Wild pollinators and Vermont’s Food System

Taylor Ricketts
Gund Institute for Ecological Economics
University of Vermont
Crops and pollination

- 70% of crops
- $10-100 billion/year globally
Pollination = assisted plant sex

Tricking bees

Good for both plants and pollinators
Pollen limitation
Honey bees

One species

Introduced in 1600

Workhorse of pollination
  • Active; Social; Mobile

Decline. Farms vulnerable?
Wild crop pollinators

- 1000’s of species
- Nest in and around farms
- Pollinate many crops
  - some better
- Insurance?

*Osmia* on apple

*Bombus* on blueberry

*Bombus* on tomato

*Andrena* on almond
Maintaining their habitats

Enough?
Who are the bees?

3000-4000 species in U.S.
~275 in Vermont
Bumble bees

- *Bombus* spp
- 19 species in Vermont
- Buzz pollinate – blueberry, tomato, etc.
- Social nests in burrows, cavities
- Out early, flying all summer
Squash bees

- *Peponapis pruinosa*
- Eats, mates, sleeps, loiters in squash blossoms
- Solitary nests in the ground near *Cucurbita* plants
- Just as effective pollinators than honeybees
- Flies June-summer

Photos: Jim Cane

Photo: Keith Delaplane
Sweat bees

- Family Halictidae
- Solitary nests in the ground
- 100’s of species in VT
- Minor pollinators of many crops

Augochloropsis metallica
Mason bees

- *Osmia* spp.
- 130 species in North America
- Solitary nests in twigs and tubes
- Managed as commercial pollinators
- Key pollinator of apples, others
What do they need?

1. Nesting sites

- Protect snags
- Leave bare soil
- Provide tube nests
What do they need?

2. Flowers for food

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© Data from Steve Javorek, Agriculture Canada
Enhance bee food

New Hampshire Blueberry Farm

Pre-Planting: 2009

Post-Planting: 2011

Courtesy Xerces Society
What do they need?

3. Protection from pesticides

• Don’t spray when bees active
• Consider other options
• Even some organic-approved pesticides kill bees.
Ongoing research

– Role of native bees in VT’s food system

– How bees respond to
  • Surrounding landscape
  • Farm management

– Does bee habitat restoration work?

– Does it make economic sense?
Blueberries
Native bees on blueberry farms

Native visitation rate (visits/10 minutes)

Farms
What explains the differences?

Factors:
• Surrounding land cover
• Crop diversity
• Hedgerows
• Flowers in/around farm
• Spraying practices
• Etc.
Resources

Xerces Society – bee info
NRCS – plant lists, funds
UVM – Collaborate?
Thanks

16 blueberry growers

Mace Vaughn
Katharina Ullmann
Leif Richardson
Vern Grubinger
Toby Alexander
Anna Beauchemin
Charlie Nicholson