

US EPA ARCHIVE DOCUMENT

## PPDC Pollinator Protection Plan Metrics WG - Meeting Minutes

1/18/2017

### Attendees:

(in person) Mike Goodis, Lead; Tom Steeger; Dee Colby; Tom Moriarty  
(phone) Stephanie Binns (for Aaron Hobbs), Ray Brinkmeyer, Michele Colopy; Steven Coy; Mark Dykes; David Epstein; Jim Fredericks; Nichelle Harriot; Dudley Hoskins; Rose Kachadoorian; Jeanette Klopchin; Peg Perreault; Caydee Savinelli; Julie Shapiro; Robin Shepard; Tom Van Arsdall; Andy Whittington; Angus Catchot; Jeff Gore; Jeff Harris; Josh O'Rear; Dennis vanEnglesdorp

### Agenda (attached)

#### Welcome, Introductions, Ground Rules, Agenda Review – Mike

Workgroup members and guest speakers introduced themselves. It was suggested that the Ground Rules, #8 be revised to make participation in Workgroup meetings for members or their representatives and guest speakers only. Public participation would occur at the full PPDC meetings; that is, the public would not be allowed to listen in during meetings. This suggestion was supported by various group members.

#### Review of Meeting Minutes from December 1, 2016 - Dee

Meeting minutes were finalized from the December meeting and will be posted on the PPDC website.

#### Report from the States' Plans Metrics Subgroup – Jeanette Klopchin

Jeanette went through the progress of the Subgroup's efforts to categorize metrics from states' plans, identifying common themes and corresponding metrics. There were 8 common themes from 30 finalized state plans. A summary document is attached.

#### Report on the Mississippi Beekeeper/Farmer Survey – Angus Catchot, Jeff Gore, Jeff Harris

The three speakers talked about the survey metric (see attached) of the Mississippi Honey Bee Stewardship Program: who was involved, the intended purpose, lessons learned and where to improve. Some key points in their discussion:

- 1) The survey was intended to measure if an increase in awareness of the importance of pollinator health had resulted from state MP3 efforts.
- 2) Formulation of questions involved all stakeholders; beekeeper and grower questions were developed separately and then combined.
- 3) Ultimately they would like to know if the increased awareness resulted in a change in behaviors, but it is difficult to document/quantify face to face changes.
- 4) Also, it was hoped that MP3 efforts, including the survey, would help safeguard the large commercial beekeeping industry in MS, but the "big guys" did not respond to the survey. There were a lot of side liners responding but not the beekeepers with the most interaction with agriculture.
- 5) The importance of keeping the survey as simple as possible was stressed. This survey has not been through the University's formal data collection process yet. Questions will be improved with the assistance of behavioral extension specialists.

### **Report from Bee Informed Partnership – Dennis vanEnglesdorp**

Dennis presented information from the Bee Informed Partnership's National Management Survey. The basis of their data collecting is to reduce colony mortality by predicting colony health by knowing the 'drivers'. While BIP data collection is strategic and NASS data collection is stratified and random, Dennis reports that the results are congruent. BIP is interested in management strategies, like *Varroa* mite management, and trends. In 2015-2016, *Varroa* was the main reason for colony loss for backyard beekeepers, sideliners and commercial beekeepers. Commercial beekeepers report 3% colony loss/month. Because 95% of beekeepers own 5% of the colonies in the U.S. and 5% of beekeepers own 95% of the colonies, the platform to address both groups should be different. The challenge is protecting confidentiality in sharing data.

See <https://beeinformed.org> for information about Bee Informed Partnership surveys and results.

### **Report from National Agricultural Statistics Service – Josh O'Rear**

Josh provided a review of NASS honey bee surveys and reports. NASS does data collection for the USDA. In general, the Honey Report gathers data on the number of colonies, cost of honey, etc. for beekeepers with  $\geq 5$  colonies. The Colony Loss Survey tracks a subsample of colonies quarterly, gathering data on the number of colonies, renovated colonies, and loss in the U.S. The Cost of Pollination report is sent to crop producers and requests information per acre and per colony. When asked about adaptability of surveys, Josh indicated that altering a survey is difficult due to funding and approval. Also, developing questions that ask what they need to ask can be difficult as well. Questions tend not to produce a single response. He also provided advice on how to elevate participation from commercial beekeepers by: 1) shooting for a 70% response rate, 2) speaking at conferences...beekeepers were easier to reach than crop producers, 3) reiterating that you are interested in just statistics and nothing personal, and 4) realizing that persistence is important for reaching commercial beekeepers.

Refer to [https://www.nass.usda.gov/Surveys/Guide to NASS Surveys/Bee and Honey/](https://www.nass.usda.gov/Surveys/Guide%20to%20NASS%20Surveys/Bee%20and%20Honey/) for NASS reports. The Cost of Pollination report can be found at <https://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=2008>

### **Discussion of metrics from multiple resources - Mike**

There was little time left to discuss common themes of metrics, but it was noted that we may be able to selectively pick metrics from different sources and adapt them for our purposes. It was suggested and agreed that we would keep the current Subgroup and add additional volunteers to help expand on the state list to include metrics from additional resources (e.g. NASS, BIP, and USDA APHIS surveys; State Apiary Inspector Reports, etc.) as we move into Project Stage 5 of the work plan. Project Stage 5 includes identifying process and product based metrics from existing resources so that the Workgroup can determine if sufficient measures are in place to document change at a national level. The amended Subgroup will consist of Stephanie Binns, Michele Colopy, Jim Fredericks, Jeanette Klopchin, Peg Perreault (EPA representative), Caydee Savinelli, Julie Shapiro and Tom Van Arsdall.

### **Meeting Recap – Dee**

Mark Dykes will be on the agenda for February to present from Apiary Inspectors of America  
Next teleconference date will be in February 2017...tentative date 02/23/2017 (turned out to be 2/15/2017)

## Pollinator Protection Plans Metrics PPDC Workgroup

Call-In Meeting 1/18/2017 2:00 – 3:30 pm

1-866-299-3188; 703-305-8578

Adobe connect:

<http://epawebconferencing.acms.com/r81ltlesrkv/>

The objective of this meeting is to discuss metrics within states' plans and areas of commonality, and to begin identifying process and product based metrics from multiple resources.

### Agenda:

#### **Welcome, Introductions, Ground Rules, Agenda Review** – Mike and Meredith (5 mins)

*Workgroup members and participants will introduce themselves.*

#### **Review of Meeting Minutes from December 1, 2016** - Dee (5 min)

*Finalize meeting minutes from the December meeting. December Meeting Minutes are attached.*

#### **Report from the States' Plans Metrics Subgroup** – Jeanette Klopchin (15 min)

*Jeanette will present the progress of the Subgroup's efforts to categorize metrics from states' plans, identifying common themes and corresponding metrics. A summary document is attached.*

Also, refer to [http://www.dec.ny.gov/docs/administration\\_pdf/nyspollinatorplan.pdf](http://www.dec.ny.gov/docs/administration_pdf/nyspollinatorplan.pdf) and <https://datcp.wi.gov/Documents/PPPComplete.pdf> for NY and WI pollinator plans. For measures guidance from SFIREG, see <https://aapco.files.wordpress.com/2016/02/sfireq-joint-working-committee-performance-measures-for-mp3-meeting-revision-clean-up.pdf>.

#### **Report on the Mississippi Beekeeper/Farmer Survey** – TBD (15 min)

*MS will report on the metric of the Mississippi Honey Bee Stewardship Program...a summary of the Mississippi Bee Stewardship Program Survey is attached.*

#### **Report from National Agricultural Statistics Service** – Josh O'Rear (15 min)

*Josh will provide a review of NASS honey bee surveys and reports.*

Refer to [https://www.nass.usda.gov/Surveys/Guide\\_to\\_NASS\\_Surveys/Bee\\_and\\_Honey/](https://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Bee_and_Honey/) for NASS reports. The Cost of Pollination report can be found at <https://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=2008>.

#### **Report from Bee Informed Partnership** – Dennis vanEngelsdorp (15 min)

*Dennis will present information on Bee Informed Partnership's National Management Survey.*

See <https://beeinformed.org> for information about Bee Informed Partnership surveys and results.

#### **Discussion of metrics from multiple resources** - Mike (15 min)

*The group will discuss common themes of metrics and if a new subgroup should form to expand on the state list to include metrics from additional resources (e.g. NASS, BIP, and USDA APHIS surveys; State Apiary Inspector Reports, etc.) as we move into Project Stage 5 of the work plan. Project Stage 5 includes identifying process and product based metrics from existing resources so that the Workgroup can determine if sufficient measures are in place to document change at a national level.*

**Meeting Recap – Dee (5 mins)**

*Review any action items*

*Work Plan Subgroup check-in...adjustments to work flow going forward*

*Next teleconference date will be in February 2017...tentative date 02/23/2017*

## PPDC Subgroup - Common Themes of State MP3s

Composed by: Jeanette Klopchin, Caydee Savinelli, Stephanie Anne-Binns, Pegg Perault

### Objectives

1. Reduce pesticide exposure through enhanced communication and collaboration among stakeholders.
2. Ensure positive relationships and peaceful co-existences among beekeepers, landowners and pesticide applicators, everyone to be part of the solution.
3. Utilize specific BMP's target state-specific problems.

### Outreach

1. Outreach and education program to raise awareness of importance of pollinators.
2. Training and education of pesticide applicators on pollinator stewardship.
3. Public service announcements, Press releases
4. Website - How to protect pollinators, safe alternatives to pesticides.
5. Engage public - active participation in reversing pollinator decline.
6. Partnerships with Extension, trade associations, government agencies to promote the plan.

### Communication

1. Beekeeper BMPs
2. Landowner/leaseholder BMPs
3. Pesticide user BMPs
4. Farmer/applicator BMPs
5. Interactive map of hive locations/pesticide use
6. System to or promotion of system to report all suspected pesticide poisonings of honey bees.

### Location of Apiaries of Beehives in Landscape

1. Drift Watch
2. Kelly Registration
3. Bee Flags – MS, MO, GA
4. State Apiary Mapping – ND, FL
5. Sensitive Crop Registry

### Pesticide Risk Mitigation

1. Provide information for safer alternative pesticides.
2. Pollinator protection info in pesticide applicator training materials.
3. Label interpretation.
4. Expand opportunities for identifying pollinator protection areas.
5. Utilize IPM

### Applicators BMPs

1. Take an IPM approach to pest control.
2. Choose appropriate pesticides to reduce the risk to pollinators from pesticides.
3. Understanding/interpretation pollinator language on labels.
4. Select products that are lower risk to honey bees if available.

5. Pesticide applicators are encouraged to work with beekeepers in regards to timing of the applications to reduce risk to honey bees.
6. Always use products at the recommended label rates and spray intervals with appropriate application equipment.
7. Inform beekeepers 48 hours before an insecticide application (Before applying a pesticide, identify and notify beekeepers of the application).
8. Method for growers and applicators to identify and contact beekeepers prior to an application - 1-2 mile radius of treatment.
9. Avoid applications when honey bees are actively foraging.
10. Don't allow pesticides to drift to non-target areas.
11. Check the application area for the presence of bees before spraying and avoid the use of pesticides during bloom or when pollinators are present.
12. When possible make applications early in the morning or in the evening to minimize the exposure of bees to pesticides.

#### **Landowners / Growers BMPs**

1. Communicate with leaseholders about honeybee issues.
2. Work with beekeepers to choose hive locations.
3. Decide who is responsible for locating hives and notifying beekeepers of application.
4. Notify ground and aerial applicators of hive locations.
5. Consider the timing of pesticide applications, and apply products according to the label.
6. Apply insecticides when drift onto bee hives is not likely.
7. Agronomists should consider pollinator impacts when making pesticide recommendations.
8. Always follow the pesticide label exactly regarding application timing and dose.
9. Use Integrated Pest Management (IPM) guidelines for your crop pest problems.
10. Heed pesticide labels that say "highly toxic to bees," "toxic to bees" or "extended residual toxicity".
11. To help choose products that are less toxic to pollinators, refer to the "Bee precaution pesticide rating" online tool from University of California Integrated Pest Management Program (UC IPM). Also see EPA's "Information on Residue Toxicity Times."
12. Avoid spraying pesticides on blooming plants being visited by pollinators. This includes crops, weeds in cropland, and wildflowers or weeds in field margins/ditches.
13. If treated seed is used:
  - a. Remove blooming crop weeds before planting treated seed.
  - b. Reduce dust release when planting treated seed.
  - c. Collect and properly dispose of any spilled treated seed. Treated seed can be toxic to birds and other wildlife if ingested.
  - d. Refer to the ASTA and CropLife guide to seed treatments
14. Educate yourself about safe pesticide use. The pesticide applicator certification training manual is a useful resource for everyone, and is required training for some types of pesticide applicators.
15. Consider using buffer strips between pollinator habitat and land that gets sprayed regularly with pesticides.

## **Beekeeper BMPs**

### **With Landowners**

1. Be a good partner with landowners - be flexible and work to develop a long-standing relationship
2. Work with the landowner to select apiary locations.
3. Beekeepers should be aware of the needs of the landowner
4. Communicate with land owners and consider your hive locations in relation to pesticide applications and other activities on the property.
5. Be aware of property boundaries and neighboring landowners when locating colonies.
6. Notify all adjoining landowners when placing, removing or moving hives.
7. When granted permission to keep hives on a parcel, do not "sublet" and allow other beekeepers to bring in their hives.
8. Do not assume that because you've worked with a landowner before, you can bring your hives in again without written permission."
9. Keep the landowner informed of hive locations, status, and concerns, and be willing to consider removing hives if the need arises.

### **With Applicators**

1. Collaborate with applicators when informed that a pesticide application is planned.
2. Make preparations in case hives need to be moved.
3. Don't leave hives in orchards or fields that are unmarked.
4. Inform local Mosquito Abatement District of beehive locations."
5. Ensure visibility of hives by obvious colors and locations. Posting a sign or placard with contact information is good practice."

### **Forage and Nutrition**

1. Manage forage in non-crop areas for bees.
2. Plant and maintain habitat
3. Avoid invasive plants and noxious weeds
4. A minimum goal is at least three plant species flowering at all times from early spring through late fall, but the more diverse the wildflower mix the better. The total seed count should be comprised mostly of forb seeds so that grasses do not crowd out forbs.
5. Annuals can be planted in the first year for rapid establishment of floral resources and weed blocking while perennial plants get established.
6. Match the seed mix to local site conditions (soil type, moisture, sun exposure, etc.)
7. A good seed mix will contain plants that host butterfly larvae (e.g., milkweeds for monarch butterflies) and bunch grasses (e.g., little bluestem) that provide nesting habitat for bees and birds.
8. If shrubs or trees are desired at your site, these can be chosen to benefit pollinators as well: American basswood, willows, and many fruit trees have flowers attractive to pollinators.
9. A combination of prescribed fire and end-of-season haying are critical to stimulate flowering in many plant species. Mowing can be done in lieu of burning, but fire is better than mowing at stimulating flowering over time.



### **Metrics/Evaluation Methods**

1. Changes in behavior
  - a. Improvements in levels of communication and cooperation among stakeholders.
  - b. Working relationships among beekeepers, farmers, and pesticide applicators
2. Changes in overall pollinator health.
  - a. Colony loss data across the state where the Plan would apply (instate surveys and credible research; Bee Informed Partnership)
3. Changes in pollinator friendly forage (quality/quantity)

### **Metrics Example: Wisconsin Set One**

1. Behavioral surveys – measure plan use and behavioral change pre/post plan release. Track website hits regarding plan.
2. Track the number of organizations, agencies, residents and others plus what programs (e.g. Conservation Reserve Program (CRP)) are using plan recommendations.
3. Survey readers on how the plan content improves their knowledge of pollinator health issues.
4. Develop and record an annual survey that organizations can distribute at growers' conferences.

### **Metrics Example: Wisconsin Set Two**

1. Track honey bee health and colony loss:
  - a. Hive health checklist via statewide inspection
  - b. Bee Informed surveys for colony loss
  - c. Expand the NASS survey on managed bees/honey production
2. Long-term monitoring research to track wild pollinator populations (collaborative effort).
3. Identify where pollinator habitat is currently and monitor over time.
4. Track acres of pollinator-friendly plantings along highway rights-of-way. DOT could monitor.
5. Track acres of pollinator friendly plants in Conservation Reserve Program and other private land programs.
6. Work with specific landowners or land managers as a pilot program.
7. Identify and offer incentives for "whole-farm" conservation planning.
8. Work with homeowners planting pollinator friendly plants.
9. Work with organizations advocating/planting pollinator friendly plants, e.g., Master Gardeners.
10. Develop a baseline evaluation tool that could be used on a county or regional basis to evaluate education/awareness every 3-10 years. Gather current and new partners to apply for grant funding.
11. Increase participation of large operators in Bee Informed surveys (large operators underrepresented in current surveys).

## Mississippi Bee Stewardship Program Survey

## 1. Are you a Beekeeper or a Row Crop Farmer?

Answer Options	Response Percent	Response Count
Beekeeper	41.2%	68
Row Crop Farmer	58.8%	97
<i>answered question</i>		<b>165</b>
<i>skipped question</i>		<b>0</b>

## 2. Please indicate what portion of the state you have bees in (check all that apply):

Answer Options	Response Percent	Response Count
Northeast	20.0%	13
Delta	7.7%	5
Central	35.4%	23
South MS	38.5%	25
Blackbelt Prairie Area	4.6%	3
<i>answered question</i>		<b>65</b>
<i>skipped question</i>		<b>100</b>

## 3. What is your primary purpose for beekeeping (check all that apply)?

Answer Options	Response Percent	Response Count
Hobby	59.4%	38
Honey production,	65.6%	42
Pollination	23.4%	15
services,	17.2%	11
Queen production,	18.8%	12
Bee production	18.8%	12
(selling packages, nucs, etc.),		
Bee rescue (swarm trapping and colony removal)		
<i>answered question</i>		<b>64</b>
<i>skipped question</i>		<b>101</b>

## 4. What is the relative size of your beekeeping operation?

Answer Options	Response Percent	Response Count
50 or less hives	73.8%	48
50 to 250 hives	18.5%	12
250 to 500 hives	6.2%	4
500 or more hives	1.5%	1
<i>answered question</i>		<b>65</b>
<i>skipped question</i>		<b>100</b>

## 5. How long have you been a beekeeper?

Answer Options	Response Percent	Response Count
0 to 5 years	46.9%	30
5 to 10 years	25.0%	16
10-15 years	4.7%	3
Over 15 years	23.4%	15
<i>answered question</i>		<b>64</b>
<i>skipped question</i>		<b>101</b>

## 6. Do you move your bees to row crops for honey production or to fruit or nut trees for pollination service at any time during the year?

Answer Options	Response Percent	Response Count
Yes	15.9%	10
No	84.1%	53
<i>answered question</i>		<b>63</b>
<i>skipped question</i>		<b>102</b>

## 7. Over the last 18 months, has your awareness of the importance of pollinator health been enhanced?

Answer Options	Response Percent	Response Count
Yes	84.1%	53
No	15.9%	10
<i>answered question</i>		<b>63</b>
<i>skipped question</i>		<b>102</b>

## 8. If Yes---please indicate the source of this information (check all that apply):

Answer Options	Response Percent	Response Count
MSU Extension Service	83.3%	45
Farm Bureau	42.6%	23
Bee related publications	72.2%	39
Other Beekeepers	53.7%	29
Social media	22.2%	12
Other Ag Industry Associations	9.3%	5
Other national or local media sources	29.6%	16
<i>answered question</i>		<b>54</b>
<i>skipped question</i>		<b>111</b>

9. In your opinion, what is the most significant production problem for you as a beekeeper (Rank them 1 to 5 in order of importance)?

Answer Options	1	2	3	4	5	6	Rating Average	Response Count
Varoa mite/Viruses	36	9	5	2	3	0	1.67	55
Small hive beetle	11	26	7	10	3	0	2.44	57
Loss of forage	2	8	17	15	3	0	3.20	45
Theft/vandalism	3	1	0	3	21	9	4.76	37
Pesticide exposure	1	7	20	8	7	1	3.36	44
Unsure	4	0	4	3	4	10	4.32	25
<i>answered question</i>								65
<i>skipped question</i>								100

10. Are your bees kept near/on row crop farms?

Answer Options	Response Percent	Response Count
Never	46.2%	30
Sometimes	35.4%	23
All The Time	18.5%	12
<i>answered question</i>		65
<i>skipped question</i>		100

11. If your bees are near/on row crop areas--do you utilize any of the cooperative standards of the Mississippi Bee Stewardship Program with your farm host?

Answer Options	Response Percent	Response Count
Yes	30.6%	15
No	69.4%	34
<i>answered question</i>		49
<i>skipped question</i>		116

12. Do you have other standing pesticide mitigation arrangements/measures to protect your bees from pesticides on the host farm?

Answer Options	Response Percent	Response Count
Yes	10.3%	4
No	89.7%	35
<i>answered question</i>		39
<i>skipped question</i>		126

13. If your bees are near/on row crop areas --has the Mississippi Bee Stewardship Program enhanced the dialogue between you and your farm host?

Answer Options	Response Percent	Response Count
Yes	34.1%	15
No	65.9%	29
<i>answered question</i>		44

14. If your bees are near/on row crop areas –do you discuss or have you ever discussed hive location on the farm with the landowner/operator prior to placement?

Answer Options	Response Percent	Response Count
Yes	47.9%	23
No	52.1%	25
<i>answered question</i>		<b>48</b>
<i>skipped question</i>		<b>117</b>

15. If your bees are near/on row crop areas –do you utilize the Bee Aware Flag to mark hive locations on the farm?

Answer Options	Response Percent	Response Count
Yes	19.1%	9
No	80.9%	38
<i>answered question</i>		<b>47</b>
<i>skipped question</i>		<b>118</b>

16. If your bees are near/on row crop areas—does your farm host take any precautions to reduce pesticide exposure to your bees?

Answer Options	Response Percent	Response Count
Yes	43.5%	20
No	56.5%	26
<i>answered question</i>		<b>46</b>
<i>skipped question</i>		<b>119</b>

17. Please indicate what portion of the state you farm (check all that apply).

Answer Options	Response Percent	Response Count
Northeast	5.3%	5
Delta	76.8%	73
Central	9.5%	9
South MS	3.2%	3
Blackbelt Prairie Area	6.3%	6
<i>answered question</i>		<b>95</b>
<i>skipped question</i>		<b>70</b>

18. Please indicate the commodities you produce (check all that apply):

Answer Options	Response Percent	Response Count
Cotton	35.5%	33
Rice	43.0%	40

Corn	68.8%	64
Soybeans	92.5%	86
Milo	39.8%	37
<b><i>answered question</i></b>		<b>93</b>
<b><i>skipped question</i></b>		<b>72</b>

#### 19. How long have you been actively engaged in farming?

Answer Options	Response Percent	Response Count
0 to 5 years	3.2%	3
5 to 10 years	7.4%	7
10-15 years	12.8%	12
Over 15 years	76.6%	72
<b><i>answered question</i></b>		<b>94</b>
<b><i>skipped question</i></b>		<b>71</b>

#### 20. Over the last 18 months, has your awareness of the importance of pollinator health been enhanced?

Answer Options	Response Percent	Response Count
Yes	97.8%	91
No	2.2%	2
<b><i>answered question</i></b>		<b>93</b>
<b><i>skipped question</i></b>		<b>72</b>

#### 21. If Yes--please indicate the source of this information: Check all that apply

Answer Options	Response Percent	Response Count
MSU Extension Service	76.7%	69
Farm Bureau	95.6%	86
Ag Press/Publications	66.7%	60
Other Farmers	22.2%	20
Social media	23.3%	21
Other Ag Industry Associations	31.1%	28
Other national or local media sources	24.4%	22
<b><i>answered question</i></b>		<b>90</b>
<b><i>skipped question</i></b>		<b>75</b>

#### 22. Have you heard of the Mississippi Bee Stewardship Program?

Answer Options	Response Percent	Response Count
Yes	93.5%	86
No	6.5%	6
<b><i>answered question</i></b>		<b>92</b>

*skipped question*

73

23. Do you host bees on any portion of your farming operation?

Answer Options	Response Percent	Response Count
Yes	42.4%	39
No	57.6%	53
<i>answered question</i>		92
<i>skipped question</i>		73

24. If you host bees on your farm, do you utilize any of the cooperative standards of the Mississippi Bee Stewardship Program on your farm?

Answer Options	Response Percent	Response Count
Yes	61.1%	22
No	30.6%	11
N/A	8.3%	3
<i>answered question</i>		36
<i>skipped question</i>		129

25. Do you have other standing pesticide mitigation arrangements/measures to protect bees from pesticides on your farm?

Answer Options	Response Percent	Response Count
Yes	44.4%	16
No	52.8%	19
N/A	2.8%	1
<i>answered question</i>		36
<i>skipped question</i>		129

26. If you host bees on your farm—has the Mississippi Bee Stewardship Program enhanced the dialogue between you and your beekeeper?

Answer Options	Response Percent	Response Count
Yes	66.7%	24
No	13.9%	5
N/A	19.4%	7
<i>answered question</i>		36
<i>skipped question</i>		129

27. If you host bees on your farm—do you discuss or have you ever discussed hive location on the farm with your beekeeper prior to placement?

Answer Options	Response Percent	Response Count
Yes	66.7%	24
No	16.7%	6

N/A	16.7%	6
<i>answered question</i>		<b>36</b>
<i>skipped question</i>		<b>129</b>

28. If you host bees on your farm—do you encourage your host beekeeper to utilize the Bee Aware Flag to mark hive locations on your farm?

Answer Options	Response Percent	Response Count
Yes	45.7%	16
No	8.6%	3
Not Needed	31.4%	11
N/A	14.3%	5
<i>answered question</i>		<b>35</b>
<i>skipped question</i>		<b>130</b>

29. If you host bees on your farm—how do you modify or would you be willing to modify insecticide applications to better protect bees on the farm (check all that apply)?

Answer Options	Response Percent	Response Count
Apply insecticides early in the morning	58.8%	20
Apply insecticides later in the afternoon	61.8%	21
Ensure wind velocity is low	82.4%	28
Utilize insecticides with less toxicity	23.5%	8
Avoid spraying during bloom	5.9%	2
Nothing	8.8%	3
<i>answered question</i>		<b>34</b>
<i>skipped question</i>		<b>131</b>

30. How do you typically apply insecticides on the farm?

Answer Options	Response Percent	Response Count
Ground	25.3%	22
Air	9.2%	8
Both	65.5%	57
<i>answered question</i>		<b>87</b>
<i>skipped question</i>		<b>78</b>

31. Do you discuss or have you ever discussed insecticide applications in regard to protecting bees with (check all that apply)?

Answer Options	Response Percent	Response Count
Farm workers	45.1%	32



Ground applicators	45.1%	32
Aerial applicators	74.6%	53
Consultants/Scouts	59.2%	42
Surrounding Farmers	38.0%	27
<i>answered question</i>		71
<i>skipped question</i>		94