An Assessment of Integrated Pest Management Needs and Priorities for Local Food Production in Montana

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Introduction/Theoretical Framework

The number of local food producers, small acreage farms, and community supported agriculture businesses in Montana is continuously rising with population growth (MDA, 2020). Interest in buying local organic food has risen due to increasing public demand for farm to table products and organic certification processes (USDA, 2019). Small acreage farms are typically diversified operations that produce food based on consumer preferences, such as locally grown and organic (Johnson, 2016). For this reason, small-scale farms must manage operations differently than large-scale conventional producers. While many growers use production practices that reduce the application of pesticides (organic and synthetic), only limited information is known about small farms use of integrated pest management (IPM) strategies in Montana local food production (EPA, 2019; MDA, 2020; UC IPM, 2019). Such information can help identify whether there are gaps in current knowledge about existing challenges. Moreover, this information would help complement existing research that seeks to develop strategies for education that helps overcome these challenges and "strengthen farms, agricultural workers, and communities" as outlined in the AAAE National Research Agenda Priority Three (Roberts, Harder, & Brashears, 2016).

Understanding how producers prioritize the need for information can give insight as to what drives their decision to explore innovative agricultural practices (Long, 2013). The Theory of Planned Behavior (TPB) is widely referenced in agricultural literature in attempt to understand why producers reject or adopt practices (Ajzen, 1991; Rogers, 2003; Saltiel, Bauder, Bauder, & Palakovich, 1994). The theory of planned behavior (TPB) states that a person's behavior is determined by their intention to perform a given behavior, as it can be predictable, deliberative and planned (Ajzen, 1991). The theory assumes human action is guided by three considerations: behavioral beliefs, normative beliefs, and control beliefs. These considerations are useful for assessing people's attitudes, norms and behavioral intention.

Purpose/Objectives

The purpose of this study was to discover Montana local food growers IPM educational and research needs to support the adoption of integrated pest management practices. The objectives were: (1) Identify small-scale farmers' current levels of IPM knowledge; (2) Identify the priorities and needs that small-scale farmers have for IPM education and research; and (3) Identify farmer-preferred methods for receiving educational information about IPM. Development of objectives were guided by the theoretical framework, local producer needs, IPM research, and direction for extension education (EPA, 2019; UC IPM, 2019).

Methods/Procedures

This descriptive study utilized a survey research design. The survey was developed in consultation with plant disease diagnosticians and reviewed for validity. A list of small-scale, local food producers was compiled using extension sources and databases. The survey was distributed via Qualtrics to 60 small-scale producers in spring 2019. Eighteen surveys were returned and complete, yielding a response rate of 30%. The survey was open for four weeks with weekly reminders (Dillman, Smyth, & Christian, 2009). To address non-response error, late responses were compared to early responses using demographic questions and no differences were revealed (Lindner, Murphy, & Briers, 2001). Primary data analysis was conducted utilizing descriptive statistics and themes generated within Qualtrics.

Results/Findings

Objective One: The average response about IPM knowledge was 3.18 (slightly above average), with a majority of respondents having either average or a somewhat high level of knowledge about IPM practices. No respondents reported having a high level of knowledge about IPM practices. Highest levels of knowledge of 11 IPM topics were about cultural practices and weed identification/management, while lowest levels of knowledge were related to insect pest monitoring/sampling and understanding insect, disease, and weed resistance to chemicals.

Objective Two: The largest percentage of respondents were interested in learning more about biological (83%) and cultural control (81%) practices. All topics received average scores (1=no need, 5= high need) in between "some need" and "high need" as indicated here by mean and standard deviation: plant insect pest management (4.17, 0.83), plant disease management (4.11, 0.81), and weed management (4.06, 1.03). When asked about IPM education and research priorities for local food production, respondents proposed a variety of ideas, with four common response themes: (1) Managing pests without chemicals; (2) The effects of weather and seasonality on pests in Montana; (3) Inexpensive management strategies; and (4) Education for the public about why local produce may look different than conventional produce.

Objective Three: On average, respondents reported that the most useful resources are networking with peers (M = 3.89, SD= 0.66) and the internet (3.89, 0.81), followed by printed publications and books (3.33, 0.67), Montana Extension (3.28, 0.99), conferences and workshops (3.17, 0.76), social media (2.59, 1.24), and local food organizations (2.58, 1.04). Respondents most preferred receiving help from extension or research personnel face-to-face on their farms, but they also favor email, publications, and face-to-face workshops or field days.

Conclusions/Recommendations

Discovering Montana local food growers' educational needs, challenges, and priorities can assist private and public agencies in understanding their decision to adopt IPM practices and guide future efforts. According to the TPB, decision-making relies on behavioral beliefs, normative beliefs, and control beliefs (Ajzen, 1991). As this study revealed, local producers rely on multiple factors to make decisions with precedence on peer networking, the internet, and continuing education to take action. These findings support the need for continuous face to face and online management resources tailored for local growers. No respondent reported a high level of knowledge about IPM practices, indicating there is room for education that can be delivered via online webinars and in-person by Extension specialists and private consultants. Related to informational needs, topics should focus on chemical-free and inexpensive strategies, climate effects on pests, and improving community education. The two most commonly used resources were peer networking and the internet supporting the growing need for updated websites and electronic communication. Professional conferences should encourage peer interaction and information exchange to influence adoption of practices. Face-to-face on-farm assistance was the preferred method for receiving information, verifying the need for specialists and consultants dedicated to work with small acreage farms.

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