

# Farming practices, level of knowledge, and methods of pest management of fruit and vegetable producers in Missouri



Jaime C. Piñero

Lincoln University Cooperative Research and Extension, Jefferson City, MO 65101



**ABSTRACT** In August, 2014, the Lincoln University (LU) Integrated Pest Management (IPM) program implemented a state-wide survey aimed at investigating the farming practices of vegetable and fruit producers in Missouri, including their knowledge level and methods of pest management. For both conventional and organic fruit and vegetable producers who responded to the survey, most selected pests (diseases, insects, weeds) as the biggest challenge on their farm. The second most-selected challenge was weather. Organic growers were more likely to select financing and access to farmland as important challenges than conventional growers; in turn, conventional growers more likely to select access to markets as an important challenge than organic growers. When asked to choose between weeds, diseases, insects, and mites, both conventional and organic growers selected insects as the most significant pest for small fruit, tree fruit, and vegetable production. This information will be used to better help growers with their pest management decisions.

**BACKGROUND** There is a need to bring research-based information on all aspects of Integrated Pest Management (IPM) to the citizens of Missouri. The Lincoln University IPM Program was established in April 2010 in response to that need. With an emphasis on fruits and vegetables, the goal of this program is to develop (through research) and promote (through Extension) affordable and environmentally compatible alternative strategies to combat pests of specialty crops including fruits and vegetables.

**OBJECTIVE** The aim of this work was to assess the farming conditions and pest management challenges and needs of commercial growers in Missouri through a state-wide survey, in order for the LU IPM program to better help growers with their pest management decisions.

**METHODS** Working with the LUCE IPM Specialist and the advisory committee, Univ. of Missouri Assessment Resource Center staff developed a survey of 25 questions to investigate the farming practices of commercial producers, including their level of knowledge and methods of pest management. A link to the survey was distributed through a variety of organizations related mostly to fruit and vegetable production. The survey was closed on August 21, 2014, at which time 111 fruit and vegetable growers had responded.

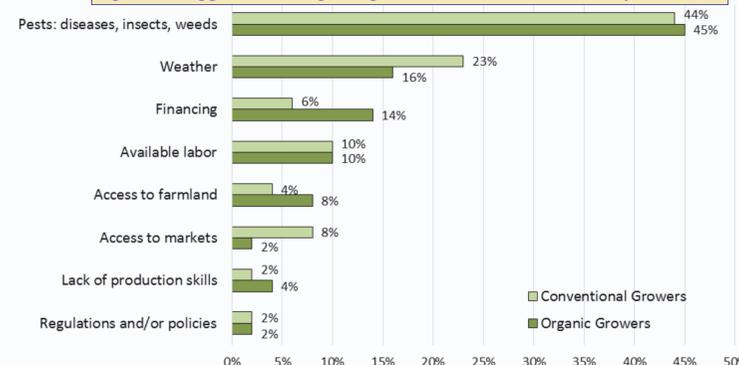
**RESULTS** Respondents were asked to identify the gender of the main operator on their farm. The most common response was male (47%), while 25% of farm operators were female and 29% indicated that work was shared equally between the two genders. Farmers from a variety of age demographics were represented, with the most common age category being 51 to 60; only 6% of farmers were under the age of 30. Respondents were not ethnically diverse, with 84% of respondents describing themselves as white, followed by Asian/Pacific Islander (8%), and black/African American (3%).

**FARMING PRACTICES.** Farmers were asked to identify their farming practices by selecting whether they used USDA-certified organic; organic, but not certified; both conventional and organic; or strictly conventional practices for growing vegetables, small fruits, and tree fruits. Across all types of production, between 78% and 87% of respondents reported using at least some organic practices (Fig. 1).

Throughout the remainder of this report, when types of practices are compared, farmers who reported using USDA-certified organic practices or organic practices without certification across all types of production were classified as organic growers. Farmers using strictly conventional methods or a mix of organic and conventional methods in one or more of the farming products asked about on the survey are classified as conventional.

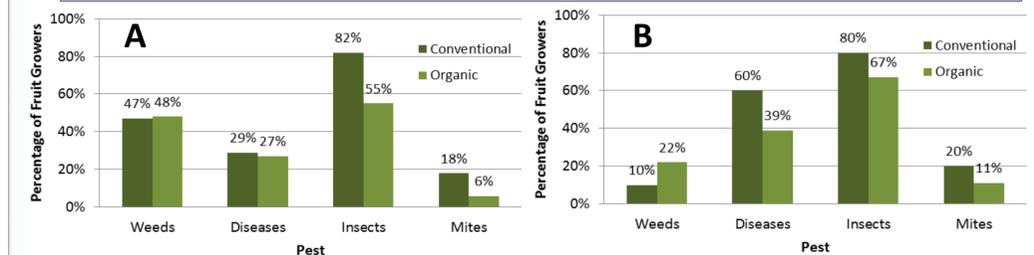
**FARMING CHALLENGES.** Farmers were asked to select the one biggest challenge on their farm from eight options (listed in Fig. 2). While both conventional and organic growers most commonly selected pests and weather as their biggest challenges, there were some notable differences between these two groups (Fig. 2). Organic growers were more likely to select financing and access to farmland than conventional and conventional growers were more likely to select access to markets than organic growers.

Figure 2: Biggest challenge: organic and conventional comparisons



**FRUIT GROWERS.** Both conventional and organic producers most commonly selected insects as a significant pest for both small fruits (Fig. 3A) and tree fruits (Fig. 3B).

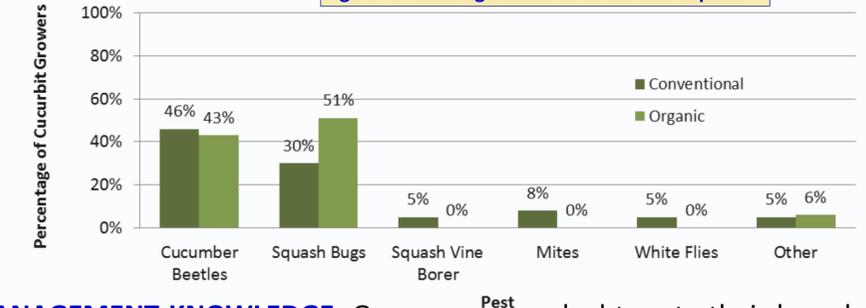
Figure 3: Biggest pest problem for organic and conventional (A) small fruit, and (B) tree fruit growers



Growers were then asked to select the most significant insect pest in their orchard from six choices. Both conventional and organic producers selected Japanese beetles as the most significant small fruit pest and fruit worms other than the Spotted Wing Drosophila as their most significant tree fruit pest.

**VEGETABLE GROWERS.** Farmers were asked to select the most significant pest (weeds, diseases, insects, mites) in their vegetable production. Both conventional (68%) and organic producers (70%) most commonly selected insects, followed by weeds (50% and 62% for organic and conventional, respectively). Farmers who grow cucurbit crops selected squash bugs and cucumber beetles as the most significant cucurbit insect pest (Fig. 4).

Figure 4: Most significant cucurbit insect pests



**PEST MANAGEMENT KNOWLEDGE.** Growers were asked to rate their knowledge of IPM using a five-point rating scale. Fifty-one percent of conventional growers and 32% of organic growers rated themselves as having a medium level of knowledge of IPM whereas 30% of organic and 12% of the conventional farmers indicated having a high level of IPM knowledge.

**PEST MANAGEMENT INFORMATION.** Growers were given eleven IPM topics and asked which of the topics they would like to learn more about. The two topics that generated the greatest level of interest were "Learning how to provide habitat for beneficial insects including native pollinators" and "using the natural enemies of the insect pests (parasites, predators) for biological control", were each selected by 33% of the farmers who answered this section of the survey.

**INTERESTED IN ADDITIONAL SURVEY RESULTS?** Due to lack of space, not all information that was collected in the survey is being presented here. Additional results concerning high tunnels, pest scouting, pesticide application, post-pesticide application evaluation, preferred sources of IPM information, and more, can be found at: <http://www.LU-IPM.net>

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