Cooperative Agricultural Pest Survey
Update on Pollinator Bycatch Guidance

From time-to-time, cooperators report bumble bees and pollinator bycatch in Cooperative Agricultural Pest Survey (CAPS) early detection surveys. The tricolored bucket trap (green lid, yellow funnel, and white bucket) is used in combination with species-specific lures to detect eight exotic lepidopteran pests, including *Autographa gamma* (silver Y moth), *Helicoverpa armigera* (Old World bollworm), *Spodoptera littoralis* (Egyptian cottonworm), and *Spodoptera litura* (cotton cutworm). Each pest species represents a threat to U.S. agriculture, including small grains, soybeans, corn, tomato, and cotton. Early detection surveys are necessary to prevent the introduction and potential spread of these pest species.

PPQ is working with cooperators and the PPQ Old World bollworm (OWB) Technical Working Group (TWG) to conduct trap and lure comparison trials to evaluate pollinator bycatch volume and target moth detection.

This document provides:

- recommendations for 2019 CAPS surveys,
- an update on what to do with pollinator bycatch samples, and
- an update on pollinator bycatch research.

Recommendations for 2019 CAPS Survey Season

Until scientific evidence is available that supports using a different trap, the tricolored bucket trap is the only color combination approved for use in CAPS surveys using plastic bucket traps. Previous guidance stated that green traps (green lid, funnel, and bucket) would be available on a case-by-case basis. At this time, green traps are no longer offered as an alternative due to lack of efficacy.

If pollinator bycatch is a concern at a survey site:

- Do not place bucket traps in locations with active honey bee hives and/or bumble bee colonies. Be especially mindful of agricultural areas where honey bees or bumble bees are used to pollinate crops,
- Do not place bucket traps in locations where people/entities are actively managing the land to encourage wild, native pollinator communities (e.g. community gardens, organic farms & gardens), and
- Discontinue surveys at locations where you observe bycatch that is higher than normal in your experience.

Note: Many variables influence pollinator movement within cropping systems and the environment. It is not a guarantee that following this guidance will prevent or reduce pollinator bycatch.

Pollinator Bycatch Samples

Beginning in 2017, PPQ asked cooperators to collect and store pollinator bycatch samples and provide bycatch collection data to the CAPS program to understand the scope of pollinator bycatch. The information you provided has helped identify research needs.

In 2019, you do not need to collect new samples or provide bycatch data to the CAPS program. However, if you observe pollinator bycatch (honey bee, bumble bee, or other bees) that seems higher than normal in your experience, please notify Heather Moylett and Lisa Jackson. When reporting higher than normal bycatch, please include the following information:

- Date
- Crop/Survey
- Trap
- Lure
- Survey target species
- Bee bycatch count broken down by: honey bee, bumble bee, other bee

If possible, please continue to keep the pollinator bycatch samples you have already collected. CAPS is currently exploring identification options for these samples. Samples should be stored in ethanol or dry in a glassine envelope or container (plastic or glass) and placed in the freezer. Alternatively, pin each specimen. Please keep the samples/specimens separated by location and date.

Pollinator Bycatch Research

Bees are a diverse group of insect pollinators. Over 3,500 species occur in United States. The colors blue, yellow, and white are visually attractive to a wide diversity of bee species and are used in traps deployed in native bee monitoring surveys. However, other than honey bees and a few other species, chemical cues and attraction are largely undescribed.

The results of trap comparison studies consistently show that pollinator, specifically bee, bycatch is lower in green bucket traps compared to tricolored bucket traps. However, target moth capture is also substantially, and often significantly, lower in green bucket traps. This is not ideal for early detection surveys, especially in states and territories where the likelihood of introduction is high. Additionally, the effect of trapping on pollinator populations and communities and the pollination services they provide is not well understood. For this reason, the tricolored bucket trap remains the only approved bucket trap until planned research is completed.

PPQ is currently funding three pollinator bycatch projects through the FY2019 PPA (Plant Protection Act) Section 7721 Program (formerly Farm Bill). The projects are a collaborative effort between PPQ, USDA's Agricultural Research Service (ARS), state cooperators, and university researchers to investigate the:

- effect of lure and/or trap color on pollinator bycatch volume,
- effect of trap color and design on early detection of target species, and
- potential impact of bycatch to local bumble bee populations and communities, as well as pollination services within different cropping systems.

The cooperators working on these projects will employ a more targeted approach to sample collection. Once research plans are complete, they may contact you and ask you to provide bycatch samples and collection data.

Following a second year of research, the cooperators will develop a guidance document that "will help survey personnel understand the scope of bumble bee bycatch and provide guidance for surveyors, thereby improving these surveys and reducing impacts of trapping practices on pollinators and pollination services moving forward."

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