Washington State Department of Agriculture

MANAGED POLLINATOR PROTECTION PLAN

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FOREWARD

The Washington State Department of Agriculture recognizes the importance of pollinators to the agricultural industry of the state of Washington. Farmers and beekeepers have a special relationship. Growers of pollinator-dependent crops need healthy bee populations to be successful.

WSDA crafted a Managed Pollinator Protection Plan (MP3) that describes the factors to be evaluated when addressing declines in managed honey bee populations, including lack of suitable habitat for bee foraging, diseases and pests, lack of genetic diversity, poor nutrition, and pesticides (including insecticides, miticides, fungicides, and herbicides).

While the MP3 is intended to address the practices of beekeepers that provide pollinator services and those that manage the production of honey, it is important to recognize the broader context of pollinator health. The effects of widespread loss of pollinator habitat has had a significant adverse impact on a wide range of pollinators including honey bees, solitary bees, bumble bees, and butterflies. Thus, the MP3 will stress the need for improved pollinator habitat management throughout the state of Washington. The MP3 provides general recommendations for beekeeper practices and hive management, including building genetic diversity in bee colonies. It also includes recommendations regarding pesticide practices that relate to the protection of pollinators. This MP3 is intended as a framework to be used as a guide when developing commodity specific MP3 plans (see the alfalfa seed/alkali bee MP3 recently completed by WSU and WSDA).

However, managed pollinator protection will not be effective without adequate scientific research and practitioner training. The Department of Entomology at Washington State University's College of Agriculture and Human and Natural Resource Sciences is an important resource for helping to ensure healthy bee colonies in this state. It is important for the state of Washington and Washington State University to continue to promote research and outreach programs for pollinator protection and to ensure such programs are adequately funded.

This pollinator plan is not a static document, but a work in progress. This plan describes the factors that may work in concert to impact pollinators and does not focus on any specific impact pathway; all pollinator declines are believed to be site specific and require additional research and planning. We intend to revisit this document annually and provide updates as needed. Effective communication among all parties is also essential to the success of this plan. With clear and effective communication, we are confident that the goals in this plan can be achieved.

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Introduction

Washington State is one of the most productive growing regions in the world. A diversity of climatic conditions and growing areas within the state, coupled with grower ingenuity, enables our farmers to produce over 300 crops each year. Washington leads the nation in production of a variety crops; such as apples, sweet cherries, concord grapes, pears, hops, blueberries and raspberries (for processing). In 2016, the value of crops pollinated by bees in Washington State was over $3 billion (primarily tree fruits, small fruits, and seed crops). Three of the top ten crops in Washington (apples, cherries, and pears) require bees for pollination.

Washington State growers use several species of bees for pollination, but honey bees are the most common and widespread managed species of pollinators in the state. Research studies performed in the United States over the past decade show that many pollinating insect populations in the United States are in decline. Much of this change in population can be attributed to changes in demographics and farming practices, although some of the decline arguably results from the introduction of parasitic mites and pathogens (vanEngelsdorp and Meixner 2010, Fairbrother et al. 2014, as discussed in Lawrence, 2016).

Colony losses over the last ten years has raised questions of the sustainability of managed honey bee colonies. This issue has gained national attention, and in response, the United States Department of Agriculture (USDA) created the Colony Collapse Disorder (CCD) Steering Committee in 2007 to look at factors contributing to bee decline. This committee includes personnel from USDA's Office of Pest Management Policy, National Institute of Food and Agriculture (NIFA), Agriculture Research Service (ARS), Animal and Plant Health and Inspection Service (APHIS), Natural Resources Conservation Service (NRCS), as well as staff from the EPA and public and private partners.

The CCD Steering Committee completed their work in 2012 and concluded that there are multiple factors impacting the decline of the honey bee in the United States and that no single factor can be blamed for the declines. These factors include pests, parasites, disease, low genetic diversity and poor nutrition. The Steering Committee also concluded that additional research is needed to determine to what extent pesticides are contributing to the declines.

In June 2014, the President of the United States highlighted the issue of national pollinator health decline in the memo *Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators*. The memo also established a Pollinator Health Task Force (Task Force). The Task Force, under Section 3 "Increasing and Improving Pollinator Habitat", gave EPA the authority to complete a broad evaluation of potential pollinator impacts and pathways for improvement. These included:

1) A process to assess the effect of pesticides, including neonicotinoids, on bee and other pollinator health and take action, as appropriate, to protect pollinators.
2) Instructing EPA to engage state and tribal environmental, agricultural, and wildlife agencies in the development of state and tribal pollinator protection plans.
3) Encouraging EPA to incorporate pollinator protection and habitat planting activities into green infrastructure and Superfund projects.
4) Expediting the review of registration applications for new products targeting pests harmful to pollinators.

A result of this process included the creation of new mandatory label directions for certain pesticides that EPA believes to be potentially hazardous to the health of honey bees if used inappropriately.

Washington has long been a national leader in putting forth practical grower-beekeeper cooperative programs to encourage measures which are mutually beneficial to growers and the pollinators on which they depend. The critical

relationship of beekeeper and grower requires both to have safeguards which allow for their sustainable and profitable existence.

Habitat

The state of Washington has experienced pollinator habitat loss through property conversion, fragmentation, and degradation of land. With the state's population expected to grow by 1.3 million over the next 15 years, additional loss of habitat is a significant concern.

Preserving, improving, and, where possible, creating additional beneficial habitat for all pollinators would greatly improve overall pollinator health and vitality. A number of steps could be taken to improve habitat management. The Washington State Department of Agriculture (WSDA) should work with NRCS and local Conservation Districts to ensure that Conservation Reserve Enhancement Program (CREP) and cover crop seed mixes include non-invasive, pollinator-friendly plant species suitable for specific geographic areas within the state.

The Washington State Department of Transportation (WSDOT), Washington Department of Fish and Wildlife (WDFW), Washington State Parks and Recreation Commission (Parks), and Washington State Department of Natural Resources (DNR) own and actively manage large tracts of land statewide. State lands should be evaluated for the potential to support non-invasive, pollinator-friendly plant species. A program of seeding state lands with pollinator-friendly and non-invasive plant species may be beneficial in some locations. Depending on research results for native bee populations and pollinator habitat, more specialized planting efforts may be warranted in areas that are not limited to the land ownership described above. Recently, WSDOT has moved forward with identification of and landscape management of rights of ways that prioritizes pollinator friendly species. These types of activities are important and should continue.

The Washington State Noxious Weed Control Board (NWCB) is distributing packets of non-invasive flower seeds for bees and butterflies. This effort has been co-sponsored by other state agencies as well as noxious weed control boards in numerous counties, and each new seed packet order allows for additional partners. One reason for this program's creation is the need to address beekeepers concerns about the removal of noxious weeds that are important pollinator habitat, and often flavor honey. Providing alternative pollinator-friendly plant species that are non-invasive is a priority for the NWCB.

The NWCB's non-invasive and pollinator-friendly flower mixes should continue to be supported. This has been a highly successful program that has elevated the level of public awareness of the importance of pollinator habitat statewide.

Pesticides

Risks to managed pollinators associated with pesticides is primarily an operational issue and can be managed by communication and education. Using pesticides wisely can help protect pollinators and reduce problems with pest tolerance.

Knowing where managed honey bee colonies are located is an important factor in the ability to avoid impacts to colonies and to employ special practices to protect them. For example, limiting pesticide applications to low activity periods (e.g., spraying in evening hours) in areas where managed colonies are known to be present could help reduce the incidence of pesticide exposure to honey bees.

Establishment of an apiary location registry website at the WSDA would be helpful in providing real-time information to pesticide applicators to minimize impacts to managed honey bees. The aforementioned pesticide applicator training conducted by WSDA as part of its applicator licensing program could be modified to include directions on how to use the apiary location registry website prior to applications.

An apiary registry could also be used to provide information regarding the location of managed honey bee colonies in urban areas. Coupled with an active public education program, the website could be helpful in protecting managed honey bee colonies in urban areas from non-agricultural pesticide use.

Challenges Faced by Beekeepers and Pesticide Users

Beekeepers - Nutrition and Pests

Nutrition has an impact on individual bee and bee colony longevity. Bees generally become active in the spring with warm weather and the flowering of plants. They remain active throughout the summer and into the fall. Ensuring nutritious forage during the active season is essential to their winter survival.

Honey bees rely on a wide variety of plants to provide pollen for their protein source and utilize nectar for carbohydrates. Honey bees are generalists; they visit many different blooming 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 quality forage are better able to handle other external stressors, including pesticides and parasites.

To maintain vibrant honey bee colonies during fall and winter months, bees must have proper food sources, including sugar and protein, in order to overwinter in a healthy state. Providing less nutritious overwintering foods, such as high-fructose corn syrup, may result in bees overwintering in a weakened state, making them more susceptible to the parasitic Varroa mite and viral diseases. Varroa mites are a widespread bee pest and are primarily responsible for the decline of honey bee populations in the United States. Miticides are generally needed to control the pest; however, miticides should be used carefully and according to label instructions so as not to create problems with resistance. Mite control should be part of an overall hive hygiene program that also addresses pest and disease management and includes provisions for proper hive ventilation.

Researchers and queen producers should work together to make breeding/selection programs more robust with the goal of improving traits such as pest resistance, productivity, etc. They can then provide higher quality queens to commercial pollinator operations. The Department of Entomology at Washington State University's College of Agriculture and Human and Natural Resource Sciences is a national leader in the science of beekeeping. In addition to providing ongoing research on beekeeping and bee health, scientists from the Department of Entomology provide training workshops on topics related to beekeeping, including how to rear high quality queens. WSU is a vital resources for the managed pollinator industry in the state of Washington.

Additional factors that beekeepers face in keeping colonies alive with the threat of Colony Collapse Disorder include 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 with some beekeepers reporting annual losses of 44 percent in 2016.

Growers and pesticide users cannot help beekeepers manage threats from the pests and diseases that weaken their hives. They can, however, help with reducing the exposure to pesticides and improve the quality of forage available

through communication and proper hive placement. Varroa mites are considered to be the greatest "in-hive" threat to honey bee colonies and the reduction of ancillary bee stress will improve survivability.

Pesticide User Challenges

Growers and Applicators encounter a number of challenges in their day to day operations. Growers have to manage insect pests, diseases, weeds and other factors impacting crop production and quality. Growers have a variety of pest management tools and strategies to choose from. They often need to affordably eliminate pests and competing plants without impacting yields.

Pesticide applicators often have a limited time frame to make an application. Factors such as pest infestation levels, temperature, precipitation, wind, water levels, buffers, and the presence of pollinators all affect pesticide choices and decisions on when, where and how to make an application. Applicators also must pay attention to the location of sensitive sites adjacent to treatment sites, such as surface water, endangered species, organic fields, vineyards and honey bee colonies. The best time to make an application 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.

Growers 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, or pesticides, or reproduce so quickly that they seem to explode within a short amount of time. Because of the nature of such pests, making timely chemical applications as part of an IPM plan is essential.

Growers and Applicators face difficult decisions when managing pests and minimizing impacts to pollinators. This plan should demonstrate how they can do both. Following the Best Management Practices (BMPs) within this document will help ensure abundant, affordable, safe and nutritious food for years to come.

The Managed Pollinator Protection Plan

The goal of the Managed Pollinator Protection Plan (MP3) is to encourage communication and cooperation between beekeepers, growers, pesticide applicators and other parties that are interested in protecting pollinators from pesticides. The MP3 does not restrict the use of pesticides. Instead, the MP3 is intended to complement the existing label and rule requirements to protect bees from pesticides, when pesticides are used in agricultural and non-agricultural settings.

The MP3 contains voluntary BMPs for pesticide users, landowners/growers, and beekeepers in hopes of creating the following positive outcomes:

- Ensuring positive relationships and peaceful co-existence among beekeepers, landowners and pesticide applicators.
- Reducing pollinator exposure to pesticides.
- Ensuring both a robust apiary industry, native pollinator population, and agriculture economy.
- Continued high compliance with pesticide label requirements and state rules to protect pollinators.

It is understood that localized issues may need more specific BMP's or efforts. A good example of this is the MP3 for Alfalfa Seed Production, recently completed by WSU and WSDA. These general guidelines are meant to be a starting point for protection of managed bee populations. Additional research and efforts may be needed for wild pollinators or beekeepers in a specific area facing a unique threat.

Beekeeper Best Management Practices

Improve Pollinator Habitat

- Locate honey bees where they will find flowers during the whole forage season, or be ready to supplement their diet with protein and carbohydrates.
- Create, and encourage others to create, more forage.
- Ensure clean water is available.
- Participate in your local county weed board to encourage preservation of blooming plants.

Work with Land Owners to Choose Apiary Locations

- Obtain permission from growers/landowners before placing honey bee colonies.
- Avoid low spots to minimize impacts from drift or temperature inversions on colonies.
- Coordinate dates in and out to assure access.
- Consider timing after rain events when determining which roads to travel.
- Discuss with landowners preferred roads/trails to use.
- Request contact information and have frequent communication between growers, beekeepers and neighbors.

Be Aware of Neighboring Landowners when Placing and Moving Honey Bee Colonies

- See that colonies have access to clean water without bothering people or livestock.
- Do not block right-of-ways or place colonies so close to shared roads, trails and section lines that they may cause problems with neighbors.
- Notify landowners and applicators when arriving and moving colonies.
- Avoid overloading areas with colonies.

Work Constructively with Applicators when Notified of Upcoming Pesticide Applications

- Have frequent and open communication with growers and applicators on spraying and other practices which might damage honey bees, and engage in creatively finding solutions.
- Block, move or net hives when informed of a pesticide application, or work with applicators on ways to manage pests while minimizing pesticide exposure to honey bees (spraying in the evening or pre-dawn, for example).

File Reports of Wrongdoing

- Report all suspected pesticide-related bee kills to WSDA Pesticide Management Division. This will allow WSDA inspectors quick turnaround on collection of important samples for analysis. They will also generate a notification to the EPA National Pesticide Information Center automatically in this process.
- Contact Pesticide Management Division at: Toll-free 1-877-301-4555.

Use Registered Pesticides According to Label

- Use only legal products for controlling pests and diseases, and use them correctly. Misuse can harm bees, contaminate honey and wax, and cause pest and disease resistance.
- Contact WSDA Pesticide Management Division with any questions on pesticide labelling or to determine whether a pesticide is registered for distribution in the state.

Comply with all Requirements of WSDA Beekeeping Law

- Register your colonies with WSDA.

- Mark your hives with your identification number issued by WSDA to help the public get in touch with you when needed and to aid in recovery in the case of theft.

Ensure Hives are Easily Visible to Applicators

- Hives must be visible so applicators can locate them before spraying.
- Paint hives white or a color that stands out from the surrounding area.

Landowner/ Grower Best Management Practices

Work with Beekeepers to Choose Apiary Locations

- Be mindful of the placement of apiary sites where your farming activity will occur.
- Work with beekeepers to choose appropriate colony locations.

Communicate with Renters about Bee Issues

- Landowners and renters should discuss bee issues, such as who has the authority to allow bees, how long they will be allowed and colony placement.

Communicate with Pesticide Applicators

- Discuss with pesticide applicators whose responsibility it is to look for hives, notify neighbors and other crucial tasks.
- When contracting with commercial pesticide applicators, establish clear understanding about who is responsible for identifying apiary locations, and communicating with beekeepers.

Agronomists; Consider Pollinator Impacts when Making Pesticide Recommendations

- Consider spray timing, location and communication with beekeepers when apiary sites are adjacent to your property.
- Control blooming weeds, such as dandelion or mustard, in the treatment area. This is especially important in early spring when honey bees will fly several miles to obtain pollen and nectar.
- Learn the pollination requirements of your crops, if and when they are attractive to bees, and plan your pest-control operations with bee hazards in mind.
- Consider using alternatives to pesticides, if available.
- When applying pesticides, always follow label directions to protect bees and other non-target beneficial insects.

Plant Bee Forage

- Plant flowering plants, such as trees and shrubs, to improve bee forage.
- Adding flowering plants to cover crop mix can provide a considerable amount of forage for pollinators.

Pesticide Applicator Best Management Practices

Use Integrated Pest Management (IPM)

- Utilize economic thresholds and IPM to determine if insecticides are required to manage pests.
- When insecticides are required, try to choose ones with low toxicity to bees, short residual toxicity, or repellent properties towards bees.

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.
- 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.
- Always comply with these and other label restrictions to reduce risks. Applicators are bound by all directions, precautions, and restrictions on pesticide labeling, even when following other BMPs.

When Possible, Apply Pesticides Early in the Morning or in the Late Evening

- Honey bees are most active during daylight hours and when the temperature is over 55 degrees Fahrenheit
- Apply pesticides early in the morning or in the late evening when bees are less active to reduce the chances that bees will be foraging in or near the treatment site.
- Be aware of temperature restrictions on pesticides. The effectiveness of some pesticides is reduced at certain temperatures.
- Be aware of temperature inversions when choosing the best time for applications.

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 insecticides 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.

Notify Beekeepers in the Area before Pesticide Applications

- Honey bees will fly several miles to find quality forage. Therefore, pesticide applicators should notify beekeepers within two miles of a site to be treated at least 48 hours before application or as soon as possible.
- Timely notification will help ensure ample time for the beekeeper and applicator to develop a mutually acceptable strategy to manage pests while mitigating risk to honey bees. This may include covering hives, moving hives, or choosing the time of day to apply. Notifying beekeepers does not exempt applicators from complying with pesticide label restrictions.
- Many insecticide labels prohibit use if pollinators (bees) are present in the treatment area.

Choose Products with Lower Risk to Honey Bees

- Avoid dusts and wettable powder insecticide formulations. These can leave a powdery residue which sticks to hairs on honey bees. Honey bees then bring the pesticide back to the hive and potentially expose the entire colony to the pesticide for an unknown amount of time.
- Granular and liquid formulations are usually safer for pollinators since granules are not typically picked up by honey bees, and liquids dry onto plant surfaces.

Resources and References

Bee Informed Partnership https://beeinformed.org/

Oregon State University and WSDA – How to Reduce Bee Poisoning from Pesticides https://catalog.extension.oregonstate.edu/pnw591

Pollinator Partnership http://www.pollinator.org/

USDA Natural Resources Conservation Service – Insects & Pollinators https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/pollinate/

USEPA Pollinator Protection https://www.epa.gov/pollinator-protection

WSDA Apiary Program https://agr.wa.gov/PlantsInsects/Apiary/

WSDA Pesticide Compliance https://agr.wa.gov/PestFert/Pesticides/ComplianceActivities.aspx

WSU Department of Entomology http://entomology.wsu.edu/

WSU and WSDA - MP3 for Alfalfa Seed Production http://ipm.wsu.edu/wp-content/uploads/sites/56/2017/10/alfalfa-seed-mp3.pdf

Xerces Society https://xerces.org/

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Selected Pollinator Crops in Washington