

Managing Brassica Insect Pests all Year

Susan B. Scheufele

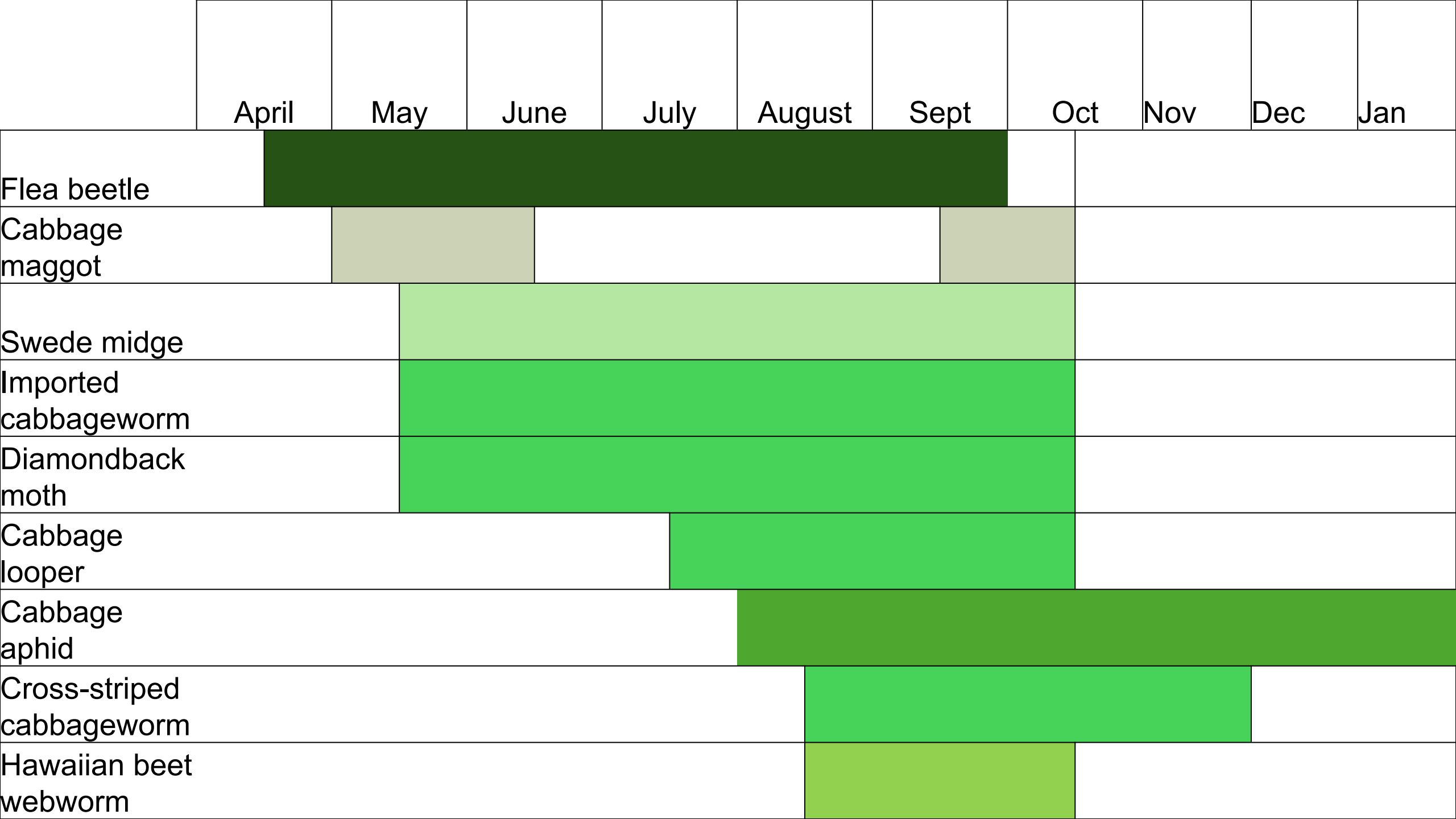
New England Fruit & Vegetable Conference

December 19, 2024



Many Perennial Pests

- Swede midge
- Flea beetles (FB)
- Cabbage root maggot (CRM)
- 4 Caterpillars (Leps)
- Cabbage Aphids
- Hawaiian beet webworm
- Black rot
- Alternaria leaf spot and head rot
- Downy mildew
- Club root
- Weeds: annuals, perennials, brassica weeds



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Many Strategies

Critical times

Crop Rotation

Tillage:

- In-season and
- end of season “residue mgmt.”

Exclusion

- Remy
- Netting
- Mulches
- Trap crops

Habitat

- Beneficials
- Overwintering sites

Chemical control

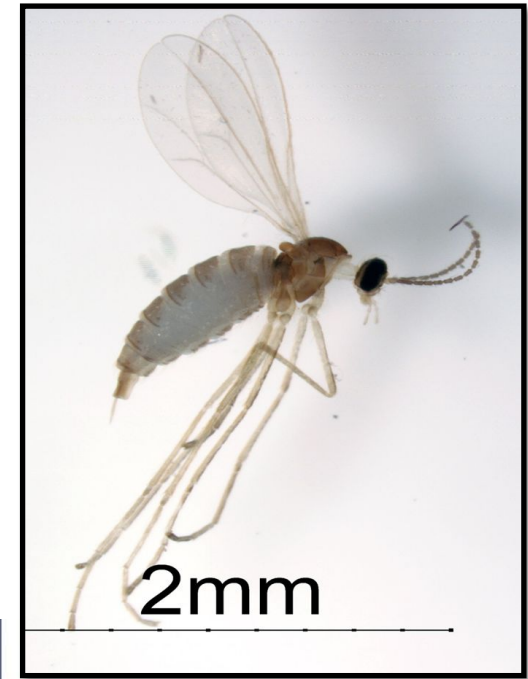
- Organic
- Conventional



Critical Timing

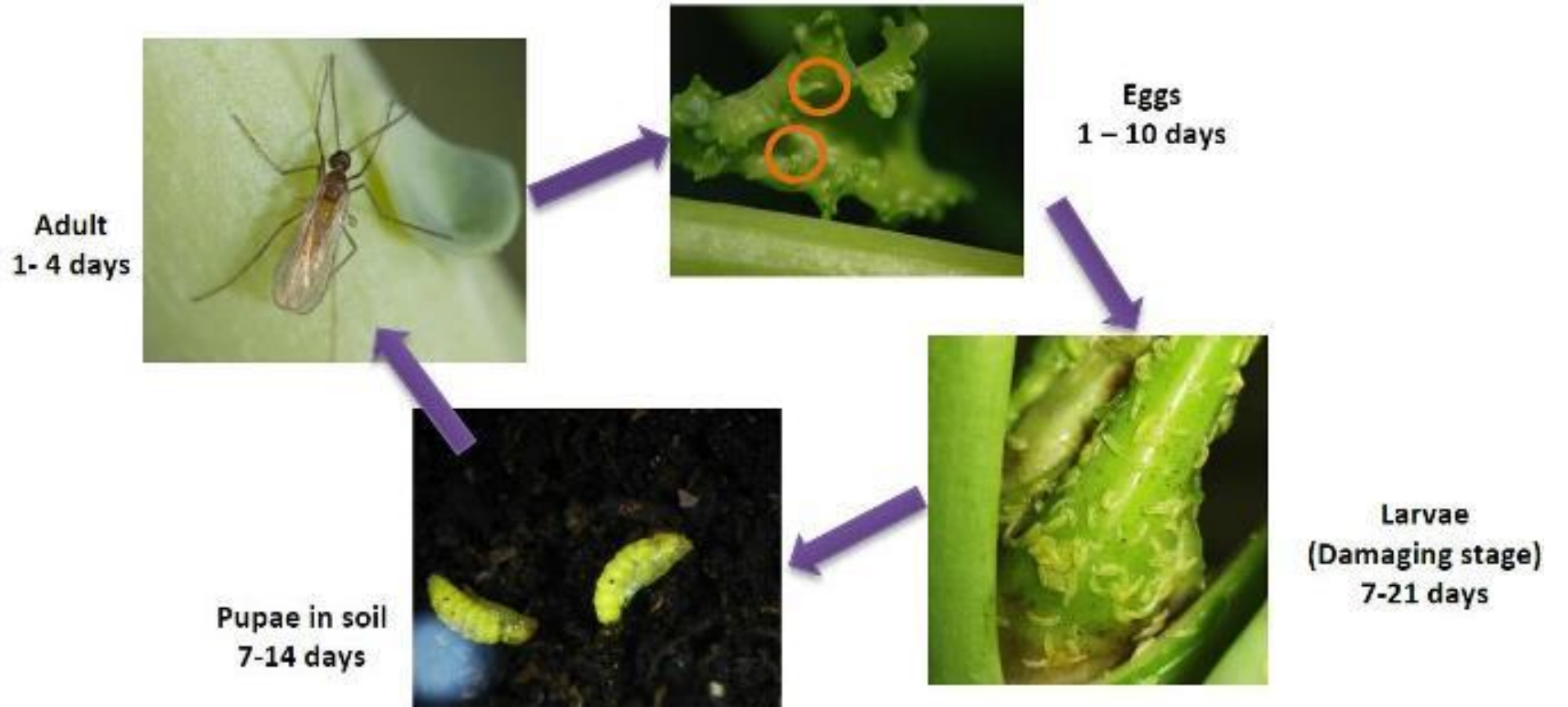
Pest more vulnerable?

Crop more susceptible?



Swede Midge: Life Cycle

3-5 generations
May to October





Critical Timing

- Pest more vulnerable?
- Crop more susceptible?**



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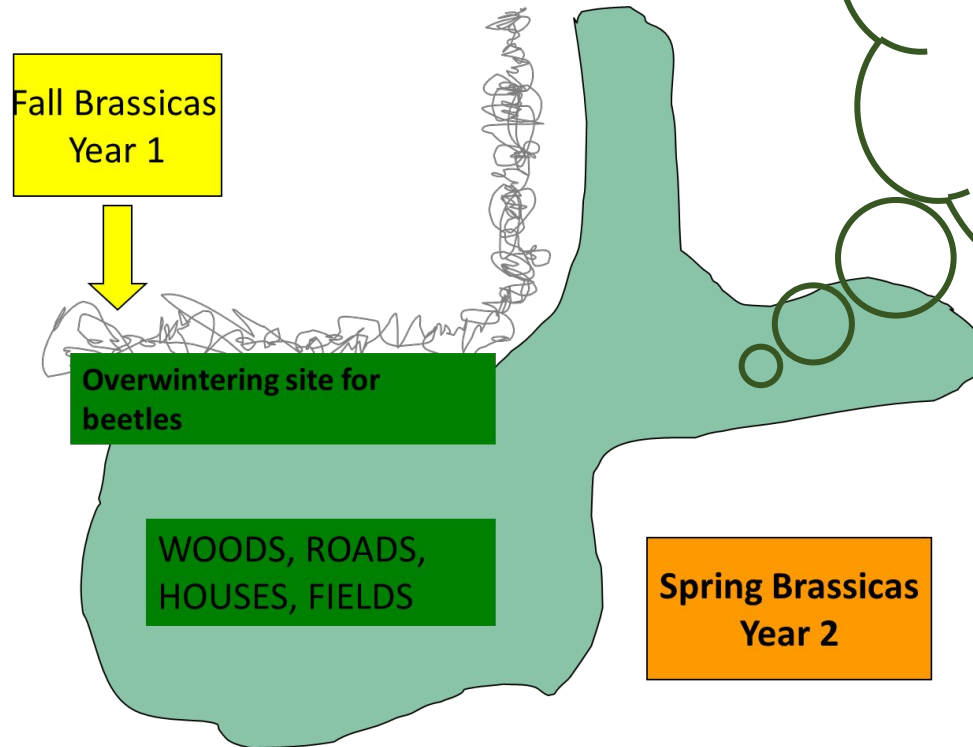
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Crop rotation

Between and within seasons



Crop rotation is our #1 tool as organic farmers. Especially spring away from fall, but in-season we are running from pests as far as we can, with every succession
-Gideon Porth, Atlas Farm





Tillage

- Mowing & Harrowing in fall
- Cultivating in season

We haven't had a problem with CRM since we switched to finger cultivators 4-5 years ago.
-Gideon Porth, Atlas Farm



Exclusion: Remay

100% control of CRM!!

100% control of FB!!

100% control all leps!!

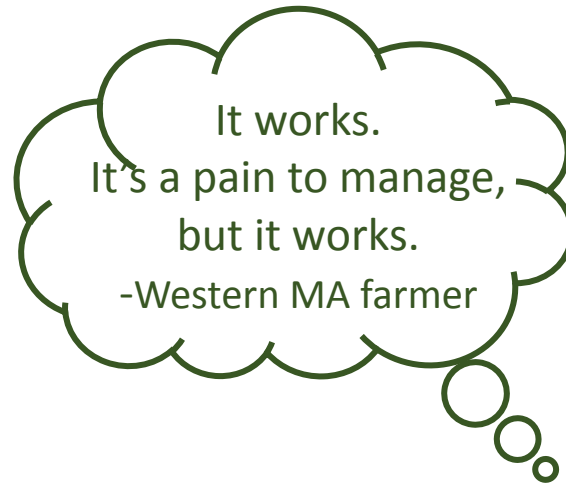
100% control of SM!!

*as long as no holes and edges sealed

Best for direct-seeded crops e.g. greens and radishes during early season

Get covers on right after seeding and seal edges

A cover with holes is not very effective



Exclusion: Insect Netting

We use netting on transplants in the GH and the 1st 3 plantings in the field. They've lasted >4-5 years and more. We buy the heavier stuff which is more durable.
-Southeastern MA farmer



< 1.0mm mesh (FB, SM)

Photo courtesy F. Zaman

Exclusion: Mulches

Reduce damage from CRM, FB



Photo courtesy F. Zaman

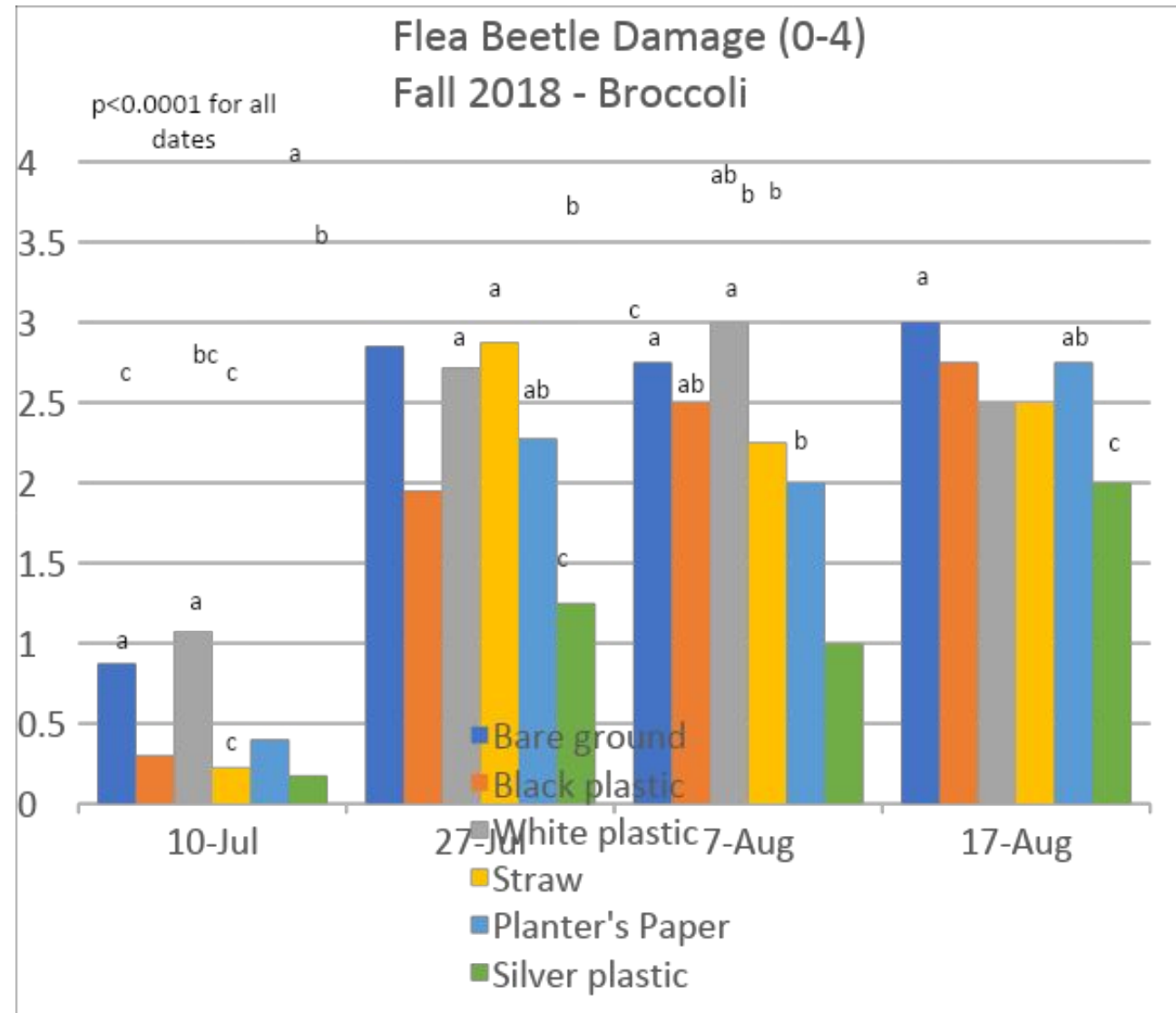
2019 study compared plastic+netting to plastic alone

98% control of CRM with plastic alone

- Interferes with egg laying
- Increases soil T kills eggs and larvae

Exclusion: Mulches

- White, silver, and organic mulches lower soil temperature
- Interfere with FB behavior, physical barrier, confusing
- Reflective silver mulch significantly reduced FB damage and improved yield
- *Try white on black for a cheaper alternative to silver*



Exclusion: Mulches

Living **mulches** and/or **intercropping** to disrupt host finding (FB, CA)

□ *60% reduction in aphid population (Ponti, L. et al. (2007))*



Photo eXtension.org

Environment: Trap cropping

Most preferred

Least preferred

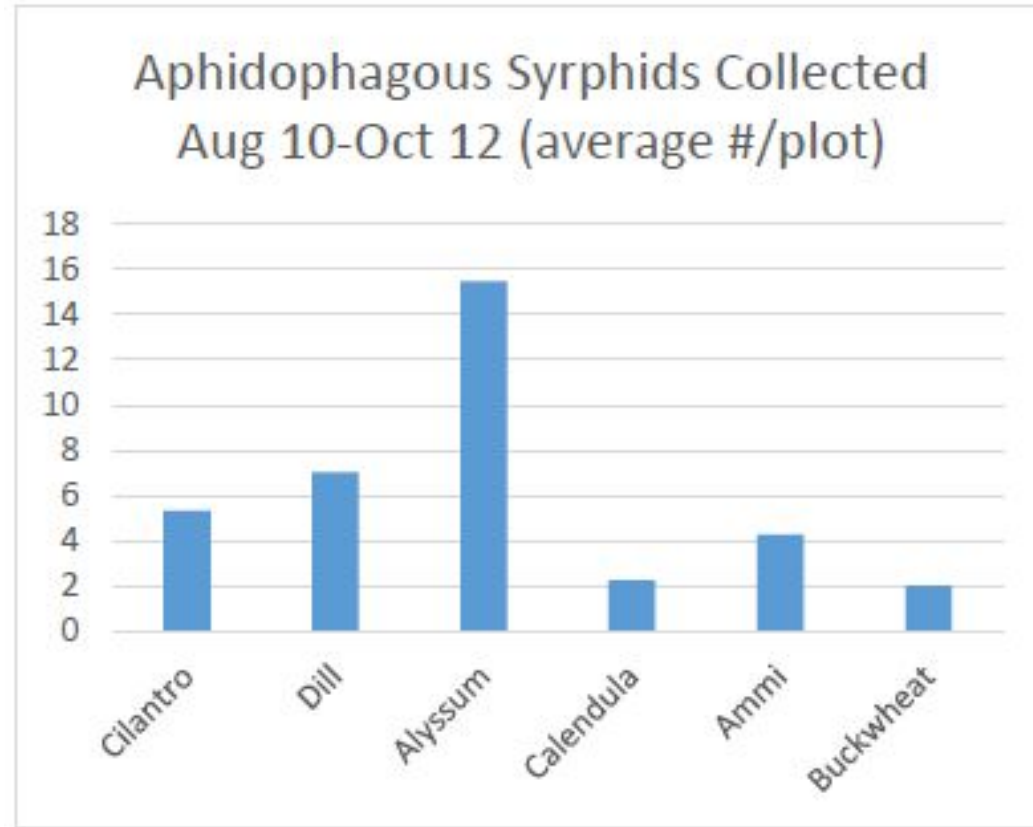
<i>Brassica rapa</i>	Bok choy , Komatsuna, Chinese Cabbage, Tatsoi
<i>Eruca vesicaria</i>	Arugula
<i>Raphanus sativus</i>	Radish, Daikon
<i>B. juncea</i>	Mustard
<i>B. oleracea</i>	Cabbage , Broccoli, Kale, Collards

Based on 2004 experiment, UMass Research Farm and other sources



2013 experiment on two organic greens farms
Bok choy planted every 8th bed.
8 acres unsprayed, 1 acre bok choy sprayed weekly*

Habitat: Insectary flowers



Intercrop: row w/in field, plant with/in row etc.

Borders: around the crop

Refuges: block somewhere on the farm

Habitat: Insectary flowers

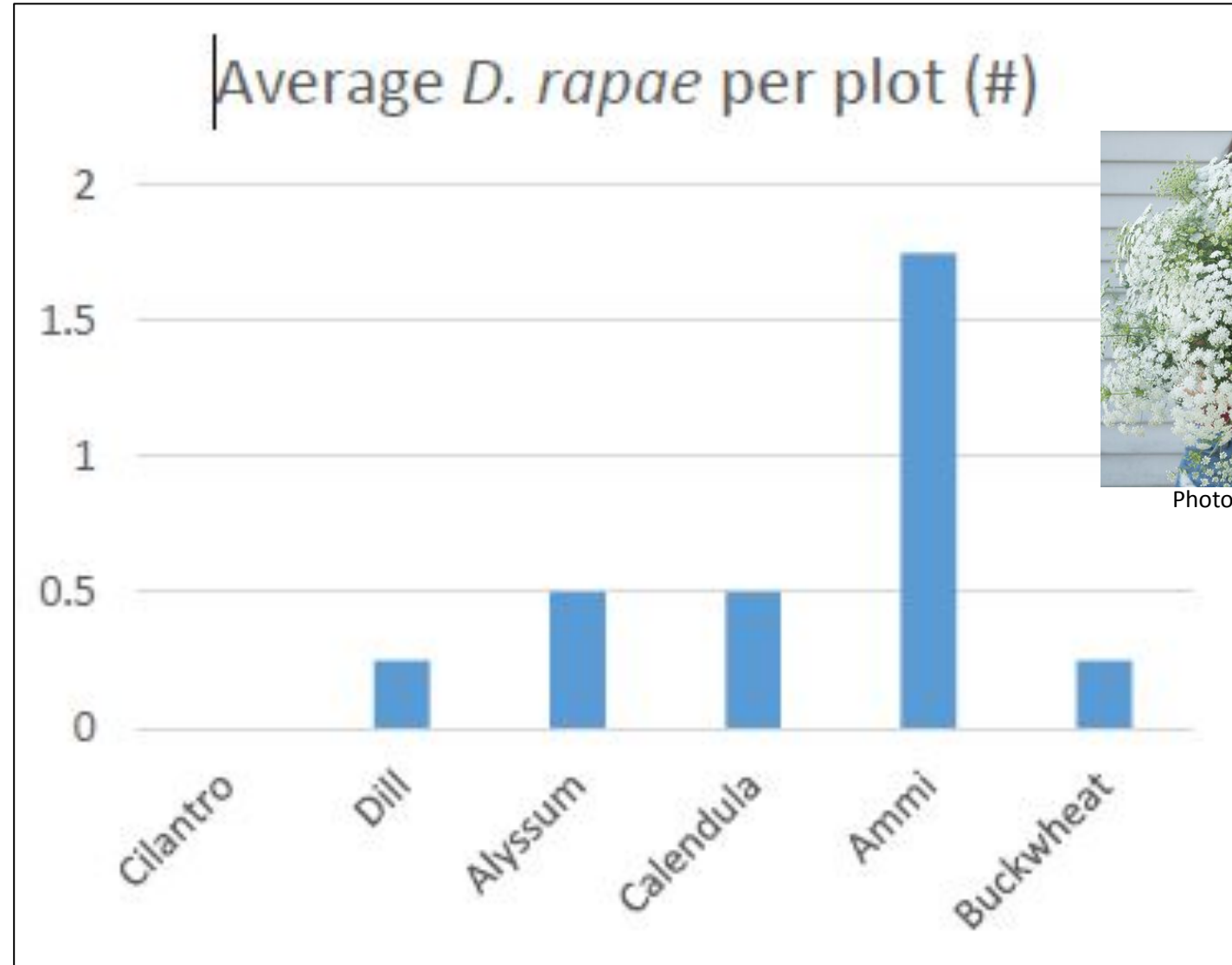


Photo from Johnny's Seeds

UMass Study, 2018

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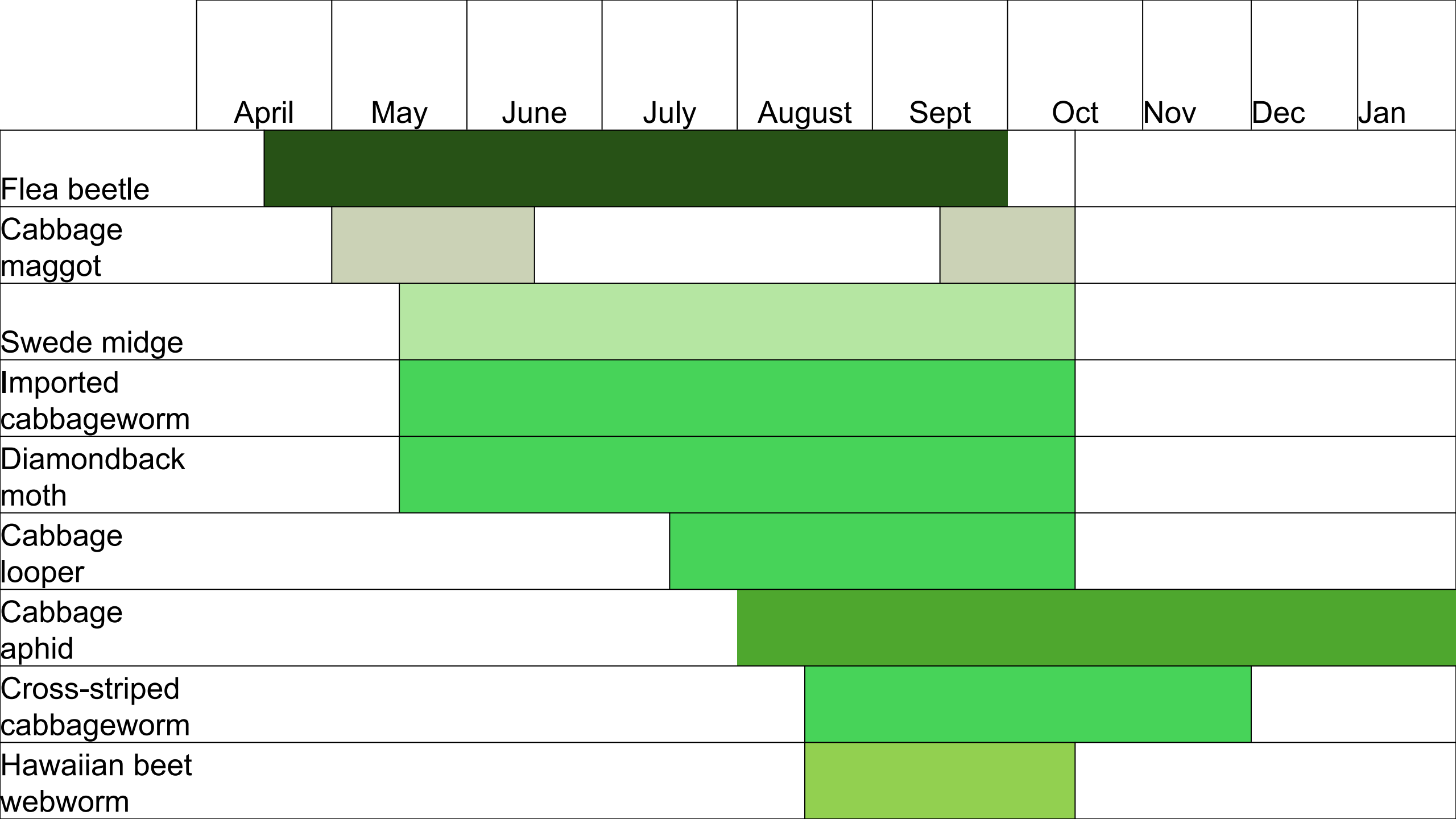
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Pre-Plant (Apr-May)

Step #1. Rotate fields

Step #2. Exclusion netting/cover

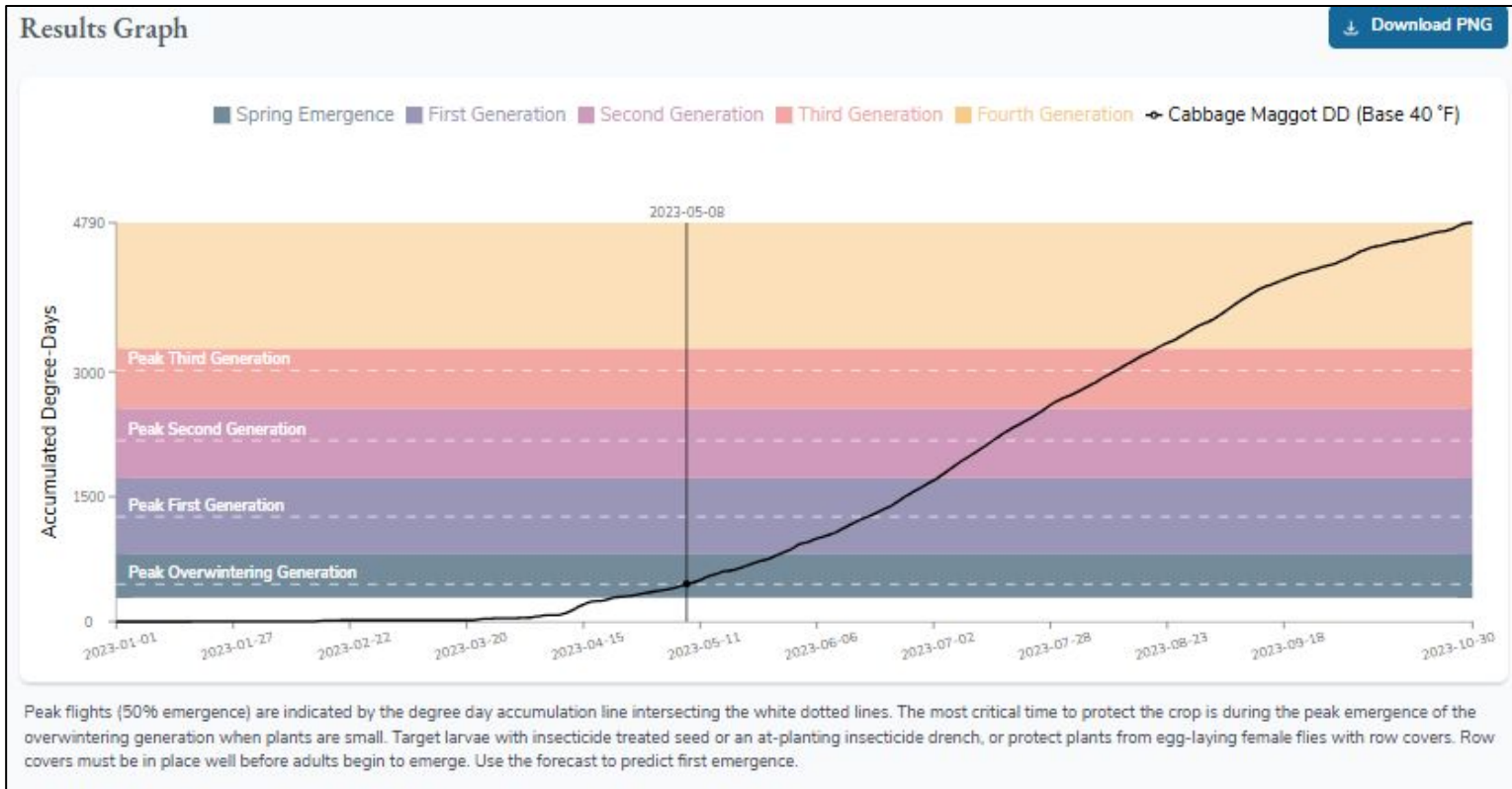
Step #3. Monitor



[WATCH TUTORIAL](#)

All Stations

Deerfield, MA



Date of Interest

May 2023						
Su	Mo	Tu	We	Th	Fr	Sa
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

Show/Hide

- Station Selection Map
- Management Guide
- Results Table
- Results Graph

Pre-Plant (Apr-May)

Step #4. Insecticide Options

- **Tray or field drench (CRM)**

- Verimark or
- Admire Pro
- Or ^{OG}Entrust (need 1-2 **follow-up drench** in field)

**Entrust drench only for leafy and heading brassicas, not radishes etc*

- **Timing!**

- *Delay planting*
- *Use larger transplants*



untreated



Verimark treated



Control of cabbage maggot damage in cabbage - 2018

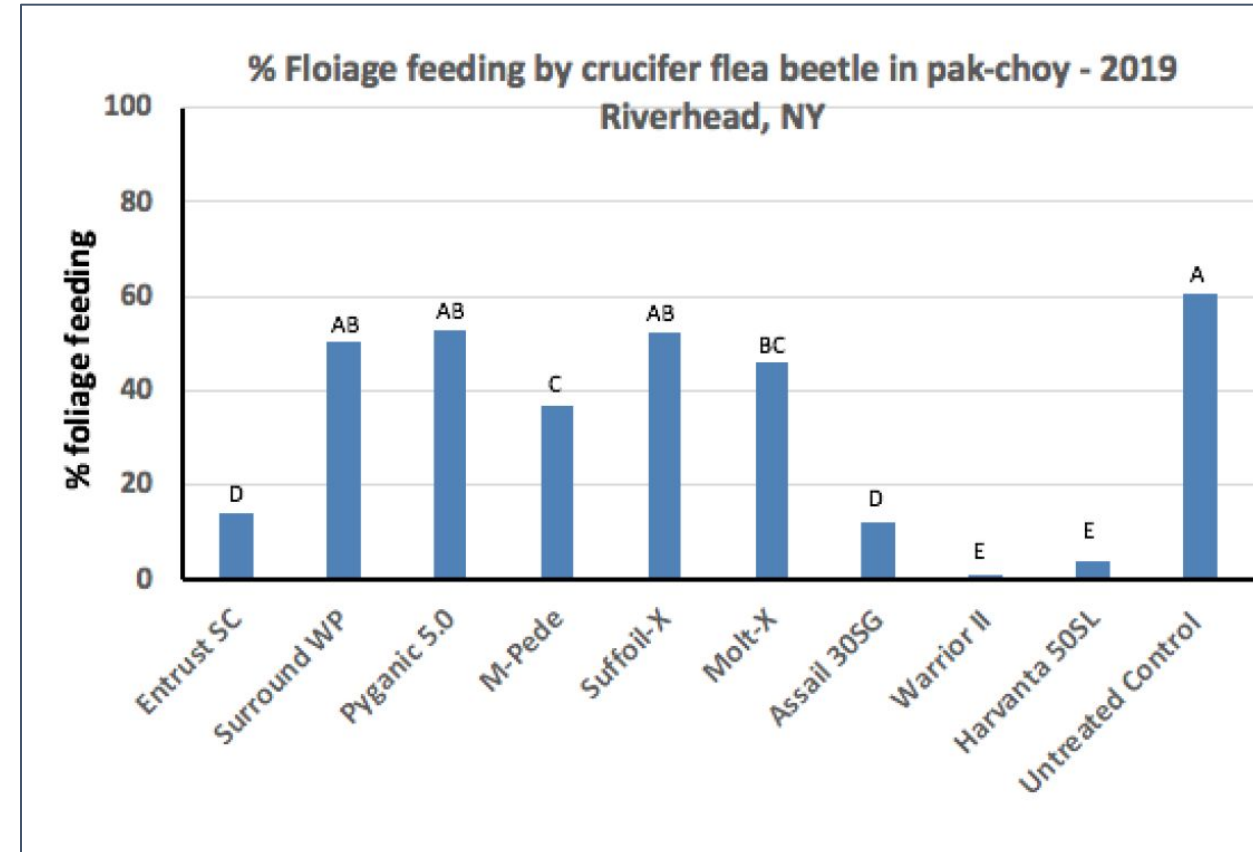


Cornell Cooperative Extension-LI Study

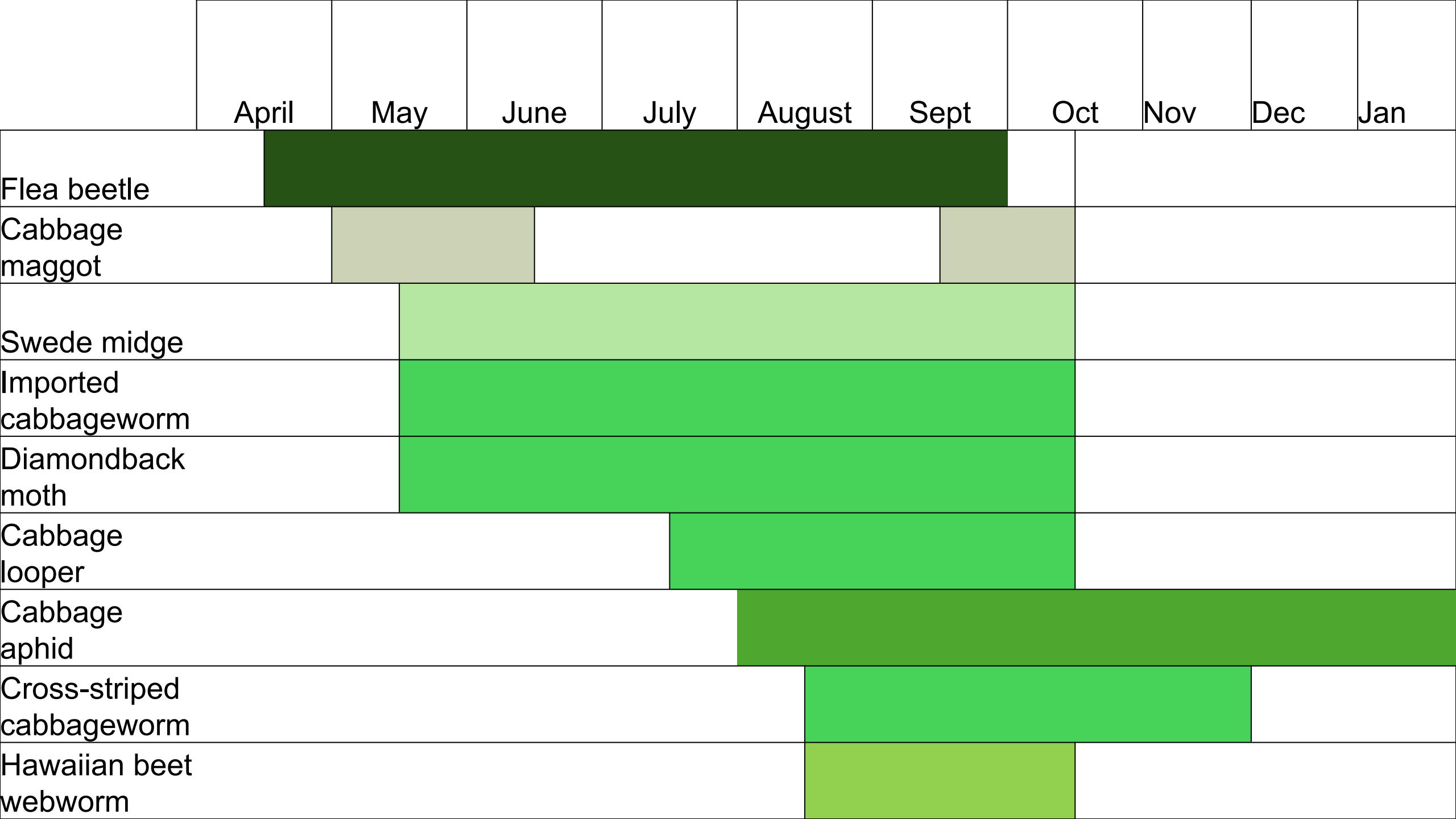
Protect Seedlings (May-June)

Foliar (FB)

- ^{OG}Entrust is most effective organic insecticide. 7 day residual. Mix with Pyganic to add knockdown. Rotate to pyganic after 2 apps.
- Several conventional options
 - Neonics e.g. Admire Pro, Venom are systemic, ~3 weeks control
 - Diamides e.g. Harvanta and Exirel are systemic, ~3 weeks control
 - Pyrethroids e.g. Mustang, Warrior, Hero
 - Carbamates e.g. Lannate—highly toxic group
 - Beseige (coragen + warrior)



Must keep up scouting and spray while plants are susceptible and beetles still present!!



Mid-Season Control (Jun-Aug)

Target: small larvae

Thresholds

- 15% infested for leafy greens or after head formation
- 35% before head formation

Organic Insecticides

- ^{OG}Bt is selective for caterpillars. Cheap and effective.
- ^{OG}Entrust is effective on leps, FB, and SM.

Re-apply based on scouting!!



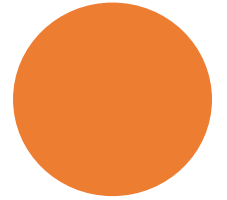
Mid-Season Control (Jun-Aug)

Target: small larvae

Conventional insecticides:

- Neonics e.g. Assail ~3 weeks control
- Diamides e.g. Coragen, Harvanta and Exirel are systemic, provide ~3 weeks control
- Spinosad e.g. Radiant
- Pyrethroids e.g. Mustang, Warrior., Fastac, Baythroid XL, Asana
- Torac (21A)
- Intrepid (18)
- Confirm (18)
- Rimon (16B)
- Prev-am (25)
- Proclaim (6)
- Avaunt (22)

Scout weekly and spray when threshold reached!!



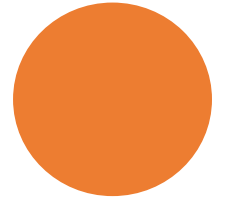
Late-Season Control (Aug-Nov)

Cabbage Aphids

- Scout early
- Rogue out founder plants
- **Threshold:** 10% infested

Insecticides

- ^{OG}Pyganic, azadiractin products, soaps, and oils are most effective. Tank mix. Re-apply based on scouting, 7-14 days once threshold reached.



Late-Season Control (Aug-Nov)

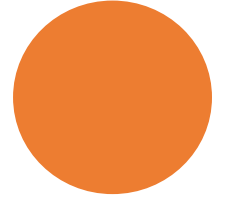
Cabbage Aphids

Conventional options:

- Beleaf and Fulfill (group 9) are selective for aphids
- Movento (group 23)
- Torac (group 21)
- Diamides e.g. Harvanta and Exirel are systemic, provide ~3 weeks control
- Neonics e.g. Assail, Venom, Sivanto, Admire
- Pyrethroids e.g. Brigade, Mustang, Warrior

Keep scouting!!

Aphids and caterpillars continue into late fall!





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Get in Touch!!
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