Project/Activity Number:

NEERA 1004

Project/Activity Title:

NEERA1004: Northeast Region Technical Committee on Integrated Pest Management

Report Information:

Annual Meeting Dates: 03/5/13 to 03/6/13

Period the Report Covers: 04/2012 to 03/2013

Participants:

Chandran, Rakesh - WV IPM Coordinator; Legrand, Ana - CT IPM Coordinator; Elmer, Wade - Conn. Ag. Exp. Station; Whalen, Joanne - DE IPM Coordinator; Madeo, Linda - NE IPM Center; Koplinka-Loehr, Carrie - NE IPM Center; Hoffmann, Mike - Experiment Station Dir., Cornell Univ; Lerman, Dion sub for Rajotte, Ed - PA IPM Coordinator, Hamilton, George - NJ IPM Coordinator; Eaton, Alan - NH IPM Coordinator; Hooks, Cerruti - MD IPM Coordinator, Seaman, Abby sub for Grant, Jennifer and Petzoldt, Curt - NY IPM Co-Coordinators; Herbert, Steve - Extension Director, UMass; Coli, Bill - MA IPM Coordinator; Cooley, Daniel - UMass; Hazelrigg, Ann - VT IPM Coordinator; Casagrande, Richard - RI IPM Coordinator; Draper, Martin - USDA NIFA; Green, Tom - IPM Institute; Grubinger, Vern - SARE Northeast Region.

Brief Summary of Minutes of Annual Meeting:

The following topics were discussed at the meeting:

1) IPM Professional Community Building Training, Errol Mazursky – ELP. Half day training session on leadership and IPM professional community interactions.

2) State IPM Programs Reports, IPM Program Coordinators - See summaries in this report. EPA Regions 1 & 2 Updates were distributed as handouts. See summaries in this report.

3) National IPM Update, Marty Draper

FY Continuing Resolution until March 27 2013 based on flat funding from previous fiscal year. Final 6 months of 2013 not funded yet. Sequester funding level of 3/1/13 likely not to be reversed (will become the base for next FY).

Farm Bill: Authorizes all NIFA spending and appropriates funding for mandatory programs. The 2008 bill expired September 30, 2012 but on January 1 the Farm Bill was extended for 9 months until Sept. 30, 2013.

Update on Extension IPM - Coordination and Support Program RFA
The RFA asks for submission of a notice of intent to apply which needs to include proposal title, names of PD and Co-PDs, application type, and suggestions for 3 reviewers who do not have a conflict of interest with the applicant. The proposal deadlines is April 16th 2013.
Funding available totals $8.5 million to be split into coordination program ($8.2 million) and $300,000 for the support program. Indirect costs are not allowed and projects are capped at $300,000. Budgets need to cover a 3 year project plan with possible no-cost extension.

Two PCAST reports were recommended: Transformation and Opportunity: The Future of the U.S. Research Enterprise, Nov 30, 2012; and Agricultural Preparedness & the United States Agricultural Research Enterprise, Dec. 7, 2012. This last report emphasized IPM.

Changes to CRIS: Information on old projects to be found in the CRIS database. New project information will use REEport which was deployed April 1, 2013. PDs need an account thru NIFA reporting portal: leadership management dashboard
http://www.nifa.usda.gov/business/pdfs/reeport_web_train_reg.pdf

4) Northeast Experiment Station Directors Update, Mike Hoffman

An update was given on the response by the Association of Public and Land-Grant Universities (APLU) Budget and Advocacy Committee (BAC) response to the Integrated Crop Protection Program proposal. A copy of the working group's discussion paper (Jan. 29th, 2013) was handed out. The BAC recommended the use of Pest Management Program for the title of the new proposed program.

5) Northeast Extension Directors Update, Stephen Herbert

Steven Herbert travelled with the congressional CARET delegations

6) NE IPM Center Update & NE IPM Center Grant Programs, Carrie Koplinka-Loehr and Linda Madeo

The NE IPM Center obtained the following grants in 2012: Administration of the NE Region IPM Competitive Grants Program ($20,000), Northeastern IPM Center ($951,380 for 2012-2013) and Promoting IPM in Affordable Housing (HUD IAA, $318,182 for 2012-2013). Summaries of each grant were distributed.

The NE IPM Center conducted its Partnership Grants Program and awarded a total of $178,022 in FY 2013 to 11 projects (5 working group projects, 6 issues in IPM projects and 1 communications project). A report was given on web traffic related to 3 websites hosted by the NE IPM Center (Northeastipm.org, StopPests.org and StopBMSB.org). In other outreach efforts, the Center is working on videos regarding the brown marmorated stink bug and distributed 800 printed copies of the IPM Guide for Affordable Housing.

The NE IPM Center is hiring a program evaluation specialist who will help with evaluation of the center efforts as well as provided assistance to project applicants. The Center also presented an update on funding diversification efforts.

7) NRCS funding for IPM activities, Tom Green, Rakesh Chandran

Tom Green addressed the group and provided an update on the IPM Institute and the NRCS and IPM Working Group efforts to promote IPM through NRCS funding. A presentation was given on how NRCS Conservation Programs can help with IPM implementation, on how Extension can collaborate with NRCS and how interested persons can be trained to become a Technical Service Provider.

8) Organic & IPM Summit Update & Discussion, Carrie Koplinka-Loehr

A Roundtable Meeting on Organic and IPM was held on Nov. 7-8, 2012 at the National 4H Center. Twenty five persons attended, leaders from IPM and organic areas of work, and discussed areas of mutual interest and how best to work together. A proposal to establish a national working group on organic and IPM. Deputy Secretary of Agriculture (Kathleen Merrigan) also spoke with the group.

9) Coordination of NE Extension Fact Sheet Development, Richard Casagrande

Information for web-based fact sheets from many states is taken from other states and the fact sheets do not contain the most up-to-date information. The regions can use more fact sheet coordination – perhaps by the NE IPM Center. The brown marmorated stink bug website from the NE IPM center is an example. Fact sheets for important NE pests should have authorship, reviewers, and date indicated. This is most needed for homeowners fact sheets. IPM Coordinators could work with NE IPM Center on this but also need to have buy-in from AES directors and Extension directors. Group members (Ann, Ana, Dick, Alan) interested on this work will continue with further conversation on developing a proposal to meet this need. The following points were made: finite number of fact sheets needed - about 100; wouldn't it be nice if there were a regional fact sheet?; make list of 50 most needed fact sheet, decide by teleconference; give author $500 honorarium; IPM in and around the home; resources database; prepare set of NE fact sheets; go to deans and ask them to pull down old stuff; each state would work with Master Gardener program; branding of IPM for homeowner; duplication of effort for each state to have its own fact sheet; promote IPM if we go through effort of making the fact sheets.

10) SARE Update & RFA Question, Vern Grubinger

NE SARE currently is managing 7 grant programs. Many proposals address pest issues but single pest project proposals with a single approach are often reviewed negatively as they are not comprehensive enough. The question to the NEERA group was for feedback on how SARE and IPM grants can / should differ. SARE emphasizes that 'holistic' approaches to IPM are more compelling to SARE reviewers (multiple strategies for managing a pest, farmscape-level approaches, and inclusion of economic/environmental issues not just production). IPM Coordinators were asked for ideas on how best to describe this to applicants. Some comments included consideration of IPM levels (basic vs. advanced, IPM Continuum).

11) Region-wide vs. state-specific IPM program coordination, Rakesh Chandran

Rakesh Chandran suggested a discussion on region wide coordination based on some personal observations after writing a book chapter related to IPM Implementation in the NE (this book is

edited by Pimentel and Peshin published by Springer). Background information for the book chapter was gathered from CRIS and PPRS reports submitted by IPM coordinators in the region over the past 12 yrs. or so. Some of the key points from this review that Rakesh shared were:

a) NE states have carried out effective IPM programs and have documented significant impacts/outcomes over the past two decades. A good and proven structure exists to continue to do so.

b) There were IPM issues based on commodities/program areas common to most/all states (e.g. tree fruits, row crops, school, housing, turf, animal husbandry, greenhouse etc.) where region-wide programming may be more effective and may result in efficient use of resources. Especially the larger states such as NY, PA, NJ etc. may want to play a lead role based on infrastructure and personnel.

c) However, most states have specific IPM programming needs and capacity to carry out programs and to capitalize the specialized resourcefulness of IPM specialists in each state would be considered useful.

d) When it comes to IPM adoption/implementation, the bottom line is economics for the grower. Unless cost-share programs are available to offset the higher costs associated with IPM approach as opposed to conventional methods, the average grower will choose the conventional approach.

12) Review and update of NEERA IPM research and extension priorities, NEERA Group

The following were listed as priority pests/issues:
Emerging insect pests: spotted wing drosophila, brown marmorated stink bug (BMSB)

Others: winter moth, Western bean cutworm, Swede midge

Ticks & Lyme disease: regional education on Lyme disease, mosquitos management

Diseases: late blight of tomato, 'Summer Rots', boxwood blight, impatiens downy mildew

Other priorities:
Weed management in orchards (mentioned by Eco Apple), weed management in general (both agric. and community), fungicide resistance (stimulating use of old "bad" pesticides) Streptomycin resistance and fire blight in apples, resist cultural and alternative practices for management of emerging pests, how to differentiate advanced IPM from basic levels, coordination or extension work regarding pesticide bans (learn from others who have already dealt with it), Garlic mustard (may be controlled by a couple of weevils, but don't need to pull it), secondary effects on other pests (scales, mites, etc.) of current controls being used for BMSB, thresholds for BMSB, pest management in high tunnels (NRCS is cost-sharing the tunnels with growers.), homeowner use of pesticides & homeowner IPM, white grub management, guidelines for use of biocontrol; more emphasis on bio-based pest management, and region-wide weather-based decision support - making sure NEWA stays in business (states may not be able to pay the fee required).

13) NEERA Working Group proposal:
Group discussed the idea of forming a working group to obtain funding. Funding or WG could cover help to handle all the administrative tasks and shepherd projects along. It could also fund professional development programs for the group and/or educational efforts on IPM success stories such as DVD about the Northeast IPM work.

Another idea discussed was a Speakers' Bureau. It can reach new audiences, who would do this and how much it will cost? Who will be the audience?

14) Next annual meeting, Chair-elect, Ann Hazelrigg

Ann Hazelrigg is the new Chair for NEERA and will coordinate next meeting (possibly in VT) in 2014.

Accomplishments and Impacts

State Reports:

New York State IPM Program - Abby Seaman

Agricultural IPM Research

- A survey of tomatoes as a potential host crop for spotted wing drosophila showed that larvae infested only cracked fruit, but in a no-choice lab test, larvae could develop on intact tomato fruit.
- Research on alternatives to Sevin for grape berry moth and grape rootworm showed no statistical difference in leaf feeding by grape rootworm between Sevin and the alternative products.
- The western bean cutworm statewide monitoring network resulted in more than twice the catch of male moths in 2012 compared to 2011, with no economic damage reported to date for 2012.
- The soil characteristics of growers' fields that may contribute to the development of root rot diseases on Christmas tree plantations are the focus of a trial on 4 farms in NYS.
- Spring applications of copper on pruning cuts in cherry provide little to no protection against bacterial canker of sweet cherry. Pruning after harvest and leaving pruning stubs can reduce disease severity. This knowledge should reduce copper use in cherry orchards.
- A soil temperature estimator developed as part of a NYS IPM mini-grant, and weed germination simulations based on growing degree days and soil moisture are the basis for models that will be incorporated into the online Network for Environment and Weather Applications (NEWA).
- An orchard commodity survey in 2012 did not find any quarantine pests. However, three new apple orchard locations with streptomycin-resistant fire blight were identified in the state.
- Spotted wing drosophila was found in all locations surveyed in NY, with an August-September population peak. Crop loss estimates are at 80% for fall raspberries and 30% for blueberries.

– Increased energy costs have caused greenhouse bedding plant growers to produce their crops at cooler temperatures. While effects on the crops have been studied, there is little research on the effects of cooler temperatures on the pests and the beneficial insects used to control them. Initial results suggest that fungus gnat populations develop more slowly but that there is still some activity of nematodes used to control them.

Agricultural IPM Extension

– The NYS IPM Field Crops Pest Report, in its 11th year and based on a weekly field crop IPM extension educator conference call, is available on-line at the NYS IPM web site, Cornell's field crop extension web site "fieldcrops.org" and was distributed to 11,000 people through two Field Crops list-serves and used in local extension and consulting firms' newsletters.
– Through the Livestock Biting and Nuisance Flies IPM meeting series, 12 meetings were held in Eastern NY reaching 110 participants. 91% of the producers surveyed said in future they would use IPM economic thresholds and 70% said they would reduce pesticide use by using IPM techniques.
– Use of a phenology based degree day model in NEWA for grape berry moth was instrumental in moving the average first insecticide application up almost 3 weeks earlier than average in accordance with the extremely early bud break and warmer than average temperatures.
– Resources for organic growers, including revisions of the Organic Production Guides and organic efficacy trials for arthropod and plant disease management, were completed in 2012
– The first sections of a decision support system for vegetable pest management are on-line. This allows growers to get specific pest management information based on crop, pest and date.
– All of the 35 participants of a Christmas tree and nursery grower twilight meeting highlighting a *Phytophthora* root rot field trial and weed identification and management reported that they better understood conifer pest issues after attending the meeting.
– Ten growers participated in a project on increasing the level of IPM adoption in Christmas tree production. After working for 2 years with local Extension educators, each grower implemented from 1-3 new IPM activities on their farms.
– To date, the 16 IPM In-depth programs held in 14 locations throughout the state have reached over 250 greenhouse growers, including an increasing number of greenhouse vegetable growers and new/potential farmers. Eighty-four percent reported their intent to change production practices at their operation based on what they had learned

Community IPM Research

– 50 rodents from an underground location have been collected for a survey of pathogens & parasites of rodents in urban areas. The second phase of this project is to survey rodents from housing locations.
– Research comparing golf course management systems continued for a 12th year, and reduced chemical management practices were taught intensively to 29 State Park Golf courses. Those courses reduced their environmental impact by 31% from 2001 to 2011.

Community IPM Extension

- The remediation approach for cockroach management suggested to an elementary school has resulted in an 80% reduction in cockroach numbers. A task force with parent input has been formed and an IPM logbook for the facility has been developed and implemented.
- A You-Tube video on rodent ID and management is in development. It is the first of a series of short videos on pest biology, identification, and treatment being developed in English & Spanish.
- IPM STAR re-certification assessments and workshops, for evaluating IPM practices in schools, were held for the Ithaca, Seaford and Buffalo City School Districts. Workshops on STAR certification were held in Nassau and Suffolk counties.
- An online pest identification guide was created to allow homeowners to systematically identify common structural pests and obtain information about pest biology and management.
- An online pesticide certification course is in development that teaches professional pest managers how to identify, inspect and best treat bed bug infestations.
- Members of the IPM Program are key components of the Nassau County Bed Bug Task Force, which addresses bed bug issues in Nassau County private and public housing and holds workshops Island-wide for a variety of audiences. People trained include nurses, social workers, school facilities managers, housing inspectors, public heath inspectors, housing managers, property owners, and those directly affected by bed bugs.

Budget Information: Funding for the New York State Ag IPM Program was included in the Governor's proposed state budget in 2013-2014 for $500,000, the same as the Program received the past 3 years, but approximately half of previous levels. There is a proposed legislative add-on of $400,000 for Community IPM for 2013-2014 – similar to what we received last year. We were able to hire two temporary staff members in 2012, one working in vegetables, the other in community. We were unable to fill a School IPM position in Eastern NY. If these budgets pass as proposed, we hope to create regular Extension Associate positions in these three areas.

Maryland IPM Program - Cerruti Hooks, IPM Program Coordinator

Several field-days and presentations at annual winter meetings and workshops (20) were directed at vegetable and fruit growers, consumers and college scholars in MD and DE. Attendees (~ 2500 total) were trained on how to use new reduced risk insecticides, ecological pest control tactics and cover crops in their disease, weed, and insect IPM programs and appropriate fertilizer rate for vegetable production. All specialty crop growers were trained on how to manage new pests, brown marmorated stink bug and spotted wing drosophila at several venues within and outside of MD. Training programs and PPt presentations were used or expanded to help growers wishing to produce vegetables but lack proper training or become better organic farmers. Experiments are underway to demonstrate fungicide forecaster effectiveness with new fungicides that were not available when MelCast forecaster system was developed. Pamphlets are being produced to aid farmers in proper identification of weed seedlings. Articles were submitted to a weekly crop update (WCU) newsletter which is mailed to vegetable stakeholders and published on line (http://www.rec.udel.edu/TopLevel/Publicat.htm). WCU has 119 subscribers, and receives circa 128 internet hits/week. The most recent survey, growers reported that they used the information on over 63,000 acres in DE, MD, VA and PN. Training on Japanese maple scale

biology and management was presented via a National IPM Webinar. Green industry professionals were trained on the influence of native and non-native plants towards the biological control of insect pests and biological control of invasive species at various conferences. IPM information on pests and beneficials of ornamental systems was disseminated to green industry professionals, extension educators/MGs and government personnel via electronic bi-weekly and weekly pest alert documents. An educational tool (IPM Training Packet) was developed for high school teachers to assist in teaching greenhouse management in MD high schools that included lesson plans, lab exercises, and pre- and post-exams on IPM, nutrient management, and water management skills in greenhouse production. The lesson plans were presented to 46 MD teachers at their summer annual meeting and posted on line at www.IPMnet.umd.edu. MD extension personnel contributed to a multi-state research/extension project headed by USDA ARS in WV and University of Tennessee to combat the invasive BMSB and development of the 1st smart phone app (IPM Pro) for pest, disease and horticultural information for nursery managers (http://www.ipmproapp.com/), respectively. PPt presentations were developed for MGs that focused on pest biology, identification, diagnosis, and damage. These were used as advanced teaching tools in several counties and presented at MG training conferences. Presentation (PPt) and accompany handouts on diagnostics and IPM of invasive species were delivered to professional audiences at 23 national, regional, and local meetings in 9 states and DC. In addition, diagnostic and IPM information on 10s of native and exotic pests have been shared with millions of viewers and listeners worldwide via newspapers, radio, and major television networks during this reporting period. Outdoor educators and MGs (~ 1025) received training on ecological IPM at 26 various training venues held locally and regionally. Among attendees 73% rated the training as excellent and 100% thought the information was very useful. MGs then answered questions and solved plant and pest problems posed by 15,500 residents using learned IPM principles. YouTube videos were produced for Grow It, Eat It program. A few are CSI in the Veg Garden (published 7/22/11; 3,198 downloads) and IPM Basics (published 7/29/11; 2,411 downloads) and BMSB (published 9/13/11; 10,564 downloads). A “Plant and Pest Problems” website (http://www.growit.umd.edu/PlantandPestProblems/) was developed as a part of a larger vegetable gardening website. In October 2011, our PSEP director served as an instructor at a national train-the-trainer session that was sponsored by NASDA Research Foundation. The training helped ensure educators are ready to use the clicker-integrated PPt presentations.

Pennsylvania IPM Program Report:

A copy of the IPM program annual report was distributed. A copy can be obtained from Ed Rajotte (uvu@psu.edu), IPM Program Coordinator.

Delaware Extension IPM Program - Joanne Whalen, IPM Program Coordinator

I. Funding: Delaware’s Extension IPM Program is primarily funded by E-IPM Coordinator-Support and State IPM funds. Although we continue to receive state funding primarily for personnel, the 2011 reduction in IPM funding has not been restored. Additional support for program activities is received from various sources including the Delaware Soybean, United

Soybean Board, State Specialty Crop Block Grants, SCRI grants, NERIPM grants and Agribusiness Grants.

II. Key Pests:

(a) Brown Marmorated Stink Bug – Although damage was generally less in 2012, the potential for damage in 2013 is higher due to fall population trends. Significant outcomes of Delaware's research and extension efforts include documentation of the effectiveness of edge treatments for BMSB management in soybeans; participation in regional trapping trials of a promising pheromone known as "odor #10"; expansion of our statewide black light trapping program to detect spread of BMSB in DE; submission of Section 18's for management of BMSB in fruit; and research in sweet corn to develop and evaluate thresholds and key growth stages for damage.

(b) Spotted Wing Drosophila – The trapping program was expanded and detection occurred in all three counties in 2012. Larval damage was detected for the first time in bramble plantings. (c) Western Bean Cutworm – Moth counts remain low; however, it can now be found in traps statewide. The first larvae were detected at very low levels in one commercial field corn site in New Castle County.

(d) Palmer Amaranth and Texas Panicum – In the spring, the DE Noxious Weed Committee decided to add two new species to the list. This involved a concentrated extension effort to make DE farmers aware of these species, how to identify the species, and develop management strategies for agronomic and commercial vegetable crops. A technical bulletin on both species was developed.

III. Staffing – We have just finished the search for an Extension Plant Pathologist. We hope to have someone in place by the summer growing season. However, this will not allow for the inclusion of a Plant Pathologist on the submission for the E-IPM Coordination and Support Grant due April 2013.

IV. Program Highlights

Specialty Crops - Vegetables – In 2012, our Soil Health Initiative to address soil borne diseases, nematodes and weed management on 19 processing vegetable farms moved to stage three where additional prescriptive treatments were implemented including biofumigants, biodrilling, composts, cover crops and green manures. The 2013 season will focus on assessment of prescription effectiveness including re-assessing the sites for change, identifying what limitations were alleviated, identifying any new limitations and assessing improvement of overall health of the soil. University of Delaware Specialist involved in the assessment of prescriptive treatments include Gordon Johnson, Extension Vegetable Specialist, Joanne Whalen, Extension IPM Specialist, Mark Van Gessel, Extension Weed Specialist, and Kate Everts, Extension Plant Pathologist (University of Maryland, joint University of Delaware appointment). Two watermelon native pollinator demonstrations were conducted using buckwheat and sunflowers as supplemental plantings to enhance native pollinators. These two "pollinator crops" provided a viable source of "food" for native pollinators and were a better fit for our production area. Wildflower plantings proved to be poor supplemental plantings in our area due to weed management and irrigation needs. One small farms sustainable demonstration was conducted by Rose Ogutu, Horticulturalist from Delaware State University, to demonstrate the effectiveness of

mulches to manage insects and weeds in eggplant and tomatillos. This demonstration was highlighted in one field tour in 2013. Field tours and fact sheets will be developed in 2103.

Insect Trapping Systems for IPM Decision Making in Processing and Fresh Market Vegetables: Thirteen black light traps and eleven corn earworm pheromone traps were placed on vegetable farms throughout Kent and Sussex counties, Insects monitored in black light traps includes European corn borer, corn earworm and all stink bug species. Survey results indicate that trapping information was used to make management decisions on the following crop acres: (a) Processing Lima Beans: 15,800; (b) Fresh Market Peppers: 180; (c) Fresh Market Snap Beans: 1350; (d) Processing Snap Beans: 1550 (includes some VA acres); (e) Fresh Market Sweet Corn: 4,000; and (f) Processing Sweet Corn: 12,500 (includes MD acres in adjacent counties to Delaware). Respondents indicated that the trapping program helped to prevent yield loss on over 35,000 acres of vegetables. They reported savings in terms of yield loss for fresh market and processing snaps beans and fresh market sweet corn averaging $44 per acre. Producers and consultants using trapping information to make spray decisions also reported improved quality of fresh market snap beans and sweet corn valued at an average of $50 per acre.

Specialty Crops – Christmas Trees – Brian Kunkel, Extension Ornamental IPM Specialist, and Nancy Gregory, Plant Diagnostician, worked with Delaware Department of Agriculture inspectors to deliver IPM programs to Christmas tree growers in all three counties. Farm visits and winter workshops were used to educate Christmas tree producers about insect identification, scouting and alternative controls for insects and diseases.

Agronomic Crops – Programs included demonstrations on the economic and environmental benefits of the use of perimeter sprays for stink bug management in soybeans and the use of vertical tillage and cover crops for slug management in no-till field corn. Kudzu Bug is currently causing significant economic losses to southern soybean systems with losses from this pest averaged 18% yield loss. This insect is considered a “hitch hiker” like BMSB so early detection of presence in Delaware is critical to prevent losses in Delaware fields. A survey of 75 soybean fields and 10 kudzu sites conducted in 2012 was supported by the Delaware Soybean Board. Although this insect was found in 19 counties Virginia in 2012, it was not detected in Delaware by the end of the season.

Consumer/Urban - Demonstration gardens located in each county were used as phenological indicators to assist landscape professionals and Master Gardeners with pest management decisions. Signs installed near plants in the gardens describe when to start scouting and possibly time insecticide applications according to plant phenology. Additional demonstrations in these gardens including improper planting practices (excessive mulching) and identification of biological control agents have been used for Master Gardener and homeowner workshops. Multi-lingual fact sheets have been developed to educate Spanish speaking clientele about the benefits of IPM as well as how to attract beneficial insects with companion plantings.

Weed IPM Programs – (a) Improving Weed and Insect Management in Organic Rotational No-Till – The overall goal is to develop sustainable reduced-tillage organic feed grain production systems that integrate pest (weed and insect) and soil management practices to overcome production constraints associated with high residue, reduced-tillage environments. This program focuses on the interactions between weed, insect, and soil-management methods for organic production of small grains, corn and soybeans. Studies also include a soil quality component. (b)

Regional Research Project on Weed Biology and Management. Delaware is involved in looking at is how best to manage weeds to eliminate the production of viable seeds. Research involves terminating the plants at various times using herbicides or methods to simulate hand-weeding or mowing. (c) Weed Science Society of America Sponsored Tour for US Environmental Protection Agency "Herbicide Resistance Issues in the Mid-Atlantic State". – The Mid-Atlantic region has been dealing with herbicide resistant weeds since 1972. In August 2012, a one day tour of four sites in MD and DE was organized to allow EPA, local weed scientists, and other Weed Science Society of America members the opportunity to discuss herbicide resistant weeds and their impact on agriculture in our region.

New Hampshire IPM Program - Dr. Alan Eaton, coordinator and Extension IPM Specialist

Key Personnel, 2012:
Dr. Alan Eaton, coordinator and Extension IPM Specialist
George Hamilton, Field Specialist, Food and Agriculture
Rachel Maccini, Education Center Director
Suzanne Hebert, Administrative Assistant
Linda Kuhnhardt, Scout
Significantly involved, but not funded via IPM funds:
Dr. Cheryl Smith, Plant Health Specialist
Dr. Brian Krug, Greenhouse and Floriculture Specialist
Dr. Becky Sideman, Sustainable Horticulture Production Specialist

Budget and Reorganization: In early 2011, the New Hampshire legislature cut the appropriation for the university system by 48%. Simultaneously, one of our ten counties (Strafford) eliminated all support for cooperative extension, and two others made significant budget cuts. As a result, we lost many people, and went through a complete reorganization. Specialists and county-based educators had to re-apply for their jobs. Thanks to grant funding from NIFA and the NH Department of Agriculture, Markets & Food, the extension IPM work continues, but we lost significant team members. We devoted a lot of time to figuring out how to operate in the new posture.

Major activities in 2012:

Management of arthropod-borne diseases: NH ranks 3rd among 50 states in the incidence of Lyme Disease. We are in the top 10 in Babesiosis and Anaplasmosis. For a while we were in the top ten for EEE as well. Our efforts aim to inform and empower people to avoid getting one of these diseases. This year I'm planning a major tick sampling effort, to refine the blacklegged tick distribution map for NH. This will involve tick dragging, and examining deer and moose at hunter checking stations. My tick publication is being updated with new information now, including statistics on Babesiosis and Anaplasmosis in NH. I estimated NH's tick disease burden at nearly $4 million/year.

Tree Fruit: We continue to show lowered incidence of pest injury on apples, and reduced spraying, compared to pre-IPM levels. The incidence of pest injury in 2012 was 3.0%. This is

below the 25 year average of 5.28%, and well below the pre-IPM average of 10 to 12%. New pests (for us, anyway) are challenging that situation: oblique-banded leafroller, Oriental fruit moth, possibly winter moth.

Small Fruit: In 2011, we completed a major project on blueberry fruit fly, improving grower's understanding, use of traps, and reducing un-necessary spraying. Then spotted wing drosophila arrived. Our fall 2012 grower survey revealed $1.5 million in crop loss to SWD this year, with heaviest losses in blueberries. Cherries and "June" crop of strawberries escaped. From mid-June through fall, we monitored 178 SWD traps, on 17 farms.

Sweet Corn: With funding from NH Dept. of Agriculture, we were able to continue our sweet corn trapping and scouting program, which is largely focused on Hillsborough and Merrimack Counties. Growers still report that the program significantly reduces culling (throwing out caterpillar-infested ears). Typically we save them $150,000/year. 2012 savings data haven't been completely analyzed yet. George Hamilton largely oversees this and the squash vine borer monitoring program.

Greenhouse IPM: After dis-solution of the Young Plant Center at UNH, we reduced our efforts in this commodity, but still run tri-state greenhouse meetings. Over the years of the Tri-State (VT, NH, ME) program, we have seen a steady increase in the percentage of greenhouse growers who try non-chemical controls.

Grass-parasitic Weed: We surveyed 58 hay fields in 5 NH counties, for *Rhinanthus crista-galli* L., known as yellow rattle. This surprising weed can kill grasses in one year, and is largely unknown to NH hay producers. We found the weed in 48% of the fields. We developed a response plan, and are disseminating identification and management information now.

IPM for Consumer/Urban Environments: Much of the IPM work directed at homes, gardens and urban settings is through the Cooperative Extension Education Center, now located in Goffstown. The toll-free info telephones, twice weekly TV spots, and Master Gardener program are run from this facility. Each year we train about 60 new Master gardeners, and handle roughly 3000 pest-related inquiries.

Impacts & Successes

Because of the Extension Integrated Pest Management program, NH apple growers reduced their pesticide spraying and the incidence of pest injury, compared to pre-IPM figures. These impacts amounted to $212,000 in 2012. The overall incidence of pest injury on the crop was 3.00% this year. Before we introduced IPM, the incidence of pest injury on fruit was 10 to 12%, and growers sprayed insecticides, miticides and fungicides roughly 40% more than they do now.

Because of the extension IPM program, NH sweet corn growers reduced their spraying and culling (throwing out insect-infested ears) by an estimated $150,000 in 2012.

92% of the attendees [to Jan. 2012 Tri-State Greenhouse IPM Workshops] learned new techniques they intend to use in the coming year, biological control in general and specifically aphid biocontrol, quality control evaluation of biocontrol agents they purchase, attention to careful identification of their plant diseases and insect pests, beans as an early season trap crop.

75% of the attendees [at 2012 Tri-State Greenhouse IPM Workshops] used biological control last year: ME: 84%; NH: 65%; VT: 76%. Of those who used biological control, 82% used predators; 54% nematodes, 46% parasites, 20% insect killing fungi, 25% disease killing microbes (soil treatments) and 14% insect-killing bacteria. This figure has steadily gone up over the last 12+ years we have included this training. When we started these workshops, only 5 to 10% of growers had ever tried biological controls.

West Virginia IPM Program - Rakesh S. Chandran, IPM Coordinator

Stakeholder Committee and Pest Issues

West Virginia University IPM program formed a Stakeholder Committee to reach out to the citizens of West Virginia to gather inputs that would improve its outreach program in IPM. Apart from the pest management specialists at WVU, the Stakeholder Committee includes representatives of row-crops and commercial applicators (Mr. Dean Beasley, Moorefield), landscape and nurserymen (Mr. Chris Chanlett, Hinton), lawn-care industry (Mr. Dan Cheslock, Morgantown) commercial vegetable growers (Eli Cook, Slanesville), invasive species in managed woodlots (Dr. Cindy Huebner), organic producers (Dr. Clarissa Mathews, Shepherdstown), commercial fruit growers, (Mr. Garry Shanholtz, Romney), forage crops and county agents (Mr. Bruce Loyd), and the West Virginia State Dept. of Agriculture – Pesticides Regulatory Program (Dr. Peggy Powell).

A conference call was held to discuss and document current issues in various areas represented by the stakeholder group. In lawn-care, Cheslock expressed that IPM is very difficult to practice based on the knowledge level of a broad range of property owners. He felt that IPM-based educational materials and training opportunities would be beneficial for the lawn-care professionals and its stakeholders.

In vegetable production, Cook mentioned several pests of concern that included insects, diseases and weeds. He indicated that efforts to help vegetable growers to identify and manage pests would be very rewarding. He also indicated that nematodes are also becoming a concern in vegetables and tree fruit. In commercial vegetable production herbicides are used cautiously due to concerns about non-target injury.

In disturbed woodlots, Huebner indicated that invasive plants such as garlic mustard, Japanese stiltgrass, mile-a-minute, and tree-of-heaven, are a major concern. Currently there is a conscientious effort to include IPM tactics to manage these pests in natural areas due to concerns of herbicide movement and non-target injury, and development of herbicide resistance. More educational efforts are needed to bring up the awareness level of woodlot managers and the general public about IPM methods to manage invasive species.

A need for IPM-based resources for management of pests in schools was expressed by Peggy Powell. There is currently an emphasis to reduce pesticide use in school grounds and any guidance and informational resources provided by the University would be valuable. Weed control in school grounds and athletic fields is an area that would benefit from such resources.

Chanlett indicated any resources on IPM would be considered very useful by nurserymen and landscape professionals. Mathews mentioned that pests are a critical concern for organic growers in West Virginia. No effective methods are available to manage emergent pests such as brown marmorated stink bug. Diseases such as late-blight and weeds form a major impediment in organic production. The meeting was concluded with the members expressing strong support of WVU's programming efforts in IPM.

Recent Staff Changes

An Extension Entomologist and Plant Pathologist and Extension were hired by West Virginia University in 2011and 2012. Their contact information are as follows:

Dr. Daniel Frank, Extension Entomologist and Assistant Professor, West Virginia University. Tel.: (304) 293-8835; email: dlfrank@mail.wvu.edu

Dr. Mafuz Rahman, Extension Assistant Professor & Specialist – Plant Pathology, West Virginia University. Tel.: (304) 293-8838; email: mm.rahman@mail.wvu.edu

Tree Fruit IPM Program

Efforts were initiated to initiate Tree Fruit IPM program with NRCS by following the new practice standards. The IPM Coordinator and the Extension Entomologist met with NRCS officials who expressed interest in continuing it as an EQIP-eligible practice. The goal was to choose IPM-oriented practices from a list of practices that would reduce any potential hazards/risks associated with pesticides used in an orchard. Practices to mitigate these risks have to be in place to be eligible for program. A survey was carried out to document grower interest. The IPM Institute of America provided a template Practice Standard Plan. We presented the plan at the NRCS State Technical committee meeting in summer of 2012 and the State Conservationist felt it would be a useful effort. He clarified that WVU would provide the technical service required to carry out the program. We also ran a model based on the WIN-PST software and developed a plan for West Virginia Growers by Fall of 2012 when sign-ups were expected to begin for 2013. We send all the necessary information to the State Resource Conservationist and State Agronomist but did not hear back. Upon further contact we were informed that the existing pool of funds for 2013 were already committed but there is a possibility that additional funds may become available. We compiled the documentation of all the efforts taken to initiate the program and requested a follow up meeting to discuss the possibility for the 2013 growing season. We assume that it was because of the continuing resolutions with the Federal budget but we have not heard back thus far.

Agronomic Crops IPM

Three growers were trained to carry out large-scale demonstrations to apply residual herbicides in bands to reduce the use of atrazine and other pre-emergence herbicides by 50% . Three demonstrations were carried out in 2012 at grower locations which revealed no yield differences between conventional broadcast application and banded fields. This practice also has the potential to increase floral diversity, reduce movement of nutrients and pesticide runoff, provide habitat for beneficial insects. We plan to continue this program in 2013. Dr. Frank monitored for beneficial insect population levels in 2012 and noted a few trends but results were not conclusive due to trap destruction by vertebrate pests. He expects to continue monitoring in 2013.

IPM Chronicle

In 2012, updates related to IPM were published as a joint effort by the three pest management specialists based in Morgantown. Due to its popularity, it was issued as a newsletter titled IPM Chronicle from 2013 onwards. This quarterly publication is expected to bring up the awareness of the general public and average end user on the importance of IPM, relevant pest management issues globally and locally in Entomology, Plant Pathology and Weed Science, and will also include other timely topics of broad interest.

Connecticut IPM Program – Ana Legrand, IPM Coordinator

1) Funding: Extension IPM funds (Smith Lever-d) cover part of the IPM coordinator and fruit IPM educator salaries. Funding for various projects and staff comes from Smith Lever funds, USDA NRCS, USDA SARE and USDA

2) Important Pest Problems: The Connecticut Agricultural Experiment Station and the Department of Energy and Environmental Protection announced that on July 16th, 2012 the emerald ash borer (*Agrilus planipennis*) was detected in Prospect, CT. The identification was confirmed by USDA APHIS-PPQ officials. Ash makes up about 4% to 15% of Connecticut's forests and it is a common urban tree. As a result, a quarantine has been declared for all of New Haven County. Regulated items include firewood of all hardwood species, chips and mulch, ash nursery stock and ash green lumber.

The spotted wing drosophila (SWD) *Drosophila suzukii* continues to be a serious problem. The infestations are statewide in commercial and home settings and so far fly larvae have been found in blueberries, raspberries, strawberries, grapes and possibly plums. A major problem noted by Mary Concklin, Fruit IPM educator, is that organic growers have a very limited choice of insecticides (Entrust and Pyganic) and many growers have plowed under the berries as a result. Dr. Richard Cowles reported that growers that suffered great losses in 2011 were able to improve management in 2012 by rotating between spinosyns and advanced generation pyrethroids. Growers have been adopting the use of sugar in the spray mix (2 lb per 100 gallons) to elicit a proboscis extension reflex response from flies contacting the spray residues. Monitoring traps using apple cider vinegar, grape juice, and alcohol were effective in monitoring programs and were adequate for detections of flies while there were competing nearby fruits. However, a standard yeast bait was found to work better than the vinegar/grape/alcohol combination. While testing attractants, Dr. Cowles detected *Zaprionus indianus*, the African fig fly, a new exotic Drosophilid that is not anticipated to be as damaging as SWD.

IPM program staff have been monitoring for the presence of the brown marmorated stink bug (BMSB) in agricultural and landscape settings. BMSB records in CT are from homeowner reports and it has not appeared as a field pest yet. On the other hand, Jude Boucher noted that green stink bugs were an unusual problem for some growers in 2012.

New problems due to plant pathogens were also reported. Impatiens downy mildew *Plasmopara obducens* was a new problem in CT gardens. Reports were confirmed starting on mid July 2012 and it continues to be a serious problem in gardens, commercial landscapes and greenhouses. Boxwood blight caused by the fungus *Cylindrocladium buxicola* was first detected in CT in 2011

and it continued to be a problem in 2012. It has caused plant losses in nurseries, public landscapes and private residences. The most susceptible species appear to be English (*Buxus sempervirens* 'Suffruticosa') and American or common boxwood (*B. sempervirens*), although many species of boxwood are susceptible to infection. Other diseases of concern were Northern corn leaf blight (showing up as a new problem for some corn growers) and late blight in tomatoes and potatoes. Weather conditions (late spring frosts, dry periods during growing season) afflicted many growers either by altering crop/pest phenology or by causing crop loss.

3) Other Pest Problems and Issues: The Connecticut legislature passed Public Act 09-56 banning lawn care pesticide applications to the grounds of day care centers and in K-8 schools. This ban went into effect on July 1, 2010. The ban also prohibits the use of pesticides on ornamental plants, woody trees, shrubs and herbaceous plants in the school landscape. Cooperative Extension Educators, IPM program staff and the CT Department of Energy and Environment Protection are working together to address pest management recommendations and concerns for school grounds affected by the ban. In school grounds, white grubs and weed management are the most important issues to address. The Connecticut School Coalition (Candace Bartholomew, Donna Ellis, Victoria Wallace, Jason Henderson, Carl Salsedo, William Dest and Richard Calarco) was formed with the objective of training school grounds and athletic field managers and their staff on maintaining grounds and fields without the use of pesticides.

Christmas tree growers have been adopting a basal spray of Safari to manage armored scales (elongate hemlock and *Cryptomeria* scales), with good effect. One grower has modified a Ventrac mower to conduct the basal spray, using an electric eye to trigger a solenoid for spraying the trunks on each side of the mower while the grower is mowing the row middles. The basal bark spray application can be expected to minimize impacts to natural enemies and non-target insects.

Bed bug and deer tick management continue to be issues of concern.

4) Pest Management Project Updates:

Fruit IPM: The IPM program welcomed Mary Concklin as our new Fruit IPM Extension Educator taking over from Lorraine Los who retired in 2012. Fruit IPM program staff collaborated in a statewide survey for the SWD which is part of a New England regional project to monitor and map this new pest.

Invasive Species: Invasive plant management continues to be a part of the program efforts. Biological control projects active in CT target purple loosestrife and mile-a-minute vine. Donna Ellis, Senior Extension Educator, is collaborating with the Connecticut Agricultural Experiment Station in a biocontrol project of mile-a-minute using *Rhinoncomimus latipes* weevils. Outreach education about mile-a-minute vine management is conducted statewide, with emphasis in the towns where mile-a-minute vine has been confirmed.

The IPM program also continues efforts in outreach education about invasive insects like the Asian Longhorned beetle and Emerald Ash borer. Pest identification presentations in Spanish

have also been delivered by A. Legrand. Research led by Ana Legrand is also focusing on management options for other beetle pests such as the Japanese, oriental and Asiatic garden beetles which are pests of turfgrass and ornamentals. Recent work has discovered the role of plant volatiles in attracting Tiphia parasitoids which attack Japanese and oriental beetles. Moreover, a recent survey documented the presence of the spring and summer Tiphia (*Tiphia vernalis* and *Tiphia popilliavora*) in MA and NH.

NRCS and IPM training: The IPM program continues to partner with the USDA Natural Resource Conservation Service to provide IPM training to growers. A new project was started to deliver IPM workshops to NRCS staff. Workshops were offered by Jude Boucher, Mary Concklin, Leanne Pundt and Ana Legrand on general IPM concepts and IPM for vegetables, fruits, and greenhouse crops.

New England Greenhouse Update Website: Six hundred growers, retailer, industry representatives in New England increased their knowledge on the use of biological controls, and best management practices through the New England Greenhouse Update website, a joint venture between University of Massachusetts and University of Connecticut. Timely, up-to-date information was posted on the website (www.negreenhouseupdate.info) with approximately 48,000 visitors per year.

Animal Agriculture: Overuse of chemical de-wormers is causing worm resistance to the de-wormers, exposing small ruminants to the dangers of the Barber pole worm (internal parasite). Low rate of gain and mortality of susceptible animals may cause these farms to abandon the production of lamb, fiber, and goat meat. Joyce Meader, Extension Educator, participated in a SARE 3 year grant titled 'Improving Small Ruminant Parasite Control' along with RI (PI), VT, and MA Extension. Farmers were instructed on scoring their animals for body condition as well as anemia to determine which animals to treat for Barber pole worm. Fecal samples were collected before and 14 days after de-worming to test for resistance to the de-wormer used by the farmer. In 2012, ten sheep and goat farm owners in Connecticut learned how to score their 118 animals for condition and anemia. One farm was re-sampled for fecal eggs after 10 days, discovering that the de-wormer only reduced the egg count by 43%, therefore labeling it as ineffective in controlling the parasites.

Bringing Deep Zone Tillage to Connecticut & New England Vegetable Farmers: Reduced-tillage systems, such as deep zone tillage (DZT), help to minimize field preparation costs; reduce energy use; eliminate soil, nutrient and pesticide runoff; help restore soil health and fertility; provide farmers access to open space; reduce irrigation demands; and provide the ultimate climate change tool for a region that is forecast to become warmer and wetter. Deep zone tillage helps the soil retain moisture during dry conditions because the soil surface is protected by mulch, and allows plant roots to grow through the plow pan and fully explore the soil profile. In wet conditions, DZT helps prevent soil crusting which improves germination, prevents flooding in low wet areas which minimizes disease problems and increases productive ground (eliminates wet holes), allows crops to be planted on time even in wet fields, and allows growers to avoid standing water when preparing ground for planting. DZT saves time, fuel, fertilizer and reduces machine maintenance while improving yields.

In an effort to spread the word about deep zone tillage (DZT), reduced-tillage, soil health, cover crops, and crop rotation, J. Boucher and partnering growers/educators have made: 9 Extension presentations in 4 states (CT, ME, MA, NH) and Nova Scotia, and published 1 magazine, 3 proceedings and 3 newsletter articles (1 DZT farm case study). The main goal of this program is to increase the number of DZT vegetable growers in New England. After communicating with Extension Educators from the other New England States in 2012, we determined that 8 additional (previously unreported) growers (1 CT, 3 MA, 1 NH, 2 ME, 1 VT) purchased new DZT machines for the 2011 and 2012 seasons, while 2 other CT vegetable growers have modified existing machines to achieve DZT on their farms (both have signed up to demo the dealer's rent-to-buy machine next spring). This brings the total number of growers that are known to be using this technology in New England to 31 (at least 5 are dairy farmers). Previously, one Connecticut grower measured the time and fuel it took to prepare and plant a measured acre using both conventional methods and DZT. Prep time was reduced 66-83%, depending upon whether the planter was attached to the zone tiller so that the field could be prepared and planted in a single pass, and fuel consumption was reduced by 72-77%. A second New York grower confirmed the calculations on over 1,500 acres of sweet corn and calculated that he also reduced his nitrogen application costs by 79%.

5) New IPM Program website: look soon for the renovated program's website at www.ipm.uconn.edu

Vermont IPM Program - Ann Hazelrigg, IPM Coordinator

Pests/diseases of interest for Vermont for 2012: Late spring frosts causing problems in apples, spotted wing drosophila-major issue for small fruit and grape growers, late blight in tomatoes and potatoes, brown marmorated stink bug (numbers increasing but still not of much concern yet), green stink bug-major issue for some vegetable growers, cucumber beetles and squash bugs present in high numbers, Phytophthora fruit rot of squashes widespread due to fall rain patterns, new identification of impatiens downy mildew, Northern corn leaf blight, mycotoxins and potato leafhopper were all issues for Vermont in the past year. Contaminated compost with persistent pesticides was an important problem in the northern part of the state in home gardens.

IPM First for Greenhouse Ornamentals

Margaret Skinner, Extension Entomologist and Cheryl E. Frank, Technician

Program Goal:

Enhance environmental sustainability and profitability of the greenhouse ornamentals industry in ME, NH and VT by increasing growers' implementation of advanced IPM techniques that minimize production costs and reduce reliance on chemical pesticides.

Approach:

Individualized educational IPM programs were developed to provide growers and their workers with practical one-on-one learning opportunities specifically designed to meet their unique interests, skill level and operation needs. Participating growers, in collaboration with Extension

personnel, determined areas of interest and need relative to IPM. An Extension specialist visited each location weekly for 1-2 months, gradually reducing visit frequency as the growing seasons progressed. To evaluate program success and IPM adoption, preliminary and annual follow-up surveys were completed by participants. In addition, annual meetings with Extension specialists were conducted to review survey responses and to determine successes, challenges and feedback on how to improve the program. January 2012 marked the 15th year of holding the Tri-State Greenhouse IPM workshops in ME, NH and VT to provide hands-on learning opportunities for greenhouse growers. Brian Spencer of Applied Bio-nomics Ltd, a producer of biological control agents, was the key speaker recruited to speak on aphid biological control and biological control agent quality control inspection methods.

Impacts & Outreach:

Eight commercial greenhouse operations have been assisted with the one-on-one educational program and 2 more have been added for 2013 (9 in VT and 1 in NH). Based on the needs surveys, participants received training on pest and natural enemy identification, scouting, sanitation, pesticide rotation, development or refinement of biological control programs, use of plant-mediated IPM systems, and strategies for reduction of costs associated with implementing IPM and biological control. Several new IPM practices were adopted, including use of sticky cards and indicator or trap plants for early pest detection, routine inspections of plants for pests and diseases, banker and habitat plants to sustain natural enemies, sanitation and rouging of infested plants and refinement of biological control and pesticide programs. Chemical pesticide applications have been reduced at all locations. With improved scouting programs, early identification of damage symptoms enabled them to release biological control agents or use spot sprays rather than making large scale pesticide applications. Better sanitation, such as weed cloth on dirt floors and removal of weeds, has also helped many sites reduce pests. All growers used some form of biological control within their IPM programs. Three locations switched from conventional chemical pesticide-based management to relying primarily on biological control as a direct result of this project. Growers were also eager to transfer their knowledge to customers by displaying eye catching signs informing the public of their adoption of IPM. At the Tri-State IPM Workshops, we reached over 150 attendees and according to the exit evaluation, 92% of the attendees learned new techniques they intend to use in the coming year, including biological control in general and specifically aphid biocontrol, quality control evaluation of biocontrol agents they purchase.

Apple IPM Program (standard apple IPM and organic apple IPM):

Lorraine Berkett, IPM Apple and Grape Specialist, UVM Extension

Project Highlights:

18 issues of the Apple IPM Alert were written and disseminated over the past year to over 100 growers who subscribed to the Apple IPM email listserve, and archived on the Apple IPM website which had an additional 650 visits.

Apple workshop organized in collaboration with the Vermont Tree Fruit Growers Association which was attended by 65 growers.

Updated and maintained Apple IPM website which had over 2,000 visits

Organic Apple IPM observations were distributed in 13 organic apple newsletter issues to over 100 organic stakeholders during the past year and archived on the Organic Apple IPM website which had over 500 visits.

Updated and maintained the Organic Apple IPM website which had over 300 visits and incorporated IPM information into a newly developed Practical Guide for Organic Apple Production which had over 400 visits by stakeholders.

Organic Apple Demonstration Orchards were maintained and used as a resource for educational purposes.

Provided one-on-one education regarding growers' apple IPM questions

Recent survey of growers revealed 88% would adopt a new IPM practice as a result of the Apple IPM program.

Cold Climate Grape IPM program:

15 issues of the Grape IPM Update were written and disseminated during the reporting period to over 200 growers who subscribed to the Grape IPM email listserve, and archived on the Cold Climate Winegrape IPM website which had approximately 800 additional visits.

Updated and maintained the Grape IPM website pages which had over 350 visits

Conducted "Field Day" at the University of Vermont Cold Climate Grape Vineyard attended by 32 stakeholders (see below for grower evaluation)

Provided one-on-one education regarding growers' IPM questions

Recent survey of growers revealed 87% would adopt a new IPM practice as a result of the Grape IPM program.

Vermont Vegetable and Berry IPM Program

Ann Hazelrigg, Extension Plant Pathologist, Plant Diagnostic Clinic

Project Highlights:

Over 300 calls and emails were fielded from vegetable and berry growers asking for help with pest and disease diagnosis and IPM management recommendations

100 disease and insect samples from vegetables and small fruit were sent to the Plant Diagnostic Clinic for identification of the pest or disease problem and management using IPM principles

Two presentations at annual Vegetable and Berry grower meetings (both organic and conventional) on past pest and disease issues and new and emerging problems.

Several twilight meetings during the growing season addressing pest and disease issues and IPM techniques

Provided one-on-one education site visits regarding growers' vegetable and berry IPM questions

Contributed to the bi weekly newsletter going out to the Vermont Vegetable and Berry Grower's Association describing new and emerging pests and diseases for the season with IPM recommendations.

Agronomic Crops IPM. Sid Bosworth, Extension Agronomist and Heather Darby, Extension Crop Specialist

Project Highlights:

Armyworm and cutworms were important pests this year. Several field visits were made for diagnosing and making IPM management recommendations

Informational flyer on armyworm and IPM management sent to 1200 growers.

Crops and Soils website continually updated with emerging pest and disease issues

Social media and Tweets were used to post information directing farmers to the Crops and Soils web page where over 400 growers accessed the information.

Leafhopper on alfalfa, mixed vegetables, and hops was a significant issue this past summer. Information in regards to leafhoppers was presented at the Annual Northwest Crops and Soils Field Day with over 250 attendees. Insect identification, lifecycle, and management were presented.

Northern Corn Leaf Blight is emerging quickly as a devastating disease in the Vermont. It is thought that a new race of the pathogen may be plaguing the southern part of the state as well as areas of MA and NY. Information in regards to the disease was presented at 6 winter workshops with over 300 attendees present. Factsheets were distributed and posted on the web.

In response to Hurricane Irene, the Agronomy IPM program developed testing protocols for mycotoxins and started analyzing local feed samples for mycotoxin levels. Over 60 farm visits were made to assist farmers with mycotoxin issues. In addition, several outreach materials were developed and distributed to over 1500 growers in VT. Articles were also posted on the web and published in local newspapers.

EPA Region 1 Agricultural Update for NEERA-IPM Meeting

Contact: Andrea Szylvian, email: Szylvian.andrea@epa.gov

TOPIC: EPA Region 1 Agricultural IPM Grants. The following Regional Ag IPM grant (formally the Pesticide Environmental Stewardship Program) was awarded in 2012: IPM for Dodder Control in Cranberry Production, University of Massachusetts Cranberry Station.

TOPIC: Strategic Agricultural Initiative (SAI) Project Updates

The SAI grant to the Massachusetts Fruit Growers Association evaluates orchard architecture (tree size, age, canopy shape, and tree/row spacing) as well as sprayers; and develops data to make informed decisions on which units could most benefit from automated controls that will improve pesticide application accuracy and efficiency. The project is slated to close summer, 2013.

The SAI grant to the New England Vegetable and Berry Growers Association had 2 focus areas. The first area was to provide support for editing/distributing the: "New England Vegetable and Fruit Management Guide." The Guide is a primary production resource for New England vegetable and fruit growers. The support also provided for adding emerging pests (such as Brown Marmorated Stinkbug) to the photo ID section in addition to increasing the over-all number of photos in the Guide to help with proper pest identification. The second project area focused on sprayer calibration in vegetable and small fruit production. A calibration device was obtained to help growers understand how tank volume, field/orchard size, tractor speed, and individual nozzles need to be evaluated for proper application & effective coverage. The project is slated to close fall, 2013.

The SAI grant to the Cape Cod Cranberry Growers Association was to address residue gaps for chlorothalonil on cranberries. The project is: conducting field trials on chlorothalonil, creating research protocol, coordinating with field researchers, while ensuring Good Laboratory Practices (GLPs) throughout the field trail portion of the project. The residue analysis for the field trial results will include: protocol development, coordination with regional labs, and ensure GLPs for the residue analysis. The project works closely with IR 4. The project is slated to close fall, 2014.

In 2011, Region 1 created a small funding opportunity; the: "Agricultural Pesticide Risk Reduction Program" to address use issues related to production agriculture IPM. The intent is to focus on areas of pesticide use such as: application techniques, applicator health and safety, drift and post application issues. These funds were used to provide additional funds to 2 of the previously funded projects with the Cape Cod Cranberry Growers Association and the New England Vegetable and Berry Growers Association. In both cases, the scope of the projects has been expanded.

TOPIC: EPA Region1 School IPM (SIPM). EPA Region 1's SIPM program supports and builds on the strong SIPM programs currently in place in most New England states. Educational and outreach efforts include basic SIPM information and support as well as targeted information on the biology and control of specific pests that pose special risks in New England states. These pests include bed bugs and selected public health pests such as rodents to reduce allergens and black-legged ticks to prevent tick vectored diseases including Lyme disease.

Bed bugs are well established in all New England states and the periodic unwanted entry of mice presents a continuing challenge to all schools in the region. Because the states in the New England region have the highest rates of tick-borne diseases of any US region, it is important that the SIPM program include outreach on pests that vector diseases. We have active research on IPM approaches to tick management and outreach to the public health, land use managers and environmental planning communities and incorporate these efforts into our SIPM outreach as much as possible.

Currently, several Region 1 staff is participating in the 2nd Annual US Department of Education's Green Ribbon Awards Program SIPM review team.

EPA Region 2 Summary, NEERA-IPM Meeting

Contact: Audrey Moore, email: moore.audrey@epa.gov

TOPIC: EPA Region 2 Agricultural IPM Grant. The following Regional Ag IPM grant (formally the Pesticide Environmental Stewardship Program) was awarded in 2012: A webinar series and interactive grower outreach for pesticide resistance management in greenhouses, Cornell University.

TOPIC: Strategic Agricultural Initiative (SAI) Project Updates. The SAI grant to Cornell University for the drift reduction technology project continues work under a no-cost time extension until July 2013. The work, which was performed at NY & NJ vineyards has had good results. Apple growers now have also contributed to the funding of the project to expand and continue the work. On a separate note, Dr. Andrew Landers, the P.I. on this project has received the Excellence in IPM Award from Cornell for all the work he has done on engineering controls for pesticide drift. The other SAI grant to Cornell University for developing resources for increasing use of biocontrol in NY greenhouses is also continuing their work under a no-cost time extension until July 2013. A draft workbook has been developed.

TOPIC: IPM in Schools

NJ School IPM Projects: Although NJ has regulations regarding IPM in schools, Region 2 performed an assessment of IPM practices in 26 schools in the District of Newark, NJ as part of the EPA FY2012 National Initiative for School IPM. Pesticide application practices as well as the status of IPM implementation were discussed and documented at all schools. In addition, visits to six randomly selected schools located in Jersey City, NJ were made to perform school walk-through and pesticide use/IPM implementation assessments. The same was performed in New Brunswick, NJ, as part of the EPA FY13 Regional School IPM Workplan commitments.

NJ Superintendent Email Listserv: EPA Region 2 is in process of finalizing the entry of all NJ county superintendents' email addresses into a database for future use for sending out information on School IPM, bed bugs, webinars etc.

New York City School IPM Assessments: During recent discussions with the New York City Department of Education (DOE) concerning the status of IPM implementation in the NYC schools, the NYCDOE invited our office to visit randomly selected schools in several boroughs. Similar to the NJ visits, the purpose of the school visits is to conduct pesticide use/IPM implementation assessments.

School IPM Webinars: Webinars were held last year and this year on the following topics: Integrated Pest Management in Schools: Protecting Children From Pests and Pesticides; Bed Bugs Go To School, and Integrated Pest Management in Schools: Outdoor and Turf. The

webinars explained the relationship between the special vulnerability of young children and pesticides use in schools. The benefits of IPM and specific IPM steps to be undertaken by schools were described in detail.