

# Integrated Pest Management for Vegetables: a Program Evaluation to Determine Value

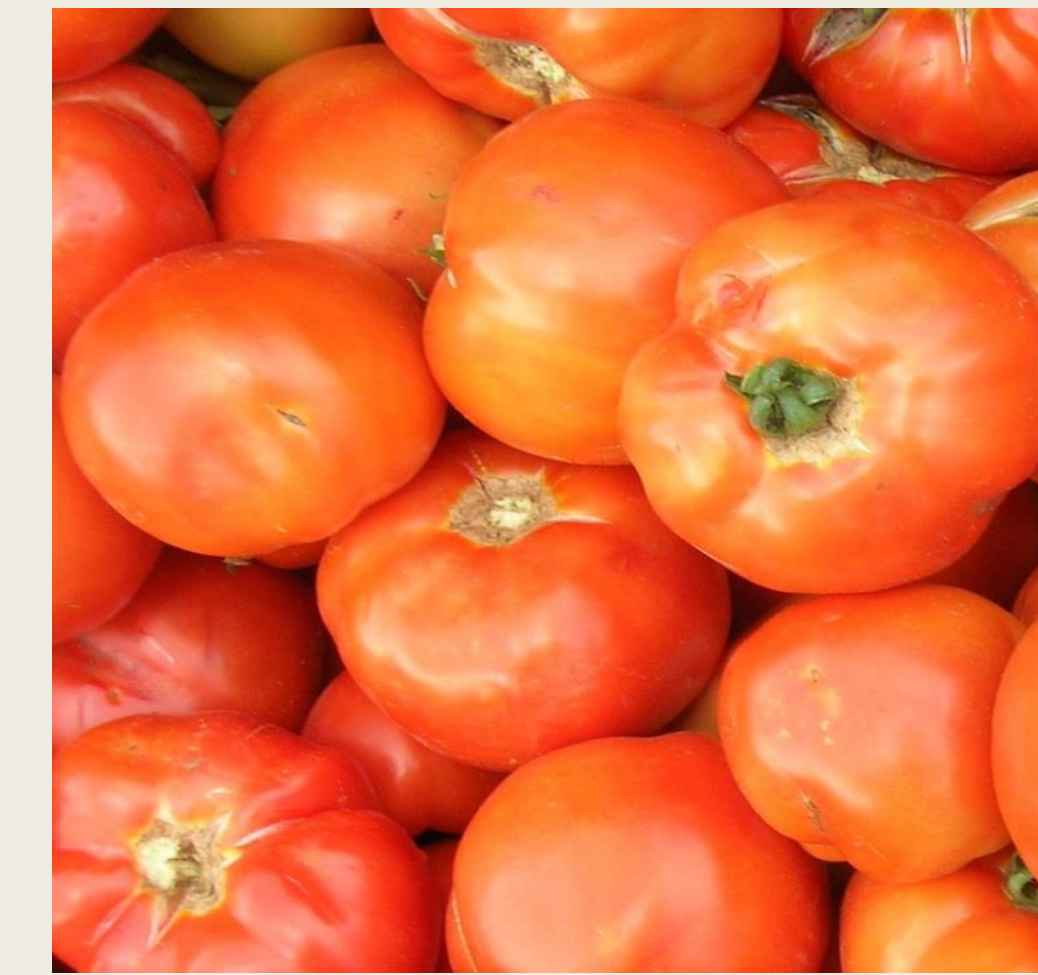
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## Abstract

The University of Maryland Extension (UME) Vegetable Integrated Pest Management (IPM) Program works with commercial vegetable producers to enhance production and profitability while reducing the use of high-risk pesticides. A program evaluation effort was undertaken in the winter of 2012-2013 to assess if training and outreach efforts by the IPM vegetable program over the last 5 years had 1. Reduced growers use of high risk pesticides, 2. Increased vegetable yield and quality and 3. Helped growers' bottom line. Survey results indicate that 51% of the respondents had reduced their use of high-risk pesticide applications and that these changes had come about by the growers' increased use of reduced-risk pesticides and cultural controls. The average reduction in use was approximately 4 applications per season (~35-40% reduction in applications). A little more than 70% of growers surveyed said they have increased their vegetable yields and quality compared with their previous practices. Over 75% of growers indicated that the Vegetable Recommendation Guide is a good or outstanding value. The total overall value in dollars saved or earned by Maryland vegetable growers per year over the last 5 years because of knowledge and skill gained is estimated to be between \$31-60 per acre by 68% of the respondents, 25% of respondents saved \$61.00 or more per acre.



## Introduction

The purpose of this evaluative study was to determine the impacts of the UME Vegetable IPM Program. From 2006 to 2010 this program emphasized 1. The reduction of high-risk pesticides (e.g., pyrethroids, organophosphates, carbamates) used commonly in vegetable production and the increased use of reduced-risk pesticides as well as cultural methods, 2. Increasing yields and quality of harvested vegetables by using the correct amounts and ratios of fertilizers, 3. The use of the *Vegetable Production Recommendation Guide*, which is updated every year with the latest recommendations of pesticides and growing tips and 4. The grower's own perception of how valuable the UME vegetable program is. Many methods of outreach were used by the Vegetable IPM Program to train growers in the new techniques of vegetable production. These methods included winter meetings, field days, fact sheets, newsletters, videos, full day training sessions, demonstration plots, etc. Our main goal in conducting the survey was to see if growers were responding to the training methods and integrating the new vegetable programs into their systems.

## Methods

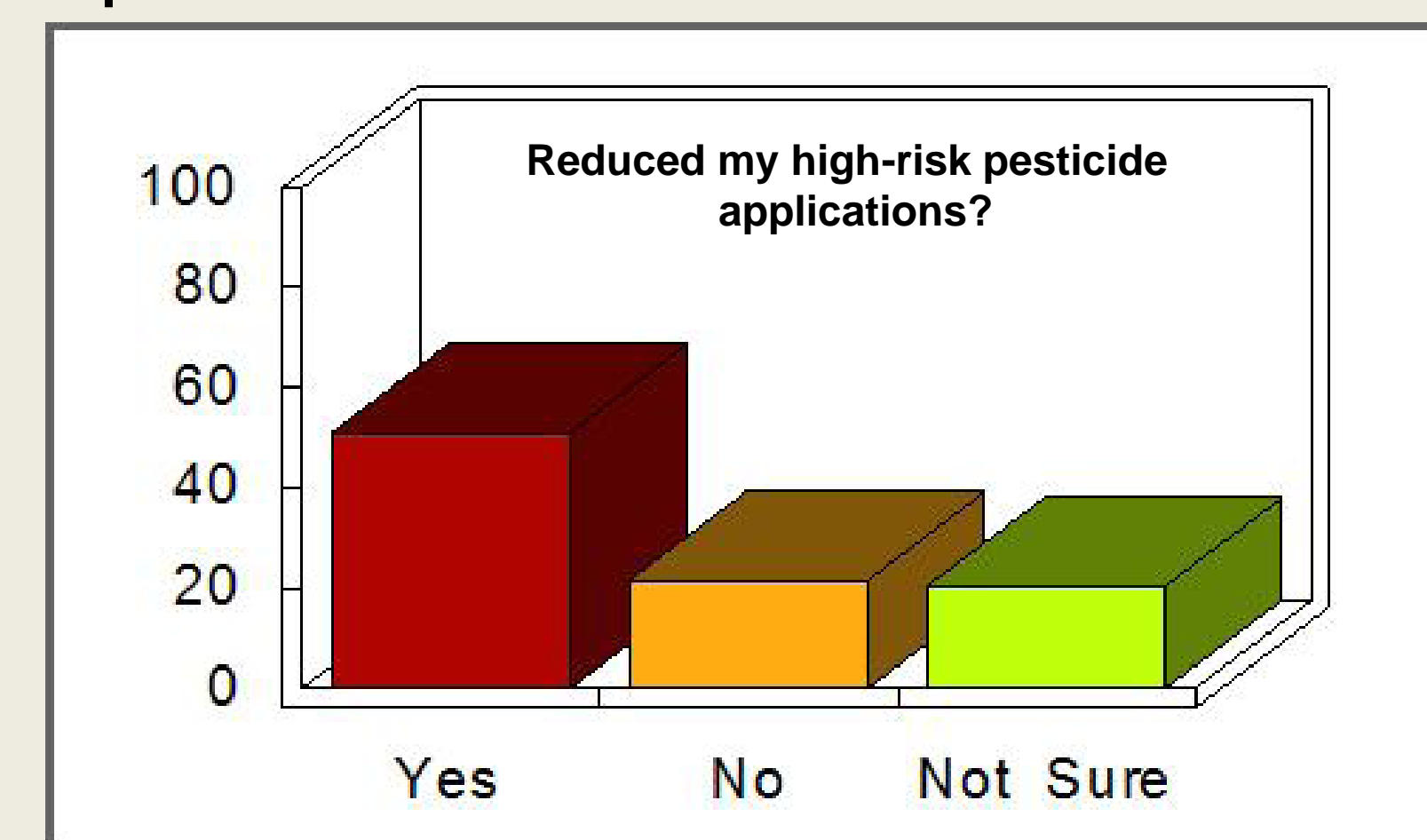
The method we used to collect the data was a survey questionnaire containing 19 questions. Individual responses were confidential and the survey was approved by the University of Maryland Institutional Review Board. To ensure the best response rate, good coverage and minimal error and nonresponse Dillman's Tailored Design Method (TDM) was used (Dillman, et al. 2009). Dillman's TDM is based on social-exchange theory in that respondents will determine that the benefits of providing the information outweigh the costs of time and effort to provide the information. This method relies on factors such as multiple contacts, giving respondents information and respect, being appreciative of their help, making the survey interesting and easy to use and providing some type of incentive. The survey questions were developed using a team approach to elicit subject matter, organization and evaluation expertise.

The survey was conducted by mail in the winter of 2013 with a plan for multiple contacts as recommended by Dillman et al 2009. A prenotification letter was sent to those chosen for the survey explaining the purpose of the research and emphasizing the confidentiality and importance of the information that would be collected. One week later an instruction letter and survey were sent along with a self-addressed stamped return envelope. One week after the survey was sent a reminder postcard was mailed and one week after this the second reminder postcard was mailed out. In total four contacts were made with the potential respondents. In addition an incentive was included, which consisted of any participant who finished the survey could return a post card with their name, address and telephone number that would be entered into a drawing for cash prizes of \$100, \$50 and \$25.

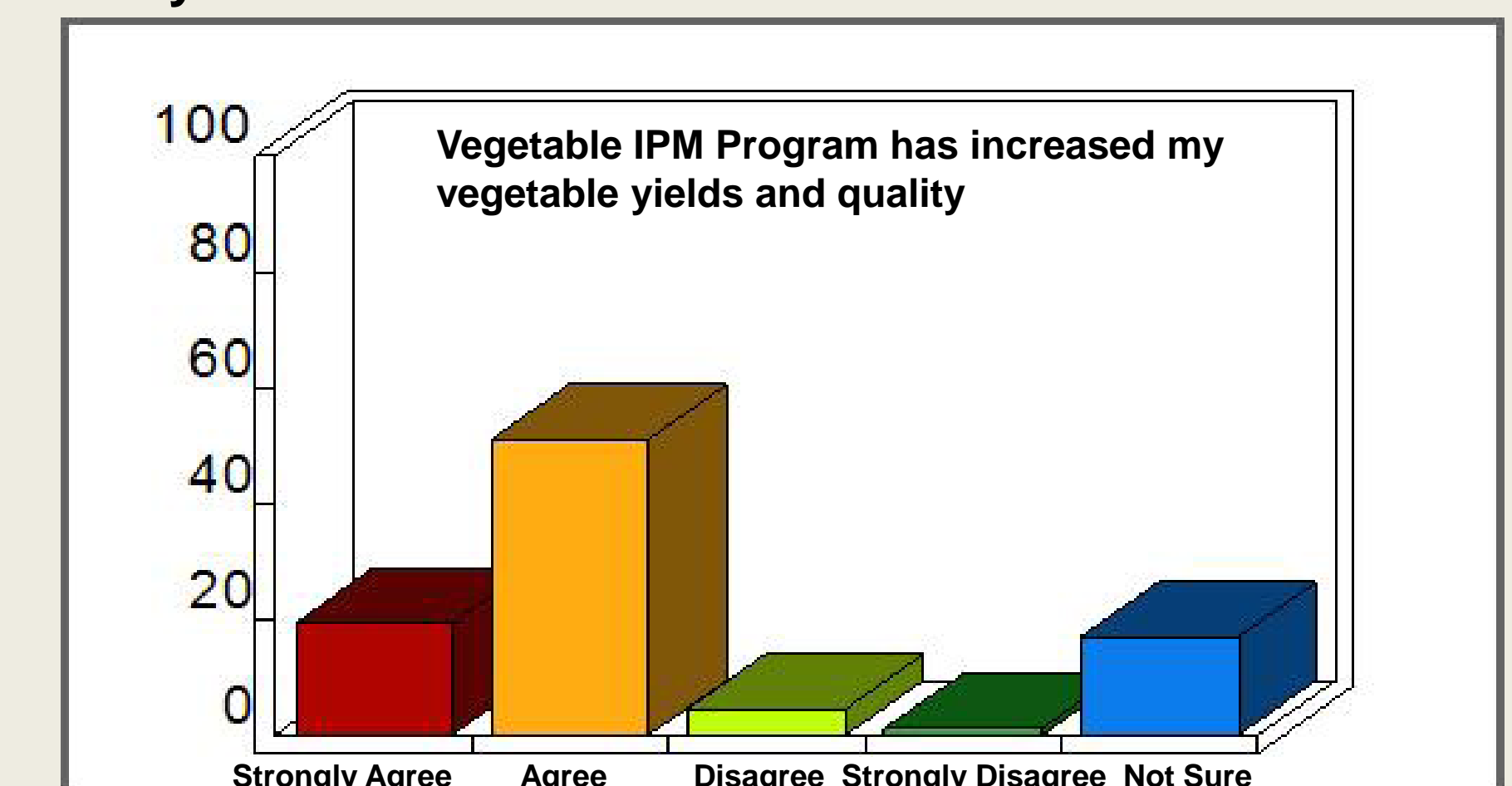
## Results and Discussion

The survey response rate was 66%. For a paper-based survey, the response rate was very good and reflects that the questions and questionnaires were well designed and that there was good implementation procedures. Almost 80% of the Maryland counties were represented in the survey, with more than 70% of the respondents growing vegetables for more than 16 years. The questions asked of growers and their responses are given below for 5 of the most important issues.

**Q. Information I have obtained over the last 5 years from the Vegetable IPM Program has reduced my use of high-risk pesticides?**



**Q. Information I have obtained over the last 5 years from the Vegetable IPM Program has increased yield and fruit quality on my farm?**



## Table 1

**Q. Estimate, on average, how many high-risk pesticide applications you have been able to decrease per season because of the information you gained from the Vegetable IPM Program.**

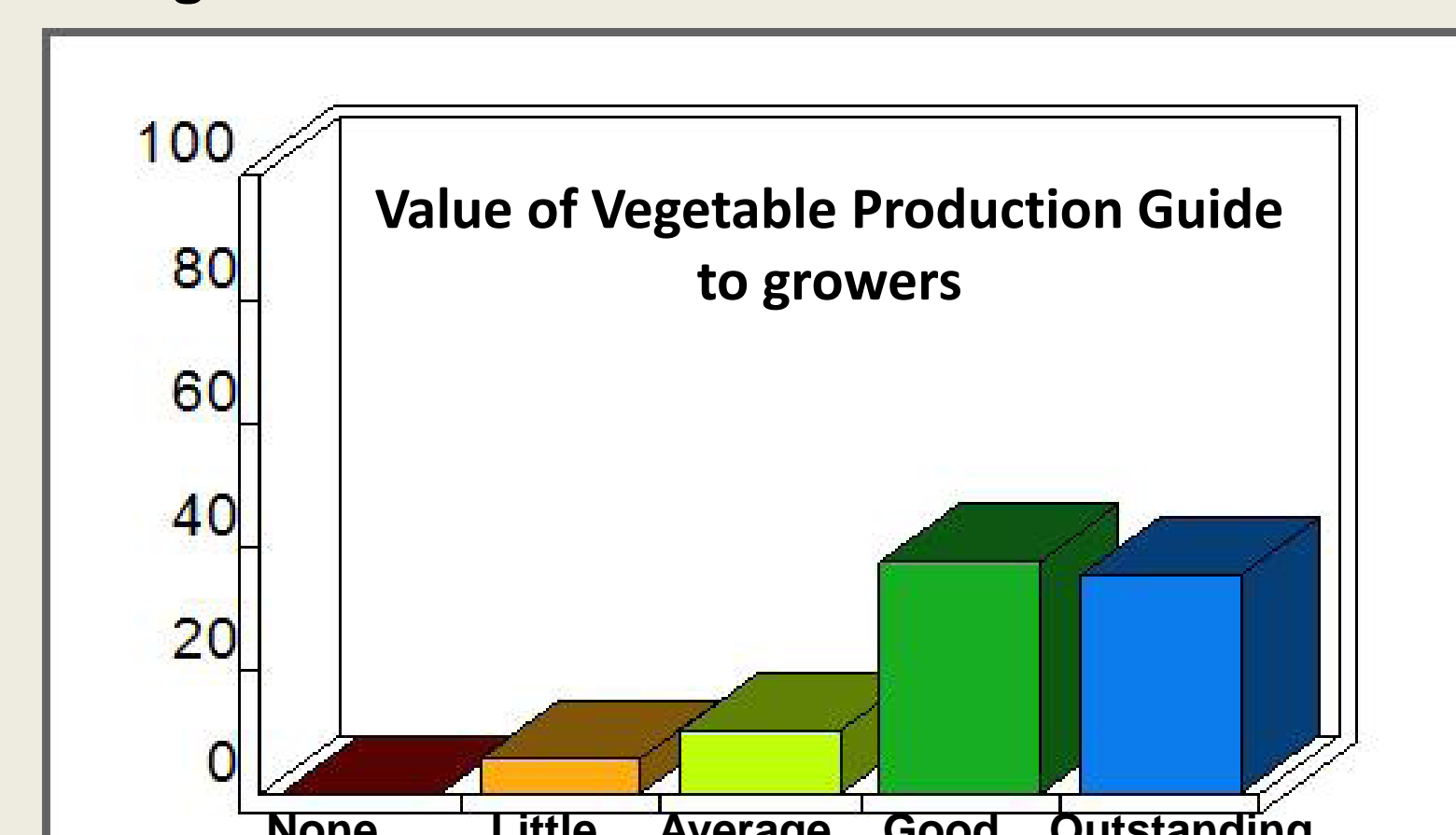
Decrease in number of sprays	% of respondents
0	1.2
1-3	42.3
4-6	25.6
7-9	6.8
≥10	3.2

## Table 2

**Q. Based on the knowledge and skills you have obtained from the Vegetable IPM Program over the last 5-years, what do you estimate to be the total value of dollars saved or earned per acre per year?**

Increase \$ amount	% of respondents
0	0.65
1-10	14.78
11-30	12.51
31-40	15.50
41-50	7.52
51-60	19.64
>60	25.73

**Q. How would you rate the usefulness for your farm system of the Vegetable Production Recommendations Guide?**



## Summary

Based on the results from this survey the UME Vegetable IPM Program has reduced the use of high-risk pesticides and increased the use of reduced-risk pesticides and cultural controls for more than 50% of respondents. Maryland vegetable growers have also increased their vegetable yields and quality of fruit over the last 5 years because of the program. The Vegetable Production Recommendation Guide that is updated each year is rated by 75% of growers as having good or outstanding value. Finally 68% of respondents said they have earned or saved \$31-60/acre each year because of the UME Vegetable IPM Program. While these results are quite encouraging more effort is needed to increase the amount of money saved by growers and to continue to reduce high-risk pesticides.