



Pollinator Stewardship Council

Pollinator News

April 3, 2015

See us at

April 11-12, 2015
Mother Earth News Fair
Asheville, NC

April 22, 2015
Earth Day
Twinsburg, OH

April 29, 2015
Rocky River Watershed Council
Medina, Ohio

May 13, 2015
Reg. 14 OH Assn. of Garden Clubs
Wadsworth, Ohio

May 21, 2015
Nelson County Beekeepers
Bardstown, KY

June 6, 2015
West Carrollton Branch Library
West Carrollton, Ohio

June 24, 2015
Tri-County Beekeepers Assn.
Wooster, OH

June 27, 2015
Vandalia Branch Library
Vandalia, Ohio

July 25, 2015
Kent Free Library
Kent, OH

Western Apicultural Society Conf.
October 1-3, 2015
Boulder, Colorado

Oct. 9-10, 2015
Tennessee Beekeepers Assn. Conf.

Nov. 13-14, 2015
Iowa Honey Producers Assn.
Winter Meeting

State Managed Pollinator Protection Plans (MP3s)

Managed Pollinator Protection Plans (MP3) are being developed across the U.S. The EPA has been working with the Association of American Pesticide Control Officials (AAPCO) to develop a guidance document for states as they develop their MP3s (<http://www.aapco.org/documents/documents.pdf>). The Pollinator Stewardship Council has a number of the MP3s on our website for your information and review. We have also created a chart listing state efforts to date concerning pollinator plans. You can compare and contrast each state, review what your state has or has not accomplished, and who to contact to start the process or be a part of the process in your state. **As the stakeholders most affected by these plans, beekeepers must be involved.**

We can protect crops AND protect pollinators. We can protect human health AND protect pollinators. While MP3 plans have been focused upon pollinators in agriculture, beekeepers working on these state plans must also be cognizant of the exposure of honey bees and native pollinators to urban and suburban applications of pesticides for mosquito control, and pesticides used on lawns and backyard gardens. Beekeepers need to be involved in their local mosquito control boards to ensure honey bees are protected to pollinate backyard gardens, community gardens, and our city parks.

(continued on the next page)

*Get your passport early
so you can attend the
Eastern Apicultural Society Conference
in Guelph, Ontario, Canada
August 10-15, 2015!*



Information and application form at
<http://travel.state.gov/content/passports/english/passports/apply.html>

Some of the initial pollinator protection plans did not differentiate between managed and native pollinators. The plans sought to protect all pollinators. Research tells us native pollinators deserve protection as they too contribute to increased crop yields, and support the diversity of a healthy ecosystem. Our 4000 native pollinators are a national treasure deserving protection with managed honey bees. Economic research concerning native pollinators found “California agriculture reaps \$937 million to \$2.4 billion per year in economic value from wild, free-living bee species . . . About one-third of the value of California agriculture comes from pollinator-dependent crops, representing a net value of \$11.7 billion per year . . .” The study estimated “wild pollinators residing in California’s natural habitats, chiefly rangelands, provide 35-39 percent, or more than one-third, of all pollination “services” to the state’s crops.”

According to Dr. Nick Calderone of Cornell University, “The total value of commodities that require pollination was about \$81.5 billion in 2010. Honey bees were responsible for \$19 billion (23%) and other insects (mostly leaf cutting bees) accounted for another \$9.8 billion (12%).” Researcher Krishna Ramanujan reported in the *Cornell Chronicle* that “honeybees pollinated \$12.4 billion worth of directly dependent crops and \$6.8 billion worth of indirectly dependent crops in 2010. Other insects, including alfalfa leaf cutter bees, bumblebees, horn-faced bees and orchard bees, added \$4 billion and \$5.9 billion in directly and indirectly dependent crops, respectively.”

The Food and Agriculture Organization noted the value of pollinator diversity, stating “More than 90% of wild flowers rely upon pollinators for their reproduction (Costanza et al. 1997). Floral diversity is strongly associated with pollinator diversity (Potts et al. 2003a). Pollinators are key elements in food webs; wild flowers provide food for many animals in the form of vegetation, fruit, berries and nuts. Adequate pollination is therefore essential to ensure the survival of animals and birds which feed upon these wild plants.”

Even though honey bees are “immigrants” to the New World, research shows they, and the native pollinators, actually make each other better pollinators. Sarah Greenleaf of UC Berkeley found wild bees make honey bees better pollinators. “When honey bees interact with wild native bees, they are up to five times more efficient in pollinating sunflowers than when native bees are not present . . . In fields where wild bees were rare, a single visit by a honey bee produced an average of three seeds. But as wild bee numbers increased, so did the number of seeds produced per honey bee visit, up to an average of 15 seeds per visit. This was the case when either the richness of the species mix of wild bees increased, or when the absolute number of wild bees increased.”

As State Pollinator Protection Plans are developed we can protect native pollinators as well. The mitigation efforts to protect managed pollinators will protect native pollinators.

As stakeholders come together, the following should be part of the plan to protect managed and native pollinators:

- extended residual toxicity and/or systemic pesticides should not be applied to pollinator attractive crops or weeds in bloom
- when applying pesticides during bloom use short residual toxicity products and apply at night

- Commercial beekeepers should be permitted access to pesticide-free pollinator forage on public lands (or on lands receiving short residual toxicity pesticides applied at night)
- moving or covering hives so pesticides can be applied is not a reasonable mitigation strategy (except in rare circumstances)
- IPM practices need to be followed according to those best management practices
- mitigation efforts to control for mosquitoes can protect human health and pollinators through night applications and use of short residual toxicity products
- mosquito control products should be applied at night when mosquitos are most active, and pollinators are not. Even though the federal pesticide label allows for exceptions to application guidelines for public health, pollinators and human health can be protected through night applications of short residual toxicity products.
- the Federal Pesticide Label shall be followed regardless of the mitigation measures included in a State MP3 Plan.



Understanding the label language and uses on crops under pollination services, and crops NOT under pollination services is important. Pollinators still need to be protected in all situations. The managed pollinators working one crop must be protected so they are healthy to pollinate the next crop. Growers of almonds who protect the hives they rent, support healthy robust honey bee colonies. These hives then will be available for many other crops dependent upon pollination service after almonds: crops such as cherries, apples, blueberries, stone fruits, cucurbits, and alfalfa seed. Even if a crop does not need pollinated, the application of pesticides in neighboring fields, and in ditches and roadways affects the honey bees pollinating the adjacent crops.

The new EPA neonic pesticide label features the new “bee icon” at the beginning of the label. It is to be pictured next to the “directions for use” on each specific crop that is under contract for pollination, for the protection of the label to apply. (EPA can always revise label guidelines and interpretations. The pesticide label however, is the law with no exceptions.)



The chart Pollinator Stewardship Council created comparing and contrasting state plans is a valuable tool for every state. The chart contains the proposed solutions, best management practices, and in one case, Oregon, just the “consensus” recommendations. To review the recommendations that received a “split opinion” and “general agreement” from the Oregon Task Force, read the Oregon Task Force’s Report (<https://olis.leg.state.or.us/liz/201311/Downloads/CommitteeMeetingDocument/41335>). The workgroups provide insight as to the level of thought and value placed upon pollinators. The state workgroup which analyzed the number of managed colonies needed to pollinate their crops brought to the forefront the fact the state does not support enough managed colonies to pollinate its own crops. The concerns of migrating honey bee colonies which may introduce pests and pathogens into a state needs addressed and understood. Managed colonies from other states are needed to pollinate crops due to low support for local honey bees, and loss of forage to support local and native pollinators.

To encourage beekeeping, and to support local beekeepers, states need to have apiary inspection programs, and well-staffed apiary programs. States need to support home-grown beekeepers who could

provide increased in-state pollination services. States need to be fair, and support inter-state commerce of commercial beekeepers, and the pollination services they provide to other states by not adding fees for them differently than in-state beekeepers. Trying to place all of the financial burden of paying for state apiary programs on migrating beekeepers is unequal. It will not promote healthy beekeeping within the state by local beekeepers.



Pollination affects all of us: the beekeeper, farmer, food wholesaler, food retailer, and food consumer. We must all work together to develop reasonable, agreeable, fair State Pollinator Protection Plans. Beekeepers alone should not bear all of the burden of moving their bees away from pesticides, and a crop in need of pollination, trying to find pesticide-free bee forage to provide high-quality nutrition for their bees, paying for lab testing of bees allegedly harmed by pesticides. Nor should beekeepers be responsible for educating others as to the toxicity of pesticide products to bees (the federal pesticide label contains that information).

The MP3 plans already completed are a good place for other states to begin the research for their own plan. One state recommended “rewarding” an agricultural stakeholder for not damaging another’s livestock/crop. Beekeeping and crop pollination are what increases crop yield. A “reward” is not given to the cattle rancher because he did not shoot his neighbor’s sheep. The corn grower is not “rewarded” because he did not chop down his neighbor’s orchard. One agricultural stakeholder should not be paid to protect another’s crop or livestock, or the water supply. The “reward” for keeping bees alive and healthy is crop yield. Suggesting a beekeeper monetarily reward a grower for not killing the beekeeper’s livestock, and damaging their honey crop, further points out all of the responsibility of pesticide related bee kills has been placed upon the beekeeper. Managed Pollinator Protection Plans are an opportunity for all agricultural stakeholders to understand each other’s needs.

Beekeepers need to keep their bees healthy from crop to crop, from winter to spring. Beekeepers need to keep queen bees healthy, strong, fertile, and surviving from crop to crop, from winter to spring. Farmers need their vegetables, fruits, nuts, and seed crops pollinated in order to have a profitable harvest. Farmers need to protect their crops from 5% of the insects that are harmful to crops and humans.

Cities need to protect their citizens and animals from mosquito-borne diseases. And beekeepers have a need to protect their honey bees from bee toxic pesticides—including herbicides, fungicides, insecticides, adjuvants, surfactants, and the “inert ingredients” in pesticide products. A need, however, is not a strategy. A need, however, is not an action

“For fruit or nut bearing crops, pollination can be a grower’s last chance to increase yield. All post pollination inputs, whether growth regulators, herbicides, fungicides, or insecticides, are generally designed not to increase yield but to conserve losses.” “Pollinator: a grower’s last chance to increase yields,” The Univ. of Georgia, College of Agricultural and Environmental Sciences

We can protect crops AND protect pollinators. We can protect human health AND protect pollinators. Research shows validates pollination:

- stimulates germination of pollen

- increases viability of seeds, embryos, plants
- creates more nutritive and aromatic fruits
- stimulates faster growth of plants
- increases number and sizes of seeds and crop yields
- increases nectar production in nectaries
- increases fruit set and reduces fruit drop
- enhances resistance to diseases and other adverse climatic changes
- increase oil content in oil seed crops

States can learn from the process of developing MP3s in other states. However, states should not just adopt another state's MP3. The climate, precipitation, soil, geography, and crops in Mississippi are not the same as in Maine. To adopt another states' MP3 is to ignore this opportunity for all of the agricultural stakeholders to come together for the benefit of increased crop yield, the benefit of all stakeholders to grow and maintain healthy, productive livestock (honey bees, and mammals as honey bees pollinate food for the mammals), and productive crops (plants and honey).

The Managed Pollinator Protection Plans should include protection of pollinators in our urban and suburban landscapes as well. Backyard gardens, lawns, and the community receive pesticide applications affecting the backyard beekeeper, native pollinators, and the health and sustainability of



graphic from www.vdh.state.va.us

community gardens, city parks, and the landscapes that add to the overall quality of life in our communities. Mosquito Control Programs must be a part of the MP3s. Mosquito control programs have resulted in numerous bee kills. Done correctly human health and pollinators can be protected. Using IPM for mosquitoes, trapping mosquitoes to determine if they are carrying disease, and if so applying a short/low residual toxicity product at NIGHT will protect pollinators. Using IPM and other mitigation for mosquito control such as mowing tall weeds (although those weeds may well be forage for pollinators, so mow after the bloom), draining standing water, or the other myriad of actions taken to alleviate mosquito habitat will help control mosquitoes.

We will not starve if pesticide use is reduced. Crops will not be decimated if a true IPM program is followed, where only one ninth of the crop management involves chemical applications. Fear is not a need, nor is it an action. Productive strategies do not develop out of fear. We can protect our crops and

protect our bees. We can protect public health from mosquito borne diseases and protect our bees. We must be united for our honey bees and native pollinators. No matter your beekeeping management style—chemical treatments in the hive, or no chemical treatments; whether you have Russian or Italian Bees; whether you are a commercial, sideliner, or backyard beekeeper; we must be united in the belief we have a right to keep managed honey bees, we have a right to keep them healthy with pesticide free forage, plenty of diverse forage, and to protect them from undue pesticide exposure.

While it would be easier for the Environmental Protection Agency to compile one MP3 plan for the entire country, it is unrealistic. States need to bring together all of the stakeholders and create a Plan that reflects their state, their crops, their apiary programs and apiary research. The MP3 planning process is an opportunity to evaluate the state apiary program, especially if the state does not have one. Do the apiary fees pay for bee inspectors, and lab testing of bees for pest, pathogens, AND pesticides? Do apiary fees fund the bee inspectors sufficiently providing them with the most basic of equipment: rubber gloves, rubbing alcohol, bee veil, and a hive tool?

The MP3 planning process is an opportunity for each stakeholder to learn from each other; to realize without pollination there is no crop yield: be it wind, rain, self-pollination, or insect pollination. Facilitators of the MP3 planning meetings must be willing and capable to bring the stakeholders together, to listen to all the needs of the stakeholders, and to guide the stakeholders into developing actions which will result in a strategy where the MP3's are truly Managed Pollinator PROTECTION Plans.

Research shows the value of pollination to all stakeholders

*Pollinators can also enhance the quality and quantity of seeds and fruits of **self-fertile** crops. A high diversity of pollinating bees can lead to a significantly higher fruit set.*

Pollination increases the **seed yield** in:

- sunflower 79%
- mustard 55%
- safflower 64%
- cotton 18%

With open pollination mean yield increased in

- strawberry 20%
- oilseed rape 20%
- field bean 40%
- buckwheat 71%

The value of wild pollinators

crop	yield increase from wild pollinators
squash	81%
tomatoes	18%
blueberries	10%

bell peppers	10%
watermelons	10%
peaches	9%
apples	9%
cucumbers	9%
cantaloupes	8%
soybeans	5%

Soybean production with honey bees

- seed production was 57% higher
- pod number was 61% higher

Pollinators near **cotton** with nearby natural vegetation saw:

- Bee species richness 57% higher per Kg/ha
- fibre fraction 1.95% higher per Kg/ha
- seed number 17.77% higher per Kg/ha
- seed yield 18.44% higher per Kg/ha

Avocado -fruit yield increase with honey bees 350%; fruit weight increase with honey bees 18%.

Blueberries in New Jersey can see an increase in gross revenues of \$112 per acre if one acre of vacant land is available to native pollinators. When blueberries were pollinated by more than one species of bees there was an increase of \$311 worth of yield per acre in North Carolina. Of the honey bees, bumble bees, southeastern blueberry bees, carpenter bees, and small native bees North Carolina State Univ. calculates the “benefit of each group (of bee) to be approximately \$1.42 million worth of yield each year.”

A honeybee hive working a hectare of cucumbers can yield 3 times more fruits than plots without bees. Each individual fruit is also heavier.

Pollinator diversity, but not abundance, was positively related to seed set of **pumpkins**.

“Cotton yield indicators declined with increasing distance from bee sources . . . the study showed a “significant positive impact of supplemental honeybees on cotton yield.”

Onion seed yield increased 41.2% due to eight different pollinators; germination increased by 68% due to pollination. Lack of pollination due to insecticide use affects onion see yields

In Florida’s agriculture honey bees increase yields 20-60%.

Research credits:

“Managed honeybees increase onion seed yield and quality,” <http://www.lrrd.org/lrrd26/1/gebr26008.htm>

“Lack of pollination due to insecticide use affects onion see yields,” <http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=5688>

“Dept. of Agriculture and Food- bee pollination benefits for avocados,” bulletin 4298,
http://archive.agric.wa.gov.au/PC_91826.html

Pollination and Plant Resources Change the Nutritional Quality of Almonds for Human Health
<http://www.plosone.org/article/info%3Adoi%2F10.1371/journal.pone.0090082>

Pollinator-Friendly Farming <http://njsustainingfarms.rutgers.edu/dontkill.html>

Increasing cropping system diversity balances productivity, profitability, and environmental health
<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0047149>

Impact of honey bee pollination activities on Bt cotton production in northern Alabama
http://www.alabees.com/impact_of_honey_bee_pollination_.htm

Importance of bee pollination for cotton production in conventional and organic farms in Brazil
<http://pollinatorstewardship.org/wp-content/uploads/2014/06/Importance-of-bee-pollination-for-cotton-259-885-2-PB-1.pdf>

Improved pollination will improve yields: Some history to back this up
<http://www.beesource.com/point-of-view/joe-traynor/improved-pollination-will-improve-yields-some-history-to-back-this-up/>

Pollination of soybean by Honey bees <http://www.scielo.br/pdf/babt/v48n1/a05v48n1>

Pollinator decline: US Agro-Socio-Economic impacts and responses <http://www.asciencejournal.net/asj/index.php/NES/article/view/430>

Pollination: a grower’s last chance to increase yields <http://interests.caes.uga.edu/insectlab/agimpact.html>

Enhancing seed production of three brassica vegetables by honey bee pollination in north-western Himalayas of India
<http://www.hrpub.org/download/201310/ujar.2013.010301.pdf>

Honey bees and blueberry pollination
<http://umaine.edu/blueberries/factsheets/bees/629-honey-bees-and-blueberry-pollination/>

Managing for higher yields
<http://www.agriculturesnetwork.org/magazines/global/28-1-insects/managing-for-higher-yields>

Organic farming improves pollination success in strawberries
<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0031599>

Contribution of pollinator-mediated crops to nutrients in the human food supply
<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0021363>

Wild pollinator habitat benefits agriculture
<http://blog.nature.org/science/2013/08/06/wild-pollinator-habitat-benefits-agriculture/>

Contribution of insect pollinators to crop yield and quality varies with agricultural intensification <https://peerj.com/preprints/184v1.pdf>

More species of bees pollinate crops, making blueberry farms see increased yield
<http://www.isciencetimes.com/articles/7186/20140509/more-species-bees-pollinate-crops-making-blueberry.htm>

Insect pollinators contribute \$29 billion to US farm income, Krishna Ramanujan, May 22, 2012, Cornell Chronicle

Wild bees make honey bees better pollinators, Liese Greensfelder, UC Berkeley news release (Study author was Sarah Greenleaf, and published in the Proceedings of the National Academy of Sciences issue on Sept. 12, 2006 an EPA funded study),
www.berkeley.edu/news/media/releases/2006/08/28_honeybees

Wild Pollinators worth up to \$2.4 billion to farmers, Ann Brody Guy, College of Natural Resources at Berkeley, 6-20-2011,
www.newscenter.berkeley.edu/2011/06/20/wild-pollinators-worth-billions-to-farmers

“Climate- Smart” Agriculture,” Food and Agriculture Organization (FAO) of the United Nations, 2010

Society for Range Management-Pollinators in Rangelands <http://www.srmjournals.org/toc/rala/33/3>