial growers and applicators in NJ. Credits are available within each 12 month period (based on initial use by individual user), and a complete 1-hour module is available for general instruction use.

Results

2008 activity for online CORE recertification credits through www.recert.Rutgers.edu totaled 55 commercial applicators attaining 82 CORE credits, for a program total of 241 online commercial applicators since the site launched in 2002. In addition, the State of Maryland officially accepted this website for CORE training and recertification credits for MD licensed pesticide applicators.

Pre and post-evaluative questionnaires and online survey results reveal:
-80% indicate a high level of satisfaction with the website design and content.
-90% strongly agreed the convenience of taking an online course was important to them.
-85% state that the website provides a necessary learning experience in addition to the recertification credit.
-Users most improved their knowledge in pesticide storage and inventory regulations (a 30% increase in evaluative test scores) and signage regulations regarding language (a 22% increase in evaluative test scores) after viewing the web site.

For general audiends in 2008, WebTrends Analysis reveals 6,043 visits (an average of 16 per day) and 10,831 page views (an average of 29 per day).

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #6

1. Outcome Measures

Medium Term - Horticultural turf management will be enhanced by the reduction in non-point source pollution and implementation of sound management practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

North Jersey Ornamental Horticulture Turf Days Conference

According to a 2001 Rutgers University study of the turf industry in New Jersey, 890,425 acres of NJ (19% of the state's total acreage) is planted in turfgrass. Professional turf managers care for 39% of this acreage. One segment of the industry is the 2,442 service providers who maintain commercial and residential properties. These private businesses employed 5,741 people at the time of the study providing $400 million in payroll and benefits. They also contributed $691 million in cash expenditures to NJ's economy. The turf service industry reported $1.3 billion dollars in revenues.

What has been done

In North Jersey Ornamental Horticulture Turf Day program focuses on turf management issues for landscape turf service providers. The main objective of the program is to encourage the adoption of integrated pest management practices by the turf management industry, ultimately reducing the amount of fertilizers and pesticides used on residential and commercial properties. Program topics are selected based upon current issues such as new pesticide or fertilizeer use regulations, the emergence of new insect or disease problems or business related topics such as tax or labor issues.

Results

In 2008, professionals who attended the program in previous years had surveyed results that were asked how the information presented at prior programs affected their business or career. Respondents (n=103) indicated:
-89% have been able to maintain their NJ Department of Environmental Protection Pesticide Applicator License.
-77% practice IPM.
-57% see improved communication with their customers
-55% use the information to train employees
-42% experienced an increase in sales
-25% indicated their attendance helped them get a promotion.

Conference participants (139) completed a program evaluation. Ninety-six percent (96%) of conference participants indicated that they would apply what they learned at the conference to their turf management practices, and 132 professionals said they will make more informed pest management decisions as a result of the program.

One hundred three (103) professionals had attended the program in the past and 76% have changed pest control practices as a result of the training. Specific examples of changed practices include: irrigation management, using soil tests, better record keeping and using less pesticides. Fifty-seven (57) professionals use 10% to 30% less chemicals. Six professionals indicated they use over 50% less pesticides as a result of the turf day program.

When asked if the conference has helped their business save money, 36 professionals indicated yes. Savings ranged from $500 to $12,000. The average savings was $5,900.00.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation

Program #9

V(A). Planned Program (Summary)

1. Name of the Planned Program

Aquaculture

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
135	Aquatic and Terrestrial Wildlife	40%		40%	
308	Improved Animal Products (Before Harvest)	60%		60%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	4.8	0.0
Actual	2.0	0.0	4.8	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
15971	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
63190	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Investigate the genetic mechanisms for disease resistance and improved quality in economically important shellfish. Create a dynamic and cooperative partnership with faculty, staff, businesses, regulatory/advisory councils and the government to research best management practices and discover effective solutions and management practices to address threats to NJ aquaculture as well as investigate opportunities to increase the quality and quantity of the aquaculture harvest. Collect and analyze data on how communities and businesses are affected by the aquaculture industry management practices. Examine the presence of unhealthy levels of contaminants in aquaculture products. Determine best techniques for shellfish hatcheries on- and off-shore.

2. Brief description of the target audience

- Aquaculture-related businesses and employees
- State Dept. of Environmental Protection
- State Dept. of Agriculture
- Industry partners who learn ways to improve or protect their harvests
- Communities who depend on aquaculture-related revenue NJAES Faculty and Staff involved in water research/outreach
- Consumers of aquaculture products, including recreational fishing

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	100	300	30	300
2008	556	135	55	450

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

Patent Applications Submitted

Year	Target
Plan:	1
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	2	48	
2008	1	41	42

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Will n ot report Output Measures on Aquaculture programs. See Outcome Measures.

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Short term Knowledge of seasonal variations for shellfish diseases Create census data on communities involved in aquaculture Determine the level of pollutants in economically important fish species Develop markers and maps of important genetic traits Knowledge of shellfish hatchery techniques that decrease time for growth to market size
2	Medium term Identify spatial and temporal relationships between patterns of shellfish diseases in NJ and environmental correlates To develop disease-resistant strains of shellfish Develop superior disease-resistant and larger genetic lines of shellfish Measure the impact of communities on the aquaculture industry Knowledge of the feasibility of off-shore shellfish farming
3	Long term Clear and comprehensive understanding of community, environmental, genetic and physical regulators of aquaculture quality and quantity A safe and secure aquaculture industry that can meet consumer demands for high-quality products and also be environment friendly and economically viable Creation of superior aquaculture products that will be of high demand outside NJ

Outcome #1

1. Outcome Measures

Short term Knowledge of seasonal variations for shellfish diseases Create census data on communities involved in aquaculture Determine the level of pollutants in economically important fish species Develop markers and maps of important genetic traits Knowledge of shellfish hatchery techniques that decrease time for growth to market size

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	200	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
135	Aquatic and Terrestrial Wildlife

Outcome #2

1. Outcome Measures

Medium term Identify spatial and temporal relationships between patterns of shellfish diseases in NJ and environmental correlates To develop disease-resistant strains of shellfish Develop superior disease-resistant and larger genetic lines of shellfish Measure the impact of communities on the aquaculture industry Knowledge of the feasibility of off-shore shellfish farming

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	250	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Broodstock Management, Genetics and Breeding Programs for Molluscar Shellfish

New Jersey's Oyster industry is critically tied to the economic base of the Delaware Bay and the regional fisheries industry. The safety of the tetraploid oyster due to disease.

What has been done

New Jersey researchers have focused its work on genetics, genomes and breeding.

Results

NJAES scientists produced the fifth generation of tetraploid oysters and continued selection for disease resistence and fast growth. Tetraploid oysters have been used for commercial production of triploids. Triploid oysters produced from tetraploids are 100% pure and grow significantly faster under normal diploids. Triploid oysters have become an important product of the oyster culture industry. The genetic markers and maps have provided useful tools to the research community and are being used to identify and manage oyster resources. Oyster survival rates in the Delaware Bay have increased more than twofold, preserving a regional fishery and thousands of jobs. The restored harvest has had a direct impact on the economy of the region with a return of $40 for each $1 spent.

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
135	Aquatic and Terrestrial Wildlife

Outcome #3

1. Outcome Measures

Long term Clear and comprehensive understanding of community, environmental, genetic and physical regulators of aquaculture quality and quantity A safe and secure aquaculture industry that can meet consumer demands for high-quality products and also be environment friendly and economically viable Creation of superior aquaculture products that will be of high demand outside NJ

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	300	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Barnegat Bay Shellfish Restoration

Shellfish harvesting was one of the main industries on which the early economy of Ocean County, NJ was built. The loss of hard clams and oysters that occurred in Barnegat and Little Egg Harbor Bay for various reasons over the last several decades, however, not only ended a commercial activity and way of life but also removed the filtration capacity and other ecological services provided by shellfish. Restoration of shellfish beds in Barnegat and Little Egg Harbor Bays offers both an environmental benefit as well as an educational benefit.

What has been done

Extension marine agents have implemented the Barnegat Bay Shellfish Restoration Program (BBSRP) (http://ocean.rcre.rutgers.edu/marine/bbsrp.html), which is a joint effort between RCE of Ocean County and NJDEP Bureau of Shellfisheries. It has spawned a non-profit organization called ReClam the Bay, Inc. (RCTB). The leadership in RCTB (www.reclamthebay.org) helps with volunteer organizations shellfish nursing, gear maintenance, fundraising and environmental education. Two years ago the BBSRP won the Seafood Industry Award from the Jersey Shore Partnership, and this year RCTB won a Governor's Award for Excellence in Tourism for the 'Clam Trail,' a public art and science education scavenger hunt and Honorable Mention in the Governor's Environmental Excellence Healthy Ecosystems Category. Also, the program won a National Gold Award for Innovative Program form the Association of Natural Resource Extension Professionals, as well as a Communications Award for their radio outreach work.

Results

The program in its three years has successfully raised through the nursery stage about 3 million clam seed and 500,000 oyster seeds. The clams have been planted in Barnegat Bay in three locations and the oysters have been placed on a reef in the Mullica River and on a newly established reef at the mouth of the Toms River. However, the program has benefits far beyond the restoration of shellfish to our local coastal waters. The education portion of the Barnegat Bay Shellfish Restoration Program extends far beyond training volunteers to grow shellfish. Some accomplishments of the program include:

-The program has seen constant growth in volunteer members, shellfish grown, upweller sites, press coverage about the program in local daily and weekly newspapers, radio and TV shows explaining the role of shellfish in the overall environment, and local businesses involved in spreading the message. In total, over 4,700 hours have been donated, which is equivalent to $100,325 in volunteer labor.

-The shellfish program has successfully worked with students at the Ocean County Marinte Academy of Technology and Environmental Science (MATES) to research issues related to shellfish aquaculture and water quality for their senior projects. These research and applied science projects give the students a real world insight into the environmental problems and possibly how to solve them, helping them better understand fields of study that they can pursue in college.

-63% of participants who completed course evaluations rate the educational value of the program excellent (37% good). Sixty percent found the utility of the program materials received excellent (37% Good, 3% Adequate). In addition, all volunteers rated the preparation class as excellent (55%) or good (45%).

-Since one of the main goals of this program is increasing stewardship, questions were asked about participants' desire for involvement in watershed activities. One hundred percent of participants stated they would continue to be involved in the program after their volunteer commitment was fulfilled. This is a 63% increase from pre-class intentions. In addition, 85% stated they had greater desire to be involved in environmental decisionmaking in their communities after the course, and 38% said they already had become more involved as a result of the course. The public value to the community and shellfish industry are evident as a result of these programs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
135	Aquatic and Terrestrial Wildlife

V(H). Planned Program (External Factors)

External factors which affected outcomes

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