

Maine Department of Agriculture,
Conservation and Forestry

POLLINATOR PROTECTION PLAN
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Introduction

Pollinators are vitally important to fruit and vegetable production both in Maine and across the country. In recent years, national concern over the health of managed and wild pollinators has increased. Beekeepers have suffered significant colony losses dating back to 2006, and a syndrome described as Colony Collapse Disorder (CCD) has garnered considerable attention in the popular press. These trends have raised questions about the sustainability of managed colonies and whether pollinator decline will adversely affect agricultural production.

Overall, Maine's pollinators appear to be in better health than those in many other states. Department of Agriculture, Conservation and Forestry (DACF) experts have not yet observed any evidence of CCD in the state. Even with a generally healthy prognosis, Maine honey bee health is clearly being impacted by parasites, diseases, management practices, and, in some cases, the presence of chemicals.

Maine has an effective apiary program with a long history of being proactive and engaged in pollinator health issues. The State Apiarist is well known and respected throughout the country and serves on national Pollinator Protection Workgroup, a subcommittee of the Pesticide Program Dialog Committee. DACF's apiary program has been effective in maintaining positive relationships with both hobbyist and contract beekeepers. Out-of-state pollinator service contractors working in Maine must pre-file permit applications which allow DACF to inspect hives and track their movements. In-state beekeepers pay a nominal fee to register their hives which also allows the State Apiarist to keep ahead of disease and pest issues.

The DACF is also known for having a progressive and active pesticide program. The Maine Board of Pesticides Control (BPC) is extremely active in the area of pesticide education, featuring timely topics presented by well-renowned experts. The BPC prides itself on responding to complaints quickly with thorough and objective investigations, which could include investigations about impacted pollinators.

DACF staff has invested considerable resources in researching pollinator health issues in recent years. Scientific literature is tracked, scrutinized and evaluated for information and recommendations that can be applied in Maine for the benefit of pollinators. Pollinator plans from other states have also be reviewed and analyzed. The collective expertise, research and insight of the DACF staff form the basis for this plan.

Maine's Pollinator Protection Plan

The DACF sees great value in taking a proactive, coordinated approach to protecting pollinators in Maine. Consequently, the DACF elected to craft a plan that documents the Department's commitment to pollinator health as well as DACF activities that support that goal. The plan also contains a compilation and synthesis of existing recommendations—in the form of Best Management Practices—intended to protect pollinator health.

This plan is modelled after the North Dakota Department of Agriculture plan. It is also based—in part—on input received at the November 20, 2014 Pollinator Health and Safety Conference co-sponsored by the DACF and the University of Maine Cooperative Extension. Cooperating sponsors included the Maine Beekeepers Association, the Maine Farm Bureau and the Maine Organic Farmers and Gardeners Association. This conference focused on pollinator issues and provided an opportunity for landowners, beekeepers, pesticide users, government officials, and other stakeholders to discuss pollinator health issues. It was also an opportunity for these stakeholders to offer input on reasonable practices that beekeepers, landowners, and pesticide applicators could incorporate to protect pollinators and minimize impacts to crop production.

This plan is designed to reduce risks to pollinators in the state, focusing mainly on managed hives. Education, improved communication, and the promotion of pollinator health Best Management Practices (BMPs) form the cornerstones of this plan. The intent is to continuously incorporate the latest scientific consensus covering pollinator issues, and to serve both as an informational document and an action plan for all interested parties.

Challenges Faced by Beekeepers

Beekeepers face a challenging task of keeping colonies alive with the threat of CCD, varroa mites, tracheal mites, small hive beetles, bacterial, fungal and viral diseases, declining quality forage, and pesticide exposure. Nationally, year-to-year colony survival is variable but elevated since CCD was first identified in 2006.

Growers and other pesticide users cannot help beekeepers manage threats from mites, beetles, and the microbes that weaken their hives. They can, however, help with reducing their exposure to pesticides and improving the quality of forage available. Even though varroa mites are considered the greatest threat to honey bee colonies, a strong colony can handle the pressures of this tiny creature better than one weakened by other stressors.

Honey bees feed on pollen for their protein source, and utilize nectar for carbohydrates. They must obtain these nutrients from a variety of plants in order to obtain all the essential amino acids and nutrients required to build and maintain a strong hive. Bees can become easy targets for pests, predators and pathogens when they do not obtain the proper balance of nutrients. Bees provided with high quality forage are better able to handle stressors from all directions.

Honey bees may be exposed to pesticides applied directly to hives to rid them of pests such as the varroa mite or applied to plants on which they forage.

Challenges Faced by Growers and Pesticide Users

Growers face many challenges in attempting to obtain acceptable yields. Growers contend with insect pests, diseases, weeds, drought, overland flooding, and other factors that impact crop production and quality. They often need to manage pests and competing plants without impacting yields. They also must consider the timing of pesticide applications with respect to harvest and rotational intervals. Even with Integrated Pest Management (IPM) systems, pests often are able to adapt quickly to different methods, rotations, pesticides, or reproduce so quickly that their populations rise exponentially in a short time. Because of the nature of such pests, making timely chemical applications as part of an IPM plan is essential to manage pests effectively.

There are over 10,000 registered pesticides in Maine that are used to manage agricultural and non-agricultural pests. In many cases, pesticide applicators have a limited time window to make an application. Factors such as pest infestation levels, temperature, precipitation, wind speed, water levels, use buffers, and presence of pollinators all affect pesticide choices and decisions on when, where, and how to apply pesticides. Applicators also must pay attention to the location of sensitive sites adjacent to treatment sites, such as surface water, endangered species, organic fields, and beehives. The ideal time to apply many of these chemicals is likely to coincide with when the pollinators are most active, putting pesticide applicators in a difficult position of balancing pest management needs and protecting pollinators.

Homeowners also need to take special precaution when applying pesticides. The pesticide user BMPs apply to anyone using pesticides. The pesticide label is the law and it contains instructions intended to minimize risks to human health, pollinators, and every other component of our environment.

DACF Activities Committed to Pollinator Health

The DACF devotes resources to the following activities in support of pollinators:

- All Maine licensed pesticide applicators must pass the core exam which covers the basics of legal and appropriate pesticide application. The study manual provided for this exam contains information on the importance and protection of pollinators.
- The Board of Pesticides Control (BPC) participates annually in numerous pesticide applicator recertification training courses. Appropriate use of pesticides and pollinator protection are emphasized in these trainings.
- The State Apiarist speaks to a wide variety of audiences about pollinator health and safety.
- New pesticide applicators can, prior to testing for the core exam, attend an optional core exam training at which appropriate use of pesticides and pollinator protection are emphasized. The DACF offers this training many times annually.
- The BPC website contains extension information and numerous pertinent links about pollinator protection and appropriate use of pesticides. The Board supported website *GotPests?* provides IPM information to homeowners.
- The BPC, in cooperation with the state apiarist, investigates all pesticide complaints regarding pollinators and, in the event of a bee kill, references the EPA's bee kill protocol for these complaints.
- The DACF will work with Maine fruit commodity groups using contracted pollinator services to improve communication and coordination, and to investigate tactics that reduce risks to pollinators.
- Hive registration and inspection conducted by the state apiarist is important to managing pollinator health and is another opportunity for outreach and stakeholder feedback.
- The DACF will continue working with University System to develop guidance on product choices to reduce risk to bees.

Best Management Practices

These voluntary BMPs for pesticide users, landowners/growers, and beekeepers are shared with the intent of:

- Encouraging positive relationships and co-existence among beekeepers, landowners, and pesticide applicators;
- Reducing pesticide exposure and subsequent risk of pesticides to pollinators;
- Supporting both a robust apiary industry and agricultural economy; and

- Continued compliance with state pesticide and apiary requirements.

Beekeeper Best Management Practices

- **Work with landowners to choose hive locations.** Ideal hive locations will have minimal impact on agricultural activities but will still have adequate access to forage and water. Avoid placing hives in low spots to minimize impacts from drift or temperature inversions on hives. Give consideration to timing after rain events when determining which roads to travel. Discuss with landowners preferred roads/trails to use. Beekeepers should also request contact information for applicators, renters, and neighbors (if applicable).
- **Be cognizant of neighboring landowners when placing and moving hives.** Neighboring landowners often use the same roads, trails, and section lines. Do not block these right-of-ways or place hives so close they may cause problems for other land-users. Take appropriate steps to ensure that bees do not negatively affect operations of neighboring landowners, such as considering the proximity of hives to neighboring yards, bins, equipment, or storage sites.
- **Work constructively with applicators when notified of upcoming pesticide applications.** When informed of a planned application, beekeepers should block, move, or net hives, or find other strategies to allow pesticide applicators to manage pests while minimizing pesticide exposure by bees.
- **Notify landowners and applicators when arriving and when moving hives.** If possible, notify nearby pesticide applicators and landowners when you place or move beehives. This will ensure they are aware of current hive locations and can notify you before making pesticide applications. Contact information for nearby pesticide applicators can usually be obtained from landowners.
- **Obtain landowner permission for hive placement every year and maintain positive contact.** As landowner information changes, it is important to ensure everybody is updated and bees are not placed without permission. This step is imperative to ensure hives do not become a nuisance.
- **Immediately report all suspected pesticide-related bee kills to the DACF pesticide program.** Inspect bee behavior regularly. The DACF is the lead pesticide regulatory agency in the state. The DACF will respond to complaints and may collect and analyze samples from the location for pesticide residues. Some pesticides degrade rapidly and timely reporting will aid the pesticide investigation. Beekeepers can report suspected pesticide incidents by calling 207-287-2731 and speaking to a representative from the BPC.
- **Use registered pesticides according to the label.** When pesticide use is necessary to manage pests within hives, use registered pesticides and comply with all restrictions, precautions and directions found on the pesticide label. Failure to comply with label directions may decrease the effectiveness of pesticides, increase the risk of adverse effects to bees, cause unsafe pesticide residues in honey and other products, and potentially lead to pesticide resistance. Contact the DACF pesticide program with any questions on pesticide labeling or to determine whether a pesticide is registered in the state.
- **Comply with all requirements of the Maine beekeeping law.**
 - For all beekeepers:

- i. Maintain hives free of diseases and parasites
 - ii. Provide the ACF Commissioner with all apiary (hive) locations
 - iii. Report the total number of colonies to the ACF Commissioner
- In state only :
 - a. Pay Beekeeper's Licensing fee each year
- If importing honeybees to Maine:
 - a. Pay Beekeeper's Registration fee each year
 - b. Obtain an import permit
 - c. Provide certificate of hive inspection prior to importing honeybees or used equipment
 - d. Continue to provide up to date hive locations throughout the season. This ensures that all locations are accurate when applicators attempt to locate them.
- **Ensure hives are easily visible to applicators.** Hives must be visible so applicators can locate them before spraying.

Landowner/Grower/Agency Best Management Practices

- **Work with beekeepers to choose hive locations.** Ideal locations for hives will have minimal impact on farming/ranching operations, but will still allow bees to access forage and water. Communicate with beekeepers about which roads/trails can be problematic when wet and any preferred traffic routes. Landowners may also want to provide contact information for applicators, renters, and neighbors.
- **Communicate with renters about bee issues.** Renting land for agricultural production is a common practice. Landowners and renters should discuss bee issues, such as who has authority to allow bees, how long they will be allowed and hive placement. These issues should be addressed and included when rental agreements are negotiated.
- **Communicate with pesticide applicators about who has the responsibility to look for hives, notify neighbors, etc.** When contracting with commercial pesticide applicators, make sure that there is a clear understanding of who has the responsibility to identify hive locations and communicate with beekeepers. Applicators may do this as part of their standard procedures, but some landowners may prefer to make beekeeper contacts themselves.
- **Agronomists should consider pollinator impacts when making pesticide recommendations.** Ensure that agronomists and crop consultants consider pollinator issues when making pesticide recommendations, including product choices and pesticide timing decisions.
- **Plant bee forage.** Plant flowering plants, trees and shrubs to improve bee forage, especially in non-farmable or non-crop areas. Doing so provides forage and it may also concentrate bees away from fields to be treated with pesticides, thereby minimizing impacts to pollinators. State agencies, such as the Maine Department of Transportation (MDOT), are encouraged to incorporate development/expansion of pollinator forage into their strategic plans. MDOT is already evaluating plantings and mowing practices that are more beneficial to pollinators.

- Many pesticide labels require untreated **vegetative buffer strips** around sensitive sites. Plant flowering plants in those buffer strips to provide additional bee forage providing that pest management in the area is compatible to pollinators.
- If planting **cover crops**, add flowering plants into the mix. Even a small percentage of flowering plants can provide a considerable amount of forage for pollinators.

Pesticide User Best Management Practices

- **Use Integrated Pest Management.** Utilize economic thresholds and IPM to determine if insecticides are required to manage pests.
- **Choose pesticides carefully.**
 - When insecticides are required, try to choose insecticides with low toxicity to bees, lower residual toxicity or repellent properties towards bees; pay particular attention to pollinator toxicity and product persistence.
 - Choose formulations that present a lower risk to bees.
 - Avoid dusts and wettable powder insecticide formulations; these can leave a powdery residue which sticks to hairs on bees. Bees then bring the pesticide back to the hive and potentially expose the entire hive to the pesticide for an unknown amount of time.
 - Granular and liquid formulations are safer for pollinators since granules are not typically picked up by bees and liquids dry onto plant surfaces.
 - Ultra low volume formulations are usually more hazardous than other liquid formulations.
 - Microencapsulated formulations are highly toxic to pollinators.
 - Avoid tank mixing of insecticides and fungicides as specific mixtures may cause synergistic toxic effects on bees and most combinations have not been researched.
- **Use caution around flowering plants.** Pesticide applicators should pay special attention when making applications on or near plants that are or will soon flower.
 - Many pesticides, especially insecticides, have use restrictions prohibiting applications when bees are foraging in the treatment area. Some labels prohibit applications when crops are blooming and require that the applicator notify beekeepers in the area prior to application. Check with the University of Maine Cooperative Extension at least annually for up-to-date product recommendations.
 - Limit applications of any pesticides, including fungicides, during bloom.
 - Identify weeds which are attractive to bees; note when they bloom.
 - Check fields for bee activity prior to making applications.
 - Mow flowering weeds prior to application so that bees will not be foraging on them.
- **Use registered pesticides according to the label.** Pesticide label language is developed to ensure that pesticides will not pose a risk of unreasonable adverse effects to human health or the

environment. Failure to comply with the label not only puts humans and the environment at risk, it is also illegal. Applicators are bound by all directions, precautions and restrictions on pesticide labeling, even when following other BMPs. Contact the DACF with any questions on pesticide label language.

- **When possible, apply pesticides early morning, in the evening or at night.** Pollinators are most active during daylight hours and when the temperature is over 55 degrees Fahrenheit. Apply pesticides early in the morning or preferably in the evening when bees are less active to reduce the chances that bees will be foraging in or near the treatment site.
 - Be cognizant of temperature restrictions on pesticides. The efficacy of some pesticides is reduced at certain temperatures.
 - Be aware of temperature inversions when choosing the best time for applications.
 - Applying pesticides in the early evening allows them to decompose during the night. Unusually low temperatures can increase the time that toxic residue remains on the crop.
- **Avoid drift.** Pesticide drift is the off-site movement of pesticides through the air from the treatment site to adjacent areas, either in the form of mist, particles or vapor. Drift reduces the effectiveness of the chemical applied since only part of the applied amount reaches the target. Drifting chemicals also pose a risk to non-target organisms that come in contact with the off-target residues. These insecticides can negatively affect bees and other beneficial insects by direct contact or by contaminating their forage and habitat. Drifting herbicides have the potential to further reduce quality forage available to pollinators. Contact University of Maine Cooperative Extension for more information on how to reduce pesticide drift.
- **Incorporate pollinator considerations in planning wide-area spray programs.** Currently, there are no wide-area spray programs routinely occurring in Maine. However, populations of the spruce budworm are on the upswing and there is a rising threat of mosquito-borne diseases. Land managers and project coordinators should plan to incorporate strategies, such as careful selection of products or spraying at dusk, in order to minimize any potential risks to pollinators.
- **Communicate with your neighbors about pesticide applications and hive locations.** Bees will fly several miles to find quality forage. The BPC has rules that allow nearby landowners to request advance notification. Apiarists are encouraged to communicate with their neighbors about pesticide use.

Supporting Pollinator Forage and Habitat

- **Bee Forage.** Everyone can plant forage for bees. Plants that support pollinators are also beneficial for other wildlife, are often visually attractive and can help improve soil health. Flowers often come to mind when thinking about bees, but bees also utilize trees, shrubs and other less-noticeable plants for pollen and nectar sources. It is important to consider diversity when choosing plants to ensure adequate forage for the entire growing season. Diversity will also ensure pollinators have access to all of the nutrients they require to be healthy. Easy, efficient ways to improve pollinator forage include:
 - Plant trees, shrubs and flowers that provide good forage for all types of pollinators. Diversity is important. The pollen and nectar of each species carries a different nutrient load for the pollinators. Diversity can be worked into existing plantings. Every time a

plant is added and/or replaced, choose a variety that will contribute to pollinator forage. Foraging honey bees are typically not aggressive.

- Create bee forage along secondary roads. Ditches along secondary roads often contain several species of plants that provide forage for pollinators. It is a common practice to mow ditches for the safety of motorists and to prevent drifting snow. Consider spot spraying noxious weeds and mowing ditches later in the year to ensure that bee forage is available. Incorporate short forbs into secondary road ditches to minimize attracting large wildlife.
- Put out flower pots, create flowerbeds, plant trees or shrubs, or establish gardens to provide forage. Create **habitat for beneficial, wild pollinators**. Roughly 70 percent of native bees nest in the ground. They burrow into areas of well-drained, bare or partially vegetated soil. Other bees nest in abandoned beetle houses in snags or in soft centered, hollow twigs and plant stems. Bees will also utilize dead trees and branches. Habitats can be created by leaving deadfalls and brush piles as nesting habitat. Consider the type of habitat you wish to create and pollinators you want to attract. Be cognizant that certain structures might attract other animals such as fox, coyote, skunks, and porcupines.
- **Increase public land access for managed hives**. Public land typically does not incorporate crop production and large scale insecticide use. There are some agencies that allow beekeepers to place honey bees on state and federal lands. Contact DACF for more information. Permission must be obtained and hives placed on state or federal lands must also be registered with the DACF.