Planting Cover Crops for Pollinator Habitat

NE Vegetable and Fruit Conference

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Thank You

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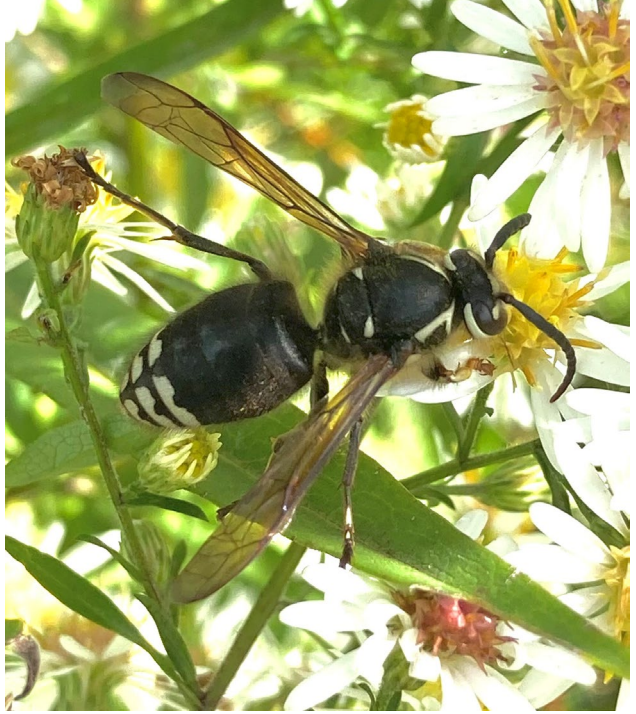
Pollinator Resources

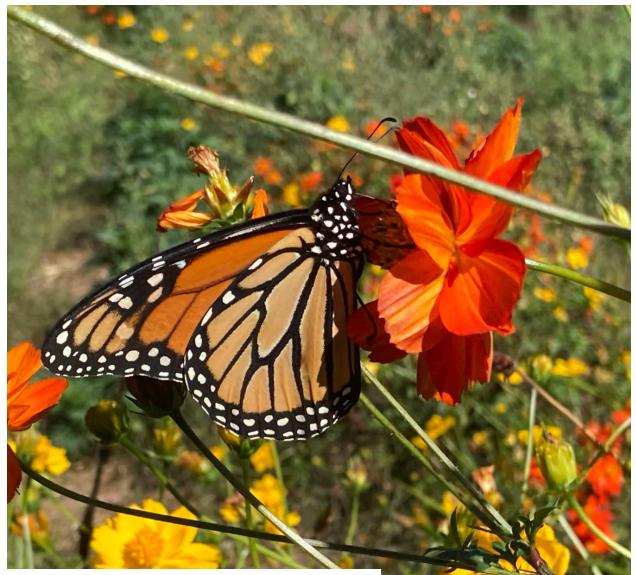
WELCOME TO THE UNIVERSITY OF VERMONT EXTENSION POLLINATOR PROGRAM

- **Support the adoption of farm practices that promote the well-being of pollinators, through education and applied research, in collaboration with other agencies, organizations, and people doing similar work.**

Who are the wild pollinators?



*Bees contribute 80% of all pollination services, while other groups contribute 20%.



https://www.pxfuel.com/es/search?q=Alimentador

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Wild bees: ~335 species in Vermont.

Graphic: Dr. Taylor Ricketts, UVM

Wild bees produce larger, better blueberry yields, new UVM

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Study Reveals Striking Decline of Vermont's Bumble Bees

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Pollinators face threats:

- Loss of habitat and resource diversity
- Pests and pathogens
- Pesticides
- Climate change

What does this mean for growers?

Inconsistencies in the field.

"it was our worst yielding crop ever with a very low (but healthy) fruit count per acre. The only thing I can attribute it to was the wet July potentially resulting in a lack of pollination……"

Image: Jim Cane, USDA, ARS

"Lack of pollinator activity was the primary driver in low cucurbit yields."

"We noticed a steep decline in visible activity…"

"This was the first year we suffered from poor pollination of early zucchini and melons. Was a real drag!"

Grower Needs Assessment Survey – 102 responses

- 64% said lack of sufficient pollination poses a risk to the quality or yield of their crops, 20% were not sure.
- 72% said their knowledge about practices to support pollinators was low to moderate.
- 94% would like to learn more about pollinator habitat plantings.

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Examples of planting for pollinators

Herbaceous annual, short-term perennial, and perennial plantings

Flowering trees and shrubs for marginal land, hedgerows, and/or buffer or field margin habitat

FLOWERING COVER CROPS

Image credit: Karen Trubitt, True Love Farm

FLOWERING CROPS

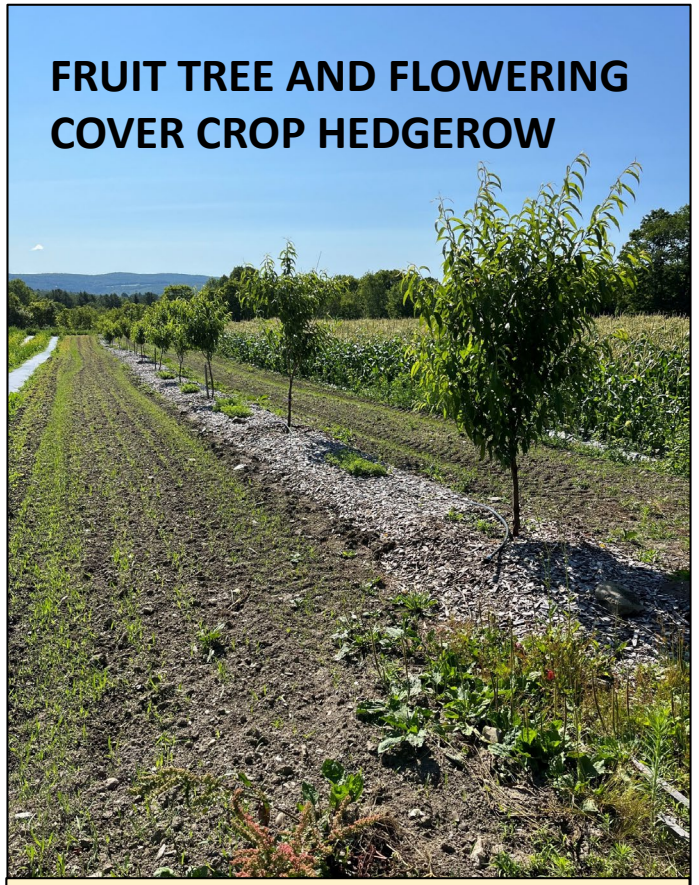

Image credit: Kyle Doda, 1000 Stone Farm

Cover crops can help provide flowers all season!

- Support pollinators when crop is not in flower, providing pollen and nectar before and after crop bloom.
- Provides floral diversity and may reduce species competition during crop bloom.
- Pollinator habitat **= support cash crop pollination services and yields**

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Cover crops can be a great source of flowers for pollinators

Image credit: Karen Trubitt, True Love Farm

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Available at www.sare.org/cover-cropping-for-pollinators, or order free hard copies by calling (301) 779-1007.

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Sustainable Agriculture Research & Education

Cover Cropping for Pollinators and Beneficial Insects

Doug Crabtree uses many tools to make his Montana farm bee friendly. – Photo by Jennifer Hopwood; **Phacelia is an attractive pollinator cover crop.** – Photo by John Hayden; **Clover fixes nitrogen and provides bee forage.** – Photo by Judson Reid

DOUG AND ANNA CRABTREE'S VILICUS FARM RESTS on more than 2,000 acres in northern Montana, and it is a model of how cover crops can be a foundation of pollinator and beneficial insect management. Like many farmers, their approach to cover cropping began with an interest in soil health and quickly grew to encompass much broader goals as they recognized the additional benefits cover crops could provide.

"We want to implement pollinator conservation at the field-level scale," Doug says. "Anyone can create a small wildflower strip, but as we scale up, we need conservation areas distributed across the entire operation."

While the Crabtrees have established permanent native wildflower strips around many of their fields to provide a skeleton of habitat throughout the farm, extensive cover crop rotations provide the muscle that makes their operation a rich landscape for bees and other beneficial insects.

This commitment to cover cropping is having clear and positive impacts. Flax, sunflower and safflower are just a few of the Crabtrees' regular crops that either require or strongly benefit from insect pollination. And, because of their commitment to integrating habitat for wild pollinators throughout their holdings, the Crabtrees have never needed to bring honey bee hives onto the farm for pollination. Instead, a walk through their fields quickly reveals an abundance of wild bumble bees, longhorn bees, sweat bees and more—all supported by the farm's habitat. A farm's ability to support its own pollinator community provides security, especially if managed honey bee hives become scarce or expensive.

In addition to supporting the pollinator community, cover crops have many traditional uses on a farm. These range from preventing erosion and improving soil health to managing weeds and serving as an additional source of income when part of a double-crop system. With cover

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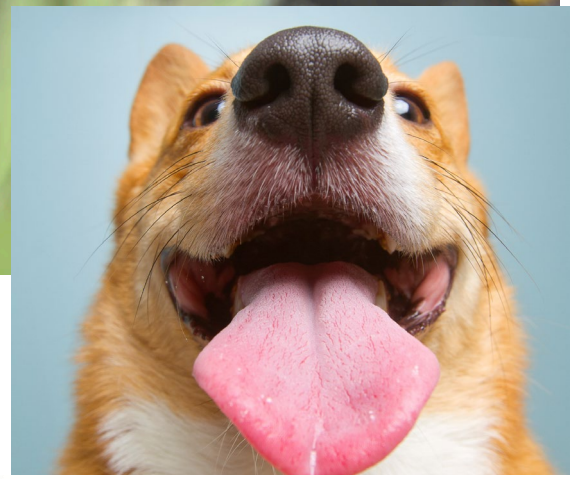
Different types of flowers support different pollinators



Flowers of legumes tend to have long, tubular corollas of varying depths and are most accessible to pollinators with tongues, like bees, butterflies, and moths.

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White clover

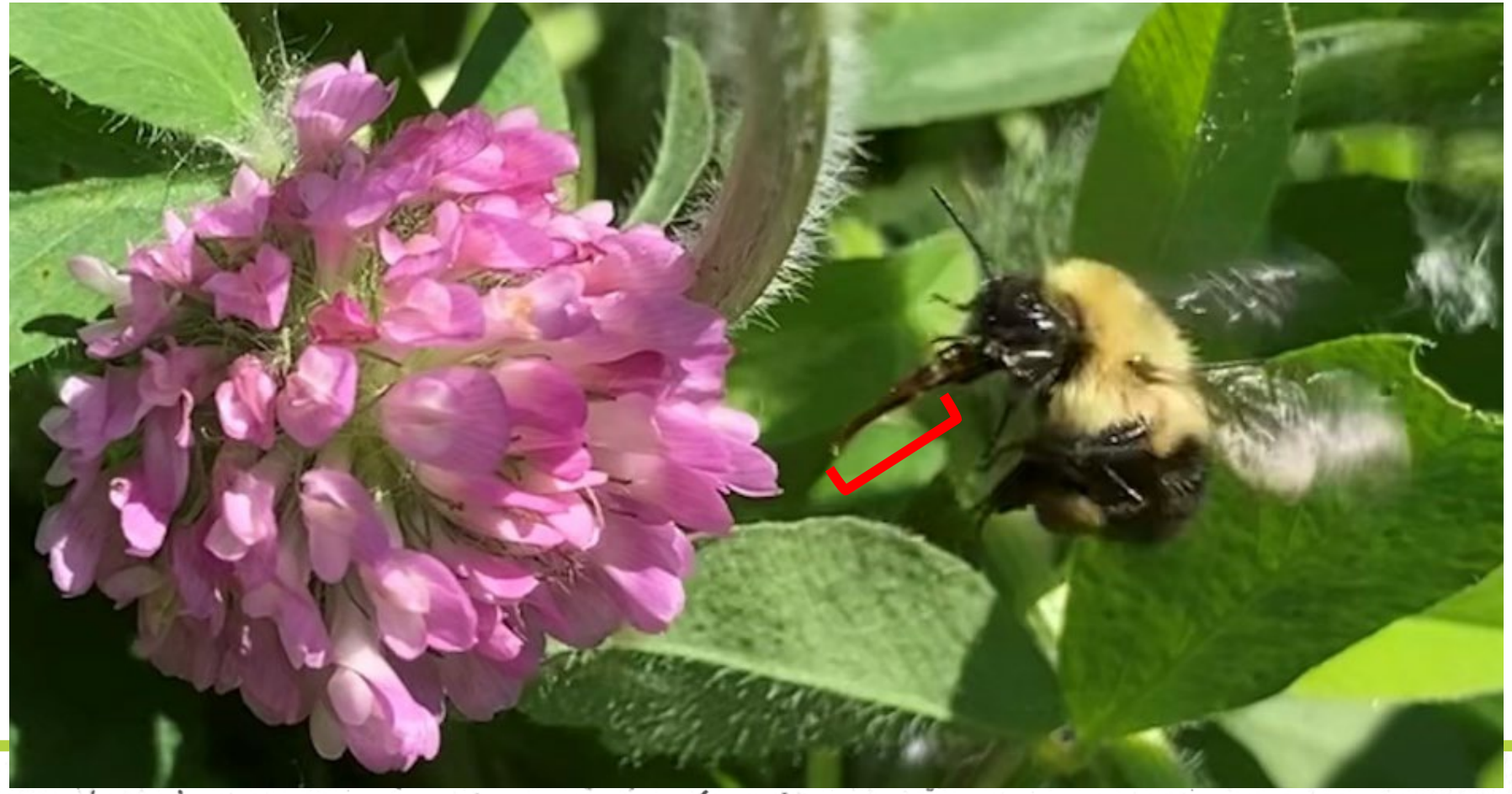
- Shallow corollas, accessible to many, including bees with shorter tongues, like honey bees. Highly valued nectar plant and pollen.

- Plant small to intermediate or medium type cultivars, such as ‘Pinnacle’ white clover - more tolerant to mowing, other farm traffic, and tend to flower more[1].

Image credit: Andy Murray Licensed by Creative Commons Attribution-ShareAlike 2.0 Generic https://www.flickr.com/photos/89396233@N00/12622731023/

Red clover

- Red clovers serve as a pollen resource for many bees. Longer corollas limit nectar access to longer tongued insects, such some bumble bees.
- Plant medium type cultivars in mowed or trafficked areas.



Birdsfoot trefoil and alfalfa

- Plant Empire-type varieties of birdsfoot trefoil, which have spreading and indeterminate growth habits favorable to mowed and trafficked field areas[2].
- Alfalfa supports managed and wild bees, including the alfalfa leafcutting bee.

Non-legume “open faced” flowers

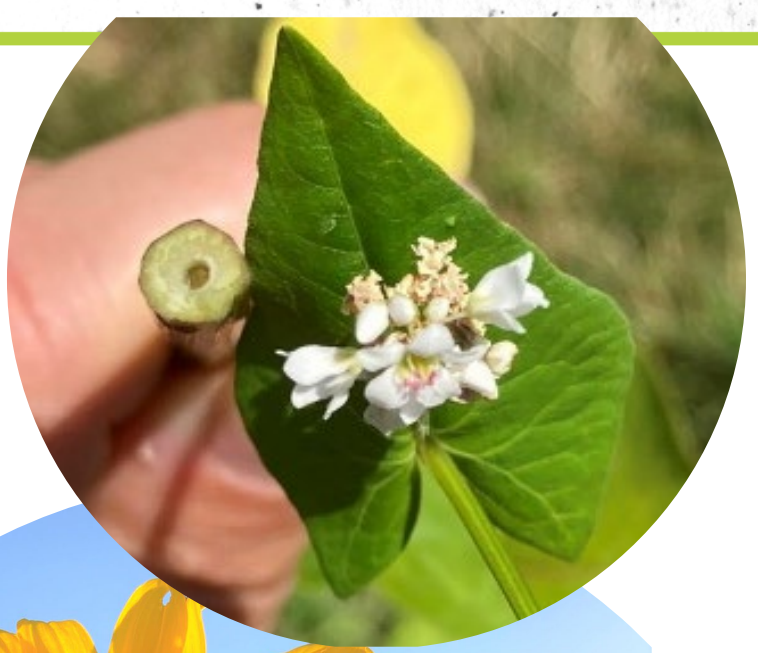
- **Can be valuable as food and shelter for insect pollinators.**

- **Are widely accessible to pollinators with and without tongues, like syrphid flies and lady beetles.**

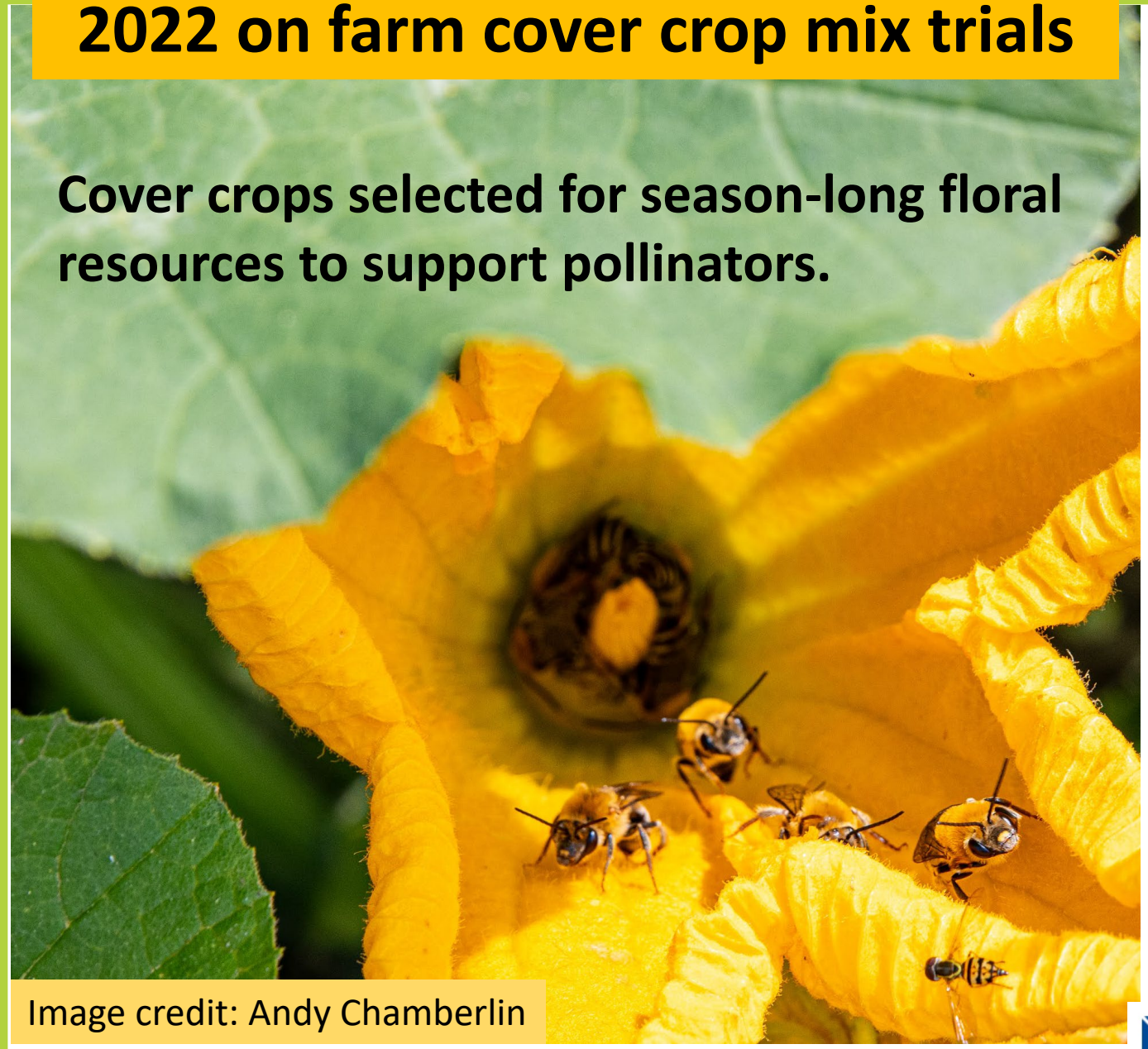
Image credit: Kyle Doda, 1000 Stone Farm

“Open access” buckwheat and sunflowers

- **BONUS! Have hollow or pithy stems.**
- **Left undisturbed until spring, these stems provide nesting habitat for overwintering certain bees and other insects.**



2022 on farm cover crop mix trials



Cover crops selected for season-long floral resources to support pollinators.

Image credit: Andy Chamberlin

Big thank you to farms who seeded mixes:

1. Bear Roots Farm
2. Cedar Circle Farm and Education Center
3. Chamberlin's Garden and Farm Market
4. Deep Meadow Farm
5. Golden Russet Farm
6. Honey Field Farm
7. Luna Bleu Farm
8. MacLennan Farm
9. Newmont Farm
10. Root 5 Farm
11. Intervale Community Farm
12. Edgewater Farm

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The cover crop mix

Cover crops with blooms from June/July → August → September

mustard

buckwheat

sunflower

sunn hemp

Legume cover crop plantings

Not pictured: balansa and alfalfa clovers.
Images taken at Intervale Community Farm, Burlington VT

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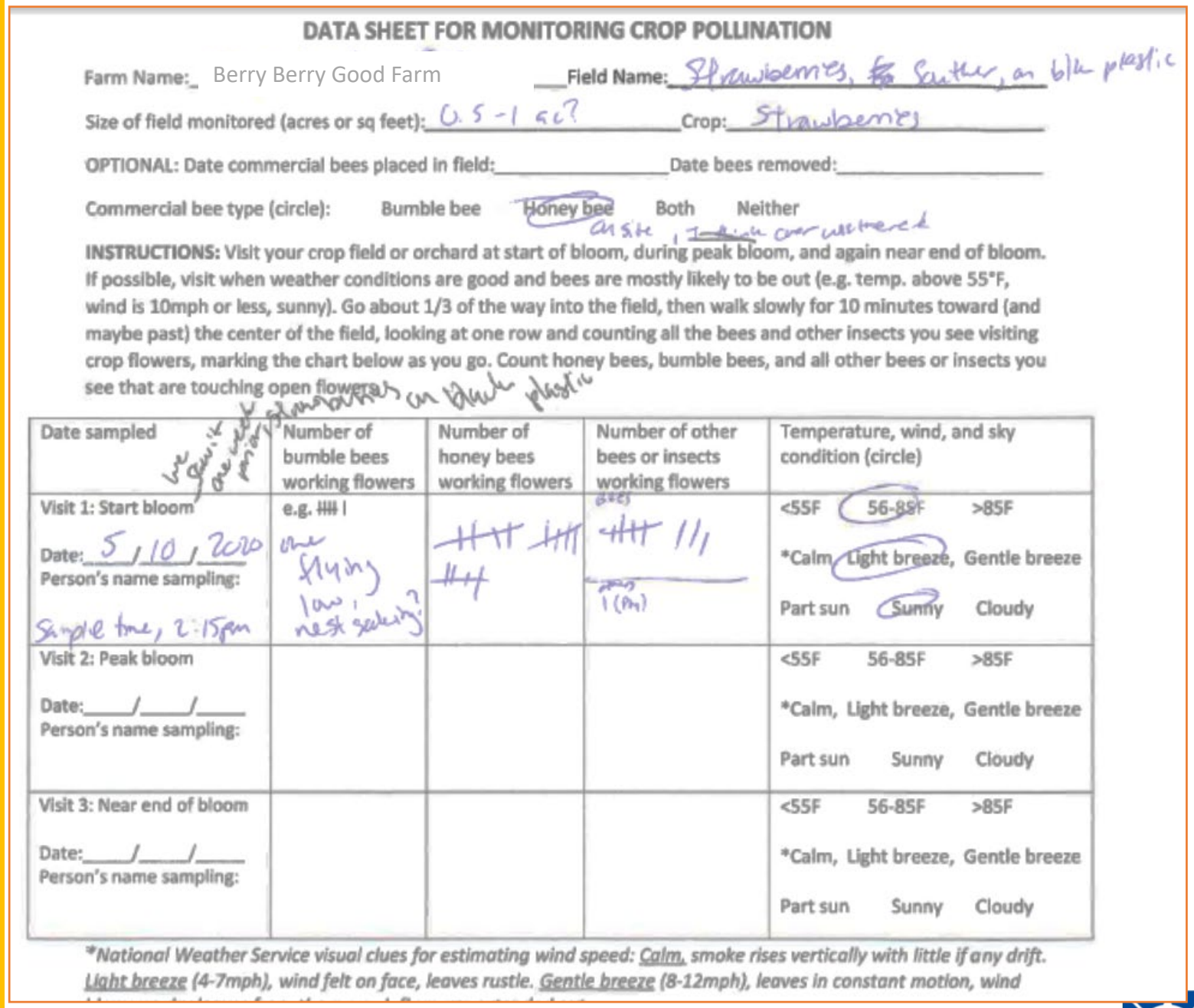

DATA SHEET FOR MONITORING CROP POLLINATION

Farm Name: Berry Berry Good Farm Field Name: Strawberries, Souther, on blk plastic

Size of field monitored (acres or sq feet): 0.5-1 ac? Crop: Strawberries

OPTIONAL: Date commercial bees placed in field:_____ Date bees removed:_____

Commercial bee type (circle): Bumble bee Honey bee Both Neither

on site, ~~I think~~ over wintered

INSTRUCTIONS: Visit your crop field or orchard at start of bloom, during peak bloom, and again near end of bloom. If possible, visit when weather conditions are good and bees are mostly likely to be out (e.g. temp. above 55°F, wind is 10mph or less, sunny). Go about 1/3 of the way into the field, then walk slowly for 10 minutes toward (and maybe past) the center of the field, looking at one row and counting all the bees and other insects you see visiting crop flowers, marking the chart below as you go. Count honey bees, bumble bees, and all other bees or insects you see that are touching open flowers.

strawberries on black plastic

Date sampled	Number of bumble bees working flowers	Number of honey bees working flowers	Number of other bees or insects working flowers	Temperature, wind, and sky condition (circle)
Visit 1: Start bloom Date: 5 / 10 / 2020 Person's name sampling: Sample time, 2:15pm	e.g. ~~IIII~~ I one flying low, nest seeking?	~~IIII~~ ~~IIII~~ ~~IIII~~	bees ~~IIII~~ III 1 (Pm)	<55F 56-85F >85F *Calm, Light breeze, Gentle breeze Part sun Sunny Cloudy
Visit 2: Peak bloom Date:___/___/___ Person's name sampling:				<55F 56-85F >85F *Calm, Light breeze, Gentle breeze Part sun Sunny Cloudy
Visit 3: Near end of bloom Date:___/___/___ Person's name sampling:				<55F 56-85F >85F *Calm, Light breeze, Gentle breeze Part sun Sunny Cloudy

**National Weather Service visual clues for estimating wind speed: Calm, smoke rises vertically with little if any drift. Light breeze (4-7mph), wind felt on face, leaves rustle. Gentle breeze (8-12mph), leaves in constant motion, wind*

Pollinator Monitoring

- 10-minutes
- Slowly walk down a row
- Looking at one row only
- Count honey bees, bumble bees, and "other bees and insects"
- Only what landed on open blossoms was foraging

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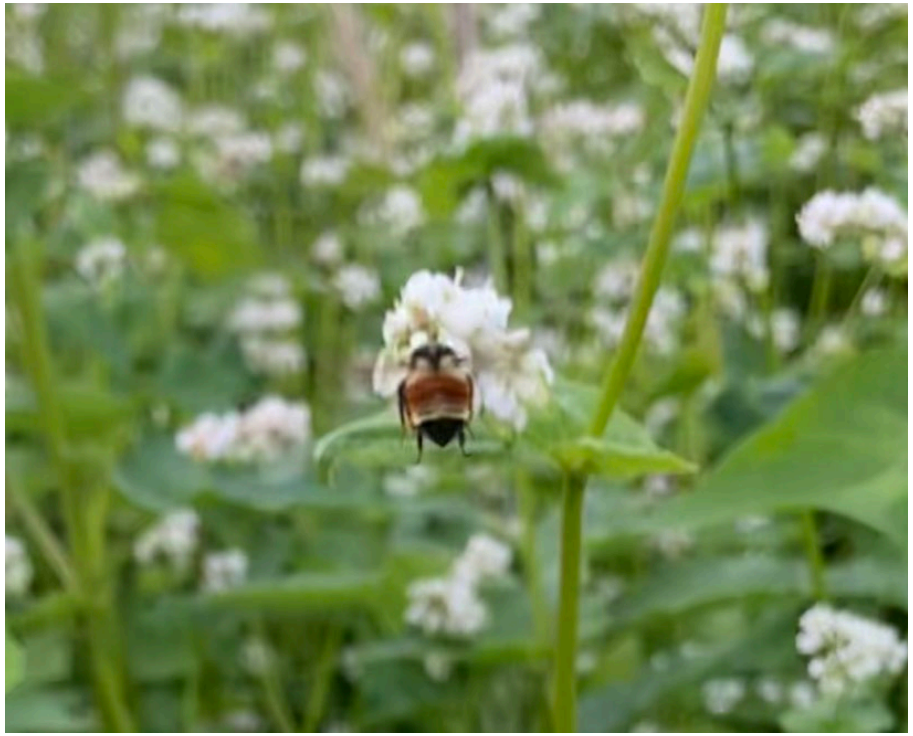
Bees seen foraging in cover crops

Bumble bees



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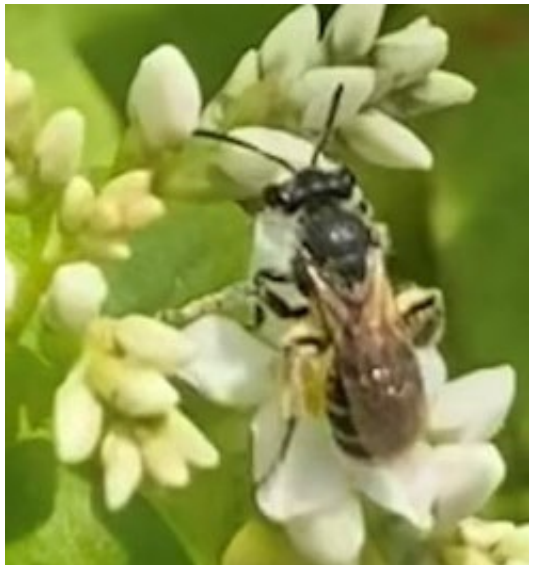
Bees seen foraging in cover crops

Green metallic bees

Small black bees



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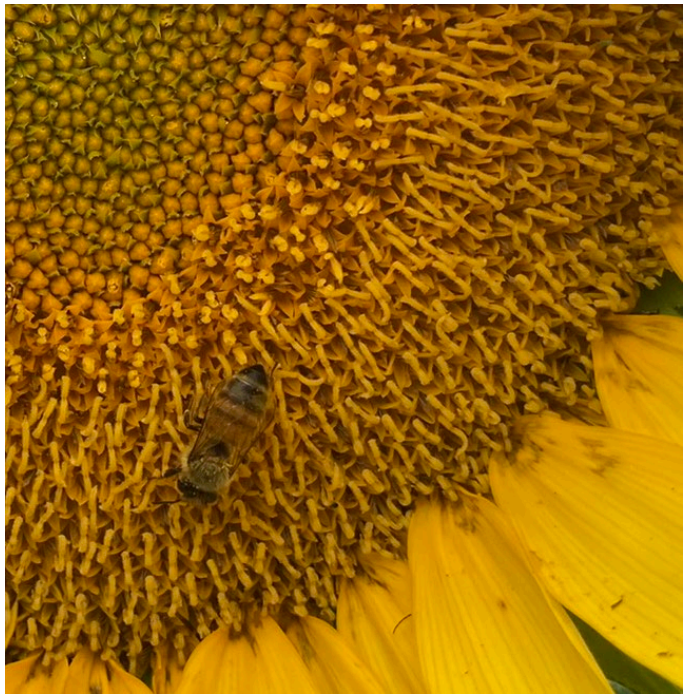
Bees seen foraging in cover crops

Squash bees

Honey bees



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Other pollinators foraging in cover crops

Flies

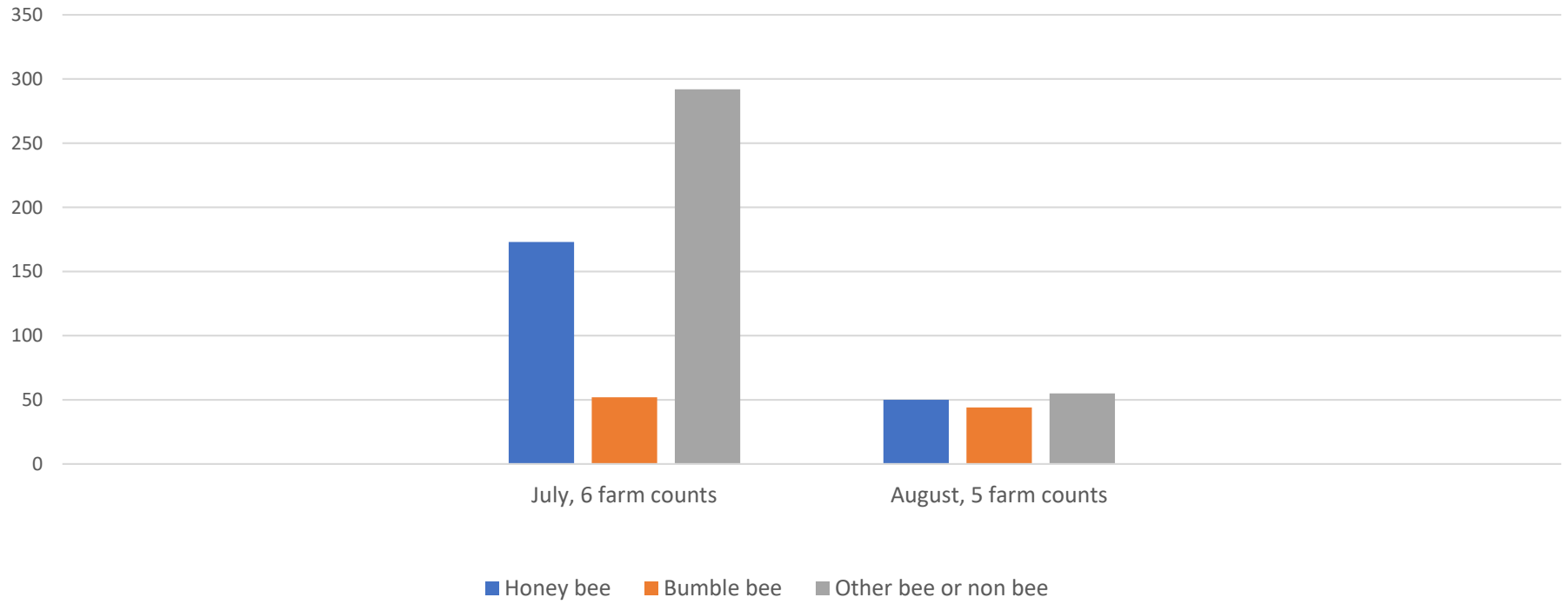
Moths

Butterflies

Beetles

Wasps

Total # pollinating insects counted over 10 minutes in cover crops



*none seen on sunn hemp where bloomed

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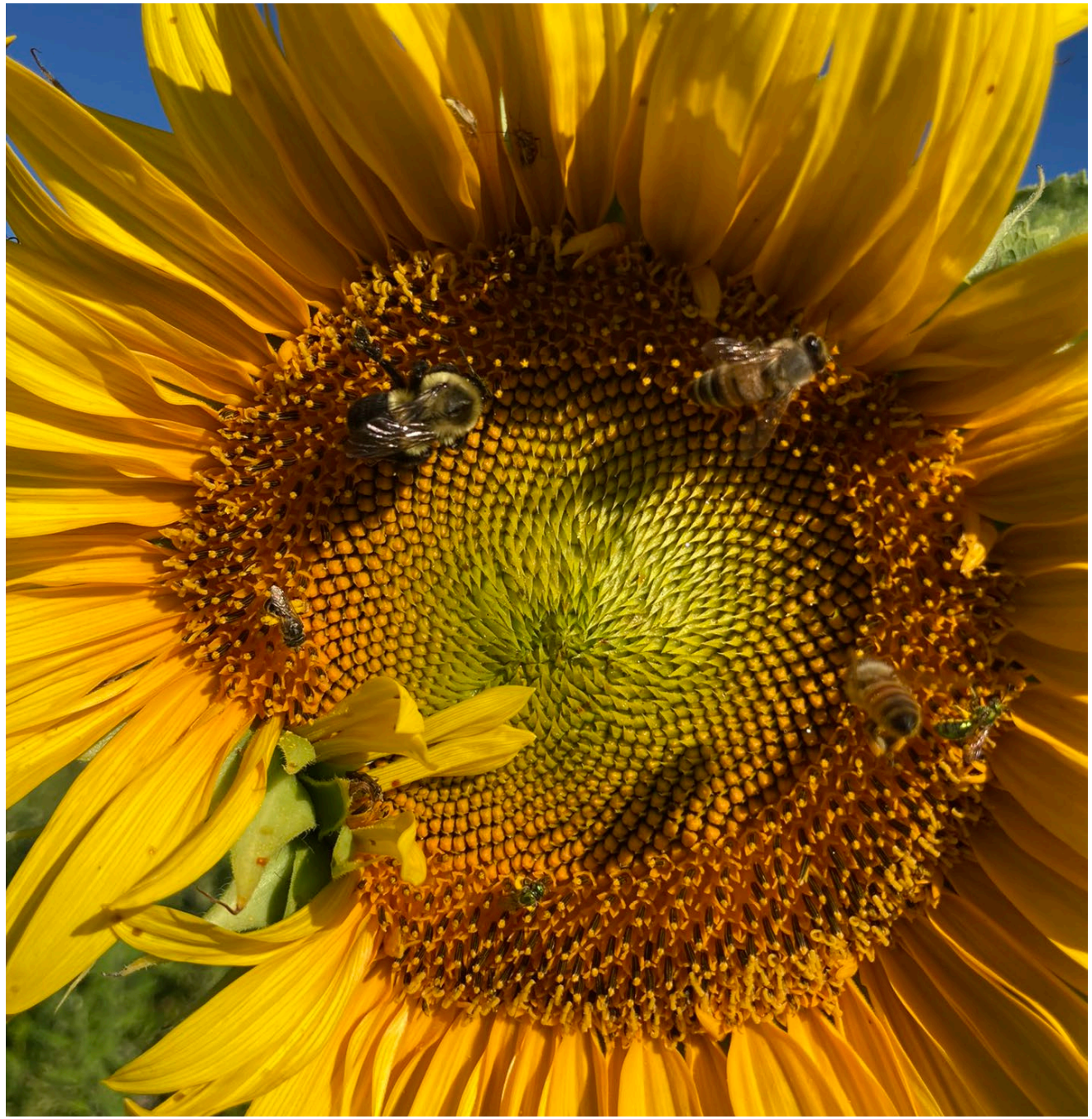
Learnings along the way

- Need dense cover, more seed/high seed rate.
- Maybe add a grass to outcompete crabgrass/lambsquarters/pigweed.
- Later seeding, after first flush of weeds? Late June?
- Needs good seed soil contact if broadcast especially in sandy soils.
- No till drill seeding in sandy soils may be tricky with smaller seed, like legumes, getting buried too deep due to machine weight.
- Variable sized seed=seed sunflower separately.
- Sunn hemp out-competed by mustard and buckwheat, maybe increase rate or as a stand alone cover crop.



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Thank you

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