

# Assessing IPM Adoption of North Central Region Pumpkin Growers

Jim Jasinski<sup>1</sup>, Carol Pilcher<sup>2</sup>, Richard Weinzierl<sup>3</sup>, Mohammed Babadoost<sup>3</sup>, Elizabeth Maynard<sup>4</sup>, Chris Gunter<sup>4</sup>, Jim Breinling<sup>5</sup>, Norm Myers<sup>5</sup>, Celeste Welty<sup>6</sup>, Brad Bergefurd<sup>1</sup>, Janice LeBoeuf<sup>7</sup>, Elaine Roddy<sup>7</sup>

<sup>1</sup>Ohio State University Extension, <sup>2</sup>Iowa State University, <sup>3</sup>University of Illinois, <sup>4</sup>Purdue University, <sup>5</sup>Michigan State University Extension, <sup>6</sup>Ohio State University, <sup>7</sup>Ontario Ministry of Food, Agriculture, and Rural Affairs



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## Abstract

The Great Lakes Vegetable Working Group project committee developed nine surveys to assess grower's level of IPM adoption in certain key vegetable crops. The surveys were arranged in nine sections and available to growers through the Internet and in hard copy format at certain vegetable educational meetings from January, 2006 to May, 2007. At this time only responses to the regional pumpkin survey have been fully analyzed using SPSS; the remaining surveys are currently being summarized. The area covered by the pumpkin survey included IL, IN, MI, MN, OH, Ontario Canada, and WI. Of the 194 respondents to the regional survey, 32 growers were classified as low IPM adopters, 108 growers were classified as moderate IPM adopters, and 54 growers were classified as high IPM adopters based on the number of practices and tactics used in their production operation. Profiles for typical low, moderate, and high level IPM adopters are being developed. Any clear practice deficiencies found within the grower population will be used to guide future research projects and Extension programs.

## Introduction

In October, 2004 a group of university researchers and Extension educators specializing in vegetable production and pest management from the North Central states including Ontario, Canada received a grant from the North Central IPM Center to form the Great Lakes Vegetable Working Group (GLVWG). The primary objectives of this group are to increase communication and collaboration between specialists throughout the region and to work on solving priority vegetable production and pest management issues within the region.

The first priority addressed by this group was to survey the level of IPM adoption in one or two key vegetable crops in each state or province within the GLVWG region. On a regional basis, jack-o-lantern pumpkins were identified as an important crop to survey. Once the surveys were collected and analyzed, it would allow specialists to determine if Extension programs or research projects would be best suited to deal with any significant pest management deficiencies. There were nine vegetable IPM adoption surveys available to growers but only the regional pumpkin survey findings will be reported here.

## Methods

The IPM adoption survey questions for each crop were developed and revised by members of the GLVWG project committee. The committee used Ohio State University's Field Crop, Fruit, and Vegetable IPM Definitions (2001) and the University of Massachusetts IPM Guidelines: Crop Specific Definitions (1999) as a resource and framework for the survey design.

All surveys were arranged in the same manner and contained an Educational, Record keeping, Pre-plant, At-plant, In-season, Harvest, Post harvest, Training, and general Demographic section. While the core questions of the surveys (Pre-plant through Post harvest) varied by crop, the remaining sections were nearly identical.

Surveys were administered initially through the Internet to growers by a web based company, Survey Monkey, beginning January, 2006. Growers who were subscribed to individual state's vegetable or pest management newsletters (VegNet, Veg Edge, Vegetable CAT Alert, etc.) were sent notices of the survey sites and encouraged to take the surveys online. Incentive prizes such as sweat shirts or gift cards were offered to encourage growers to take the surveys. In the fall of 2006 and through the spring of 2007, hard copies of the electronic survey were also handed out at specific vegetable related educational meetings. The surveys were collected at the end of the meeting, then entered into Survey Monkey for analysis. All surveys were closed May, 2007. Confidentiality of all survey respondents was maintained throughout the survey period.

In June, 2007 all survey data sets were summarized using a standard protocol on Survey Monkey. Respondents who did not complete at least half of the questions were removed from the analysis. After the initial summary, the pumpkin survey was further analyzed using SPSS. Each IPM tactic in the Pre-plant through Post harvest sections was assigned a Low, Medium, or High point value. The grower's level of IPM adoption was ultimately determined by the number and value of specific practices conducted on their farm. Based on the percentage of points accumulated, growers were sorted into three categories; 0-33% (Low adopters), 34-66% (Moderate adopters), and greater than 67% (High adopters)

## Results

The regional response to the pumpkin surveys yielded 194 valid instruments in the following states: Indiana (n=31), Illinois (n=16), Michigan (n=15), Minnesota (n=7), Ohio (n=93), Wisconsin (n=4) and Ontario, Canada (n=13). The remainder of the respondents (n=15) did not provide a state designation. The majority of growers (54%) were farming 0.1 to 5 acres of pumpkins, and most of the respondents (34.7%) had 6 to 20 acres of total vegetable acreage. The pumpkin acreage covered by these respondents represented approximately 12.8% (3,425 A+) of the total pumpkin acreage (43,858 A) in the region. Over 62.8% of the growers had over 10 years experience in vegetable production. Conventional fresh market produce was the primary market for pumpkins and 96.3% of their acreage was designated for this purpose.

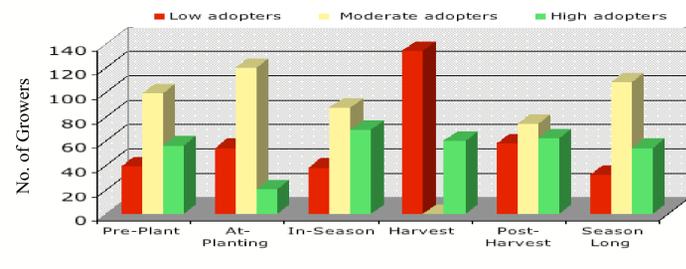
Respondents overwhelmingly indicated they would like to receive more IPM training, such as scouting, pest identification, and trapping (84.1%); a critical fact given that 82.4% of growers scout and monitor the crop themselves. Growers employ crop consultants at some level approximately 17.1% of the time, claiming a lack of crop consultants (33.3%) and being too expensive (60%) as primary reasons against more interaction.

The number one management issue for growers is disease control (52.3%), followed distantly by weed (17.6%) and insect control (13.6%). Growers have adopted several key IPM practices to manage these pests. They actively scout for diseases 73.1% of the time, use cultivation for weed control until vines close the row, 76.3% of the time and monitor for squash bugs 64.5% of the time. In addition, there is a conscious decision by growers to protect bees by properly timing pesticide sprays in the evening and early morning (83.9%).

When focusing on continuing and seasonal educational section, the annual meetings and field days were highly attended by growers (69.9%), while exploring alternative markets (25.1%) received the least involvement. Only 37% of growers indicated they received a university written vegetable pest management newsletter via email but an additional 40.5% received the newsletter via postal service or fax. Over one third of the growers (36.4%) do not receive any pest management newsletter.

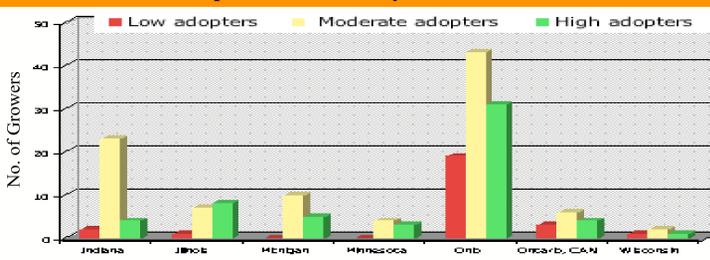
Growers were rated low, moderate, or high IPM adopters based on their overall survey score. Grower ratings were sorted across the five major survey sections ranging from Pre-plant to Post harvest (Table 1). Seasonally, as well as in the five distinct operational times, the moderate adopters represented the highest percentage of growers. The exception was in the Harvest interval, where there were no moderate adopters. The bulk of IPM tactics occur in the Pre-plant and In-season sections.

**Table 1. Percent of growers who scored in the Low, Moderate, and High IPM adoption ranges during each segment of the season.**



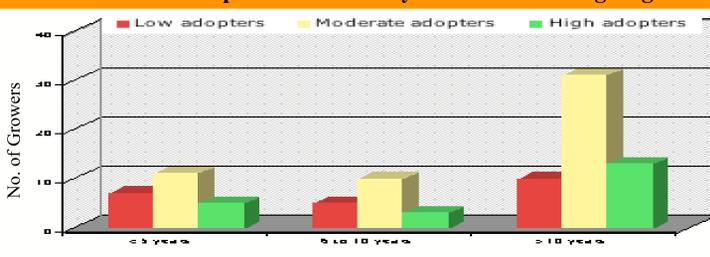
The IPM adoption level of growers were also broken down by state (Table 2). Ohio had the greatest number of respondents (93) while Wisconsin had the fewest (4). Ohio has the greatest number of moderate (43) and high level IPM adopters (31). Indiana has the highest percent of moderate adopters (79.3%) while Illinois has the highest percentage of high level adopters (50.0%).

**Table 2. IPM Adoption Breakout by State or Province.**



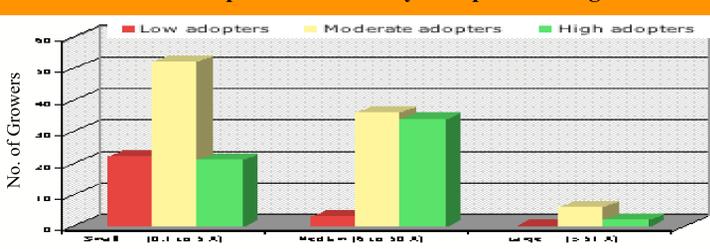
The IPM adoption level of growers was also broken down by years of growing experience (Table 3). Most of the growers who responded to this survey fall into the highly experience category (> 10 years). In all three experience intervals, the moderate adopters had more growers than either of the low or high adoption categories. The greatest number of high level adopters were in the >10 years growing experience interval.

**Table 3. IPM Adoption Breakout by Years of Growing Vegetables.**



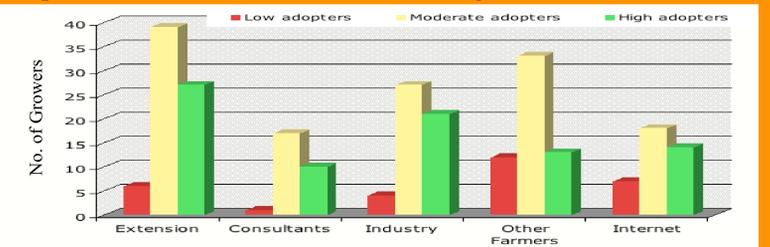
The IPM adoption level of growers was also broken down by acreage (Table 4). The majority of growers (53.9%) grew less than 5 acres of the crop in 2005, followed by 41.5% of growers who grew between 6 and 50 acres per season. Only eight growers (4.5%) reported growing over 51 acres of pumpkins per season. The number of low and moderate level IPM adopters dropped precipitously as the acreage increases from small to large. Lastly, high level IPM adopters are numerically more prevalent in medium, then small, then large acreages.

**Table 4. IPM Adoption Breakout by Pumpkin Acreage.**



All growers were asked to rate the sources where they "usually" gather crop and pest management information (Table 5). Numerically, more high level IPM adopters use Extension to find information, then Industry, Internet, Other farmers, and lastly Crop consultants. Numerically, more moderate level IPM adopters also chose Extension as their source of information, followed by Other farmers, Industry, Internet, and lastly Crop consultants. Numerically, more low level IPM adopters rely on Other farmers for their information, then use the Internet, Extension, Industry, and Crop consultants.

**Table 5. IPM Adoption Breakout of Growers who "Usually Use" Specific Information Sources (Season Long Considerations).**



## "High level IPM" Pumpkin Grower Profile

This individual has been growing vegetables for over ten years and has a medium size farm in terms of total vegetable acreage (6 to 50 acres). The number of acres of pumpkins is also medium in size (6 to 50 acres). This individual most often uses the following sources of information for IPM considerations: additional reference materials (81.4%), attends state meetings/field days (79.7%) and obtains the latest state/provincial or regional guide (78.0%). In addition, this individual usually uses Extension information (46.6%) and Industry information (36.2%) for IPM considerations.

This grower is **most** likely to conduct the following pre-plant IPM activities: use proper spray application equipment (nozzle type, drop nozzles, etc.) (100%), select hybrids with good tolerance or resistance to powdery mildew (96.6%), and take steps to minimize non-target pesticide drift (94.9%). In addition, this grower is most likely to conduct the following in-season IPM activities: protect bees by properly timing sprays (98.3%), scout fields regularly to identify diseases/take corrective action if warranted (91.5%) and control nearby weeds that may be hosts for insects and diseases (89.8%). After harvest, this grower is most likely to identify and establish successful practices and incorporate them in future years (93.2%).

## "Low level IPM" Pumpkin Grower Profile

This individual has been growing vegetables for over ten years and has small size farm in terms of total vegetable acreage (0.1 to 5 acres). The number of acres of pumpkins is also small in size (0.1 to 5 acres). This individual most often uses the following sources of information for IPM considerations: maintains additional reference materials (45.2%), attends state meetings/field days (45.2%) and obtains the latest state/provincial or regional guide (38.7%). In addition, this individual usually uses information from other farmers (54.5%) and information from the internet (41.2%) for IPM considerations.

This grower is **least** likely to conduct the following pre-plant IPM activities: high pressure wash machinery shared between fields to prevent the spread of disease (0%), use a stale seedbed technique (3.2%) or plant pumpkins after a herbicide resistant crop for decreased weed pressure (3.2%). This grower is least likely to conduct the following in-season IPM activities: use pheromone traps to monitor squash vine borer/treat according to guidelines (0%), scout for non-winged aphid colonies/treat if thresholds are exceeded (3.2%), and modify fungicide applications based on weather conditions or past field disease (6.5%). After harvest this grower tends to not keep cut fruit dry and above 40 degrees F to prolong quality (16.1%).

## Summary

This is the first survey of pumpkin practices to be conducted on a regional basis in the North Central states, and will serve as a baseline for future surveys. It is clear from the results of this regional survey that although there are many IPM practices available to growers ranging from minor to essential practices, there are more moderate and high level IPM adopters in all the states compared to low level adopters. This seems to be a positive sign that Extension professionals (the key source of information) have been training growers in the appropriate practices. These practices have largely been adopted, although there is always room for improvement. One issue that university specialists need to realize is that growers are also seeking information from industry representatives and Internet sources, which means we need to continue to work with industry partners and provide materials in a fashion that make them easier to locate and consume.

These results have helped us develop a general grower profile for the "High" and "Low" level IPM adopter. While these profiles highlight general strengths and deficiencies of growers, they can also provide researchers a window into questions that need to be answered, and Extension educators an opportunity for targeted training and program to further encourage adoption of select IPM practices.

The complete summary of the regional pumpkin survey is available online at <http://glvwg.ag.ohio-state.edu/projects.php>.

## Acknowledgements

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