Native Meadow Trials at the Hudson Valley Farm Hub

Handouts for the Twilight Meeting on Sept. 22, 2020

Presenters:
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For detailed descriptions of the trials during their first three years, please see the various reports posted on https://www.hvfarmscape.org/agroecology. There you also find a link to the "Farmscape Ecology" movie by Jon Bowermaster and videos of presentations featuring these native meadow trials.

Native Meadow Mix B seeded in the Native Meadow Trials at the Hudson Valley Farm Hub in May 2017

Common Name	Scientific Name	Flowering Period	Native Range	Percent of mix by volume (seed/ft2)	Trend in Abundance from 2018-2020
Autumn Bentgrass	*Agrostis perennans*		NY, etc.	15.0%	down, occasional
Big Bluestem	*Andropogon geradii*		NY, etc.	6.4%	up, dominant
Blackeyed Susan	*Rudbeckia hirta*	July (into Sept)	Eastern and Central NA, prob. not NY	6.3%	down, but still dominant in one plot
Canada Wildrye	*Elymus canadensis*		NY, etc.	10.7%	same, common
Indiangrass	*Sorghastrum nutans*		NY, etc.	6.7%	same, common
Lance Leaved Coreopsis	*Coreopsis lanceolata*	June-July (into Sept)	Eastern and Central NA, prob. not NY	3.2%	down, occasional
Little Bluestem	*Schizachyrium scoparium*		NY, etc.	16.0%	down, occasional
Partridge Pea	*Chamaecrista fasciculata*	Aug-Sept	NY, etc.	1.1%	occasional
Purple Coneflower	*Echinacea purpurea*	July (into Sep.)	Eastern NA, prob. not NY	5.3%	down, occasional
Purple Lovegrass	*Eragrostis spectablis*		NY, etc.	1.3%	?
Purple Prairie Clover	*Dalea purpurea*	June	Central NA	2.1%	down, not seen in 2020
Purpletop	*Tridens flavus*		NY, etc.	16.4%	down, occasional
Slender Lespedeza	*Lespedeza virginiana*	July?	Eastern and Central NA, prob. not NY	1.1%	down, not seen in 2020
Switchgrass	*Panicum virgatum*		NY, etc.	8.5%	same, common

Native Meadow Mix A seeded in Native Meadow Trials at the Hudson Valley Farm Hub in May 2017					
Common Name	**Scientific Name**	**Flowering Period**	**Native Range**	**Percent of mix by volume (seed/ft2)**	**Trend in Abundance 2018-2020**
Blackeyed Susan	*Rudbeckia hirta*	July (into Sept)	Eastern and Central NA, prob. not NY	6.5%	down, but still common
Browneyed Susan	*Rudbeckia triloba*	Aug-Sept	Eastern NA, prob. not NY	2.2%	same, occasional and patchy
Butterfly Milkweed	*Asclepias tuberosa*	June (into Sept)	NYS, etc.	1.1%	same, sparse
Common Milkweed	*Asclepias syriaca*	July	NYS, etc.	1.1%	same, sparse
Dense Blazingstar	*Liatris spicata*	August	Eastern NA, prob. not NY	1.1%	same, sparse and patchy
Early Goldenrod	*Solidago juncea*	August	NYS, etc.	3.2%	up, common
Joe Pye Weed	*Eupatorium purpureum*	Aug-Sept	NYS, etc.	1.0%	none
Lance Leaved Coreopsis	*Coreopsis lanceolata*	June-July (2nd fl period: Aug-Sept)	Eastern and Central NA, prob. not NY	8.6%	down, common, but patchy
Lavender Hyssop	*Agastache foeniculum*	August	Midwest	8.6%	up, occasional
Little Bluestem	*Schizachyrium scoparium*		NYS, etc.	19.4%	up, common, but patchy
Mistflower	*Eupatorium coelestinum*	Sept-Oct	Eastern NA, prob. not NY	6.5%	down, occasional and patchy
Narrowleaf Mountainmint	*Pycnanthemum tenuifolium*	July	NYS, etc.	3.8%	same, sparse
New England Aster	*Aster novae-angliae*	Sept-Oct	NYS, etc.	2.1%	up, common
Ohio Spiderwort	*Tradescantia ohiensis*	May-July	Eastern and Central NA, prob. not NY	2.2%	up, occasional
Partridge Pea	*Chamaecrista fasciculata*	Aug-Sept	NYS, etc.	2.2%	same, common
Purple Coneflower	*Echinacea purpurea*	July (into Sep.)	Eastern NA, prob. not NY	4.3%	same, common
Purple Prairie Clover	*Dalea purpurea*	June	Central NA	2.2%	same, sparse
Roundhead Lespedeza	*Lespedeza capitata*	July-Aug	NYS, etc.	1.1%	same, sparse
Showy Goldenrod	*Solidago speciosa*	Sept-Oct	NYS, etc.	2.3%	up, common
Slender Lespedeza	*Lespedeza virginiana*	July?	Eastern and Central NA, prob. not NY	2.1%	same, sparse
Smooth Blue Aster	*Aster laevis*	Sept-Oct	NYS, etc.	2.1%	same, occasional
Tall White Beardtongue	*Penstemon digitalis*	June	NYS, etc.	9.7%	up, occasional, but patchy
Wild Bergamot	*Monarda fistulosa*	July	NYS, etc.	6.7%	up, dominant

NMT 1A through its first year (2017)

12-April-2017 (3 harrowings)

19-May-2017 seeding

12-June-2017

3-July-2017 (mowed 6 July)

11-July-2017 (mowed 28 July)

4-Aug-2017 (mowed 15 August)

11-Sep-2017 (after 3 cuts)

3-Nov-2017

14-Dec-2017

NMT 1A through its second year (2018)

27-March-2018

27-April-2018

25-May-2018 (selective weeding)

8-June-2018

19-June-2018

10-July-2018

18-July-2018

9-Aug-2018

13-Sept-2018

NMT 1A in its third year (2019)

17-April-2019

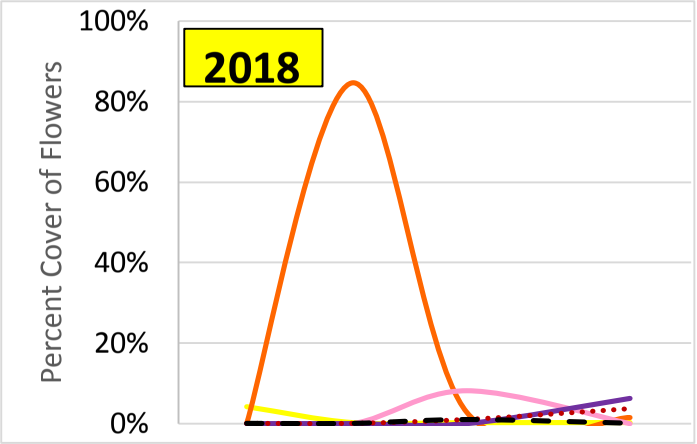
22-May-2019

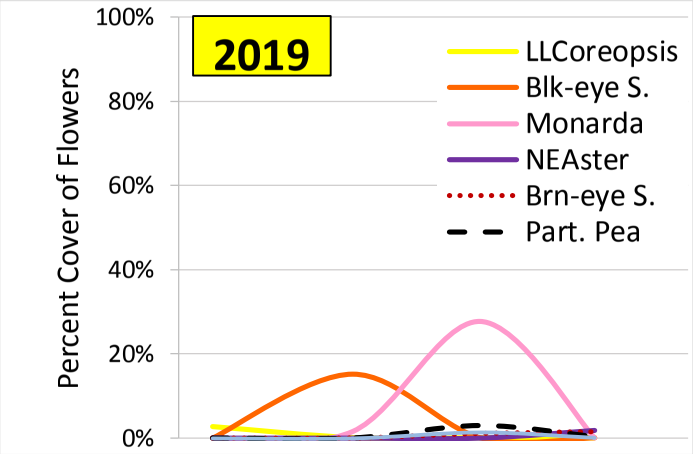
27-June-2019

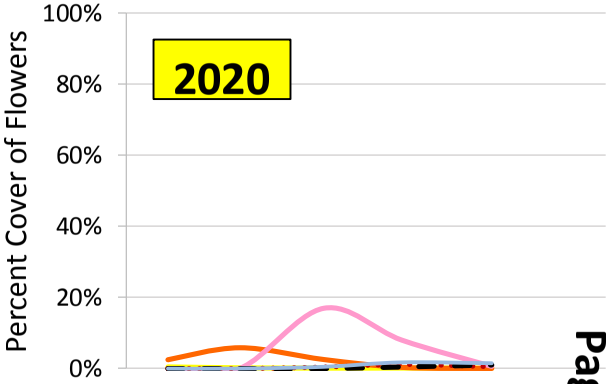
15-July-2019

14-Aug-2019

20-Sept-2019

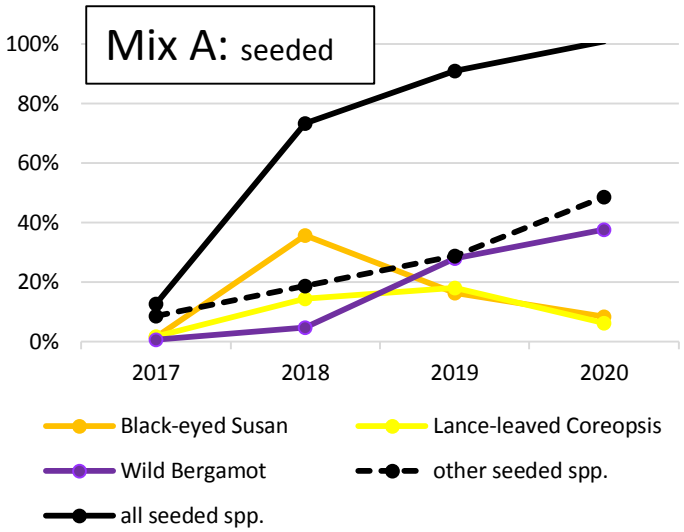


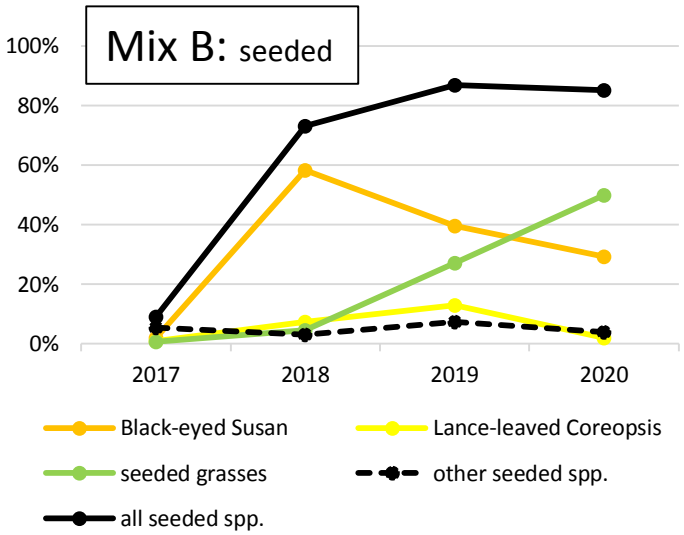




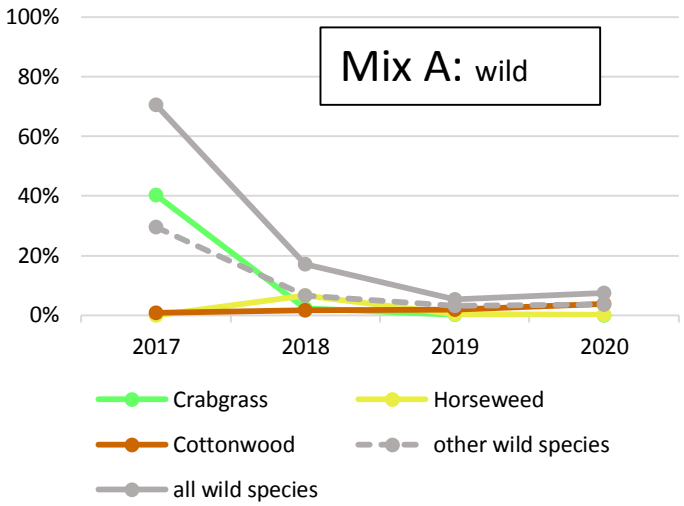
Evolution of Plant Composition in Native Meadow Trials

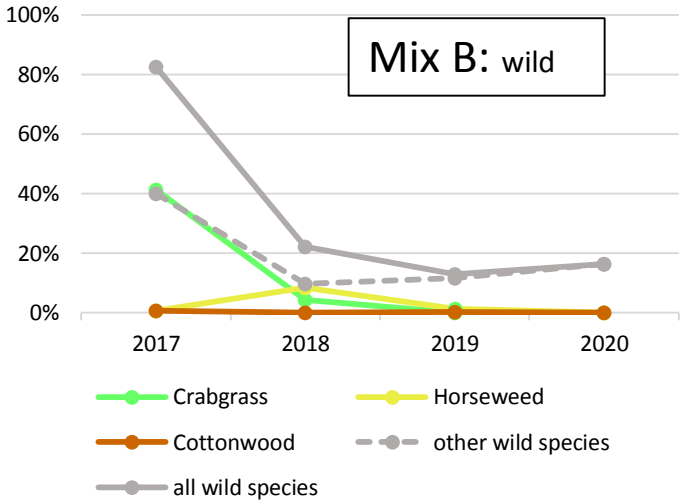
Seeded Species

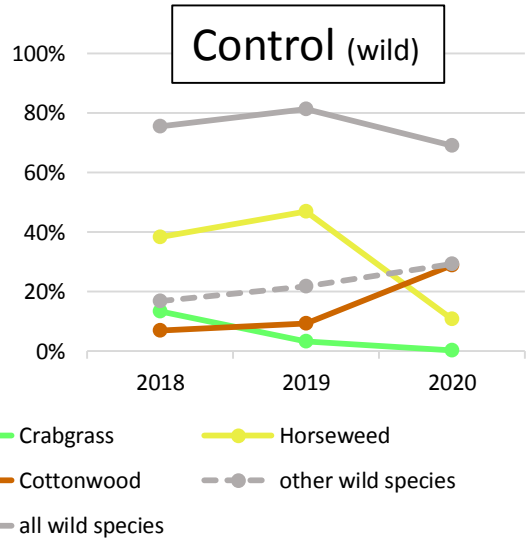


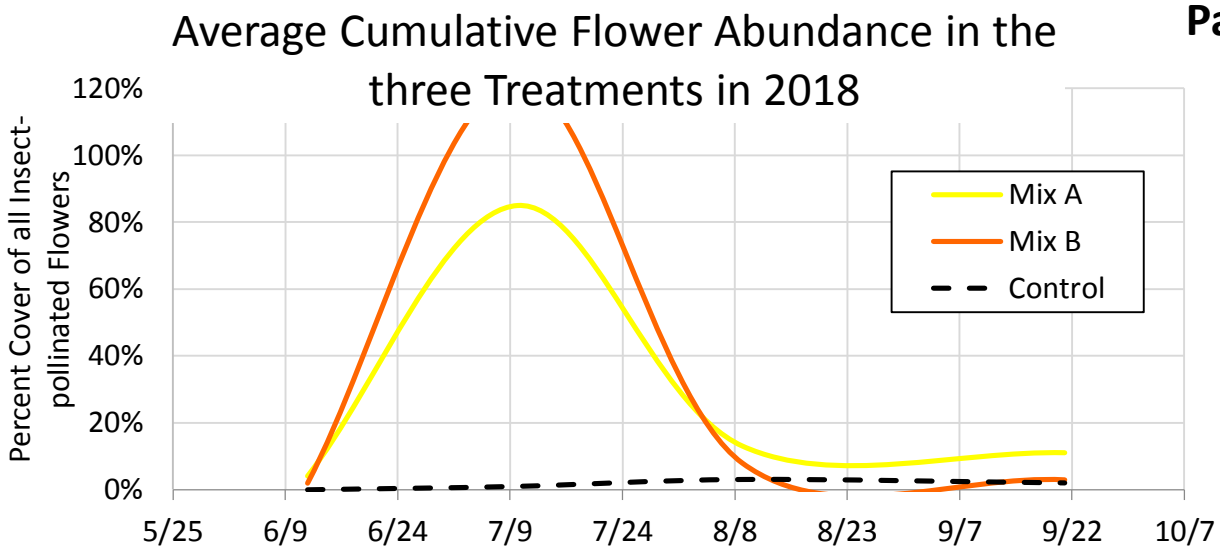


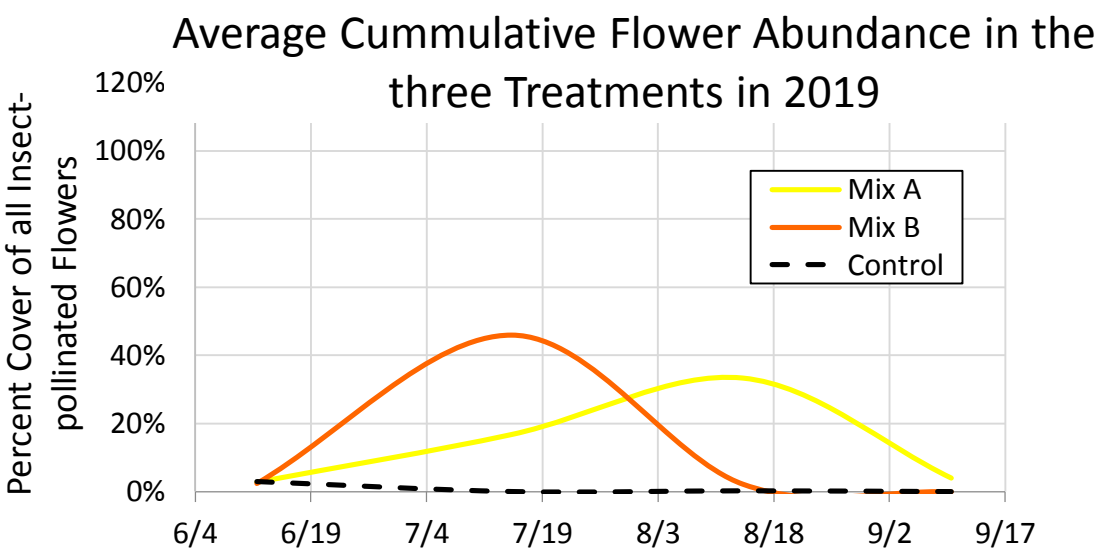
Wild Species








Average Cumulative Flower Abundance in the three Treatments in 2018
Percent Cover of all Insect-pollinated Flowers
120%
100%
80%
60%
40%
20%
0%
5/25
6/9
6/24
7/9
7/24
8/8
8/23
9/7
9/22
10/7
Mix A
Mix B
Control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6/4
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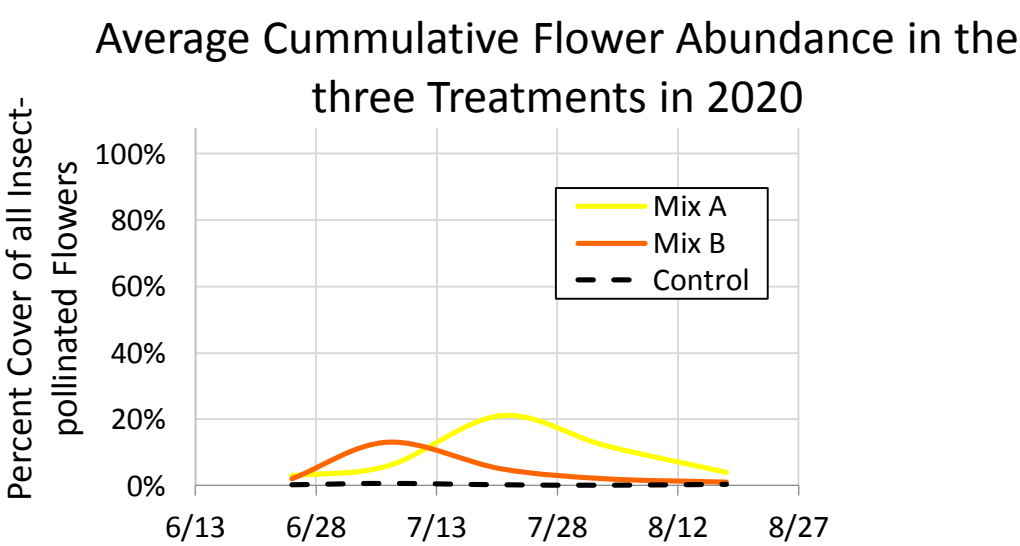
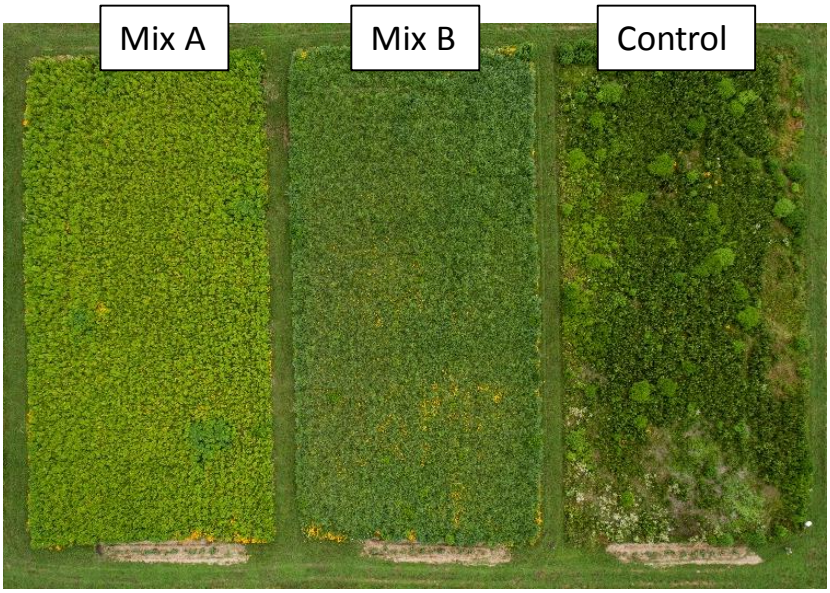
7/19
8/3
8/18
9/2
9/17
Mix A
Mix B
Control


Average Cummulative Flower Abundance in the three Treatments in 2020
Percent Cover of all Insect-pollinated Flowers
100%
80%
60%
40%
20%
0%
6/13
6/28
7/13
7/28
8/12
8/27
Mix A
Mix B
Control

Comparison of Native Meadow Trials on 8 July 2020

drone images courtesy of Oceans8/ Jon Bowermaster

NMT1

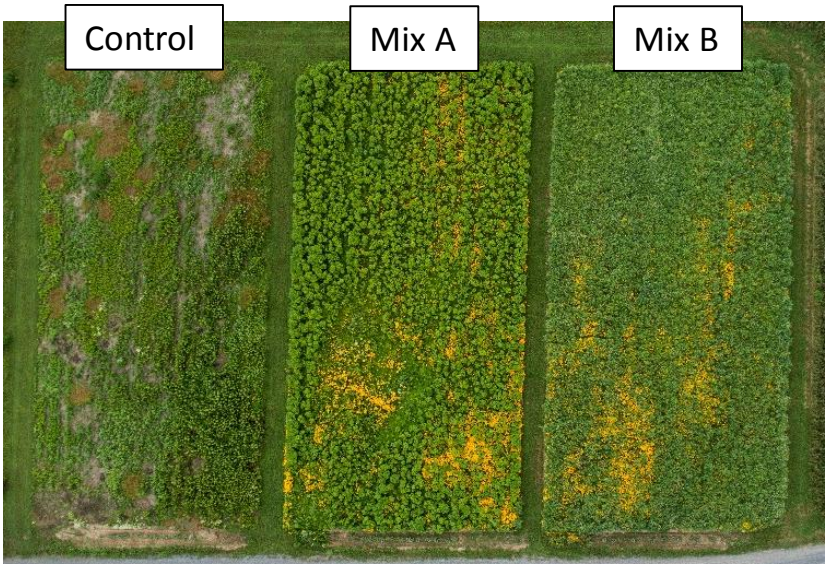


Homogeneous silt clay

NMT2

Homogeneous sandy

NMT3



Patchy soil, incl areas of poor drainage

21 Sept 2020. C Vispo, conrad@hawthornevalleyfarm.org

DOES IT 'WORK'? IF YOU BUILD IT, DO THEY COME?

How does one define if it is 'working'?

- Pretty Flowers
- Low Maintenance
- Support Biodiversity
- Support Farm Production

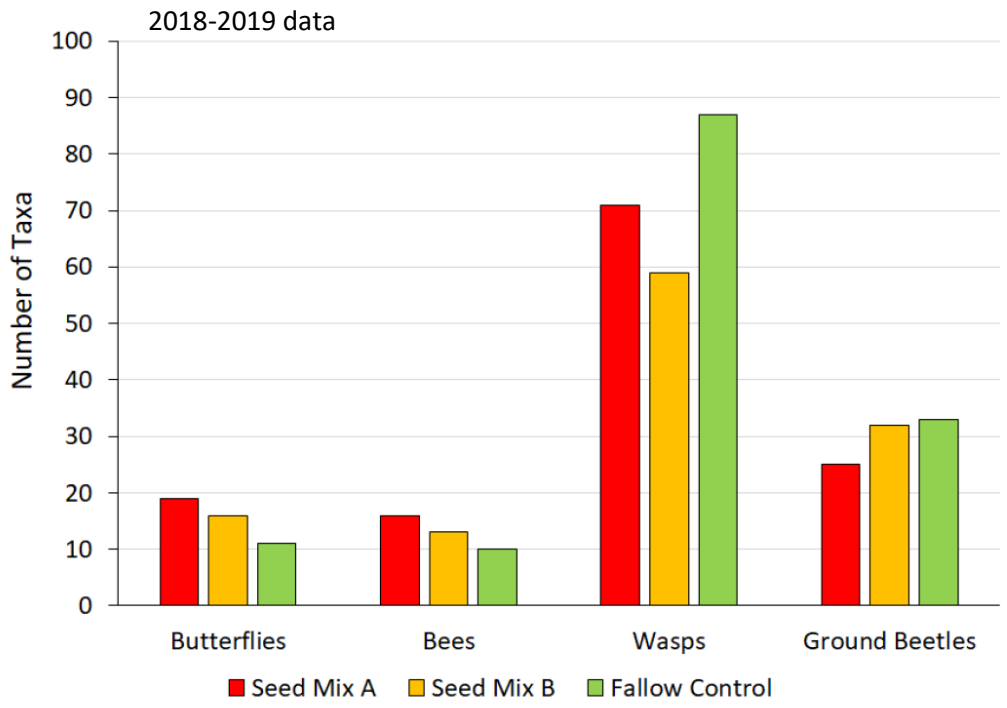
Remember:

Seed Mix A = High # of Flowers, Low # of Grasses

Seed Mix B = Low # of Flowers, High # of Grasses

Fallow Control = No seeding, similar management

Do the wild flower plantings support insect biodiversity? Perhaps in some cases.



Do the wild flower plantings support farm production?

A. Flowers attract beneficials / discourage pests (net benefit balance).

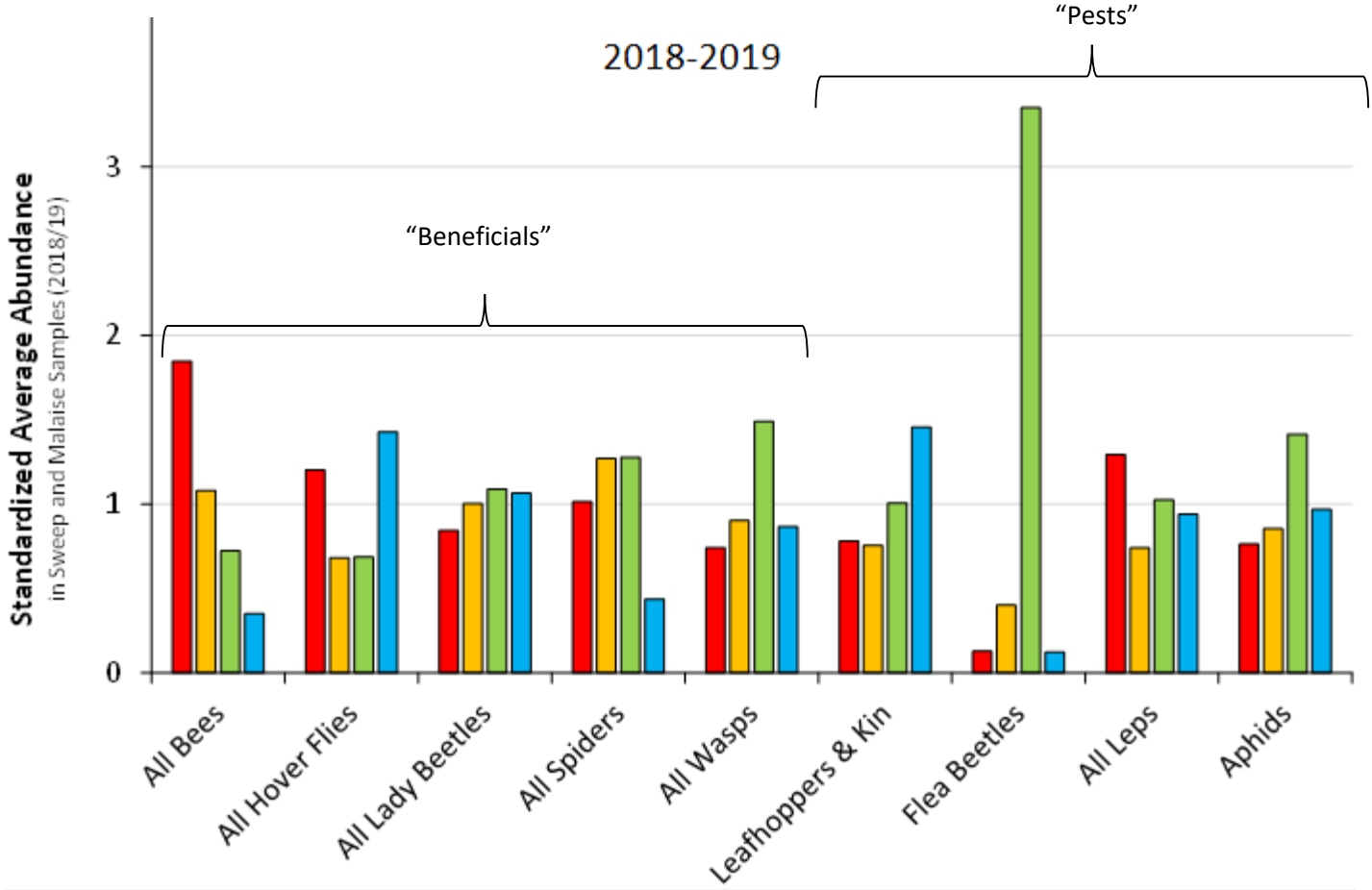
↓

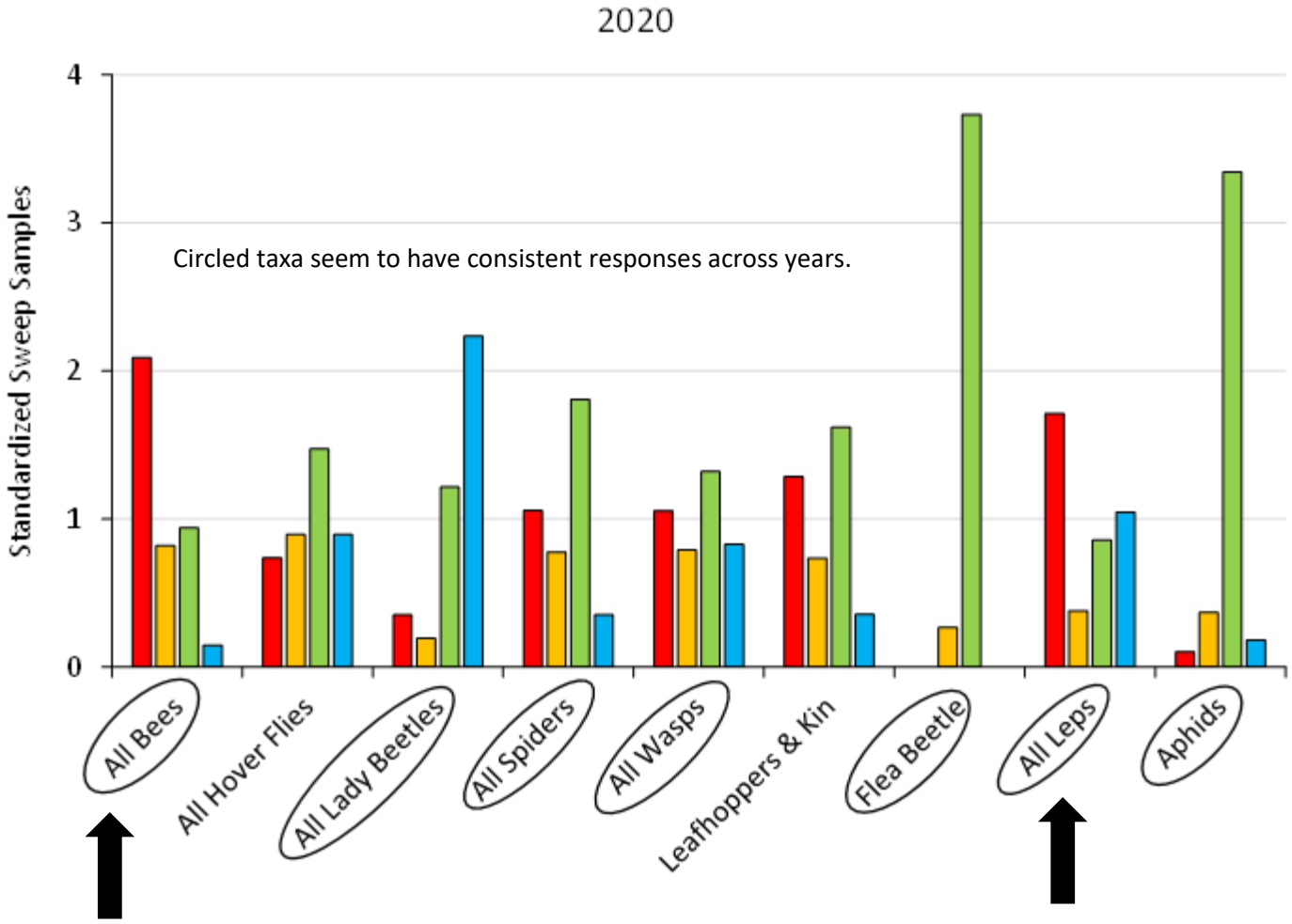
B. Those creatures are shared with adjacent crops.

↓

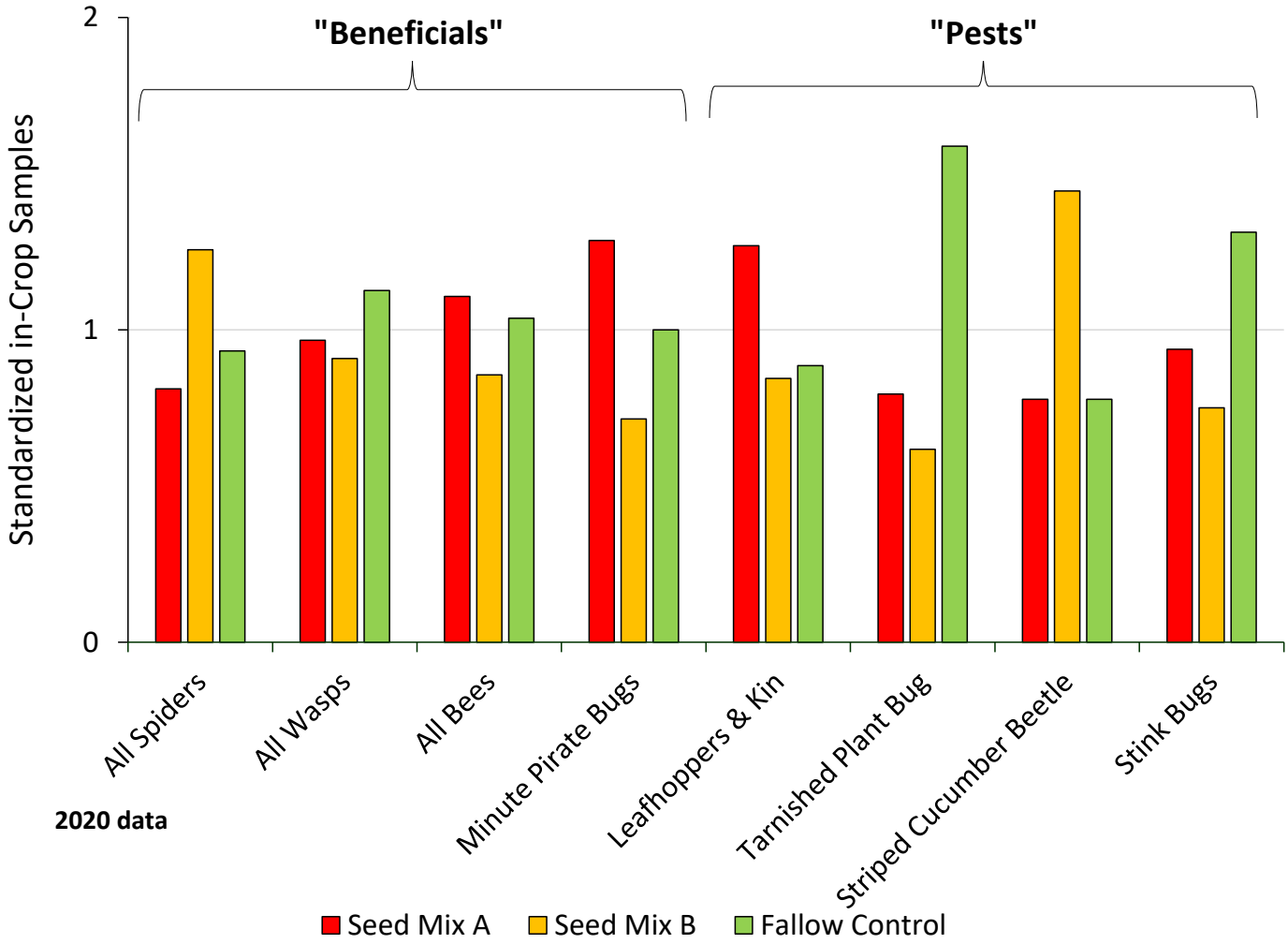
C. Those crops respond in a positive way.

A. Which creatures come to these plots?





B. What seeps over into adjacent veggie plots?

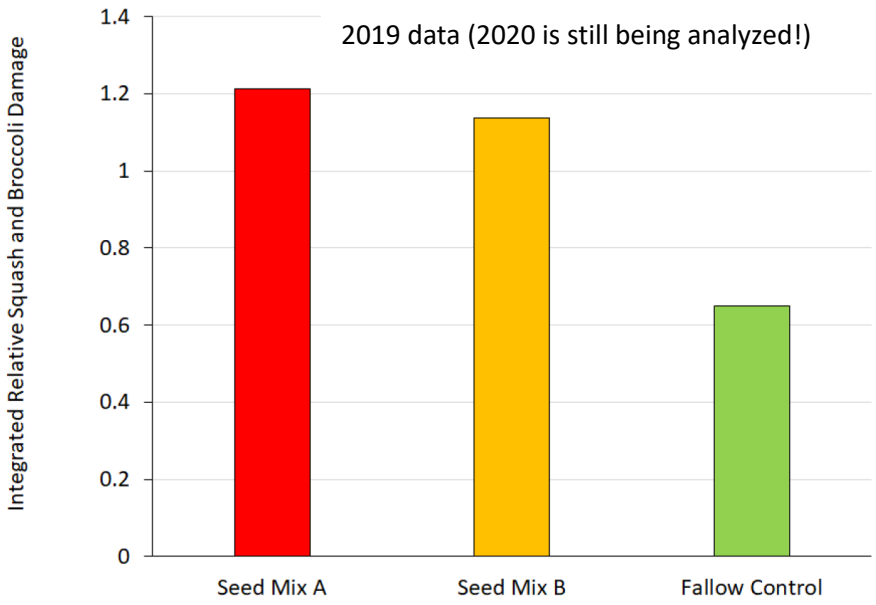


C. What do the adjacent veggies think of all this?

BUTTERNUT SQUASH

	Average No. of Ripe Squash per Bed		Mean Squash Weight (lbs)		Total Harvest from Treatment (lbs)	
	2019	2020	2019	2020	2019	2020
Seed Mix A	81.7	41.7	4	3.5	933.8	437.3
Seed Mix B	91.3	48.3	4.1	3.5	995.4	507.8
Fallow Control	97.7	58.3	4.5	3.6	1284.2	624.7

In terms of total harvest, in both 2019 and 2020, total Butternut Squash harvest in Mix A was a bit over 70% of the harvest from next to the Fallow Control; Seed Mix B harvest was around 80% of that from adjacent to the Fallow Control. There is *no indication that Seed Mix A helps adjacent organic squash production in this farm's landscape*.



Higher squash damage next to Seed Mix A?

SWEET CORN (2020 only)

	Leaves & Stalks			Cob Characteristics					
	Holes (# of leaves, out of five)	Specks (# of leaves out of five)	# ECBs in top 5 internode	# Punctures	% fert	% tip fill	avg. ECBs in 2° cobs	Mass (g)	Length (inches)
Seed Mix A	1.47	1.2	0.18	2.39	84.44	40	0.05	198.6	7.5
Seed Mix B	1.89	2.11	0.16	0.71	77.06	30	0.52	178.3	7.3
Fallow Control	2.17	1.94	0.03	0.72	68.89	38.89	0.22	170.92	7.5

ECB = European Corn Borer a major corn pest

Cob or ear weight from adjacent to Seed Mix A averaged about 15% heavier and leaves (& cobs?) had lower damage, although stink bug damage to kernels (="punctures"?) may have been higher…. A hint of a positive effect – needs repeating.

Conclusions

- Yes, one can establish native wild flower meadows organically on a farm such as this, although not without effort.
- Those meadows attract some beneficials but perhaps not others (no doubt dependent on specifics of flower mix and planting locations)
- Net effect on adjacent crops is unclear, may be negative in some cases, perhaps positive in others, perhaps neutral in yet others.
- There are other reasons to plant native wild flowers (aesthetics, conservation), but effects on the production of nearby crops is likely nuanced and very dependent on the crops, the specific farm system, and the landscape in which the farm is embedded.