

Award Category: International IPM Award of Excellence

Type of Nomination: Team/Group (Project)

Nominee Name of Individual or Group: Muck Crops IPM

Improving economic benefits related to IPM adoption: Checked

Reducing potential human health risks:

Minimizing adverse environmental effects: Checked

Brief Summary of Nominee's or Program's Accomplishments (500 words or less):

The Muck Crops IPM program has been operating for 11 years in the Holland Marsh region of Ontario, Canada, a region of intensive vegetable production on approximately 7000 acres. The main objective of the IPM program is to provide information on development and risk of insect pests and diseases to the growers, to allow for informed and timely decisions about crop protection. Pest management recommendations are provided, based on provincial standards and local research results. The program contributes to economically and environmentally sustainable vegetable production.

This is a truly integrated program. Specific fields are scouted twice a week for insect pests, diseases and weed outbreaks. There is a diagnostic service, which is essential to ensure that growers are applying the appropriate crop protection method. Applied research is conducted at the research station to improve or develop treatment thresholds, identify improved management practices (cultural, biological or chemical) and test new IPM methods. This is a true IPM program, in that information on cultural controls, host resistance and biological methods of pest management are incorporated into recommendations. Over the past 15 years, research has been conducted on trimming of carrot foliage as a cultural control for Sclerotinia, spore trapping to improve the IPM forecasts for Botrytis leaf blight of onion and Sclerotinia on carrots. The research on Botrytis leaf blight showed that the original spray threshold was too conservative and resulted in a change to the threshold. Many biological controls and reduced-risk pesticides have been tested and the results provide to growers and the industry. Since 2013 the program has been experimenting with aerial surveillance using unmanned aerial vehicles (drones) to determine if this technology can improve the overall IPM program and make scouting more efficient.

The program is developed and delivered through the research program of Prof. Mary Ruth McDonald, Dept. of Plant Agriculture, University of Guelph and is based at the university's field station, the Muck Crops Research Station. The program involves cooperation with the provincial extension service, the local growers cooperative and the local growers association, and receives funding from individual growers, industry sponsors and various granting agencies.

The information is provided to individual growers and is summarized to provide a regional picture of pest pressure and risk that is posted on the web site (www.uoguelph.ca/muckcrop) twice a week and is available to all. This information is also used to inform research priorities. Research results, such as new monitoring methods, or thresholds, are quickly incorporated into the IPM program. Yearly summaries and research updates are presented to growers each year at the Annual Muck Vegetable Growers Conference (attended by over 100 people each of the 2 days) and written up in the annual Muck Crops Research Report, in addition to published scientific papers. Growers can also see the field research plots each year at the annual Muck Station Field Day, held the first week of September each year. The information is also incorporated into factsheets and posted on provincial extension materials.

Describe the goals of the program being nominated; why was the program conducted? What condition does this activity address? (250 words or less):

The Muck Crops IPM program has been providing important delivery of IPM services and information for 11 years in the Holland Marsh region of Ontario, Canada. The "Marsh" is a region of intensive vegetable production on approximately 7000 acres. The main objective of the IPM program is to provide information on development and

risk of insect pests and diseases to the growers, to allow for informed and timely decisions about crop protection. Pest management recommendations are provided, based on provincial standards and local research results. Information on cultural controls, host resistance and biological methods of pest management are incorporated into recommendations, based on the scientific literature, local research and the experience and knowledge of the IPM coordinator and other support staff..

The program is developed and delivered through the research program of Prof. Mary Ruth McDonald, Dept. of Plant Agriculture, University of Guelph and is based at the university's field station, the Muck Crops Research Station. The success of the program can be attributed to effective communication and partnerships. There is cooperation with the provincial extension service, the local growers cooperative and the local growers association which is also reflected in the funding from individual growers, industry sponsors and various funding agencies. There are effective communication channels with growers, researchers, extension staff and the crop protection industry, including articles for the North American industry and the general public. Research results, such as new monitoring methods, or thresholds, are quickly incorporated into the IPM program.

Describe the level of integration across pests, systems and/or disciplines that was involved. (250 words or less):

The Muck Crops IPM program uses a wide range of scouting and forecasting methods for the major insect pests and diseases that attack the vegetable crops in the Holland Marsh. Insect traps for pests such as the onion maggot fly, and carrot weevil and carrot rust fly, are placed in growers' fields each year. Insect monitoring is combined with forecasts using temperature thresholds to calculate day degrees. Several disease forecasting programs are used, such as Downcast (for onion downy mildew) and Botcast (for Botrytis leaf blight of onion). Field scouting for disease symptoms is incorporated to provide more accurate information on disease risk. Spore traps in selected locations are also used to determine the presence of the inoculum of plant pathogens Botrytis, Stemphylium and Peronospora (onion downy mildew). Crop scouts walk each field twice a week, counting insects on traps, changing traps and checking plants for disease symptoms. A general assessment of weed control, and notes on specific weed problems are made. Scouts also look for symptoms of nutrient deficiencies. All of this information is provided in note form to the individual grower, every time the field is scouted. If a scout is unable to identify a problem, they will bring a sample to the Muck Crops Research Station, which is also the home base of the scouting program, for consultation with the IPM coordinator and other specialists, and diagnosis. There is a plant pathology diagnostic facility at the Muck Station that works closely with the IPM program.

Describe the team building process; how did the program being nominated get partners involved? Education and awareness are essential in an IPM program. (250 words or less):

The Muck Crops IPM program involves a team of university researchers, private industry, extension specialists and the local growers' association, the Holland Marsh Growers Association. The program was initiated by Prof. Mary Ruth McDonald, a researcher studying crop protection and pest management at the University of Guelph. Prof. McDonald established a steering committee consisting of the manager of the local growers' cooperative (Bradford Coop), which sells many of the specialized crop protection materials to the vegetable growers, the provincial extension specialist responsible for this crop group, and the President and the Executive Director of the local growers' association, the Holland Marsh Growers.

The program is advertised through the Coop and growers' association, updates are provided through extension publications and the IPM web site. Diagnostic services are provided to all growers and others in the industry. The University of Guelph provides the venue to house the program, the training and diagnostic services and the financial accounting. The Bradford Coop collects the funds from the growers. The Holland Marsh growers support the program through funding opportunities, and as a result, each grower member receives free scouting of one, 10 acre field. Several crop protection companies sponsor the program each year and receive the twice weekly updates.

Summaries of the scouting information and forecasts are posted on the web site twice a week and emailed to the sponsors, extension specialists and researchers. Seasonal summaries, survey information and research updates are presented at the two day Annual Muck Vegetable Growers Conference each spring.

What outcome describes the greatest success of the program?:

There are a number of successes that can be attributed to the Muck Crops IPM program, and several can be difficult to quantify because they are an absence of problems, such as no resistance to insecticides or fungicides, and no (or reduced amount) of crop losses as a result of onion thrips or downy mildew following from timely information on pest development.

One major success is the accurate forecasting and early warning for onion downy mildew, and conversely, informing growers when the risk of downy mildew is low. Downy mildew of onion can develop rapidly and devastate a crop, resulting in no marketable yield, but it does not develop at all in some year. In 2011 and 2012, no downy mildew developed in the Marsh area and growers did not need to apply downy mildew specific fungicides, resulting in a reduction of 4 or 5 applications. In 2013, downy mildew developed late in the year and growers only needed to apply one fungicide spray. In 2014, downy mildew forecasting and scouting showed high risk of downy mildew in late July and growers were able to protect

Provide evidence of change in knowledge, behavior or condition as a result of the program/individual. (250 words or less):

The Muck Crops IPM program provides specific field scouting to growers who pay for the program and also provides some scouting to members of the Holland Marsh Growers Association, but all vegetable growers in the Holland Marsh have access to the summarized scouting information and disease and pest forecasts. Thus the program has an influence on all of the production area and there has been a general reduction in pesticide use and increase in knowledge of pest and disease life cycles and management practices. There has also been a rapid uptake of reduced-risk materials, as the effectiveness is demonstrated through local research and extension efforts.

When the IPM recommendations are compared to a calendar spray schedule, growers can reduce fungicide sprays from 7 to 4 a season for Botrytis leaf blight and from 10 to 4 for onion thrips, with no differences in control. Harvest assessments of all fields are conducted each year to provide an accurate assessment of damage from insect pests and soilborne diseases. Growers on the program keep good records of pesticide application. There strong and continued support from the Holland Marsh Growers Association, the Bradford Coop and several crop protection companies also demonstrates the effectiveness of the program.

Who or what should receive the most credit for the success of this program?

Prof. Mary Ruth McDonald established the program in 2003, as part of her research program. She identified the need for an IPM program for the Holland Marsh area, following the collapse of a province-wide program and uneven coverage of the Marsh¹ by companies that were providing some IPM services. Over the 11 years of the program she has hired and trained IPM coordinators, assisted in training of the IPM scouts, served on the steering committee for the program, wrote grant proposals to provide funding for the program and oversaw the financial management of the program. The IPM program depends on the support of several partners, but it would not exist without the continued involvement and support of Professor McDonald

If selected, suggested Citation for Award Certificate (40 words or less):

The Muck Crops Integrated Pest Management Program is recognized for excellence in delivery and development of pest management that contributes to the sustainability and success of vegetable production in the Holland Marsh, and for innovation in integrated pest management methods