

V(A). Planned Program (Summary)

Program # 8

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: 2010 | Extension | | Research | |
|------------|-----------|------|----------|------|
| | 1862 | 1890 | 1862 | 1890 |
| Plan | 25.0 | 0.0 | 13.0 | 0.0 |
| Actual | 18.0 | 0.0 | 1.0 | 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 |
| 217810 | 0 | 124108 | 0 |
| 1862 Matching | 1890 Matching | 1862 Matching | 1890 Matching |
| 1327658 | 0 | 402113 | 0 |
| 1862 All Other | 1890 All Other | 1862 All Other | 1890 All Other |
| 133750 | 0 | 86446 | 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

Extension

- 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 monitoring and recommendations.

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
- New Jersey residents
- School faculty, staff and children
- NJAES researchers
- Secondary and university students
- Governmental agencies
- Environmental organizations
- Agricultural, landscape, fine turf and other related industries

2010

3300

0

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 results in 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 | Long Term - Upland Fruit (Tree Fruit and Grape) Integrated Pest Management Delivery: 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. |

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 Measure

Outcome #2

1. Outcome Measures

Medium Term - Research and educational programs, and public awareness campaign results in 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 |
|-------------|----------------------------|---------------|
| 2010 | 2500 | 0 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Pesticide Safety Information Program/Integrated Pest Management Program

Pesticide Education and Safety Program (PESP): Currently in New Jersey there are 15,000+ certified applicators registered with the New Jersey Department of Environmental Protection (NJDEP) - Pesticide Control Program. Of these, approximately 3,000 are private applicators. To remain certified New Jersey law requires that private and commercial applicators accumulate at

least 12 hours of recertification training divided between CORE (4) and CATEGORY (8) classifications during a five-year period.

Integrated Pest Management Program (IPM): During FY10 the IPM programs coordinated by Rutgers Cooperative Extension encompassed production agriculture in the areas of blueberries, nurseries, greenhouses, tree fruit, and vegetables. Research conducted by faculty and staff connected to these various programs is helping to increase the adoption of IPM and at the same time reduce reliance on pesticides as the sole pest management tool being used.

What has been done

Approximately 25,000 applicators were recertified by the PESP program in 2010. This program also offered initial CORE training sessions in English and Spanish for commercial operators and applicators. Finally, this program provides training to school employees and master gardeners so they understand the proper use of pesticides and the issues surrounding their use.

Results

As a result of the PESP program, several thousand private pesticide applicators, and commercial pesticide applicators and operators were provided with basic information that allowed them to conduct their jobs in a safe manner. In addition, information and training provided by this program gave growers and other applicators the skill set necessary to successfully complete their state pesticide licensing exams. In doing so, the application of pesticide in the state is a safer operation that is being done in a manner that does not create a hazard to applicators, workers or the general public. As a result of the IPM program, benefits were seen in the areas of fruit, greenhouse, nursery and vegetable production systems. The various programs were able to document the following benefits: Pesticide use in tree fruit was reduced between 50% to 80% for Oriental fruit moth control. Growers in the vegetable IPM program received more timely information that resulted in less pesticide use, Nursery growers were better able to predict pest outbreaks and more effectively manage these outbreaks, greenhouse growers were better able to manage pests and reduce insecticide and fungicide use because of the scouting program provided by the greenhouse IPM program.

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 |
|------|---------------------|--------|
| 2010 | 3000 | 0 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Blueberry and Cranberry Insect Pest Management - Towards the Development and Implementation of Reduced-Risk Strategies

The blueberry and cranberry industry in New Jersey suffers major yield losses due to insect pests. Growers rely heavily on insecticides to manage pest problems.

What has been done

The Blueberry/Cranberry Entomology Program at Rutgers University focuses on the development and implementation of cost-effective reduced-risk insect pest management practices in blueberries and cranberries and the dissemination of this information to blueberry and cranberry growers. Several methods of information transfer including annual grower meetings, field days, twilight meetings, newsletters, and electronic media are used to serve the blueberry and cranberry industry in New Jersey.

Results

Researchers at NJAES have developed and implemented new tools for monitoring insect pest populations in blueberries and cranberries; worked with IR-4 on the registration of new insecticides in blueberries and cranberries; evaluated, implemented, and promoted adoption of new reduced-risk strategies for insect control in blueberries and cranberries. These strategies have had a positive impact on the environment and the well being of humans and their communities.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|---------|------------------------------------|
| 216 | Integrated Pest Management Systems |

Outcome #4

1. Outcome Measures

Long Term - Upland Fruit (Tree Fruit and Grape) Integrated Pest Management Delivery: 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 |
|-------------|----------------------------|---------------|
| 2010 | {No Data Entered} | 0 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Upland Fruit (Tree Fruit and Grape) Integrated Pest Management Delivery

New Jersey tree fruit production is located in both southern and northern counties. Statewide in 2010, tree fruit was valued at \$21.2 million for apples and \$31.3 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 approximately \$10-\$15 million.

What has been done

An integrated crop management (ICM) program was delivered to commercial fruit growers who produced apples, peaches, and nectarines. Growers and industry personnel were trained throughout the season and at several annual winter meetings.

Results

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 \$52.3 million throughout the state for tree fruit and \$39 million for grapes. Laboratory tests were completed in 2010 as part of the fertility component. Over 75% of areas sampled were shown to have sufficient phosphorous levels, which led to decreased phosphorous use on those sites.

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

See Qualitative Outcome and Impact Statements

Key Items of Evaluation