Integrated Pest Management (IPM) Assessment for Apples and Wine Grapes, Pilot Program 2016-2017
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Introduction

Integrated Pest Management (IPM) Assessments for apples and wine grapes were developed and offered by the UVM Apple & Grape Programs as pilot models from 2016-2017. The assessments included a series of research-based best management practices encompassing soil and nutrient management; cultural practices; pesticide application techniques, record-keeping, tactics for insect, disease, and weed management; and grower participation in educational activities. Two apple growers and three wine grape growers were selected to participate in testing the models. The goal of the assessment tool is to improve IPM at individual operations and to guide future education programming.

Methods

The IPM Assessments were adapted for Vermont growers from UMass Extension Integrated Pest Management Program "IPM Guidelines" (https://ag.umass.edu/integrated-pest-management/ipm-guidelines/apple, https://ag.umass.edu/integrated-pest-management/ipm-guidelines/wine-grape) and offered as online surveys containing yes/no questions about management practices. Both apple and wine grape growers were surveyed for soil nutrient management and cultural practices; pesticide application and recordkeeping; disease, insect, and weed management; and participation in educational activities. Apple growers were additionally surveyed for mite and vertebrate management; pest suppression; and pest, weather and crop monitoring. Wine grape growers were additionally surveyed for pre-plant practices and considerations. Additional comments were also collected from all participants.

The initial IPM Assessment surveys were administered in May 2016. Specific practices were assigned points based on their importance to an IPM system and total points scored were used to determine current IPM needs of individual growers. Program staff then met one-on-one with individual growers on-site at their operation to discuss results and offer tailored suggestions to improve IPM practices. These meetings were also an opportunity to review specific survey questions and their relevance to Vermont. Follow-up assessments were administered in May 2017 to assess impacts of IPM educational efforts.
Results

All growers surveyed actively utilize IPM practices. The scoring system is a way to screen for gaps in application that may be addressed and does not indicate poor practice. Not all IPM practices are necessarily adapted to every farm, and growers may farm sustainably without necessarily adopting every practice on the list.

Initial IPM Assessment (2016)

Upon initial assessment, apple growers scored an average of 54% and wine grape growers scored an average of 45% of the total possible. After review and one-on-one grower meetings (see below), three apple and eight wine grape management practices that were not applicable to Vermont growers, as highlighted by a uniform lack of positive response, were removed from the scoring process. By removing these practices from the scoring process, apple growers scored an average of 58% and wine grape growers scored an average of 52%.

Both apple and wine grape growers scored well in soil nutrient management and cultural practices. Apple growers also scored well in mite and disease management; pest, weather and crop monitoring; and participation in educational activities. Wine grape growers also scored well in disease management.

The initial assessment highlighted several areas for improvement of IPM practices. Both apple and wine grape growers most consistently scored lowest in pesticide application and recordkeeping. Apple growers also scored poorly in weed management and vertebrate management. Wine grape growers most consistently scored lowest in pre-plant practices and considerations and participation in educational activities.

One-on-One Grower Meetings

The unique environments of individual grower operations raised several questions about the phrasing and definitions within the assessments. This was expected due to the adaptation of the survey from an outside source. Vermont has its own unique climate, pests, cultivation practices, and regulations. For example, several wine grape assessment practices initially included pests that are not problematic in our region or on the cold-hardy varieties grown here. In addition, the survey participants covered a range of beginning and experienced growers.

Follow-up IPM Assessment (2017)

Upon follow-up assessment, using the corrected scoring process with removed practices, apple growers scored an average of 60% (4% increase) and wine grape growers scored an average of 74% (41% increase). Apple growers improved average scores in pest monitoring, insect management, and vertebrate management. Apple grower average scores decreased in disease management and weather and crop monitoring. All other average scores remained stable. Wine grape growers improved average scores in all areas.
Discussion

Apples have been an established crop in Vermont since Colonial times. Wine grapes are a relatively new crop to Vermont with the introduction of cold-hardy varieties in the 1990's. Management practices available to apple growers are well defined whereas wine grape growers have fewer proscribed practices due to the newness of the crop and the inexperience of growers. New research and practices are in continuous development for both crops.

The age of these industries is noticeable in the results of the IPM Assessment pilot models. Apple growers scored higher in initial assessments and demonstrated only a modest increase or no change in scores following consultation. Wine grape growers scored much lower in initial assessments and demonstrated dramatic increase in scores following one-on-one meetings. Increases (and decreases) in apple scores were largely due to adoption of (and understanding of, therefore adjusting responses to) IPM practices by a new grower following their one-on-one meeting.

The IPM Assessment tool was successful at raising awareness of specific IPM practices among apple and wine grape growers. This became evident in one-on-one meetings where growers raised questions directly related to practices in the assessment. One apple grower stated that the assessment "got him thinking" about specific cultural practices to enhance pest management and methods to improve pesticide application safety.

Further adaptation of the IPM Assessment tools are necessary to improve their usefulness for Vermont growers. Accommodations for age of separate plantings within an operation, considerations for cultural practices that are not employed (herbicides, subsoiling), and inclusion of pollinator-friendly practices were all specified by growers as desired adaptations.

The information gathered from these pilot assessments will now be used to develop self-assessments of crop-specific IPM practices tailored to Vermont growers. The assessment will be available as an online tool to facilitate IPM education and assist grower decision-making in the future.