

AOE: Vegetable Year: 2007

Goals and Objectives for Year:

Goal #1: Promote healthy lifestyles by supporting the expansion of the Michigan vegetable industry to assure an abundant supply of safe, nutritious, locally-grown vegetables to the citizens of the State.

Objectives:

- 1) To provide vegetable growers with timely, environmentally sound, research-based information on how to manage emerging and existing pest problems.
- 2) To provide vegetable growers with information and management skills necessary to select superior plant varieties well adapted to their growing and marketing conditions and that provide the highest possible yields and quality at the lowest possible cost.
- 3) To provide vegetable growers, processors and packers with information necessary to manage water resources efficiently and in accordance with all State and Federal rules and regulations.
- 4) To provide vegetable growers with current, research-based information on how to maintain and preserve high soil nutrition and quality in an environmentally sound manner.

Goal #2: Support developing entrepreneurs in the vegetable growing, packing, processing and marketing industries by helping them to manage their businesses in a more profitable manner.

Objectives:

- 1) To assist vegetable growers, packers, processors and marketers in management, recruitment and training of employees and in achieving compliance with all State and Federal Laws relating to labor.
- 2) To provide all entrepreneurs involved in the vegetable production and marketing system with cutting edge, research-based advice on how to market their products in a more profitable manner.
- 3) To assist vegetable growers in complying with all federal, state and local environmental or land use regulations.
- 4) To assist vegetable producers and marketers in short and long-term economic planning.

Goal #3: Build leadership in the vegetable industry that will allow that industry to expand and to compete on a regional, national and global basis.

Objectives:

- 1) To encourage and assist industry leaders and potential industry leaders in developing skills necessary for the role of industry leader
- 2) To provide opportunities for them to interact with industry leaders and researchers from other production areas in an effort to keep leaders of the Michigan industry at the cutting-edge of the knowledge curve.

Team Activities/Programs for year: State-wide

2007 Great Lakes Fruit, Vegetable and Farm Market Expo:

This annual program is the Vegetable Area of Expertise (AoE) Team's most important educational program. The Expo is jointly sponsored by the Michigan Vegetable Council and the Michigan State Horticultural Society and was held in Grand Rapids, Michigan December 4-6, 2007. This year's Expo set an attendance record of 3652 paid attendees, which represents an almost 10% increase compared to 2006. Registrants were from 34 states and five provinces. Our team members in consultation with the Michigan Vegetable Council began organizing the vegetable education sessions in March 2007. The sessions our team organized or had a role in organizing: Asparagus, Pickling Cucumber, Tomato, Pepper & Eggplant, Potato, Vine Crops, Pollination, Carrot, Onion, Celery, Plasticulture, Sweet Corn and Organic Vegetable Production. Team member Ron Goldy, also helps organize the Farm Market Sessions with Bob Tritten of the Fruit AoE. Our team members also participated in organizing and coordinating these general sessions: Water Use Issues, Farm Labor, Cultivating Organic Markets and Preparing for Organic Production and Certification. Out-of-state speakers were included in most sessions, but more than half of the presentations are given by Team members, especially Campus based staff. Additionally, the Extension Booth, which is organized and staffed by Vegetable Area of Expertise Team staff, sold \$9,289.39 in extension bulletins, publications and educational CDs.

Phytophthora/Downy Mildew Workshop:

The Vegetable Area of Expertise Team organized and coordinated a PREF Workshop on January 24, 2007 at the East Lansing Marriott Hotel. The program was entitled "Phytophthora/Downy Mildew Workshop" and targeted growers and agricultural consultants who work with crops affected by these diseases. *Phytophthora capsici* is a major long-term threat to growers of vine crops and solanaceous crops all over North America. This disease has rendered thousands of acres of cropland unusable for growing these crops and threatens what is at least a \$40 million

industry in this State. Downy Mildew is a new disease, which is a particular threat to the Michigan pickling and slicing cucumber industry. This disease killed thousands of acres of cucumbers in Michigan during the 2005 and 2006 growing season. Since Michigan leads the nation in pickling cucumber production and is a major producer of slicing cucumbers, Downy Mildew has become the most serious threat faced by those industries. Michigan State University Extension specialists and researchers along with Extension specialists and researchers from North Carolina State University and Purdue University updated attendees on cutting-edge research into disease control and management. The program was attended by 128 paying participants from all over the northeastern United States and Ontario. Evaluations of the workshop were positive and our group received many positive comments.

Great Lakes Vegetable Working Group:

This group of vegetable oriented specialists and field staff from Michigan, Indiana, Ohio, Illinois, Wisconsin, Minnesota, North Dakota, Pennsylvania, New York, Missouri, Kentucky and Ontario held its second annual meeting in Leamington, Ontario February 28 to March 1, 2007. This group is designed to find answers for common problems identified by the vegetable industries in participating states and provinces. During the 2007 annual meeting IPM Scout training was identified as the greatest common need. Because the vegetable industry is so diverse and Extension Staff so limited in our region, putting together a high quality IPM Scout training is beyond the means of the individual Extension Services or Agriculture Ministries. Our group determined to develop a common scout training program that could be recorded on CDs and used in all participating states or provinces. Since vine crops are grown in all participating areas, it was decided to use them as the first training module. Since the Great Lakes Expo in Grand Rapids is the largest vegetable educational event in our region, our group decided to hold the training there and pay to have it recorded for use at other meetings. The Great Lakes Vegetable Working Group IPM Workshop was held December 6, 2007. It was attended by 120 growers and consultants, all of whom received a CD of the recorded program. Evaluations of the program were positive. Insect- related topics, soil quality issues and weed control were cited as especially useful. Plans for 2008 call for developing an IPM Sweet Corn module to be presented and recorded in the same manner.

Vegetable Crop Alert Team (CAT) Reports:

The Vegetable Area of Expertise Team supports the Vegetable Crop Alert Team Reports, both financially and through participation of Team members. It is an important vehicle in disseminating pest, fertilizer and horticultural information to our clientele in a timely manner. This year's CAT Reports were especially valuable in dealing with the Downy Mildew outbreak in pickles and cucumbers, as well as any number of other more traditional pests. The Vegetable Crop Advisory Alert is published both in print and on the Internet.

European Corn Borer and Corn Earworm Trapping:

The Vegetable AoE also supports a state-wide European Corn Borer and Corn Earworm Trapping program, both financially and through team member participation. This network allows sweet corn, snap bean and pepper growers to have a reliable basis for insecticide decision making when treating for these pests. The Vegetable CAT Reports and code-a-phones maintained by field staff serve as good vehicles for delivering these numbers to our clientele.

Vegetable AoE Team Website:

The Vegetable AoE supports a website that contains a couple of unique and valuable features. Our website is a search engine for vegetable research and extension publications from all land grant universities and USDA research entities. It allows users to access vegetable production and marketing information that can be used to solve production, post-harvest, economic and marketing problems. Additionally, our team members' post new pesticide labels to our website so that growers have instant access to any changes. AoE sponsored bulletins and fact sheets are also posted to our website including Bulletin E-312 "Insect, Disease and Nematode Control for Commercial Vegetable Crops" and Bulletin E-433 "Insect, Disease and Nematode Control for Commercial Vegetable Crops." These publications are widely recognized as the authoritative pest control bulletins in the Midwest.

Team Activities/Programs for year: Regional or Area-wide

Oceana Asparagus Day:

This annual program for asparagus growers and associated industry people is held in Oceana County. It is the largest asparagus educational workshop east of the Mississippi River and draws an audience from Michigan, and surrounding states and provinces. The program is organized by Team Member, Norm Myers at the direction of the Michigan Asparagus Industry Research Farm Committee, with the help of Team Member Jim Breinling. The March 8, 2007 was attended by 112 growers and industry support persons. The program mainly consisted of MSU Extension Specialists including Vegetable AoE Team members Mathieu Ngouajio, Bernie Zandstra, Beth Bishop and Mary Hausbeck.

Veggie School:

This annual educational program for vegetable growers in the West Michigan was held February 8, 2007 in Hart and was attended by 28 growers. It is organized by Team Member Jim Breinling with support from Norm Myers. This program covered a variety of topics including integrated pest management of vine crops, carrots and snap beans, general topics like food safety, Enviro-weather, water regulation and manure use on vegetable crops. Speakers

included team members Jim Breinling, Norm Myers, Beth Bishop, Mathieu Ngouajio, Mark Trent and Bernie Zandstra and other MSU Specialists not affiliated with the AoE.

Onion Twilight Meeting:

An onion twilight meeting was held in Allegan County's Gunn Marsh on August 22, 2007. This meeting was organized by Team Member Darryl Warncke with the support of Bill Steenwyk. The meeting was attended by 35 onion producers from the Michigan's Southwestern Region.

Southwest Hort Days:

This meeting is held annually in Berrien County and is designed to update area vegetable growers on current research at Michigan State University. The program is organized by Team Member Ron Goldy with participation from team members Dr. Mathieu Ngouajio and Dr. Walter Pett. Brian Cortright from Dr. Mary Hausbeck's Laboratory also gave a presentation. A total of 27 growers attended the 2007 meeting.

High Tunnel Open House:

Ron Goldy also organized a tour of the High Tunnel Research being carried out at Southwest Michigan Research and Extension Center near Benton Harbor. A total of 38 people attended.

Southwest Michigan Research and Extension Center Tours:

As a part of Ron Goldy's responsibilities at the Southwest Michigan Research and Extension Center, he gives tours to growers and industry people interested in vegetable research. During the 2007 program year he guided three tours totaling 51 people.

Vegetable Crops Update:

Hannah Stevens, Vegetable AoE Team member serving Southeast Michigan, organized a vegetable crops update in Imlay City on July 12, 2007, which brought 40 local vegetable growers up to speed on current MSU Research.

Sweet Corn Variety Plot Field Day:

Hannah Stevens also serves as a primary resource to Michigan's fresh sweet corn industry. As a part of that responsibility she organizes an annual variety plot field day. This year's Field Day was held in Romeo, Michigan August 24th. The meeting was attended by 50 SE Michigan sweet corn producers.

Irrigation Regulatory Updates:

Because of the importance of irrigation to the Michigan vegetable industry two irrigation regulatory updates were held by Team members during 2007. Jim Breinling and Norm Myers organized an update February 22nd in Hart and Fred Springborn did a similar meeting in Montcalm County February 27th. A total of 24 producers attended the Hart meeting and 18 attended the Montcalm meeting.

Consultant's Breakfasts:

Two breakfasts for vegetable consultants and scouts are organized by Vegetable AoE Team Members. These meetings are held in Montcalm and Oceana Counties and are organized by Team Members Jim Breinling and Fred Springborn. Since in most cases scouts, consultants or agri-chemical dealers are the last people growers talk to before treating for pests, these meetings are an excellent opportunity to multiply the impact of MSU research by "educating the educators."

USDA Farmers Market Promotion Grant, Mount Clemens Farmers Market:

In an effort to increase market viability Hannah Stevens, Vegetable Educator in SE Michigan, spearheaded an effort to analyze the sales data, vendor types and numbers for the Mount Clemens Farmers' Market. Evaluations showed the market achieved an increase in local and statewide media attention, attracted new vendors who offered popular products, increased market revenue by 12%, formed new collaborations to better serve the community and helped to identify long-range plans for more effective marketing and operation.

Active AoE Grants:

AoE Matching Grant:

"Methyl Bromide Alternatives" – Mary Hausbeck

AoE Competitive Grants:

"Aster Yellows Infectivity Network of Michigan's Vegetable Industry" – Beth Bishop

"Organic Farming Management & Certification Training for Extension Educators & Agricultural Consultants" – Vicki Morrone

"The How's & Why's of Cover Crops for Farmers & MSUE Educators" – Vicki Morrone

"A Web Based Interactive Program for Soil Tests Reports" – Darryl Warncke

Team Accomplishments/Impacts:

Cover Crop Research in the Celery Industry:

Team Member Mathieu Ngouajio (Department of Horticulture) recently conducted research on the effect of cover crops when added to Michigan celery rotations. The effect of this research on the Michigan celery industry has been dramatic. On-farm trials with brassica cover crops have led to increased adoptions of cover crops by growers (about 60%). When the practice is applied an average of 10% yield increase (corresponding to 150 more boxes per acre) has been reported. With a price range of \$8 to \$20/box this corresponds to \$1,200-\$3,000/A benefits. With a total of 1,800 acres harvested in Michigan in 2007 this represents potentially to \$216,000 to \$540,000 benefit for the industry.

Downy Mildew Research:

Team Member Mary Hausbeck (Department of Plant Pathology) has led a multi-state effort to protect Michigan's pickle and cucumber industry from Downy Mildew, a disease which, if untreated, could have drastically reduced the production of these crops throughout the State and Region. Her efficacy trials on fungicide treatments, monitoring of spore numbers throughout the pickle growing regions of the State, timely updates via her web site and the Vegetable CAT Alert system, allowed the Michigan pickle and vine crop industry to successfully control this disease during the 2007 growing season.

Great Lakes Expo Educational Programs:

The in-depth survey designed by Dr. Murari Suvedi for the 2005 Expo demonstrated the effectiveness and impact of the Great Lakes Expos programs in educating participants. In-state survey respondents reported the educational programs resulted in an additional \$17,500 income, with out-state survey respondents reporting a higher figure. This year's program experienced an increase of over 8% in attendance over last year and an increase of 2.4% in the number of exhibitors.

Vegetable Crop Alert Team Reports:

In an average week during the 2007 season, over 400 people viewed the issue on the Internet or read a print copy. The team published about 100 articles along with regional reports from Extension educators in 18 issues. Articles were also reprinted locally by Extension staff and media further extending the benefit from this information. Another indicator helps measure the importance of web-based publishing. For example an average issue posted to the web, for July 25, 2007, received 145 visits and 563 views over a two-week period.

EVALUATION OF ONE PROGRAMMING GOAL:

Programming Goal Evaluated:

Goal #1: Promote healthy lifestyles by supporting the expansion of the Michigan vegetable industry to assure an abundant supply of safe, nutritious, locally-grown vegetables to the citizens of the State.

Why was the Program Needed?:

In order to provide a safe vegetables supply Michigan growers need to be able to manage the many pests that attack vegetable crops.

What stakeholder input did you have?:

The Vegetable AoE meets with the Michigan Vegetable Council (MVC) annually to gather input for setting goals and priorities. The MVC not only serves as our stakeholder group, but contributes \$53,000 annually to members of our AoE to support research and extension programs. In addition, Dave Smith, Executive Secretary of the MVC is a member of our AoE and participates in planning and discussions at most meetings. Their financial support was critical to making our programs successful. Our team worked with various commodity groups (Michigan Asparagus Advisory Board, Michigan Onion Committee, Michigan Celery Research Inc, Pickle and Pepper Research Committee, Carrot Committee, etc.) to identify research priorities and develop relevant research studies. Team members also interact one-on-one with growers to determine their needs.

What were the performance goal(s)?:

- 1) To provide vegetable growers with timely, environmentally sound, research-based information on how to manage emerging and existing pest and production problems.
- 2) To provide vegetable growers with information and management skills necessary to select superior plant varieties well adapted to their growing and marketing conditions and that provide the highest possible yields and quality at the lowest possible cost.
- 3) To provide vegetable growers, processors and packers with information necessary to manage water resources efficiently and in accordance with all State and Federal rules and regulations.
- 4) To provide vegetable growers with current, research-based information on how to maintain and preserve high soil nutrition and quality in an environmentally sound manner.

What were the key program components?

- 1) Great Lakes Fruit, Vegetable and Farm Market Expo – Vegetable and Farm Market Sessions
- 2) Phytophthora/Downy Mildew Workshop (PREF Program)
- 3) Regional and Area Education Components – including: Oceana Asparagus Day, Southwest Hort Days, Veggie School, Vegetable Crops Update, Sweet Corn Variety Trials Field Day, High Tunnel Open House, Irrigation Regulatory Updates, Onion Twilight Meeting, USDA Farmers’ Market Promotion Program
- 4) IPM Updates: Vegetable CAT Reports, Consultant Breakfasts, Downy Mildew Web Page, local code-a-phones and newsletters, pest trapping networks
- 5) Publication – development or up-dating of research-based programs, bulletins and factsheets

How was Campus Involved? (i.e., staff, materials, curriculum, research info)

Campus-based staff, in consultation with stakeholders and field staff, do much of the research on which we build our programs. Campus also supplies curriculum for some field programs. Staff, graduate students and technicians are involved in carrying out field research in important vegetable producing areas.

What were the internal and external linkages?:

Our AoE has internal linkages to a number of other AoE teams. This linkage is especially strong with the Fruit AoE because of the educational sessions developed for the Great Lakes Expo and the co-sponsoring of the Extension Educational Booth at the show. Linkages have also developed with the Field Crop AoE, especially in the area of organic programming, but also in the soil fertility and water use areas. Linkages with other AoEs also exist in the areas of labor, since it is a common problem with many agricultural industries. Internal linkages are also being sought in the manure management and food safety subject areas. External linkages exist with the MVC as well as a number of commodity groups including asparagus, onions, potatoes, celery, pickles and carrots. External linkages exist with other universities through the Great Lakes Vegetable Working Group.

Who was the target audience?:

Our programs are targeted at all Michigan vegetable growers. A secondary target audience are people working in support industries including agri-chemicals, food processing and scouting.

What was the evaluation framework? What methodology did you use?

A written evaluation was used for the Phytophthora/Downy Mildew Workshop (2007 PREF Program). An extensive written evaluation of the Great Lakes Fruit, Vegetable and Farm Market Educational Sessions was done in 2005, with the idea of periodic repeats of the evaluation. Details are in the report.

What were the output indicators and results?:

The written evaluation measured the usefulness of all of the speakers and topics in the program. All topics were rated on a scale of 1 to 4, with 1 representing “not useful” and 4 representing “very useful.” Topics presented were: 1) “An Overview of the Disease *Phytophthora capsici*” ranking= 3.1 2) “Research Updates on Phytophthora in Michigan” ranking=3.2 3) “Managing Phytophthora in Michigan: fumigants and fungicides” ranking=3.3 4) “Impact of Cover Crops on Phytophthora Management in Vegetable Production” ranking=2.5 5) “Phytophthora Management in North Carolina Peppers and Yellow Summer Squash” ranking=2.7 6) “Growing Strategies to Combat Phytophthora in Michigan Peppers” ranking=2.8 7) “Hands-on Laboratory” ranking=3.4 8) “Downy Mildew Introduction and Overview” ranking=3.4 9) “Downy Mildew Epidemic of 2004 and 2005 in the Eastern US” ranking=3.4 10) “Four Years of Cucurbit Down Mildew in Indiana: Field Trials and More” ranking=3.1 11) “Downy Mildew on Vine Crops in North Carolina” ranking=3.4 12) “Downy Mildew Advances in Michigan” ranking=3.6

What was (or is for on-going existing program) the program duration?:

This was a one-time program, but it did connect closely with Dr. Hausbeck’s Downy Mildew Control efforts during the 2007 growing season. Since these diseases have a high probability of continuing to be a problem, the program may be repeated as needed.

What were the resources allocated?:

Mary Hausbeck: taught at the program and provided two other speakers from her laboratory. In addition, she devoted four weeks of graduate student time and four weeks of undergraduate labor. Mathieu Nguouajio: taught at the program. Norm Myers: provided two weeks of secretarial time. Jim Breinling served as moderator.