**Survey Findings from Two Lowbush Blueberry Pollination Workshops**

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 In May and June of 2014, two free pollination workshops were offered for lowbush blueberry growers, one at Blueberry Hill Farm in Jonesboro and one at Seven Tree View Farm in Warren (funded by SARE grant #GNE13-055, Collum and Hanes co-PIs). The workshops provided information on bees’ life histories, bee identification, and how to assess bee abundance and contribution to fruit set and yield. Dr. Frank Drummond conducted the workshops. Dr. Samuel Hanes and graduate student Kourtney Collum administered a survey to workshop participants to learn about their pollination practices and perceptions of native bees. Summarized below are key findings from the survey.

**METHODS:**

Eight people attended the workshop at Blueberry Hill Farm and 18 people attended the workshop at Seven Tree View Farm. Participants included blueberry growers and representatives from agricultural agencies such as Cooperative Extension and the Natural Resources Conservation Service. In total, 19 growers completed a survey and one declined to participate. Ninety-five percent of respondents (n=18) said they regularly attend Cooperative Extension meetings or workshops, and of those, 78% (n=14) said they attend three or more meetings or workshops per year. Given this high rate of participation at Cooperative Extension events, we classify workshop participants as potential early adopters of agricultural innovations. Thus, we assume that respondents are more likely than the average grower to use a diversity of pollination management practices and to adopt new pollination management practices in the future.

**RESULTS:**

Respondents were asked how effective they think native bees are for pollinating their crop, on a five-point scale from *very ineffective* to *very effective* (Fig. 1). Overall, 74% of respondents said they think native bees are *somewhat effective* to *very effective*.

**Figure 1.** Response to the question “How effective do you think native bees are for pollinating your crop?”

Despite positive perceptions of native bees’ effectiveness, more than 40% (n=8) of respondents felt they would never be able to get sufficient pollination from native bees alone, and only 11% (n=2) felt they could get sufficient pollination from native bees alone every year (Fig. 2).

**Figure 2.** Response to the question “In your opinion, how often would you be able to get sufficient pollination from native bees alone?”

The survey contained a list of pollination management practices—other than stocking commercial honeybees or bumble bees—and respondents were asked to indicate whether they regularly use each practice, whether they tried the practice in the past but discontinued it, or whether they never used the practice at all. They were also asked to indicate which practices they planned to use in 2014 (Fig. 3). The most commonly used practices were: altering pesticides to avoid harming pollinators (88.2%; n=15); avoiding mowing wildflowers to provide food for pollinators (41.2%; n=7); and leaving standing deadwood for pollinators (38.9%; n=7).

More than half of respondents (53.3%; n=8) said that they planned to identify different kinds of native bees in their fields next season, and 40% (n=6) said they planned to estimate bees’ contribution to fruit-set in their crops next year. These two management practices were the focus of the pollination workshops. Aside from these two practices, intention to use the pollination management practices listed on the survey was low among respondents (Fig. 3).

**Figure 3.** Respondents’ past, current, and planned use of nine pollination management practices.

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| --- | --- | --- | --- | --- |
| Pollination Management Practice | Regularly Use | Tried & Discontinued | Never Used | Planned to use in 2014 |
| Identify different kinds of native bees in my fields  | 38.9% (n=7) | 5.6% (n=1) | 55.6% (n=10) | 53.3% (n=8) |
| Monitor the size of the native bee population in my fields in any way  | 5.6% (n=1) | 11.1% (n=2) | 83.3% (n=15) | 26.7% (n=4) |
| Estimate bees’ contribution to fruit-set in my crops | 11.8% (n=2) | 11.8% (n=2) | 76.5% (n=13) | 40% (n=6) |
| Use leafcutting bee nest boxes or bumblebee nesting items | 5.6% (n=1) | 16.7% (n=3) | 77.8% (n=14) | 6.7% (n=1) |
| Avoid mowing wildflowers to provide food for pollinators  | 41.2% (n=7) | 5.9% (n=1) | 52.9% (n=9) | 13.3% (n=2) |
| Plant wildflowers or bee meadows specifically for pollinators  | 11.8% (n=2) | 0% (n=0) | 88.2% (n=15) | 33.3% (n=5) |
| Leave standing deadwood for pollinators  | 38.9% (n=7) | 0% (n=0) | 61.1% (n=11) | 26.7% (n=4) |
| Alter pesticide application to avoid harming pollinators  | 88.2% (n=15) | 0% (n=0) | 11.8% (n=2) | N/A |
| Limit floral competition during bloom by cutting wildflowers or other blooming plants  | 17.6 (n=3) | 0% (n=0) | 82.4% (n=14) | 20% (n=3) |

Respondents’ were also asked to indicate how easy or difficult it would be to identify native bees, monitor the size of native bee populations, and estimate bees’ contribution to fruit-set, on a scale from *very easy* to *very difficult* (Fig. 4). The high number of “*neutral*” and “*not sure*” responses suggests that some growers are uncertain about the time or skill required to implement these management practices. Furthermore, approximately 47% (n=9) of respondents indicated that estimating bees’ contribution to fruit-set would be *difficult* or *very difficult*, and 42% (n=8) said the same of monitoring the size of the native bee population in their fields.

**Figure 4.** Respondents’ perceptions of the difficulty of identifying bees, monitoring bees, and estimating bees’ contribution to fruit-set.

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| --- | --- | --- | --- | --- | --- | --- |
| Pollination Management Practice | Very Easy | Easy | Neutral | Difficult  | Very Difficult | Not Sure |
| Identifying different kinds of native bees in my field(s)  | 5.3% (n=1) | 26.3% (n=5) | 31.6% (n=6) | 26.3% (n=5) | 0% (n=0) | 10.5% (n=2) |
| Monitoring the size of the native bee population in my field(s)  | 0% (n=0) | 15.8% (n=3) | 31.6% (n=6) | 26.3% (n=5) | 15.8% (n=3) | 10.5% (n=2) |
| Estimating bees’ contribution to fruit-set in my crop(s)  | 0% (n=0) | 10.5% (n=2) | 26.3% (n=5) | 42.1% (n=8) | 5.3% (n=1) | 15.8% (n=3) |

**CONCLUSIONS/RECOMMENDATIONS:**

Stocking commercial bees during bloom remains the dominant pollination management strategy practiced by more than three quarters of Maine lowbush blueberry growers (Hanes et al. 2013, Rose et al. 2013). Findings from the workshop survey and previous research suggests that—beyond stocking commercial honeybees or bumble bees—few growers are implementing other pollination management practices, such as monitoring their bee populations or actively managing their fields to enhance wild bees. Respondents did express interest in some of the alternative practices, yet expressed uncertainty about the value of the practices and time and skill required to implement them. We conclude that further outreach and training is needed for growers who wish to implement additional practices to improve their decision-making about pollination management. Specifically, we recommend further training on: (1) monitoring native bee populations, and (2) estimating wild and commercial bees’ contribution to fruit-set. We are in the process of writing a Cooperative Extension fact sheet on the workshop's contents that will include short profiles of blueberry and apple growers' who are successfully implementing alternative or diversified pollination strategies. The fact sheet will be available by spring of 2015.