Science For A Better Life

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

CENTER FOR FOOD SAFETY

BEYOND PESTICIDES
www.beyondpesticides.org

PAN NORTH AMERICA

Take Part


Join me in telling Bayer to stop selling bee-killing pesticides in the U.S.
—BETTE MIDLER


Zakaria: The new al-Qaeda threat / Ted Cruz / Foreshar: Yellen over Summers for Fed chair / Low Rolling in Vegas
TIME
A WORLD WITHOUT BEES
THE PRICE WE'LL PAY IF WE DON'T FIGURE OUT WHAT'S KILLING THE HONEYBEE
BY BRYAN WALSH

The Washington Post

Source: News 2 – 01 September 2016

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.

The Washington Post

BAYER

"**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."**

Snopes.com
Rumor Has It

BAYER

"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**

Bayer North American Bee Care Center
Research Triangle Park, NC

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

Dr. Kristen Healy – LSU

Evaluation of insecticides against honey bees in the lab, semi-field, and in field based studies

- 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.

Dr. Kristen Healy – LSU

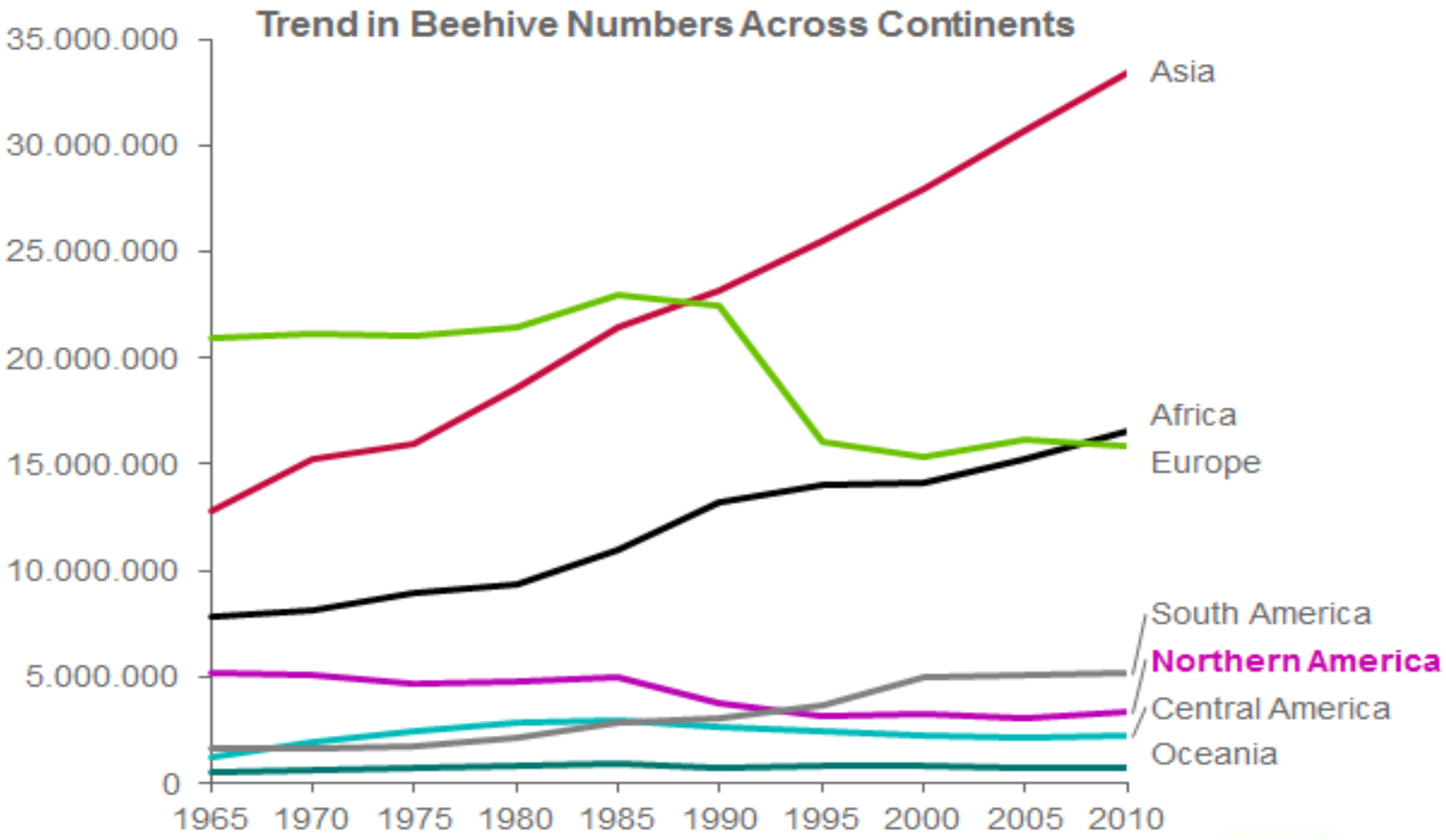
- Each station contained spinners and slides, which were evaluated using fluorescent dropvision
- Each pesticide and rate was replicated at least 3 times
- Good mosquito mortality resulted for most products
- Did not see high mortality in bees.
- Bee mortality for the pyrethroids (low and high rates) 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.

Dr. Kristen Healy – LSU

Field study with sentinel beekeepers in East Baton Rouge parish.

- 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.

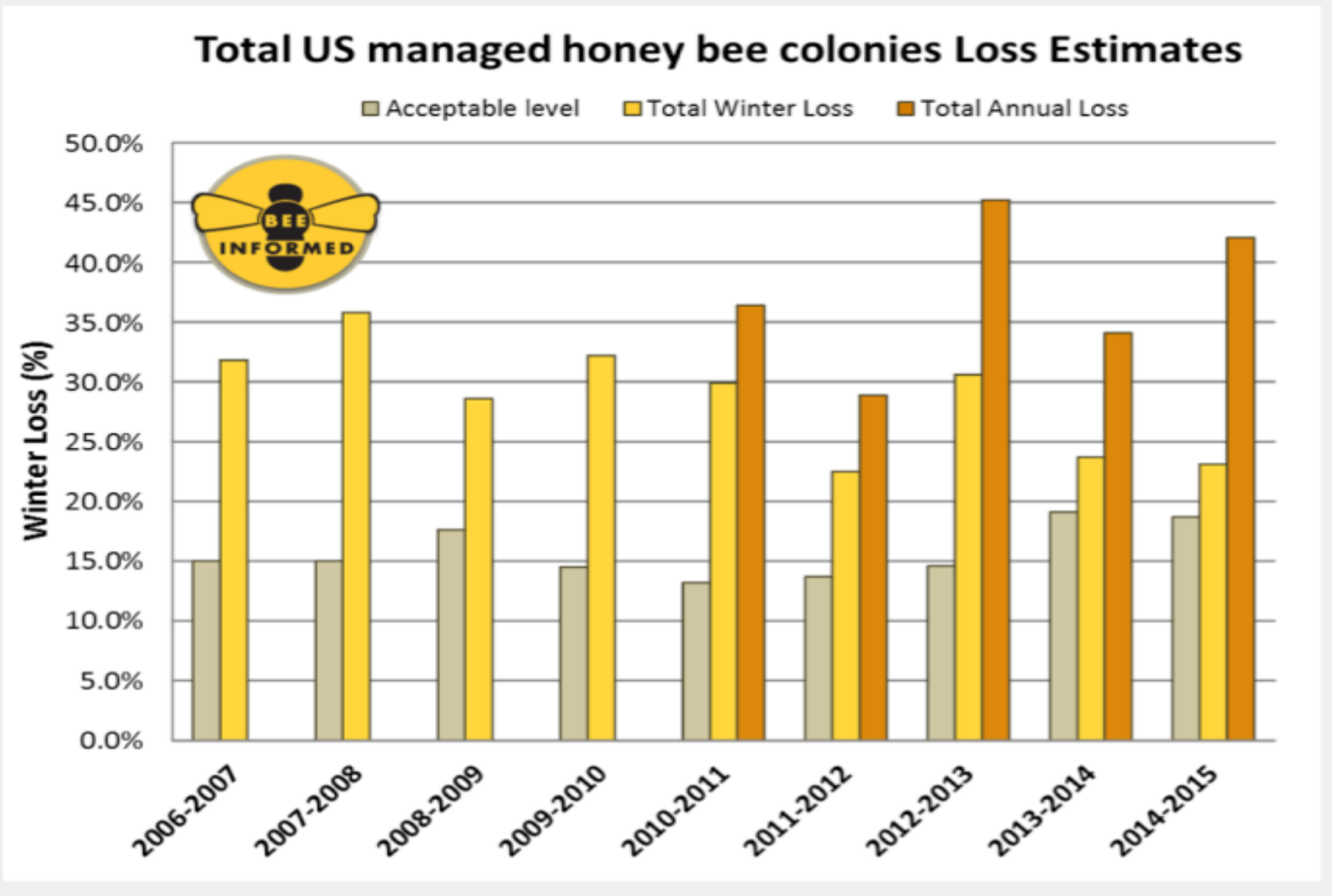
Global Honey Bee Populations Are Robust



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

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Varroa destructor: Public enemy No. 1

Varroa destructor: Public enemy No. 1

The Beekeepers View

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%

Winter 2011 - Spring 2012 *
Bee Informed Partnership

Beekeepers do not consider CCD a major factor. Reported incidences dropping as beekeepers assess other factors

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

*http://www.ibra.org.uk/articles/US-honey-bee-winter-colony-losses-2011-12

Pesticides with Contact LD50 ≤ 11 µg/bee

Carbamates

Aldicarb
Carbofuran
Carbaryl
Methiocarb
Methomyl
Propoxur
Oxamyl

Neonicotinoids

Acetamiprid
Dinotefuran
Clothianidin
Thiamethoxam
Imidacloprid

Organophoshates

Chlorpyrifos methyl
Acephate
Dicrotophos
Dichlorvos
Ethoprop
Dimethoate
Chlorethoxyfos
Malathion
Fenitrothion
Chlorpyrifos
Diazinon
Naled
Phorate
Phosmet
Pirimiphos-methyl
Profenofos
Tetrachlorvinphos

Herbicides

Bensulide
Sethoxydim
Diuron

Pyrethroids

Alpha-cypermethrin
Phenothrin
Lambda-cyhalothrin
Beta-cyfluthrin
Bifenthrin
Tefluthrin
Imiprothrin
Cyfluthrin
Cypermethrin
Prallethrin
Zeta-cypermethrin
Cyphenothrin
Deltamethrin
Momfluorothrin
Pyrethrins
Esfenvalerate
D-trans-allethrin
Permethrin
Fenpropathrin
Etofenprox
Tetramethrin
Resmethrin
Fluvalinate
Gamma-cyhalothrin

Others

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

Naturals

Spinosad
Spinetoram
Azadirachtin
Rotenone
Arsenic acid

Pesticide Risk = Toxicity x Exposure

Reduce Exposure

→

Reduce Risk

Bee keeping practices, long distance hauling stressing bee colonies

HONEYBEES ARE A AGRICULTURAL COMMODITY

1: Pollinator movements and crops in the U.S.

Apples
Blueberries
Raspberries
Cranberries
Cherries
Pears
Plums
Alfalfa
Canola
Sunflowers
Alfalfa
Apples
Cherries
Cucumbers
Apples
Cherries
Plums
Blueberries
Cranberries
Apples
Blueberries
Cucumbers
Melons
Berries
Cucumbers
Almonds
Berries
Cherries
Melons
Citrus
Avocados
Sunflowers
Alfalfa
Melons
Alfalfa
Melons
Cucumbers
Melons
Apples
Blueberries
Melons
Blueberries
Melons
Cucumbers
Sunflowers
Citrus
Blueberries
Melons
Cucumbers
Citrus

Summer feeding grounds

Total pollinated crop acres by state

- Less than 20,000
- 20,001 to 80,000
- 80,001 to 150,000
- 150,001 to 250,000
- 250,001 to 500,000
- More than 500,000

Dashed line represents distinct pollination routes

As of June 2014

Source: Adapted by USDA, Economic Research Service from Kautzmann (2011), with input from commercial beekeepers and apiculture experts, including Dr. Jeff Pettis and Dr. David Epstein, an entomologist and authority on pollinators with the USDA's Office of Pest Management Policy. Crop production acres are from USDA, NASS, 2012 Agricultural Census, 2014.

USDA

United States Department of Agriculture, Economic Research Service

The views expressed are those of the author(s) and should not be attributed to the Economic Research Service or USDA.

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:

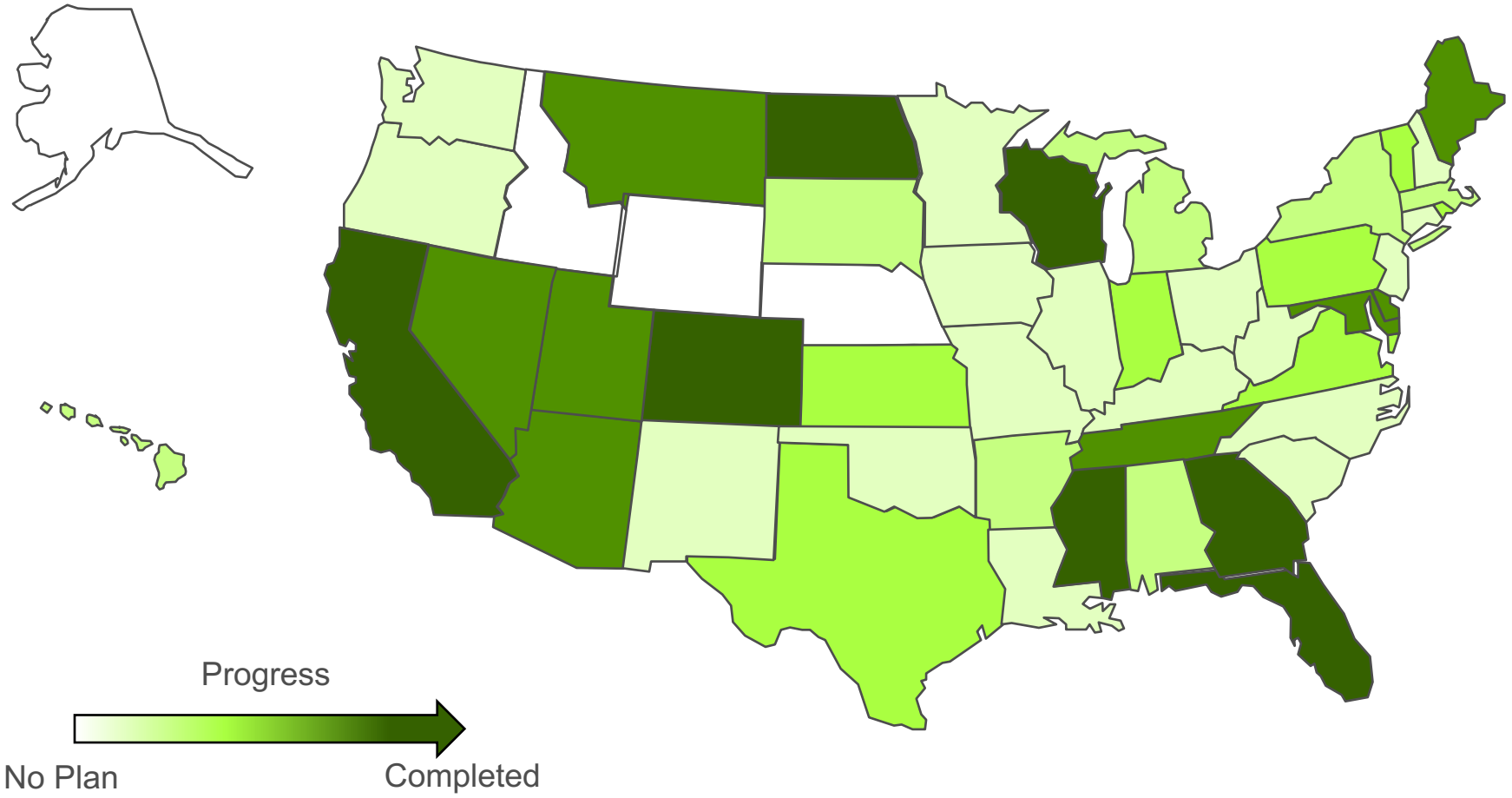
- North Dakota – ag focused 10 pages
- Wisconsin - Ag, urban and roadside focus – 54 pages

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



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..

Bee Helpful

- Notify beekeepers of your spray routes and treatment schedule.
- Recommend that hives be placed in areas that will help reduce exposure:
  - 300 ft. away from truck spray routes;
  - In protected areas, if possible (under tree canopies, opposite side of bushes, shrubs, and fences from the spray vehicle)
  - Prevailing winds are often predictable so recommend placement of hives up wind from established spray routes.
- Find / recommend a beekeeper willing to rescue bee swarms, if reported.
- Time adulticide applications when bees are least active, both by site (blooming crops/trees/plants) and time (after dusk, and before dawn), whenever practical.

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!

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