Pollination on Organic Farms in TN

Assumptions:
- Small scale farming
- Diverse crops
- Reduced pesticides

Observations on:
- Small scale farms - conventional and organic
- Recording # of bees, rate of visitation, types of bees on crops and flowers

Crops
- Blueberry
- Summer Squash
- Cucumber
- Cantaloupe
- Watermelon
- Pumpkin
- Sunflower

Apoidea (sensu latu) – Bees
- Andrenidae – Sand bees, Mining bees
- Apidae – Bumble bees, Carpenter bees, Cuckoo bees, Digger bees, Honey bees
- Colletidae – Plasterer bees, Yellow-faced bees
- Halictidae – Sweat bees
- Megachilidae – Leafcutting bees, Mason bees
- Melittidae – Melittid bees

*Discoverlife.org
Agapostemon sp.

Osmia sp.

Habropoda laboriosa?

Photos by Dan Eiser
Acorn Squash
*Cucurbita pepo*

Sweet Potato Pumpkin
*Cucurbita mixta*

New England Pie Pumpkin
*Cucurbita pepo*

Winter Squash Autumn Cup
*Cucurbita pepo*

*Cucurbita spp.*
*Peponapis spp.* Squash bee

- Cucumber
- Cantaloupe
- Watermelon

Watermelon in New Jersey and Pennsylvania
• Importance of native bees stronger than in Kremen et al. California study
• Calculated native bees could provide full pollination at ≥90% of their locations if the honey bee was absent


Watermelon in California
• Pollination by native bees related to proximity of natural habitat
• Predictive model to identify pollination provided by an area of adjacent habitat
• Associate economic benefit to pollination as an ecosystem service
Nutrition from diverse sources of pollen critical for honey bee health

Monoculture landscapes implicated as a factor in CCD

Nectar sources needed after main spring honey flow is over

- *Buckwheat* - honey bees and bumble bees before noon
- *Yellow clover* - mostly honey bees, some bumble bees
- *White clover* - bumble bees and honey bees
- *Vetch* - bumble bees
- *Monarda* - “lemon mint” bumble bees
- *Partridge pea* - bumble bees and some honey bees, early morning
- *Daisies, Black-eyed-susan’s and similar* - small native bees
- *Sweet William (Dianthus)* - Nothing
- *Cosmos* - all types of bees

**Benefits:**
- Conservation funding
- Wildlife food plots
- Cover crops - nitrogen, soil health, etc.
- Scenery for farm tours
- Cut flowers
- Pollination

**Questions?**
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