Minnesota and Our Nation's Honey Bees
How Can We Help Them?

Marla Spivak
University of Minnesota
spiva001@umn.edu
www.BeeLab.umn.edu
Honey is produced in every state. Leading honey-producing states are California, Florida, Minnesota, Montana, North Dakota and South Dakota.

About half of the nation’s full-time beekeepers migrate with
“Looks like 2013 could go down as the smallest honey crop produced in MN and maybe the US as well. We’ll know in a few months when the NASS surveys get released.”

“I hope you all had a decent honey crop this season. Unfortunately, ours has been consistently poor for the last 5 years now, which is quite short of what I have seen over the last 30+ years of my beekeeping career. However on a better note, our bees did come through the summer with less than 10% loss, and with that we are very pleased.”
Managed honey bee colony losses in the US

Percent total colony winter loss:
- 2006-2007
- 2007-2008
- 2008-2009
- 2009-2010
- 2010-2011
- 2011-2012
- 2012-2013

+9.2 pt. mortality

Acceptable range
The Interacting P’s

- Pathogens and Parasites
- Pesticides
- Poor nutrition
- Public Perception of Poor beekeeping Practices
Varroa destructor: mite parasite

Feeds on bee blood, circulates bee viruses among adult bees and brood.
Varroa destructor: Treatment

To keep bees alive, beekeepers resorted to treating bees with miticides for crop protection, beginning in 1990s.

- Synthetic miticides leave residue in comb
- Mites have developed resistance to miticides
- IPM/ Organic treatments are limited or ineffective
- No treatment for viruses
Damned if they do, damned if they don’t

- Beekeepers would prefer organic treatments if they controlled mites and didn’t harm bees
- Beekeepers would leave bees untreated if they could afford to take 80-90% loss of bee hives yearly
- The public and fruit, vegetable, almond, and seed growers can not afford to lose 80-90% of our pollinating honey bees
SIX detectable pesticide residues in every batch of pollen

Pyrethroids
Organophosphates
Carbamates

Fungicides
Herbicides

Neonicotinoids
Insect Growth Regulators
Organochlorines

Adjuvants
Sublethal doses interact with honey bee health in ways we never imagined


Poor nutrition
Paucity of nectar and pollen producing flowers

Honey bees:
- Visit 2 million flowers to make 1 lb of honey
- Need 75 lbs of honey per colony to survive winter
- Visit 50-100 flowers, usually of the same species, on one foraging trip
- Need 50-100 lbs of pollen per colony over season
- Need diverse pollens (sources of protein) over growing season for immune system health and survival
  - Alaux et al., Environ. Microbiol. 2009
  - Di Pasquale et al. PLoS ONE 2013
  - PhD research Matthew Smart

- There are at least 130,000 colonies of honey bees in MN
Traditional Honey and Pollen Plants in MN

- Clover (many species)
- Basswood trees
- Alfalfa
- Buckwheat
- Sunflower/ Aster
- “Wildflowers”
Native Plants: good for honey production?
Funded by General Mills

Smooth Penstamon
*Penstamon digitalis*

Dotted Mint
*Monarda fistulosa*

Purple prairie clover
*Petalostemum purpureum*

Fragrant Giant Hyssop
*Agastache foeniculumn*

Mountain Mint
*Pycnanthemum virginianum*

New England Aster
*Aster novae-angliae*
Native and restored prairies, and Wildlife Management Areas, roadsides, and crop borders with few flowers are not good honey bee, or native bee habitats.
Will prairies, WMA’s, roadsides, and crop borders with native flowers help honey bees as much as they will help native bees??... To be determined!