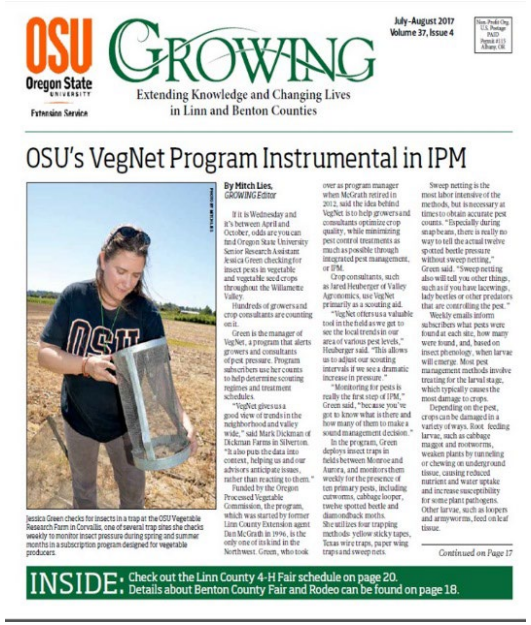
Expanding VegNet: an insect monitoring program

Jessica Green

Oregon IPM Center

Oregon State University
College of Agricultural Sciences



OSU Oregon State University Extension Service

GROWING

Extending Knowledge and Changing Lives in Linn and Benton Counties

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OSU's VegNet Program Instrumental in IPM

Jessica Green checks for insects in a trap at the OSU Vegetable Research Farm in Corvallis, one of several trap sites she checks weekly to monitor insect pressure during spring and summer months in a subscription program designed for vegetable producers.

By Mitch Lies,
GROWING Editor

It is Wednesday and it's between April and October, odds are you can find Oregon State University Senior Research Assistant Jessica Green checking for insect pests in vegetable and vegetable seed crops throughout the Willamette Valley.

Hundreds of growers and crop consultants are counting on it.

Green is the manager of VegNet, a program that alerts growers and consultants of pest pressure. Program subscribers use her counts to help determine scouting regimes and treatment schedules.

"VegNet gives us a good view of trends in the neighborhood and valley wide," said Mark Dickman of Dickman Farms in Silverton. "It also puts the data into context, helping us and our advisors anticipate issues, rather than reacting to them."

Funded by the Oregon Processed Vegetable Commission, the program, which was started by former Linn County Extension agent Dan McGrath in 1996, is the only one of its kind in the Northwest. Green, who took over as program manager when McGrath retired in 2012, said the idea behind VegNet is to help growers and consultants optimize crop quality, while minimizing pest control treatments as much as possible through integrated pest management, or IPM.

Crop consultants, such as Jared Heuberger of Valley Agronomics, use VegNet primarily as a scouting aid.

"VegNet offers us a valuable tool in the field as we get to see the local trends in our area of various pest levels," Heuberger said. "This allows us to adjust our scouting intervals if we see a dramatic increase in pressure."

"Monitoring for pests is really the first step of IPM," Green said, "because you've got to know what is there and how many of them to make a sound management decision."

In the program, Green deploys insect traps in fields between Monroe and Aurora, and monitors them weekly for the presence of ten primary pests, including cutworms, cabbage looper, mocha spotted beetle and diamondback moths. She utilizes four trapping methods: yellow sticky cups, Texas wire traps, paper wing traps and sweep nets.

Sweep netting is the most labor intensive of the methods, but is necessary at times to obtain accurate pest counts. "Especially during snap beans, there is really no way to tell the actual mexive spotted beetle pressure without sweep netting," Green said. "Sweep netting also will tell you other things, such as if you have lacewings, lady beetles or other predators that are controlling the pest."

Weekly emails inform subscribers what pests were found at each site, how many were found, and, based on insect phenology, when larvae will emerge. Most pest management methods involve treating for the larval stage, which typically causes the most damage to crops.

Depending on the pest, crops can be damaged in a variety of ways. Root feeding larvae, such as cabbage maggot and rootworms, weaken plants by tunneling or chewing on underground tissue, causing reduced nutrient and water uptake and increase susceptibility for some plant pathogens. Other larvae, such as loopers and armyworms, feed on leaf tissue.

Continued on Page 17

PSEP

Pesticide Safety
Education Program

"..goal of good pest management: use of control strategies to **reduce pest populations to levels** that do not cause **economic injury** to the commodity, without exposing humans to harmful control agents, **without disrupting nontarget organism(s)**, and without causing other forms of harm to the environment." *Center for Invasive Species and Ecosystem Health*

"the careful **consideration** of all **available pest control techniques** and subsequent **integration** of appropriate measures that **discourage the development** of pest populations and keep pesticides and other interventions to levels that are economically justified and **reduce or minimize risks** to human health and the environment. IPM **emphasizes the growth** of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms." *United Nations FAO*

Oregon State University
Oregon IPM Center

"an **effective** and environmentally sensitive approach to pest management that relies on a **combination** of common-sense practices. IPM programs use current, comprehensive **information** on the **life cycles** of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most **economical** means, and with the **least possible hazard** to people, property, and the environment." *United States Environmental Protection Agency*

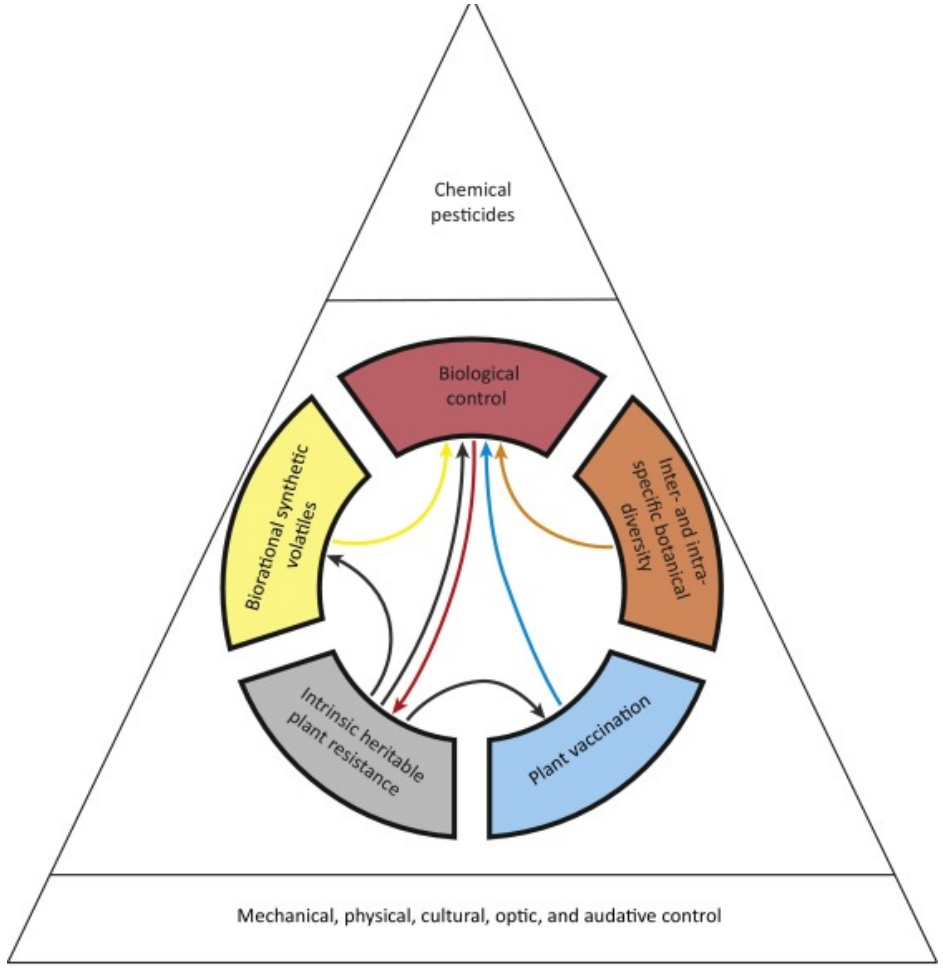
Opinion

A Conceptual Framework for Integrated Pest Management

Johan A. Stenberg [1]

Show more

https://doi.org/10.1016/j.tplants.2017.06.010



Trends in Plant Science

The New Integrated Pest Management Paradigm for the Modern Age

Surendra K Dara

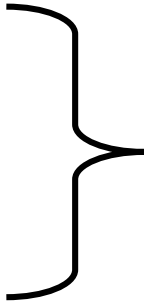
Journal of Integrated Pest Management, Volume 10, Issue 1, 2019, 12, https://doi.org/10.1093/jipm/pmz010

Published: 29 April 2019 **Article history** ▾

OSU VegNet

A regional insect pest monitoring and reporting network for **vegetable growers**, crop consultants, researchers, and **ag industry professionals**

- 24-year history
- Monitoring
- Interpretation
- Reporting



Monitoring

- Essential component of IPM
- Informative
- Decision-aid
- Quantify

Monitoring

- 10+ Species

- Pheromone traps
- Sticky traps

- Sweep nets
- Leaf pulls
- Scan and dig


5-JUN-17
MNRO
177

Dusky sap beetle feeding on sweet corn

@quickbugclips

Like

94 views 3 years ago

Not a primary pest, usually only found in ears with loose husks or those already damaged b

Learn more: https://beav.es/o5p **...more**

Interpretation

- Adults » Eggs » Larvae » Pupae

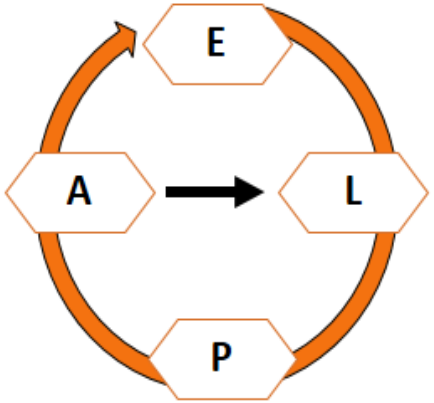
Adult flight

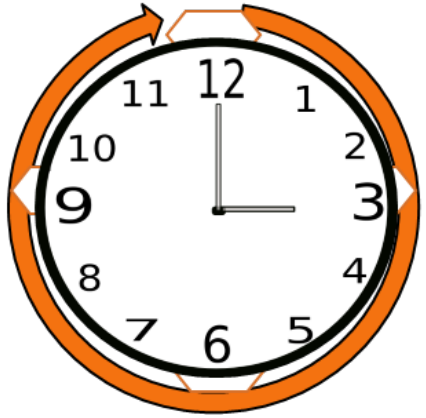
↓

Larval prediction

↓

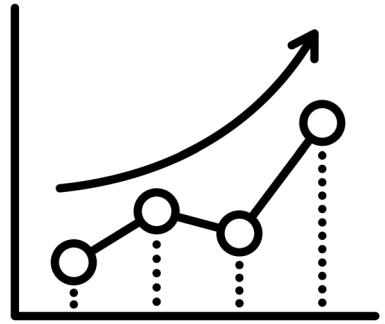
Mgmt. decisions



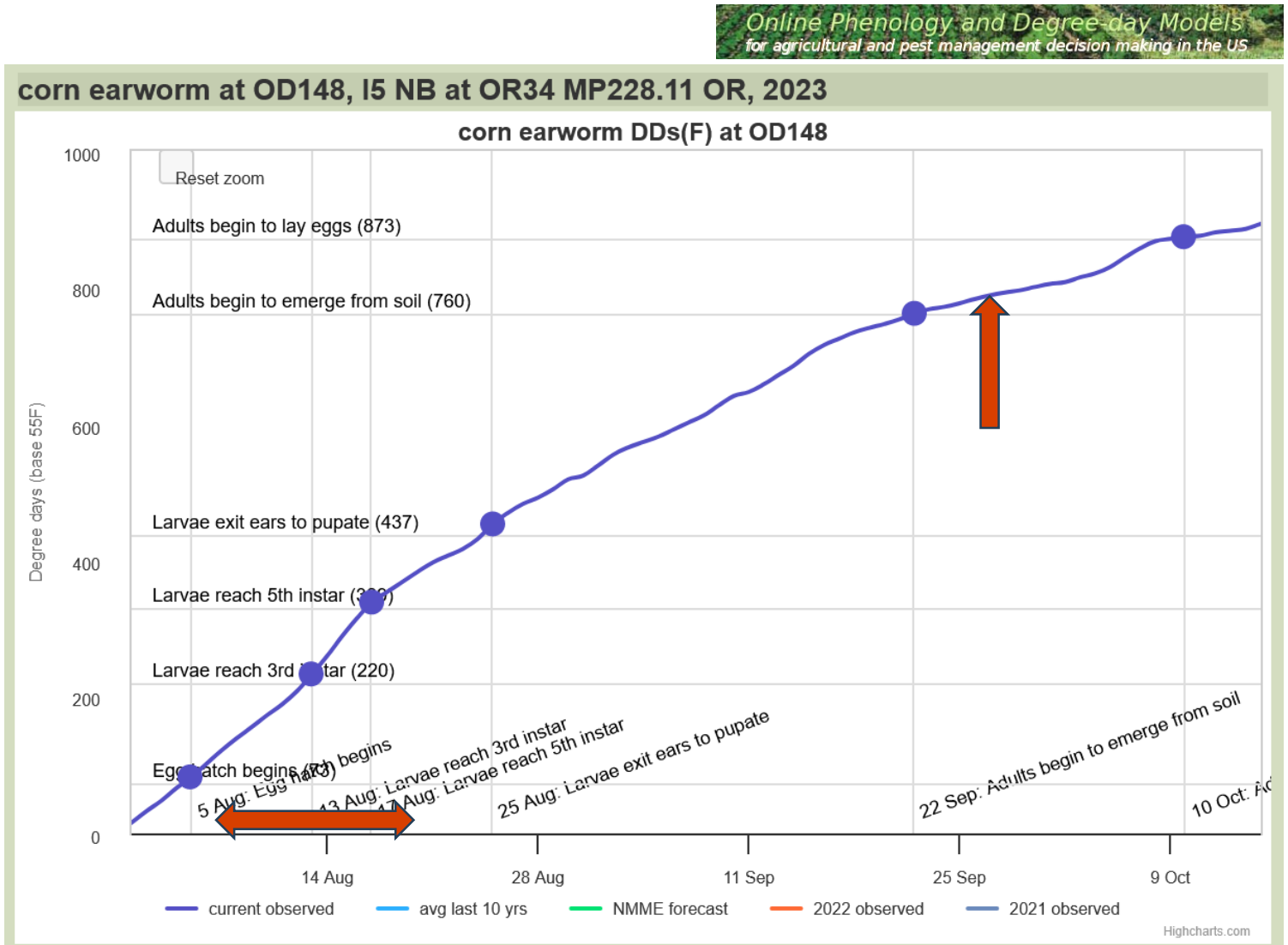


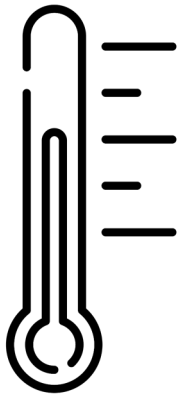
Interpretation

- Adults » Eggs » Larvae » Pupae
- Phenology models
- Biofix
- Growing degree-days
- Prediction



USPEST.org





- Biofix = first silk *
- GDDs <u>at</u> location
- Treatment window

  Aug 5-17th
- Scouting window

Importance of Ground-Truthing !

Corn Earworm

Location of study: College Station, Texas (field studies)

Developmental threshold
Lower: 54.7°F (12.6°C)
Upper: 91.9°F (33.3°C)

Method of calculation: Single sine
Cutoff method: Intermediate cutoff

Degree-day accumulations required for each stage of development

	DD (°F)	DD (°C)
Eggs:	72.9	40.5
Small larvae (1st - 3rd instars):	147.1	81.7
Large larvae (4 & 5th instars):	217.1	120.6
Pupae:	323.1	179.5
Generation time (egg to adult):	760.1	422.3
Pre-egglaying adults:	112.7	62.6
Generation time (adult to adult):	872.8	484.9

MODELS FOR COTTON INSECT PEST MANAGEMENT 365

With MOTHZV-2, predictions concerning the timing and size of future generations of Heliothis spp. were made by using expected (long-term average) temperatures and projected crop phenology. Simulations were initialized with numbers of eggs or moths and were carried through the number of generations that occur at a given locality during one season. A bookkeeping system was used to record the number of eggs, first- to third-instar larvae, fourth- and fifth-instar larvae, pupae, preovipositing adults, and ovipositing adults for each day of the simulation. Each stage of the insect could be advanced one calendar day at a time by using the degree-day concept so daily mortality (natural, insecticide, parasites, and predators) could be considered. The output of MOTHZV-2 consisted of tables or graphs showing the numbers of Heliothis spp. of each stage present on each day.

Hartstack, A. W., Jr., J. P. Hollingsworth, R. L. Ridgeway, and J. D. Lopez. **1976.** MOTHZV-2: A **computer simulation** of *Heliothis zea* and *virescens* population dynamics. User manual. 1976. U.S.D.A. ARS-S-127.

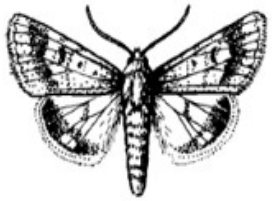
Importance of Ground-Truthing !

Corn Earworm

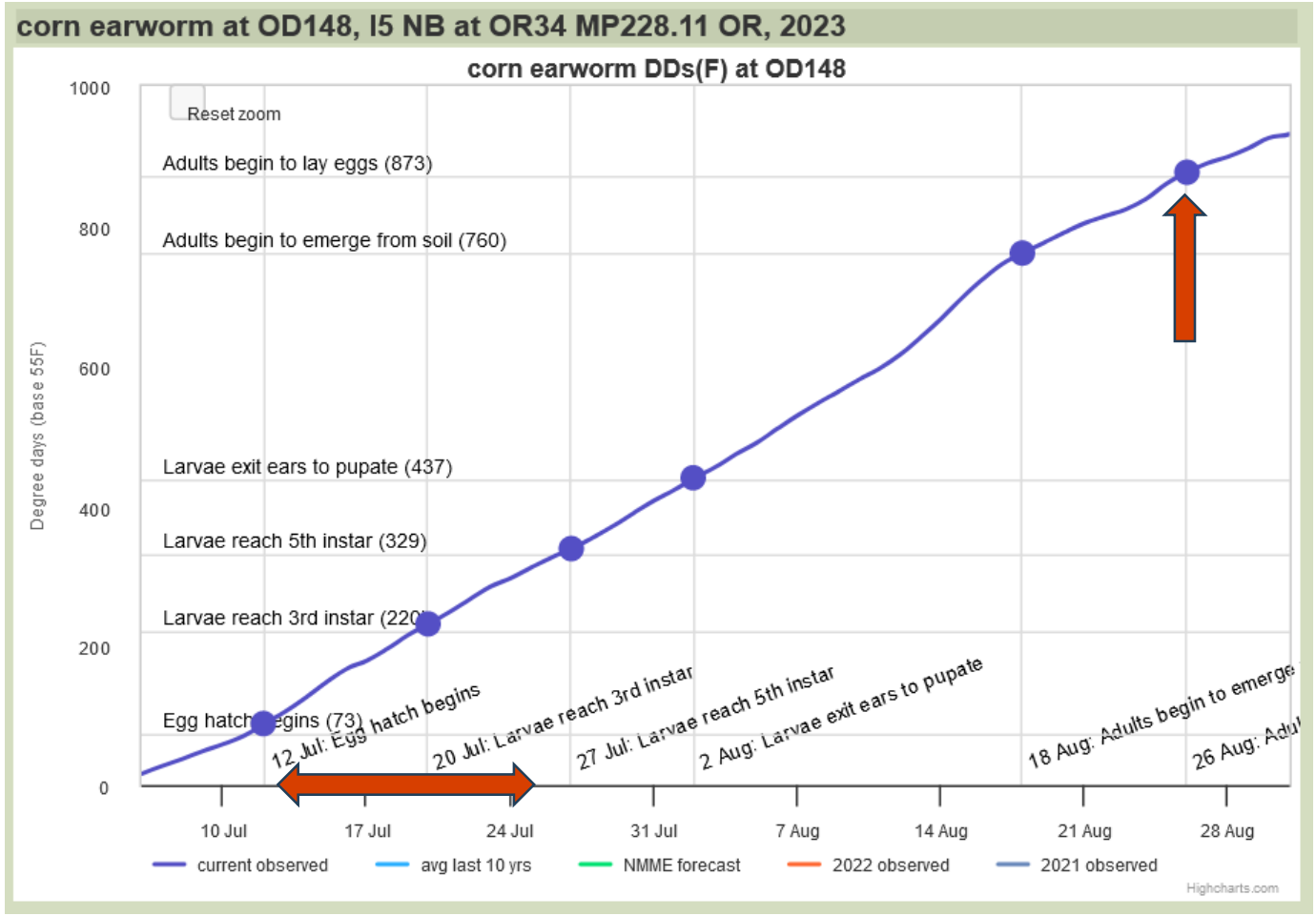
Silk = Eggs = Aug

Yes, but…

Early plantings
Field history



Importance of Model Parameters !



6-Jul

- Biofix = detection *
- Treatment window
  Jul 13-25th
- Scouting window
- Better alignment with observed (2023)

Online Phenology and Degree-day Models
for agricultural and pest management decision making in the US

Corn Earworm

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Online Phenology and Degree-day Models
for agricultural and pest management decision making in the US

Sweet Corn

CROPTIME

Vegetable and Weed Degree-day Models

Croptime introduces degree-day (DD) models for vegetable varieties and weeds. Vegetable DD models can help schedule planting dates and predict harvest dates more accurately than calendar days. Weed DD models

Reporting

- Timely
- Applicable
- Accessible
- Easy to understand

VegNet — May, 19, 2008

VegNet is a pest and disease monitoring and reporting network serving the processed vegetable industry, provided by the Oregon State University Extension Service, and funded by the Oregon Processed Vegetable Commission. VegNet is available on the net: http://extension.oregonstate.edu/linn Go to commercial vegetables then VegNet. If you have questions or suggestions, and if you would like to add or remove your name from this newsletter mailing list, Contact: Dan McGrath, OSU Extension, PO Box 765, Albany, OR 97321 phone (503) 931-8307; email daniel.mcgrath@oregonstate.edu

Cabbage Looper

Moth counts for cabbage looper are very high very early this year. Prepare now for a modified spray program to prevent load rejections in broccoli. You may need to spray three times to get the job done this year.

The first spray may need to go on at the "button stage". You may need two "clean up" sprays just prior to harvest.

As looper worms move through their late instars (worms 1/2 to 3/4 inches long) they look for a place to pupate. They prefer to pupate on narrowly spaced vertical surface (such as broccoli flower stems). Once they are stuck there, future insecticide applications are of not use. A "button stage" insecticide spray knocks them out before they crawl up into the elongating flower stems.

Insecticides are not perfect. They generally produce about a ninety six to eight (96-98%) percent kill. The two percent (2%) of the worm population that survive a single clean up spray in an outbreak year, are sometimes enough to get a load rejected.

Oregon State University Extension

Dan McGrath (

Therefore, if worm loads are high as you approach harvest, spray once early and check the field carefully to make sure the residual worm load is undetectable. You may need two clean up sprays.

One last cautionary note: It is not uncommon to have a gap in one's insecticide spray pattern. In an outbreak year, the numbers of wor
in the spray skip are insig

The only way to detect a
scout the field across the
leaf sample from every r
field three or four times
many as 300 to 400 leaf s
field safe.

If this is too much work f
hiring a professional scou
option is to simply go wit
program.

Early looper moth counts
One can never predict th
perfectly, but consider th
warming. 2008 may be a
Be careful and good luck.

Flea beetles

Flea beetles have been fie
Cole crops, at least in the
valley.

VEGNET 2008

Week of May 12, 2008 Willamette Valley, Oregon

	Aurora	MtAngel	Gervais	Stayton	Dever	Corvallis
BCW	0.00	0.00	0.00	0.00	0.00	2.00
CEW	0.00	0.00	0.00	0.00	0.00	0.00
PHX	0.00	0.00	0.00	0.00	0.00	0.00
12S-YST	0.00	0.00	0.00	0.33	0.67	1.00
12S-SN	na	na	na	na	na	na
CL	41.00	23.33	12.00	14.67	17.67	30.00
AL	1.00	1.00	0.67	0.00	0.00	0.00
DBM	0.00	0.33	0.00	na	0.67	0.00
BAW	0.00	0.00	0.00	0.00	0.00	0.00
VCW	7.67	11.00	1.00	5.67	14.67	3.00
CWB/2min	0.00	0.00	0.00	0.00	0.00	0.00

Willamette Valley 7day Ave Week of May 12

Insects	5-Yr Ave.	2007	2008	Note
BCW	0.67	0.89	0.33	Normal Risk
CEW	0.0	0.08	0.00	Normal Risk
PHX	0.12	0.34	0.00	Normal Risk
12S-YST	0.19	0.44	0.33	Normal Risk
12S-SN	na	na	na	na
CL	6.70	0.49	23.11	High Risk
AL	1.74	0.01	0.44	Normal Risk
DBM	0.5	0.05	0.20	Normal Risk
BAW	na	0.01	0.00	Normal Risk
VCW	3.0	4.45	7.17	Normal Risk
CWB/2min	0.2	na	0.00	Normal Risk

VegNet Key

BCW = Black Cutworm Moths
PHX = False Corn Earworm Moths
CL = Cabbage Looper Moths
DBM = Diamondback Moths
VCW = Varigated Cutworm Moths
YST = Yellow Sticky Trap Counts
na = not available

CEW = Corn Earworm Moths
12S = 12 Spot Beetle
AL = Alfalfa Looper Moths
BAW = Bertha Armyworm Moths
CWB/2min = Cabbage Butterflies
SN = Sweep Net Counts/10 Arcs

VEGNET 2019

Week of May 27th, 2019 Willamette Valley, OR

Insects/day*	AURO	PRKV	MTAG	BRKS	ALBN	CVRO	MNRO
BCW	n/a	0.14	n/a	n/a	2.00	0.60	0.00
WAW	n/a	0.00	n/a	n/a	0.00	0.00	0.00
CEW	n/a	n/a	n/a	n/a	n/a	0.00	0.00
PHX	n/a	n/a	n/a	n/a	n/a	0.00	0.00
LYG	n/a	0.00	n/a	n/a	0.00	0.00	0.00
12S	n/a	0.14	n/a	n/a	0.67	0.20	0.00
CL	n/a	86.43	n/a	n/a	27.33	90.40	62.29
AL	n/a	1.14	n/a	n/a	0.17	0.60	0.57
DBM	n/a	0.00	n/a	n/a	0.00	0.00	0.00
BAW	n/a	0.00	n/a	n/a	n/a	0.00	n/a
VCW	n/a	1.00	n/a	n/a	n/a	6.20	n/a
CWB*	n/a	0.00	n/a	n/a	0.00	0.00	0.00
FLEA~	n/a	n/a	n/a	n/a	0.00	0.00	0.00

Willamette Valley 7day Ave Week of MAY 27

Insects/day*	12Yr Ave	2018	2019	Note
BCW	0.86	0.48	0.69	Normal risk
CEW	0.03	n/a	0.00	Unknown
PHX	0.33	n/a	0.00	Unknown
12S	0.09	0.27	0.25	*Above Normal*
CL	5.84	0.09	66.61	*Alert*
AL	1.58	0.00	0.62	Normal risk
DBM	2.11	1.08	0.00	Normal risk
BAW	0.10	n/a	0.00	Normal risk
VCW	2.57	n/a	1.80	*Unknown*
CWB*	0.25	n/a	0.00	Normal risk

VegNet Key

BCW = Black Cutworm Moths		CEW = Corn Earworm Moths
PHX = False Corn Earworm Moths		12S = 12 Spot Beetles
DBM = Diamondback Moths		VCW = Variegated Cutworm Moths
CL = Cabbage Looper Moths		AL = Alfalfa Looper Moths
YST = Yellow Sticky Traps		CWB = Cabbage Butterflies/2 min
SN = Sweep Net Counts/10 Arcs		WAW = Western Yellowstriped Armyworm
LYG = Lygus spp.	n/a = not available	FLEA~ = Flea Beetles; preliminary sampling

* Values reported are pests per day, except CWB and SN, which are snapshots

Week 10

Reminder: We use a data table to quickly detect localized hotspots and make comparisons to historical patterns. If you need a re 4 (3.3%) on interpreting the data, please visit: https://beav.es/ZG7 and remember tha 3 (2.5%) ved reports are always available on the companion blog

Access the Data Table 29 (23.8%)

HIGHLIGHTS

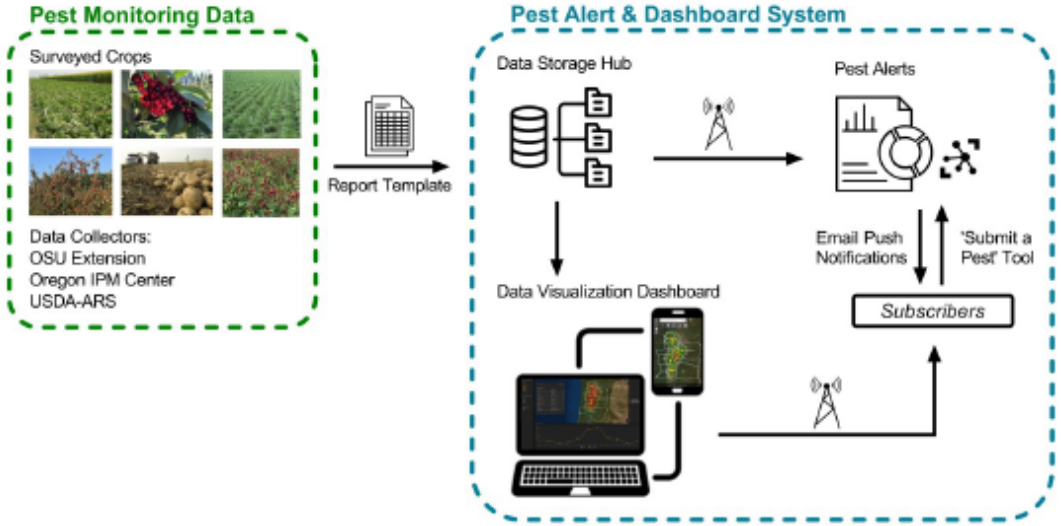
- Let's start with the good news - natural enemies were very abundant at every field site. I noticed many hoverflies, lacewings, and yellowjackets. These important **beneficial** 15 (12.3%) help to regulate pest populations. Learn more
- Many of us were u 24 (19.7%) **reme heat stress** last week. View some sad pics of leaf scorching at field sites (but sense the relief being given by irrigation!). A 2016 article looked at this phenomenon in depth using the USDA Irrigation Survey database to assess the **impact of water scarcity on irrigation decisions for PNW producers** (orchard/vineyard, vegetable, whe 6 (4.9%) lfa, hay, and pasture). Access the manuscript here
- Are you following the Oregon IPM Center? They publish a quarterly newsletter with **relevant IPM topics** and offer: seasonal trainings, events, information about regional jobs and funding opportunities, and more! 13 (10.7%)
- I received a call from a community member who found a **Pandora moth** in Lincoln County. This 'largest forest insect' has a wingspan of 3+ inches! Larvae defoliate pine trees in the Western US, and were 25 (20.5%) a food source by Indigenous Peoples. Learn more

FROM OREGON, FOR THE WORLD

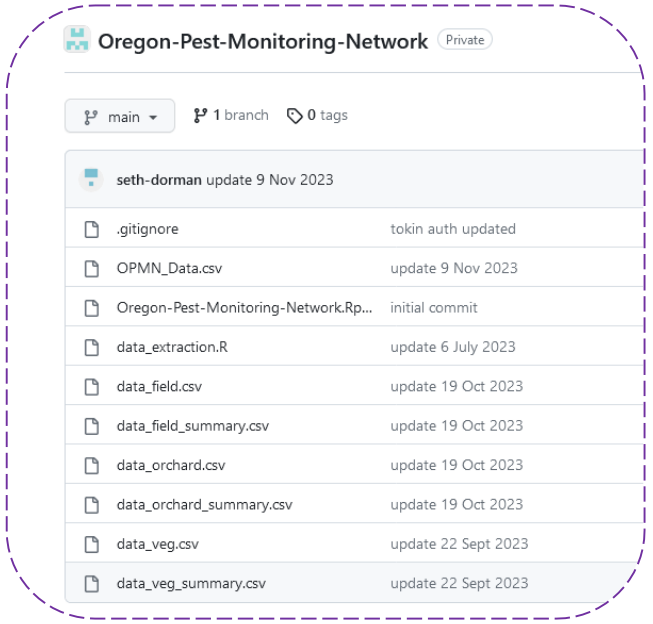
The Agriculture and Natural Resources Extension Program at Oregon State University helps grow Oregon's economy, keep family farms vibrant, strengthen ecosystems, and support safe and sustainable food and water systems. OSU VegNet welcomes subscribers at all levels of engagement. We aim to be a collaborative, helpful resource for agricultural producers.
INNOVATIVE – COMMUNITY – IMPACT

0 (0%) 0 (0%) 1 (0.8%)

Past to Present

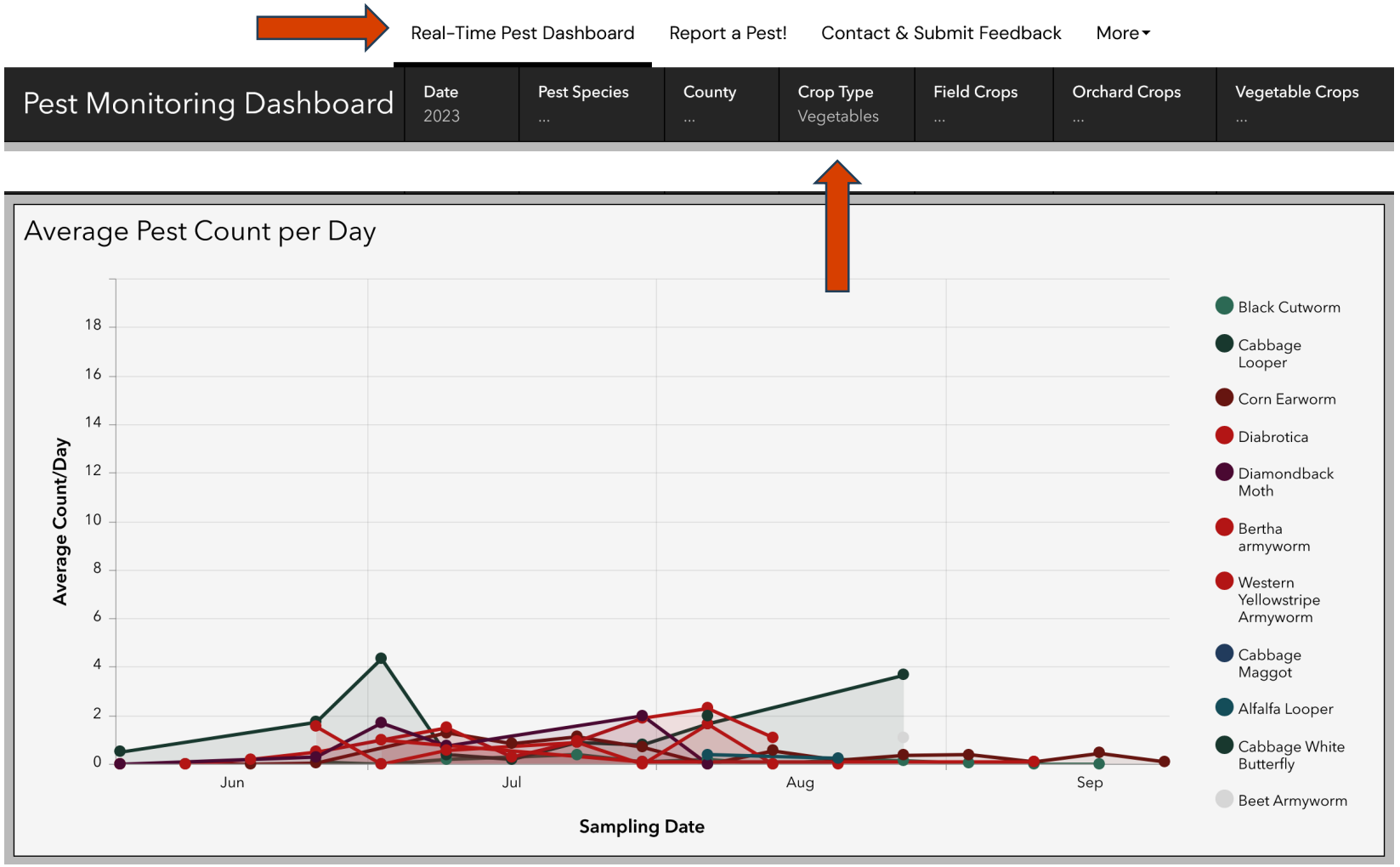


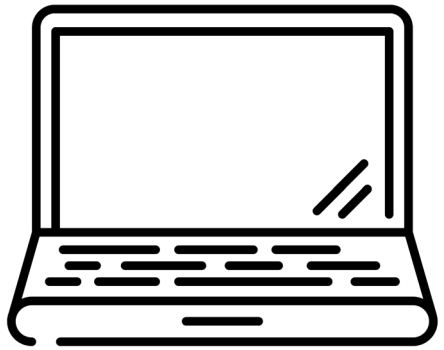
- Direct input
- Data storage hub
- Visualization dashboard



...to Future

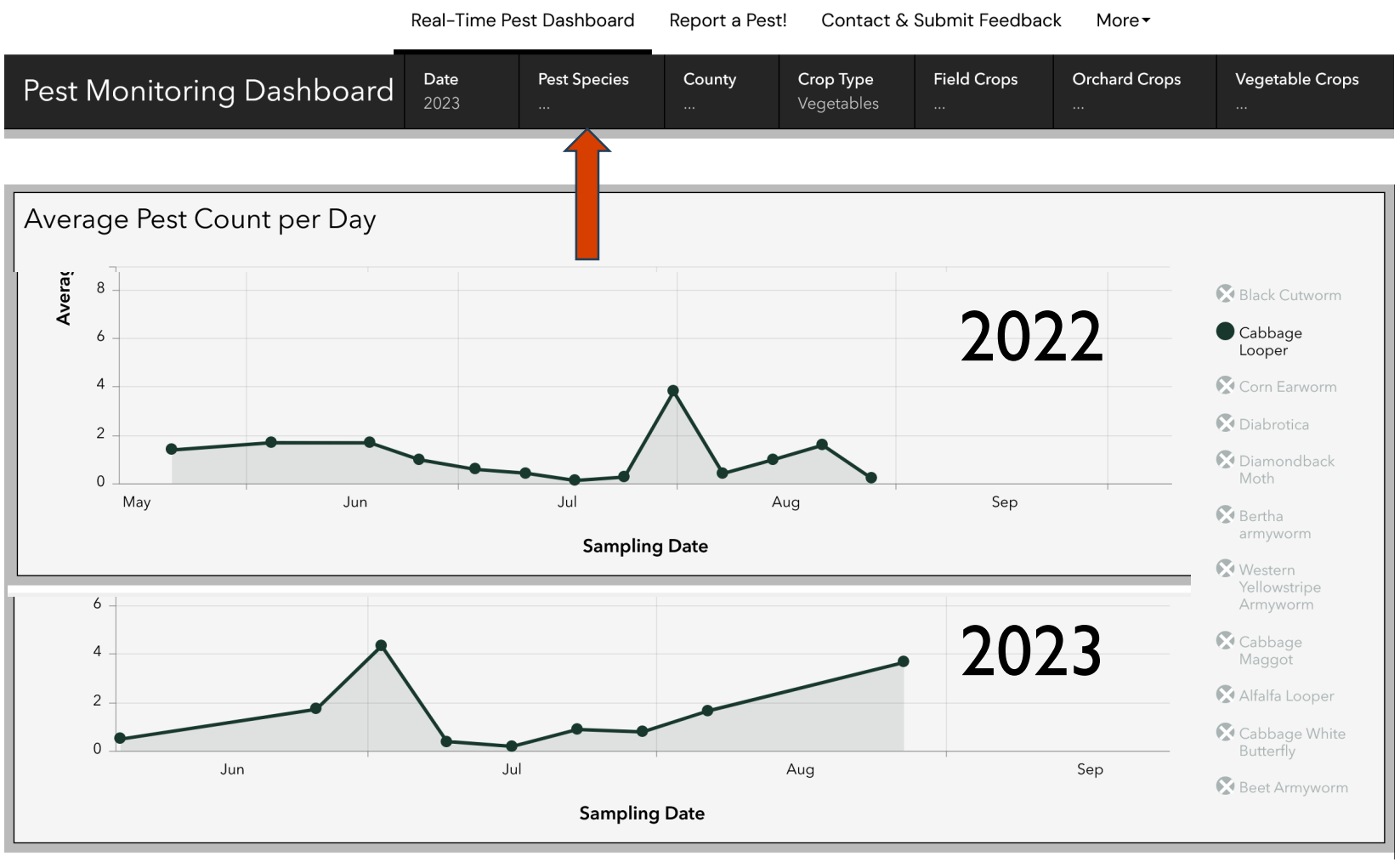
Oregon Pest Monitoring Network





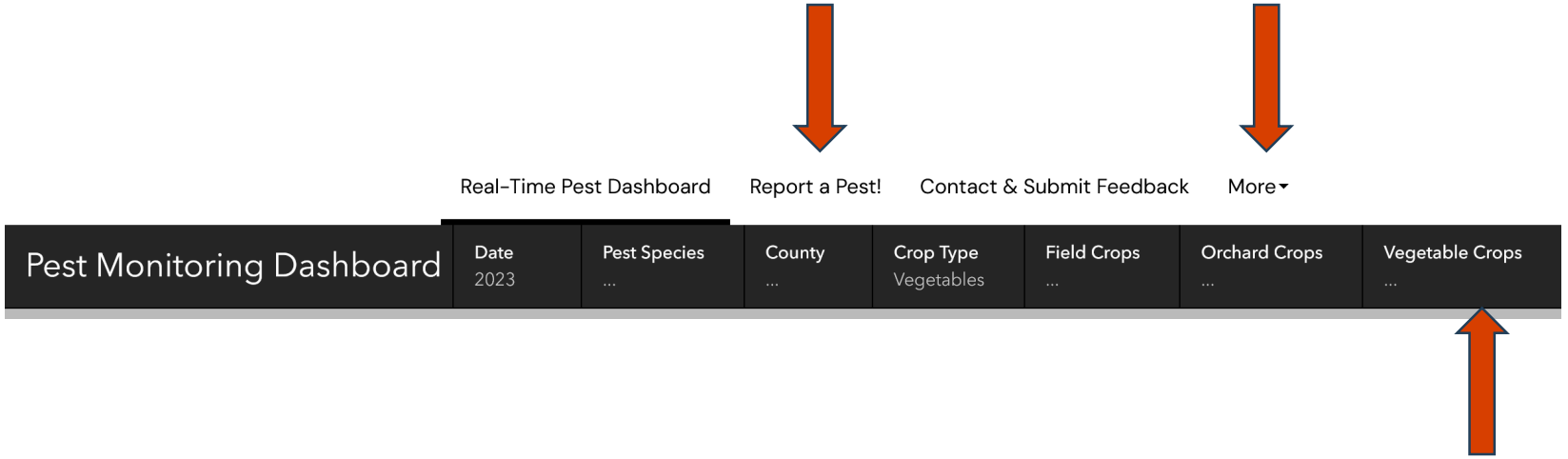
http://beav.es/iRT

Oregon Pest Monitoring Network



http://beav.es/iRT

- Select by pest
- Compare years

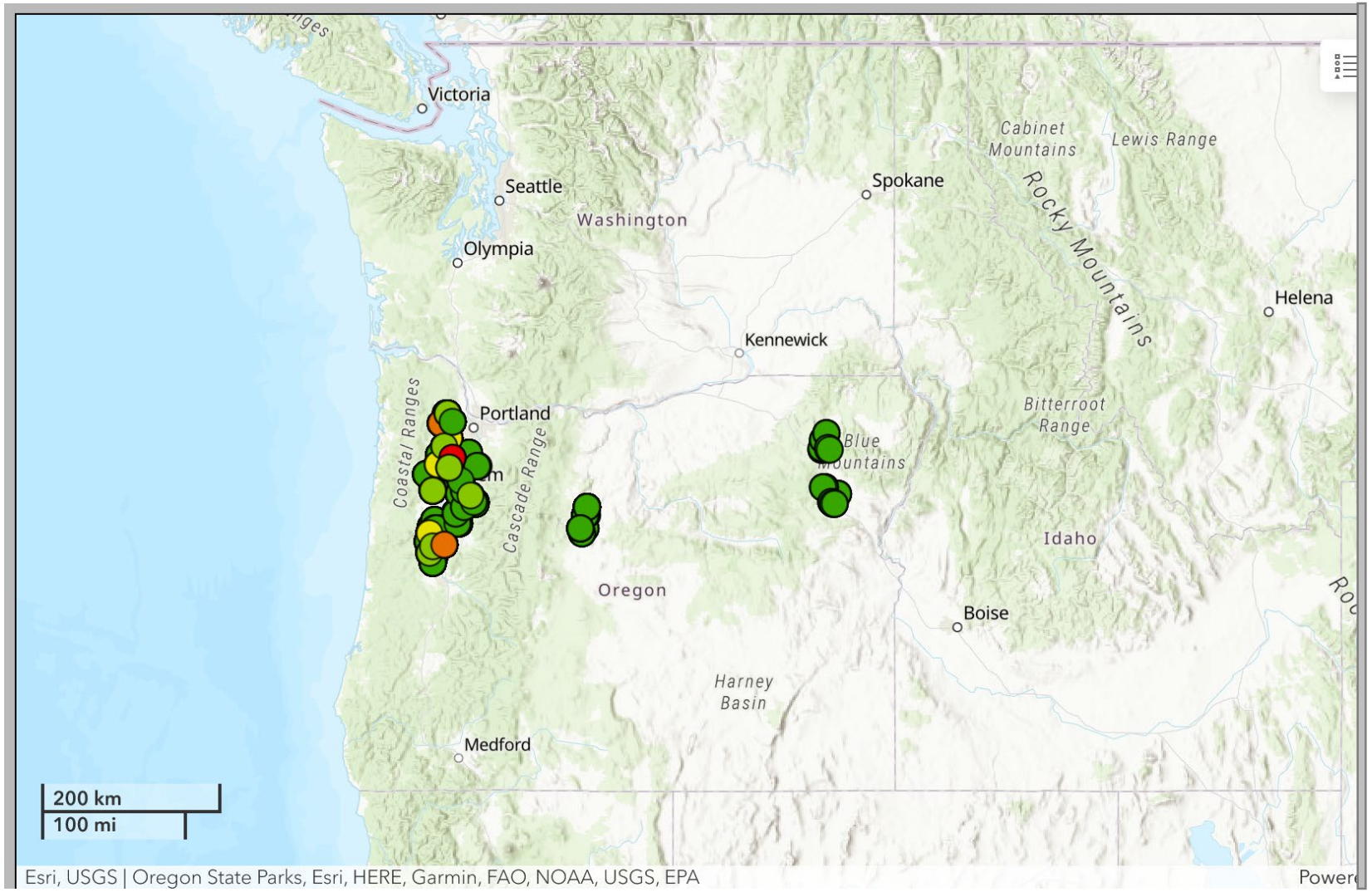


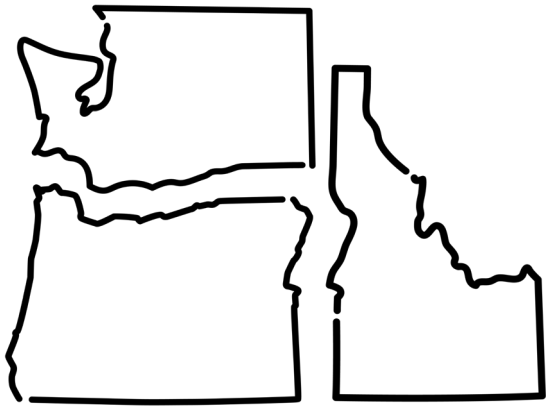
http://beav.es/iRT

2024

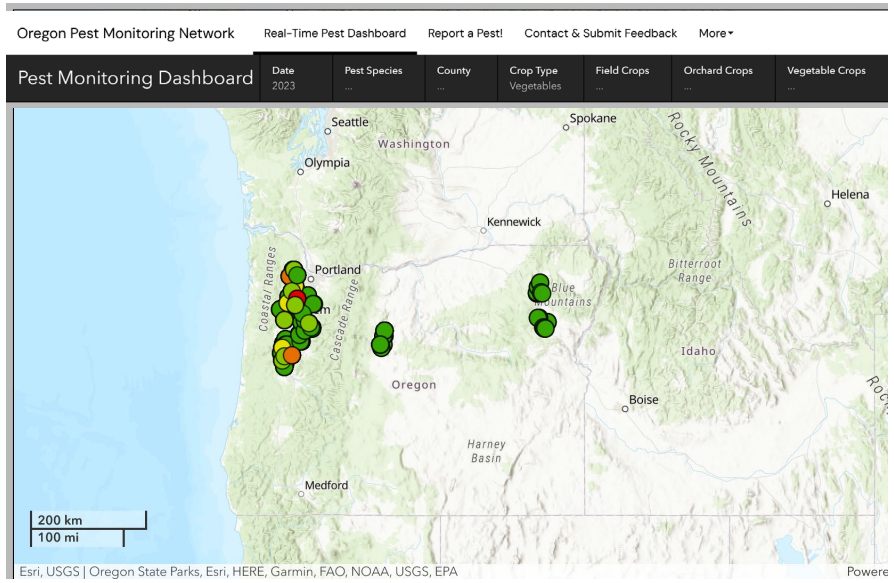
- Push alerts
- Submit a pest
- Integrated forecasts
- More commodities…

Interested in Contributing ?





Thoughts?



site_ID	date	target_pest	county	crop_type	crop	pest count	pest count per day
GRVS	27-Jun	Bertha Armyworm	Marion	Vegetables	Broccoli	3	0.30
SS-2	27-Jun	Bertha Armyworm	Marion	Seed Crop	Radish	1	0.10
CVRO-2	15-Jun	Black Cutworm	Linn	Research Station		27	1.93
CVRO-2	27-Jun	Black Cutworm	Linn	Research Station		4	0.40
LKSD	15-Jun	Black Cutworm	Benton	Vegetables	Mixed	8	0.53
LKSD	23-Jun	Black Cutworm	Benton	Vegetables	Mixed	10	1.25
GRVS	17-Jun	Cabbage Looper	Marion	Vegetables	Broccoli		*SET*
GRVS	27-Jun	Cabbage Looper	Marion	Vegetables	Broccoli	16	1.60
MNRO	15-Jun	Cabbage Looper	Benton	Vegetables	Spinach	6	0.40
MNRO2	23-Jun	Cabbage Looper	Benton	Vegetables	Spinach	8	1.00
SS-1	17-Jun	Cabbage Looper	Marion	Seed Crop	Cabbage	17	1.06
SS-1	27-Jun	Cabbage Looper	Marion	Seed Crop	Cabbage	0	0.00
SS-2	17-Jun	Cabbage Looper	Marion	Seed Crop	Radish	58	3.63
SS-2	27-Jun	Cabbage Looper	Marion	Seed Crop	Radish	2	0.20
GRVS	27-Jun	Cabbage White Butterfly	Marion	Vegetables	Broccoli	1	1.00
CVRO	15-Jun	Diabrotica	Linn	Research Station		0	0.00
CVRO	27-Jun	Diabrotica	Linn	Research Station		0	0.00
LKSD	23-Jun	Diabrotica	Benton	Vegetables	Mixed	0	0.00
MNRO2	15-Jun	Diabrotica	Benton	Vegetables	Spinach		*SET*
MNRO2	23-Jun	Diabrotica	Benton	Vegetables	Spinach	0	0.00
SS-1	27-Jun	Diabrotica	Marion	Seed Crop	Cabbage		*SET*
GRVS	17-Jun	Diamondback Moth	Marion	Vegetables	Broccoli		*SET*
GRVS	27-Jun	Diamondback Moth	Marion	Vegetables	Broccoli	0	0.00
MNRO2	23-Jun	*Apamea* spp. (cutworm)	Benton	Vegetables	Spinach	343	42.88
CVRO	27-Jun	Seedcorn Maggot	Linn	Research Station		35	5.83
MNRO2	23-Jun	Seedcorn Maggot	Benton	Vegetables	Spinach	4	0.50
CVRO-1	15-Jun	Variegated Cutworm	Linn	Research Station		56	4.00
GRVS	17-Jun	Variegated Cutworm	Marion	Vegetables	Broccoli		*SET*
GRVS	27-Jun	Variegated Cutworm	Marion	Vegetables	Broccoli	242	24.20
MNRO	15-Jun	Variegated Cutworm	Benton	Vegetables	Spinach	61	4.07
MNRO2	15-Jun	Variegated Cutworm	Benton	Vegetables	Spinach		*SET*
MNRO2	23-Jun	Variegated Cutworm	Benton	Vegetables	Spinach	7	0.88
SS-1	17-Jun	Variegated Cutworm	Marion	Seed Crop	Cabbage	12	0.75
SS-1	27-Jun	Variegated Cutworm	Marion	Seed Crop	Cabbage	0	0.00
SS-2	17-Jun	Variegated Cutworm	Marion	Seed Crop	Radish	64	4.00
SS-2	27-Jun	Variegated Cutworm	Marion	Seed Crop	Radish	11	1.10

Companion Blog

VegNet

your regional insect pest monitoring resource!

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Categories

armyworm beneficials black cutworm brassicas brown marmorated stink bug cabbage maggot community corn earworm cutworm degree-days diamondback flea beetles garden and landscape invasives loopers management migration monitoring onion peas pest ID rootworm seedcorn maggot snap beans squash sweet corn uncategorized winter cutworm wireworm

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Category Archives: brassicas

Spring Predictions

Posted on 16-April, 2021 by greenje

While none of us have a crystal ball, especially in agriculture, I thought it might be fun to offer some thoughts / warnings of how this year might look for insect pests of vegetables. I predict* .....

- **"Flea beetles will be rampant."** In the spring, adult flea beetles emerge from overwintering, and are already causing some problems in radish. We've been told by both local and regional sources that it's going to be a hot and dry summer = flea beetles' favorite weather. I suggest early and often scouting in brassica crops. Starting now, begin to scout weedy areas around fields. Once the crop emerges, or shortly after transplanting, focus efforts on field edges. It may be necessary to scout daily – yes, daily. Be aware that these insects are easily disturbed (they jump), sticky traps placed ~10″ off the ground can help assess activity – place them near edges. You'll recognize the distinctive 'pitting' on cotyledons and true leaves. Check stems for signs of damage as well, just above the soil surface. For more information, see the flea beetle pest profile page.
- **"Wireworms are a cryptic foe we should get to know."** They are a common problem in grass and potato production. Adult click beetles do not live for very long and do not cause damage. Larvae (wireworms), on the other hand, live for 2-6 years and damage can be extensive. Before planting, especially if you are coming out of a grass rotation, take my advice and place a few bait traps to assess larval activity. Instructions and more information is available at the wireworm pest profile page.
- **"Every other year, cabbage loopers cause fear."** Ok, I admit, this one is just a stretch to fit the rhyme scheme. However, it is true that in the Willamette Valley, we have had major looper outbreaks in 2017 and 2019... so 2021 is a possibility. Trap count data will be available soon.

* PLEASE NOTE: these are merely educated guesses. In fact, part of the fun of monitoring insects is that they are truly so unpredictable!

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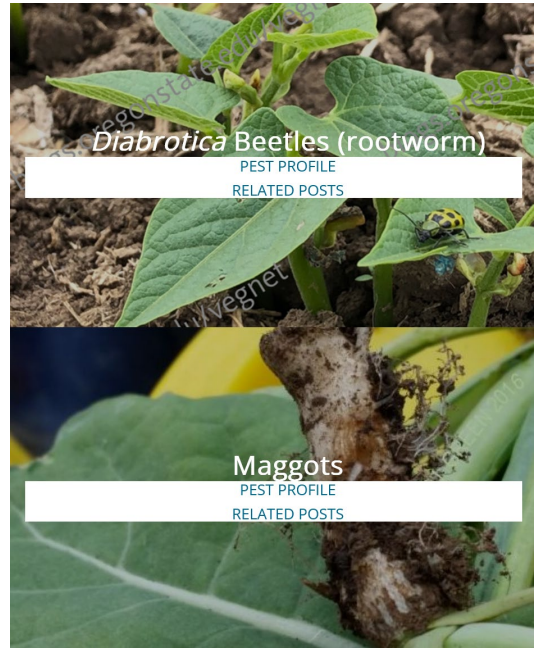
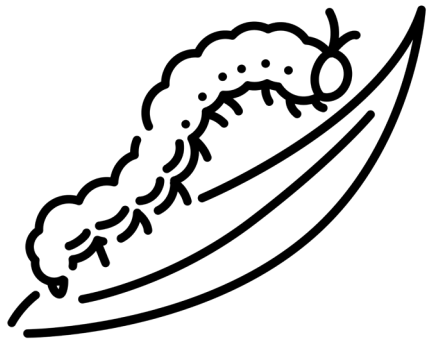


Notable Pests & Issues



Pea Leaf Weevil

Sitona lineatus

Pea leaf weevil on broad bean

@quickbugclips

Like

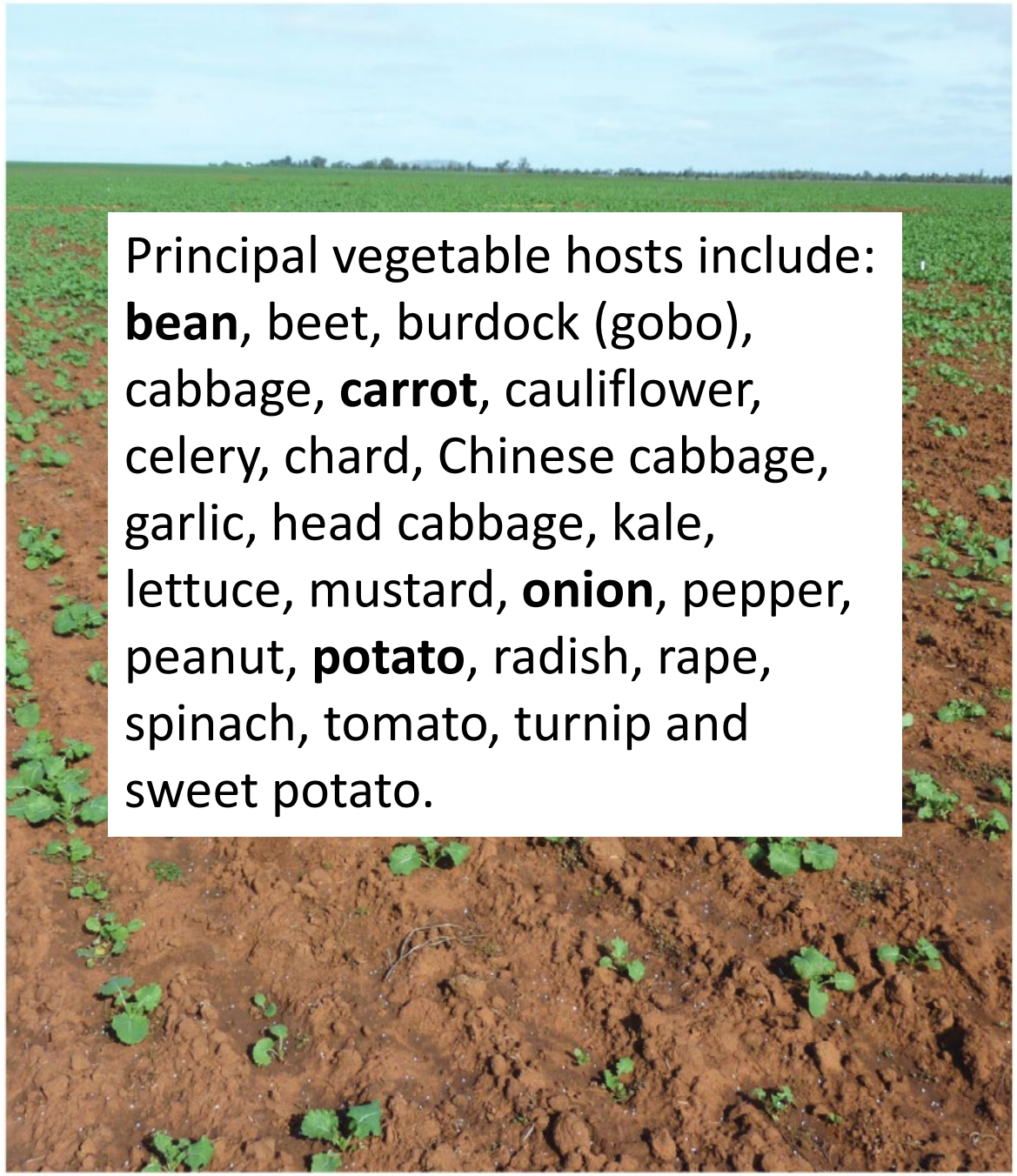
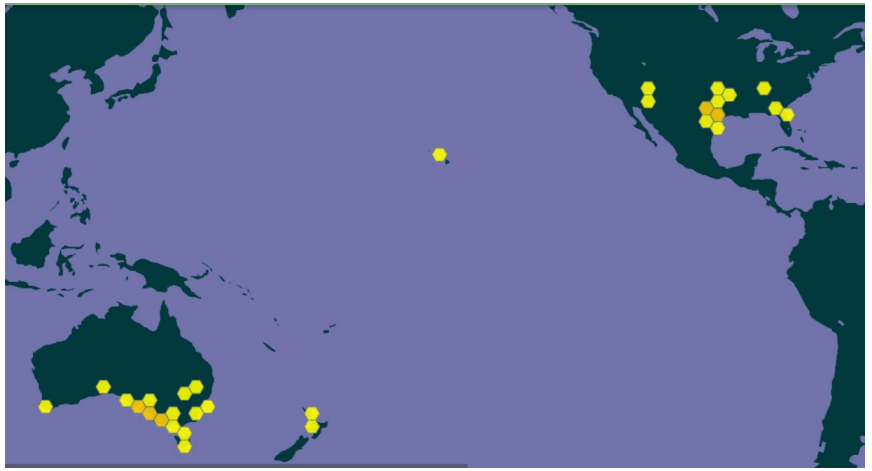


PHOTO: **cesar**

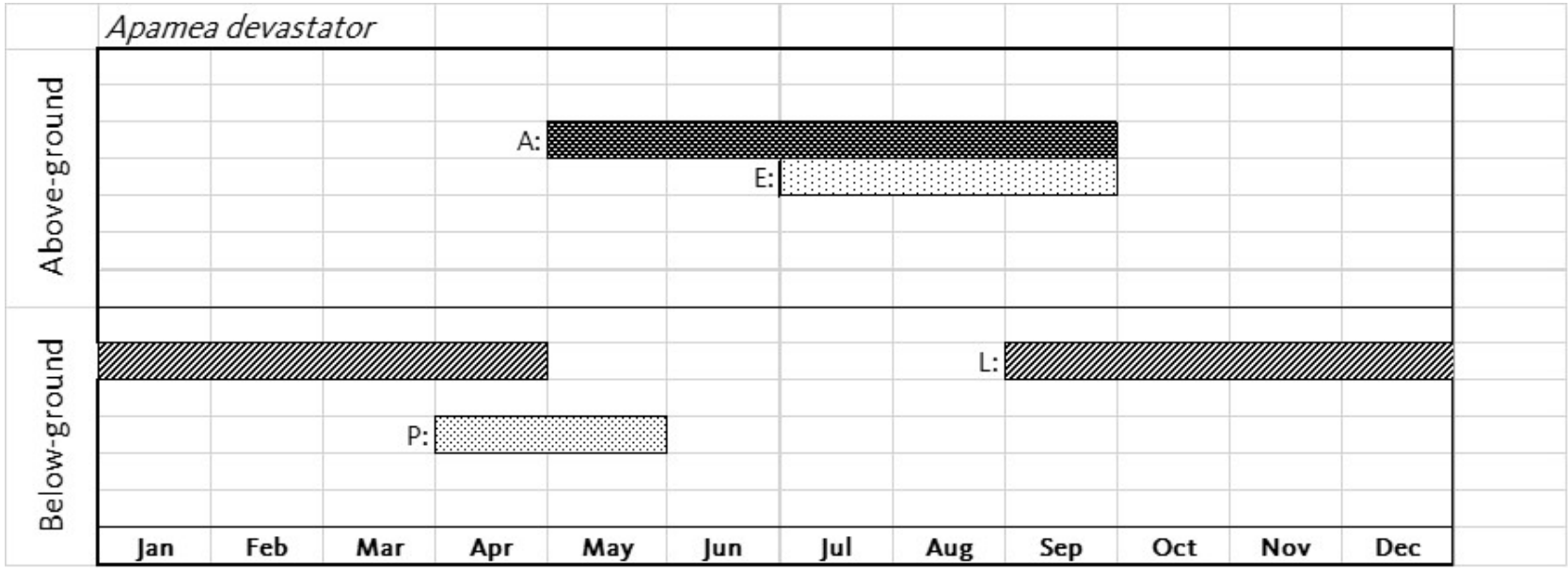
Vegetable Weevil ?

Listroderus difficilis



Glassy Cutworm

Apamea devastator

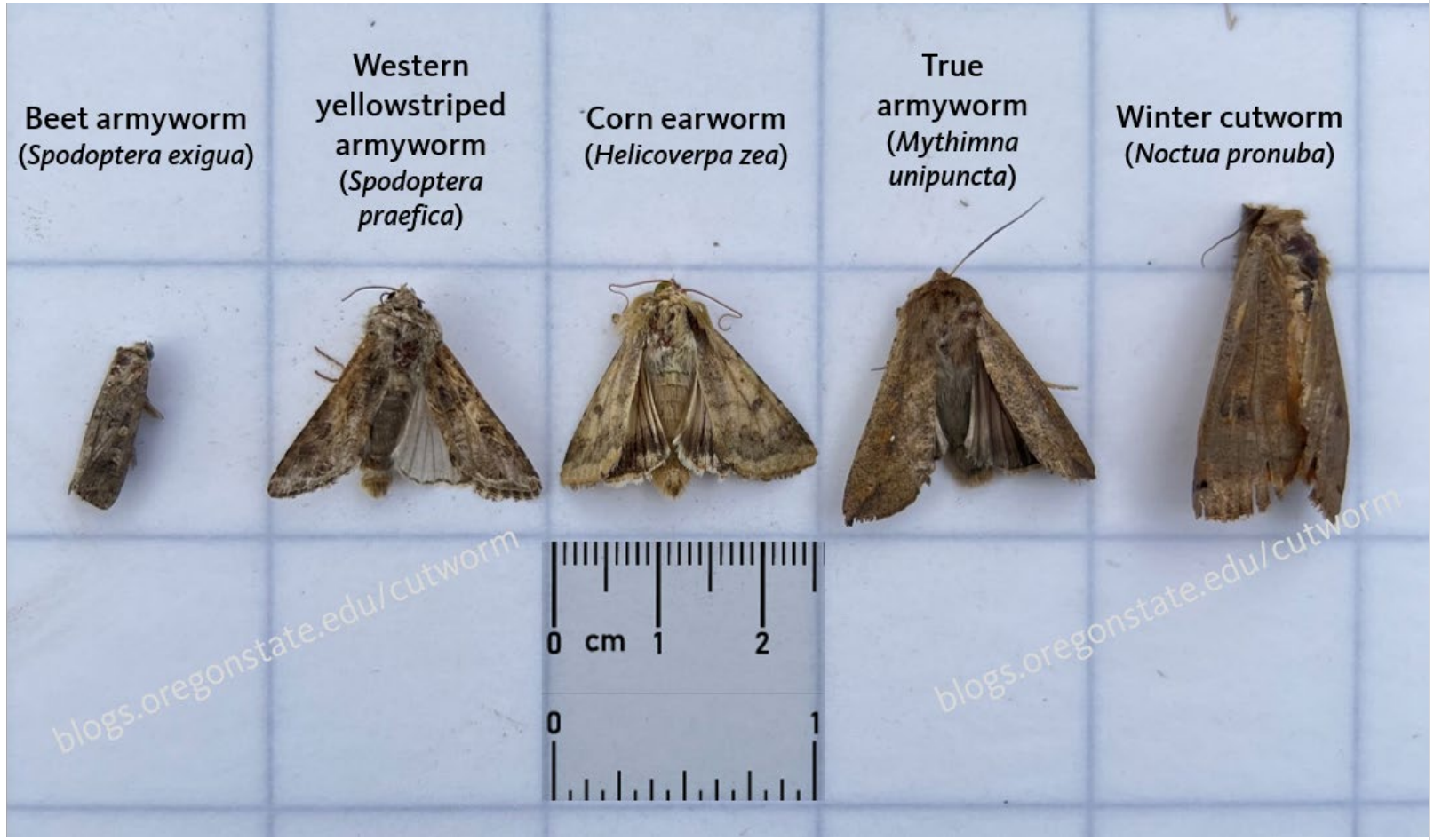


Glassy cutworms have reddish-brown heads and a darkened plate just behind the head.

Grass, cereals, **corn**. But when populations high enough, documented feeding on:

bean, **beet**, **cabbage**, **lettuce**, **radish**

Moth ID

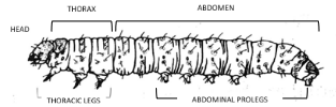


Oregon State University
Extension Service

Cutworm & Armyworm Identification

– quick guide reference –

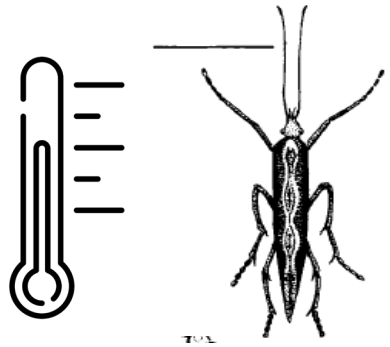
TRUE ARMYWORM *Mythimna unipuncta*	Prefers grasses and corn, but can be polyphagous. Alternate hosts include: brassicas, millet, common bean, pea, clover, radish, corn, and sunflower	Repeating lateral stripes of different colors, the ventral-most section may have a pinkish hue. Each proleg has a black tip. The head is small and eyes have a strong netting pattern. Feeds and moves across landscape in large groups	
GLASSY CUTWORM *Apamea devastator*	All grasses, especially fescue, reed canary grass, orchardgrass, and corn. If populations are high enough, feeding on cabbage, lettuce, bean, beets, and radish can occur	Translucent, whitish coloring, devoid of any identifying marks. Head is reddish-brown with a darkened plate on the thorax (just behind the head). Glassy cutworms feed near the soil surface, and also chew on roots and vegetative parts underground	
CLOVER CUTWORM *Anarta trifolii*	Clover and other legumes, peas, common lamb's quarters, beets, quinoa, lettuce, cabbage, elm, poplar, weedy mustards. More common East of the Cascades	Green or dark forms possible, a yellowish band is evident on the sides of the back, with black dashes just above it, spiracles surrounded by dark. Dorsally brown to gray, with a central line that can vary from faint pink to bright yellow	
VARIEGATED CUTWORM *Peridroma saucia*	Generalist feeders, larvae documented on 100+ species of plants including clover, dock, sugarbeet, and extensive damage to mint	Large and 'bulky', reddish-brown. Black dashes possible. In late stage larvae, a series of yellow dots is evident, but they do not extend the entire length of the body. Winter cutworm looks similar but does not have yellow spots on back	
BLACK CUTWORM *Agrotis ipsilon*	A generalist feeder, common on corn and herbaceous vegetables, but known to feed on 50+ plants, incl. sugarbeet	Overall 'greasy' appearance, body a uniform color, one may see pairs of uneven black spots on the back of each segment. Head is brownish with spots or netting pattern on the eyes, depending on age	



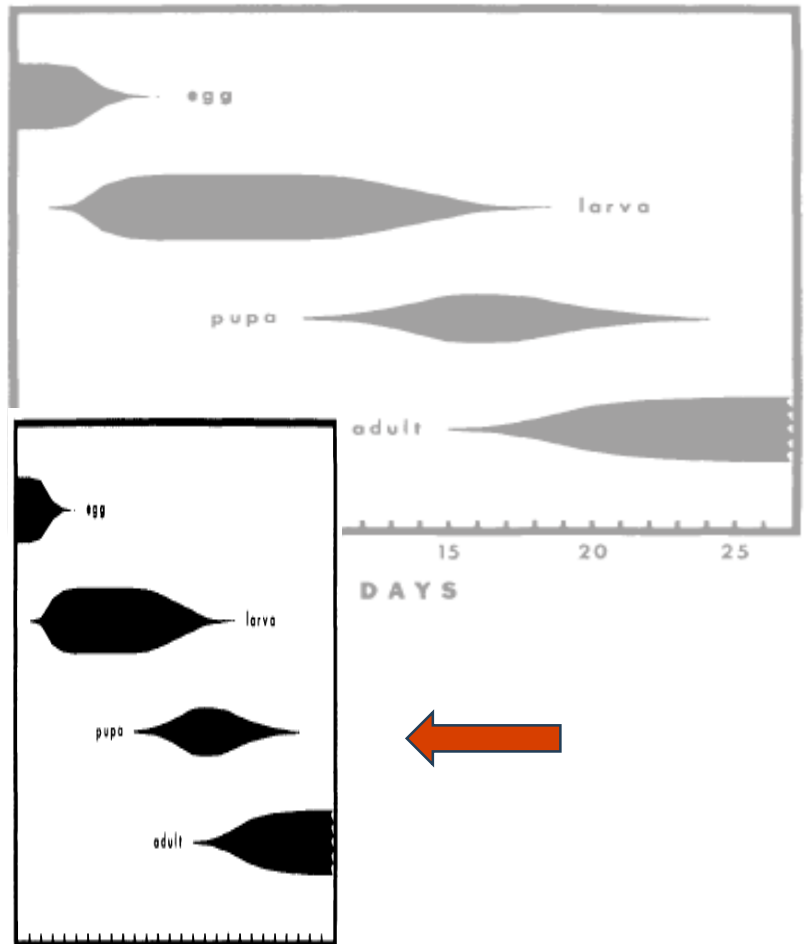
For more infomation:
jessica.green@oregonstate.edu
https://beav.es/Zqg

http://beav.es/Zqg

Diamondback Moth



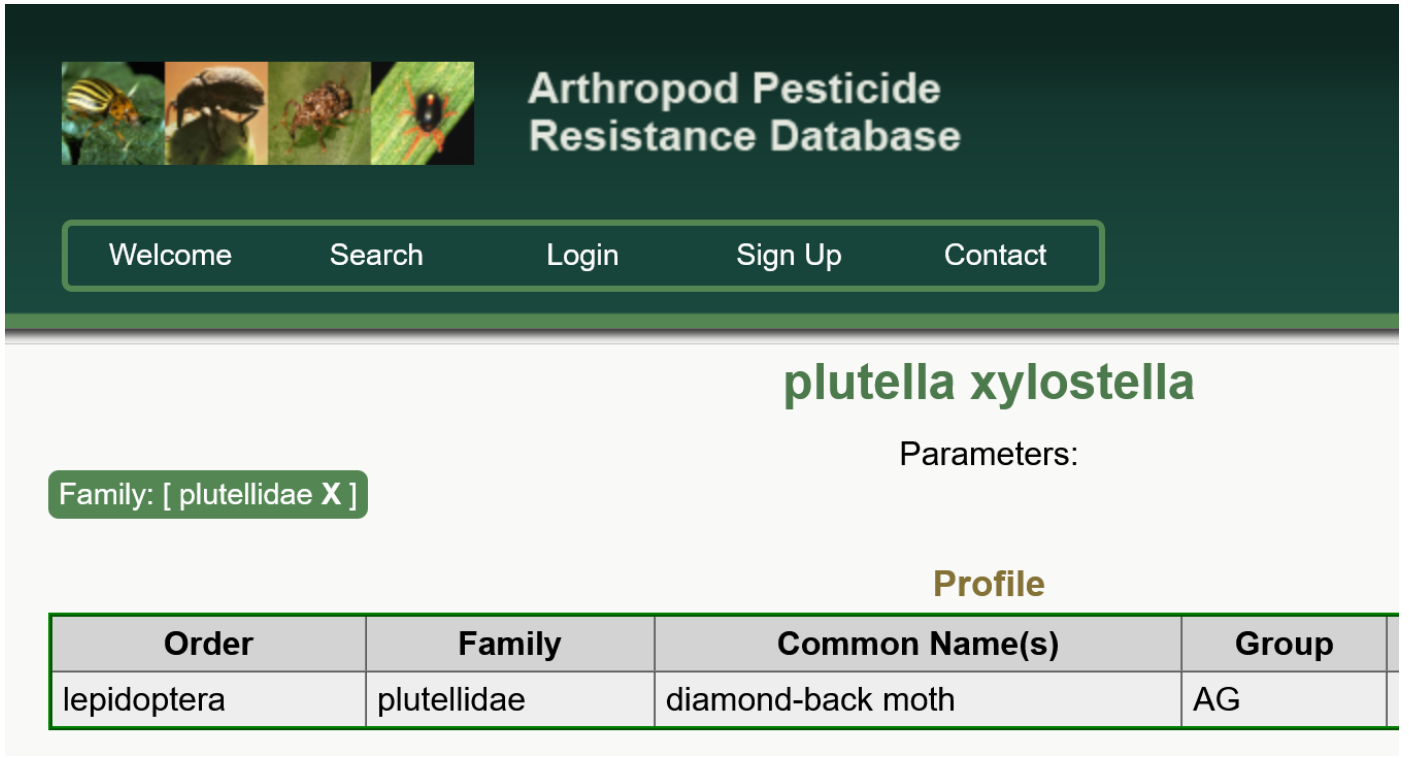
- Many generations per year
- Development
  - 60°F = 27 days
  - 80°F = 11 days !



Diamondback Moth

Insecticide Resistance (IR)

- 101 a.i.s
- 141 publications
- 596 locations



HA – CA – OH – FL – GA – TX - NY

Diamondback Moth

OR – WA – ID ??

Insecticide Resistance (IR)

Preliminary assays

% mortality

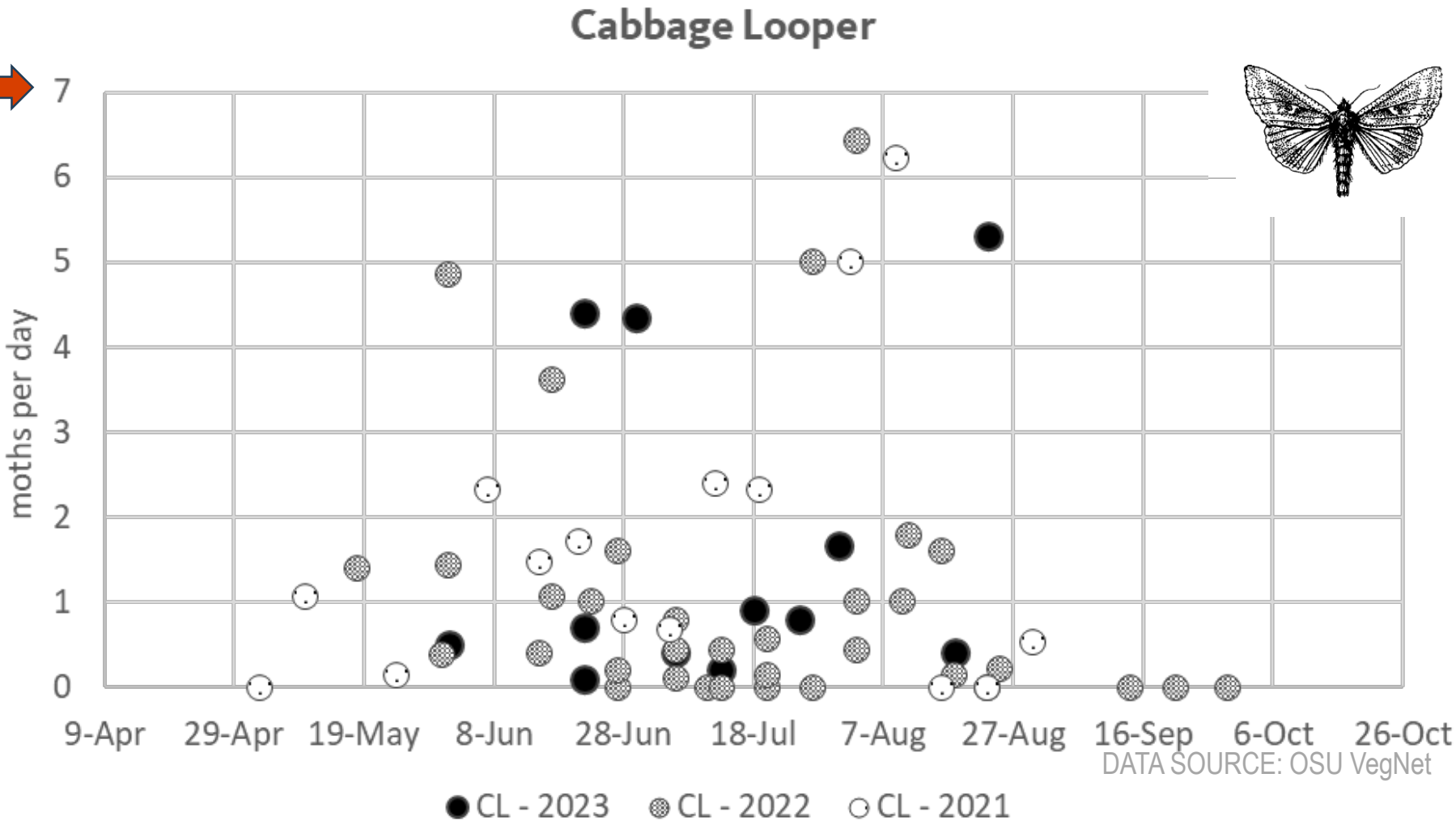
Z-cypermethrin [3]
spinetoram [5]
cyantraniliprole [28]

IRAC GROUP	Active ingredient	Population	% mortality – DIAMONDBACK [a]	% mortality – LOOPER [a]
3A	z-cypermethrin	MTAG	33	100
	(Mustang Maxx)	STLU	33	100
		CVRO	40	100
		BRKS	83	---
5	spinetoram	MTAG	33	100
	(Radiant)	STLU	33	100
		CVRO	40	100
		BRKS	100	---
28	cyantraniliprole	BRKS	67	---
	(Exirel/Verimark)			

Cabbage Looper

vs.

108-184 moths per day (2019)



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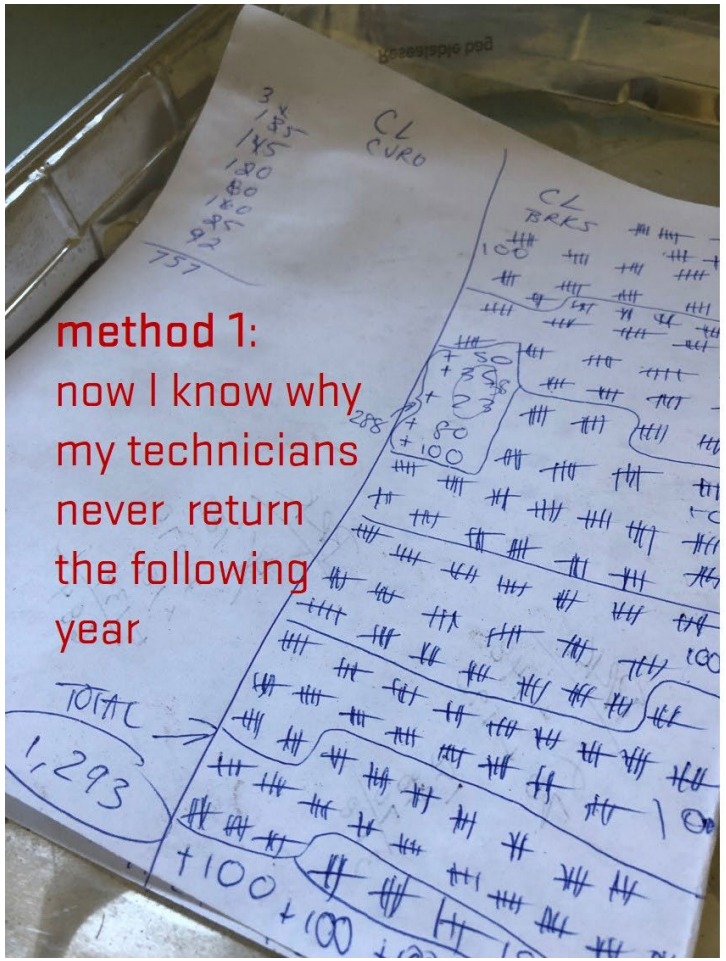
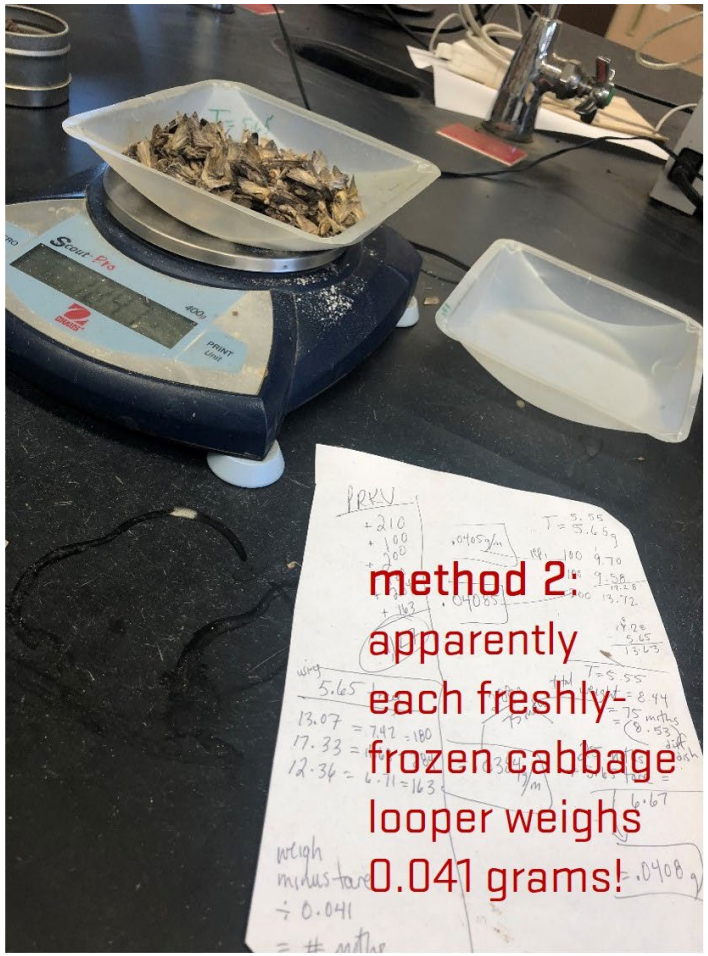




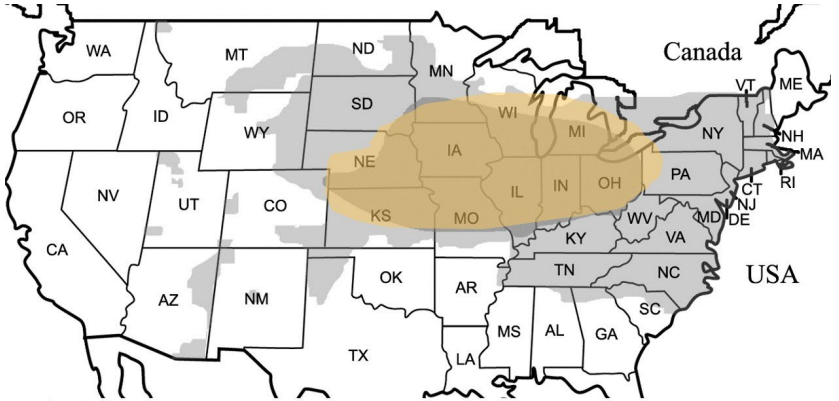
"Necessity is the mother of invention."

Western Corn Rootworm

- Range
- ODA survey (2018)
- OIPMC intern (2023)

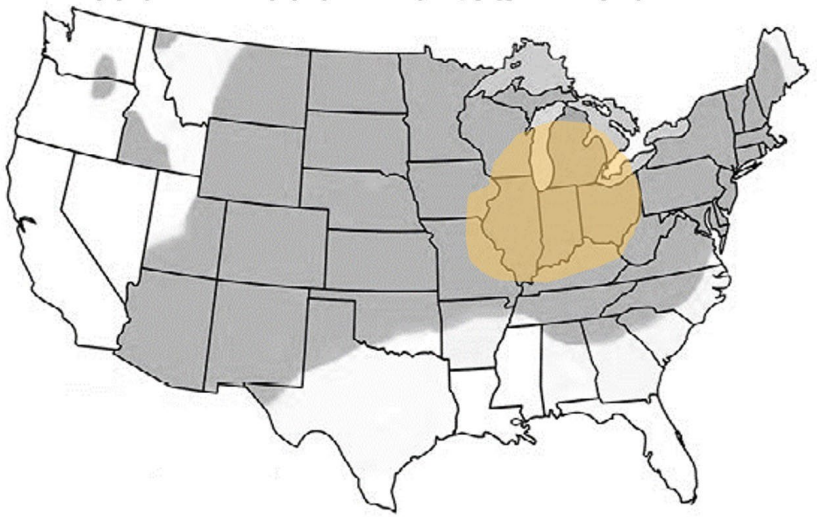
2014. Western corn rootworm in eastern Oregon, Idaho, and eastern Washington. PNW 662.
A. Murphy, S.Rondon, C. Wohleb, S. Hines.

2004



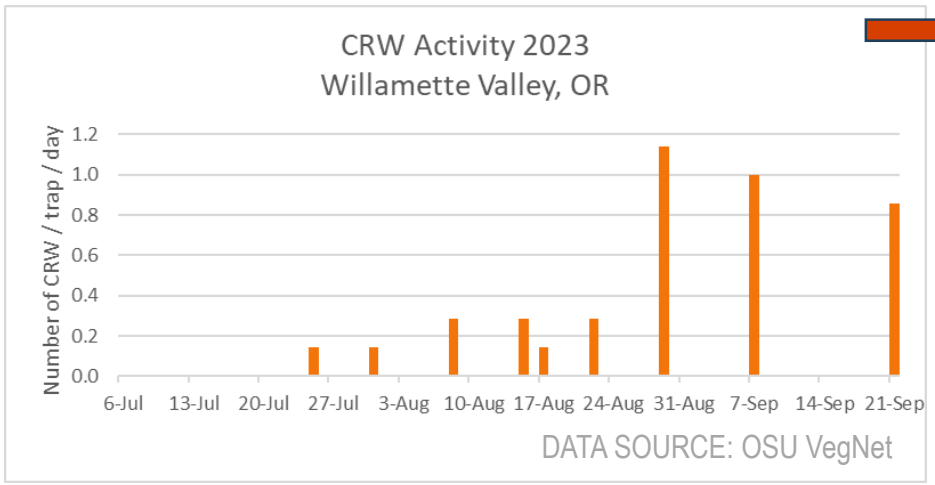
Range of Activity
Greatest Impact

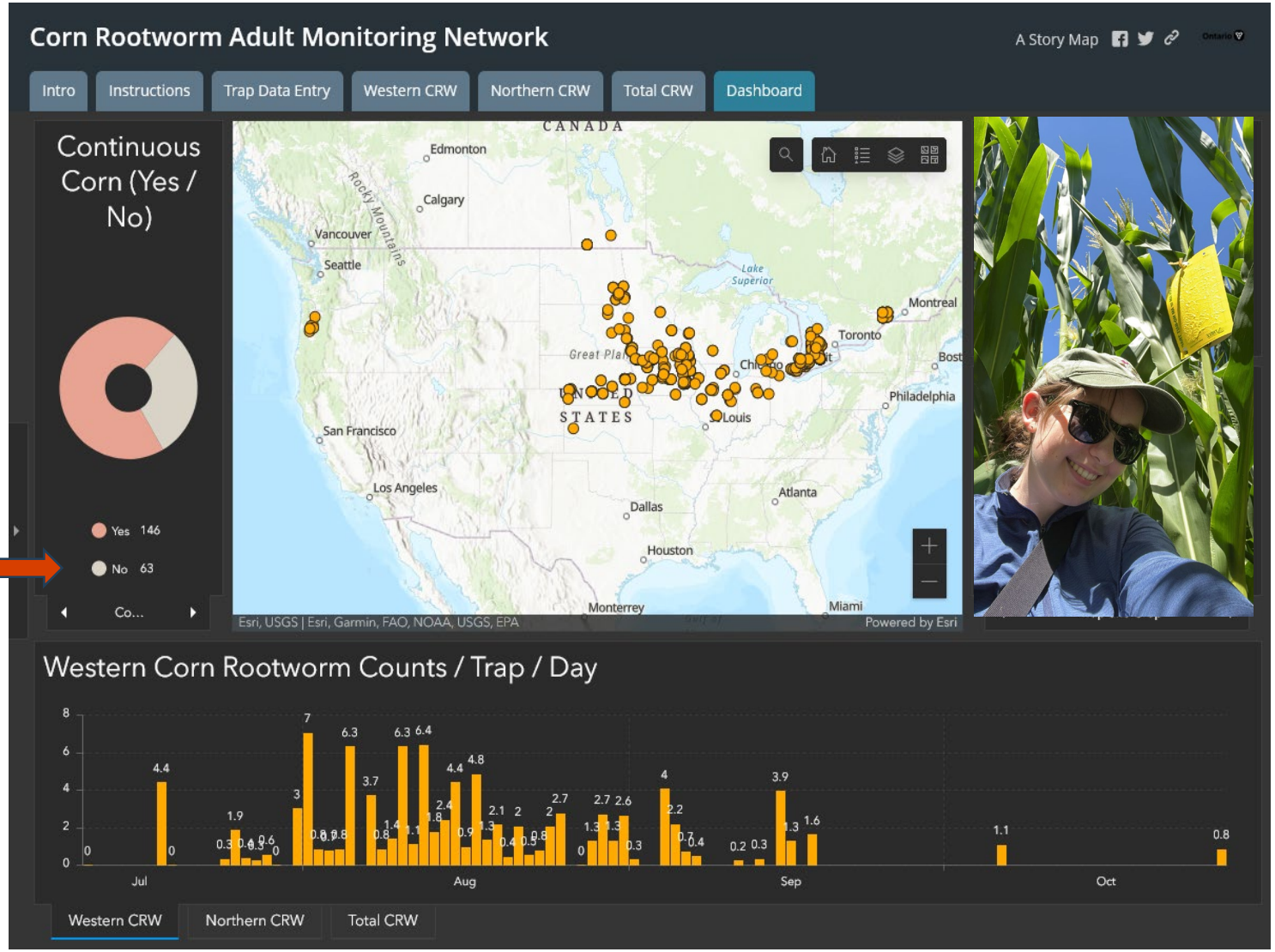
2014



2024 ?

Corn Rootworm Network Partner Logos





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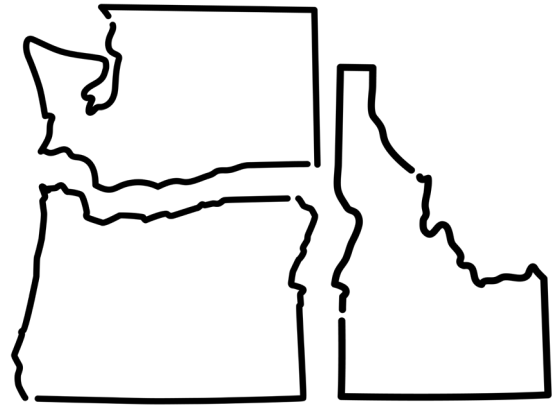

USPEST.org

Oregon Pest Monitoring Network

Cutworm ID

Diamondback Resistance

Looper Outbreaks

Rootworm Survey

VegNet blog

Thank You!

jessica.green@oregonstate.edu

Oregon State University
Oregon IPM Center

OREGON PROCESSED VEGETABLE COMMISSION

Beans - Beets - Broccoli - Carrots - Cauliflower - Sweet Corn

USDA This project was funded in part by the USDA National Institute of Food and Agriculture, through the Western Integrated Pest Management Center.

Western IPM Center