Pollinator Protection Update:

Gordon Morrison & Dr. Frank Wong
3 Pound Package
Queen & 3 lbs. of Italian honey bee workers
The Public Atmosphere for Pollinator Protection
Join me in telling Bayer to stop selling bee-killing pesticides in the U.S.

—BETTE MIDLER
PERCEPTION VS. REALITY

TIME
A WORLD WITHOUT BEES

THE PRICE WE'LL PAY IF WE DON'T FIGURE OUT WHAT'S KILLING THE HONEYBEE
BY BRYAN WALSH
Morning Mix

‘Like it’s been nuked’: Millions of bees dead after South Carolina sprays for Zika mosquitoes

The Post website is regularly exceeding 50 million unique monthly visitors in the U.S. and crossed the 20 million point with international readers earlier this year.
“Dorchester County is apologizing for accidentally killing millions of bees in Summerville. The honeybees were killed by an aerial spray of a pesticide used to control mosquito populations over the weekend. The spray came after rising concerns of the Zika virus. There are 4 confirmed travel related cases of Zika in the Summerville area.

Registered bee owners are supposed to be warned prior to mosquito spraying but were not told this time.

We spoke to bee keepers who say they were devastated to see their colonies dead. “I was angry that day, I just couldn’t wrap my head around the fact that we spray poison from the sky, said bee owner Andrew Macke. But Macke wants this incident to be a teaching moment.”
“Stanley estimates she lost more than 3 million bees, and says she'll have to destroy the contaminated honey and equipment and start over.”

Investigation is underway

Puts mosquito control in a negative light for the **Public and Manufactures**
Part of Bayer’s Global Bee Care Program, which provides a more focused and centralized resource for Bayer scientists and external stakeholders. A gathering place for researchers, bee experts, students and other visitors.
Found differences in susceptibility in bees of different ages and strains

Most relevant work was our semi-field (cage trials) that were done over several years.

Work was done in collaboration with East Baton Rouge Mosquito Control, The USDA Bee lab, LSU, and the USDA Aerial applications lab in College Station TX.

Evaluated (both low and high application rates): Scourge, Duet, Fyfanon, and Aqua Pursuit

Three rows of stakes with both caged bees and mosquitoes at 50, 100, 150, 200, 250, and 300 feet.
Each station contained spinners and slides, which were evaluated using fluorescent dropvision.

Each pesticide and rate was replicated at least 3 times.

Good mosquito mortality resulted for most products.

Did not see high mortality in bees.

Bee mortality for the pyrethroids (low and high rates) was below 10% at all distances compared to much greater mortality in mosquitoes for the same experiments.

Greatest bee mortality resulted from Fyfanon, but only at the stations closest to the sprayer. In our experience, we do see a greater chance of acute mortality with OPs.
- Graduate student put “dead bee collecting boxes” on hives in both treatment and control areas.

- Followed the hives over several months, and measured mortality each week with “dead bee collecting boxes”.

- No difference in mortality in treatment and control sites, even during weeks of mosquito adulticiding activities.

- Measured other hive health indicators (adult bees, brood quantity, brood quality, presence of queen, and stress enzymes). Did not find any difference in adverse health outcomes in bees between treatment and control sites.

- Spinners and slides were used for each spray event during the study, Appropriately sized droplets made it to the bee hives. But we never saw increased mortality.
Global Honey Bee Populations Are Robust

Source: UN Food and Agriculture Organization
Recent US Loss Estimates
Source: Bee Informed Partnership

Winter losses in the US are steady. Annual loss statistic is causing concern.
WHAT’S THE CURRENT SITUATION?

- Parasites (Varroa Mites, Hive Beetles)
- Disease
- Nutrition
- Bee keeping practices Professional & Hobby
- Pesticides
- Genetic Weakness
Varroa destructor: Public enemy No. 1
Varroa destructor: Public enemy No. 1
A national survey* US beekeepers attributed their losses to:

- Weak colonies in the fall  34%
- Queen failure  32%
- Starvation  31%
- Varroa mites  17%
- Poor wintering conditions  10%
- CCD  9%
- Pesticides  7%
- Nosema  6%
- Small Hive Beetle  4%

Self reported and no consistent understanding of symptoms. Losses could be attributed to more than one cause.

Pesticides with Contact LD50 ≤ 11 μg/bee

**Herbicides**
- Bensulide
- Sethoxydim
- Diuron
- Bensulide
- Sethoxydim
- Diuron

**Carbamates**
- Aldicarb
- Carbaryl
- Methomyl
- Oxamyl

**Neonicotinoids**
- Acetamiprid
- Dinotefuran
- Clothianidin
- Thiamethoxam
- Imidacloprid

**Pyrethroids**
- Alpha-cypermethrin
- Beta-cyfluthrin
- Cyfluthrin
- Cyphenothrin
- Esfenvalerate
- Fenpropathrin
- Fluvalinate
- Lambda-cyhalothrin
- Imiprothrin
- Zeta-cypermethrin
- Momfluorothrin
- Permethrin
- Resmethrin

**Organophosphates**
- Dicrotophos
- Ethoprop
- Malathion
- Diazinon
- Naed
- Pirimiphos-methyl

**Others**
- Abamectin
- Fipronil
- Cyantraniliprole
- Chlorfenapyr
- Endosulfan
- Sulfoxaflor
- Pyridaben
- Metaflumizone
- Amitraz
- Fenazaquin
- Bifenazate
- Fosthiazate
- Indoxacarb
- Tolfenpyrad
- Emamectin benzoate

**Others**
- Chlorfenapyr
- Endosulfan
- Sulfoxaflor
- Pyridaben
- Metaflumizone
- Amitraz
- Fenazaquin
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Pesticide Risk = Toxicity x Exposure

Reduce Exposure
Reduce Risk
Bee keeping practices, long distance hauling stressing bee colonies
HONEYBEES ARE A AGRICULTURAL COMMODITY
Executive and Regulatory Actions to Promote Pollinator Protection

- White House Pollinator Health Task Force 2015 Order
- Reduce honey bee colony losses to no more than 15% within 10 years
- Increase Monarch butterfly populations from 200M to 225M
- Restore 7M acres of pollinator habitat over next 5 years
- Key EPA Actions to Protect Pollinators
  - New guidelines for pesticide safety for pollinators: fungicides-herbicides-insecticides
  - Limits of use of pesticides ‘acutely toxic’ to pollinators on blooming plants
  - Draft & implement State Managed Pollinator Protection Plans (MP3s)
  - Restriction of herbicides to protect milkweed & Monarch butterflies

Vector control and public health measures were not a focus of the White House order and resulting EPA actions,
Chemicals in Registration Review
Pollinator Protection Impacts on Adulticides

All Mosquito adulticides are under FIFRA registration review to be completed in 2017 – 2018

• Organophosphates: Chlorpyrifos, Malathion, Naled
  • Draft Biological Evaluation released April 2016
• Pyrethroids: Pyrethrins, Etofenprox, Permethrin, Prallethrin, Resmethrin, Sumithrin, Bifenthrin
  • Draft Ecological Risk Assessment to be released October 2016

It is not clear how the impact on pollinators will be addressed in registration review

• All adulticides are acutely toxic to bees
• Potential for EPA to restrict uses or request mitigations

Both classes of chemistries will also be fully evaluated under the Endangered Species Act adding to the potential for limiting use
State Managed Pollinator Protection Plans (MP3) Update/Status

Voluntary Management Plans coordinated by State Ag Depts with bee keepers, Growers, researchers, and industry

State inventory:
- 7 Published Plans (CA, CO, ND, GA, WI)
- 39 in process of drafting and approving
- 4 States not yet drafting or do not plan to draft

MP3s vary greatly in content and focus. Examples include:
- North Dakota – ag focused 10 pages
- Wisconsin - Ag, urban and roadside focus – 54 pages

March 2016 – National MP3 summit coordinated by USDA/NASDA to try to coordinate state efforts

Vector Control programs need to be active participants in MP3 meetings to help assure MP3’s are bases on science and best management practices
Status of State MP3s
Based on RISE/CLA Tracking – Updated May 4

Progress
No Plan  Completed

Map of the United States with states colored to indicate progress on MP3s.
Bee Helpful

- Train personnel how to communicate the real issues affecting bee health.
- Prepare a ‘Fact Sheet’ about your program that includes pollinator protection initiatives.
- Establish a relationship with your local (state) apiary specialist. (Usually employed through your state department of agriculture or university extension service.)
- Seek out local beekeepers and beekeeping associations and bee equipment suppliers.
- Develop a list of locations of honey bee colonies, noting that these may be transient within a given season.
通知书蜂农你的喷洒路线和治疗时间表。
- 建议蜂箱被放置在有助于减少接触的地方:
  - 距离喷洒路线300英尺远;
  - 在受保护的区域，如可能（在树冠下，对面的灌木、灌木丛和围栏）。
- 预报的风向通常是可预测的，因此建议将蜂箱放置在与已建立的喷洒路线相反的风向。
- 找到/推荐一个愿意救援蜂群的蜂农，如果被报告。
- 在蜜蜂活动最不活跃的时间进行杀虫剂的施用，无论是地点（开花作物/树木/植物）还是时间（日落后，日出前），只要可能的话。
So What’s Next
Pollinator Protection

• Honest discussion on Pollinator Health and Human Health
• Continued development and refinement of Vector Control BMPs to protect pollinators
• Education and Stewardship Programs
• Regulation based on sound science and risk-based assessments
• Representation of vector control in regulatory and legislative arenas
Thank You!