Seed Corn Maggot (*Delia platura*) Management

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Overview

- Current status
- Life cycle
- Management
  - Model use
  - Labeled products
  - Cultural control
- IR-4 trials
- Conclusions
- Future research needs

Magnified image of a seedcorn maggot.

Photo Source: Lindsey du Toit, Washington State University

Taking an Integrated Approach to Control

Cover crop termination timing

Manure timing

PLANTING DATE!

In-furrow or seed treatment pesticides

Crops Impacted

Onions

Corn

Beans

Cucurbits

Carrots

Parsnip

Crops with slow germination and emergence are particularly vulnerable!!!

Searching for egg-laying locations in decaying OM

Pupal stage

Emerging Adults

Egg laying

2-4 days

Larvae

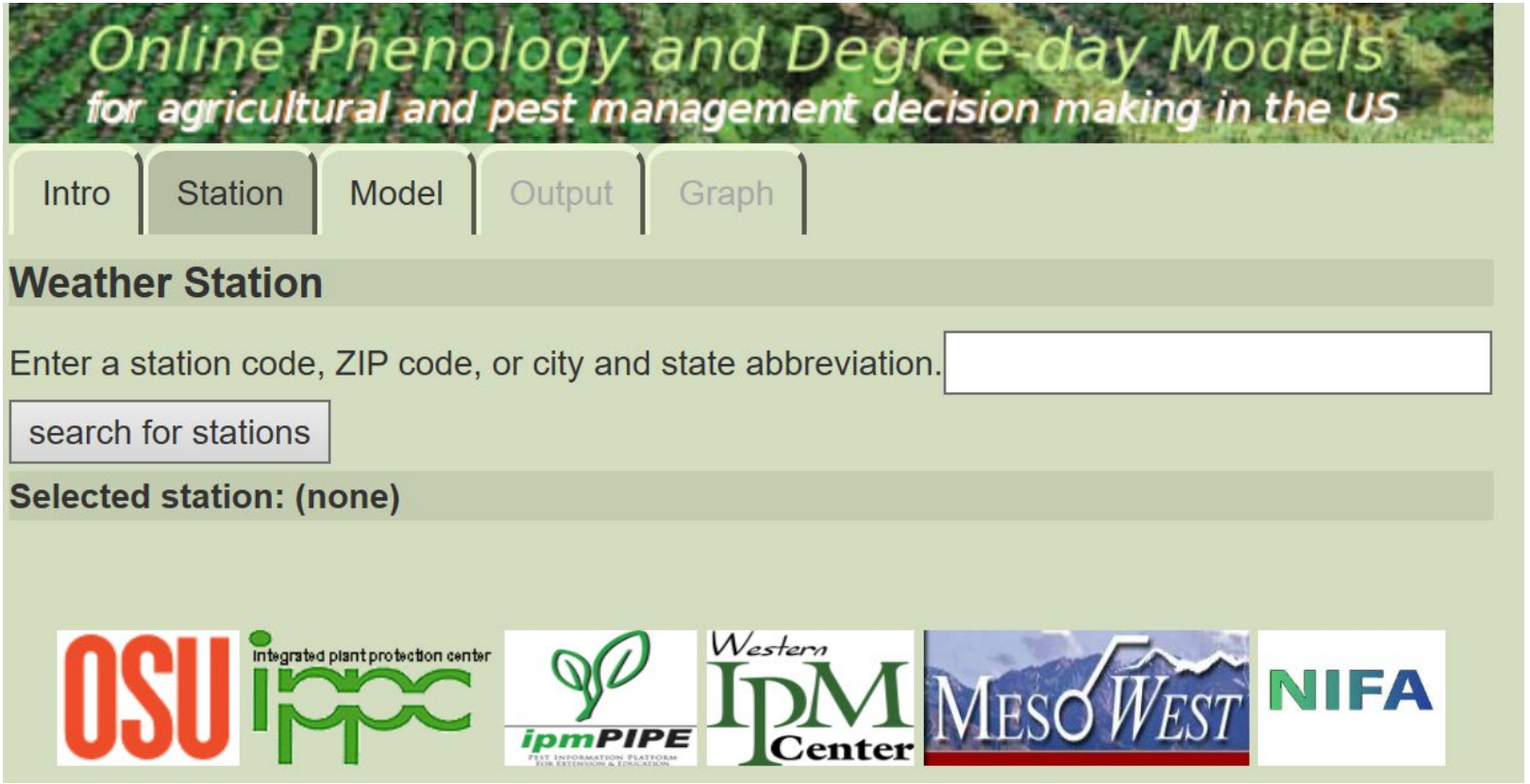
Crop feeding stages

Life cycle
3-4 weeks

Holm and Cullen, Insect IPM in Organic Field Crops: Seedcorn maggot, UW Extension A3972-01

Degree day modeling

- Successfully predict periods of high egg-laying potential
- Enables farms to alter planting dates to avoid peak populations
- Can be highly effective
- Used as a combined approach



https://uspest.org/dd/model_app

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

Intro | Station | Model | Output | Graph

seedcorn maggot [corn, soybean]
insect model of WI State, PA State, IA State

Model Inputs

Model species/general links	seedcorn maggot [corn, soybean]
Type	insect
Model source/other links	WI State, PA State, IA State
Calculation method	simple average
Lower threshold	39°F
Upper threshold	84°F
Directions for starting/BIOFIX	Calendar date Jan. 1
Starting date	standard date 1-1 2023
Ending date	default date 12-31 2023
Model validation status	testing
Region of known use	PA, SD, MN, IA, other Midwest & E. US states
Extended forecast type	no forecast

Events Table

DDs(F) after Jan 1st	Model Event
360	Peak adult emergence and egg laying
414	egg hatch, larval feeding begins
781	pupation, end larval feeding
1116	2nd gen adult emergence and egg laying
1170	2nd gen larval feeding begins
1537	2nd gen pupation, end larval feeding
1872	3rd gen adult emergence and egg laying
1926	3rd gen larval feeding begins
2293	3rd gen pupation, end larval feeding

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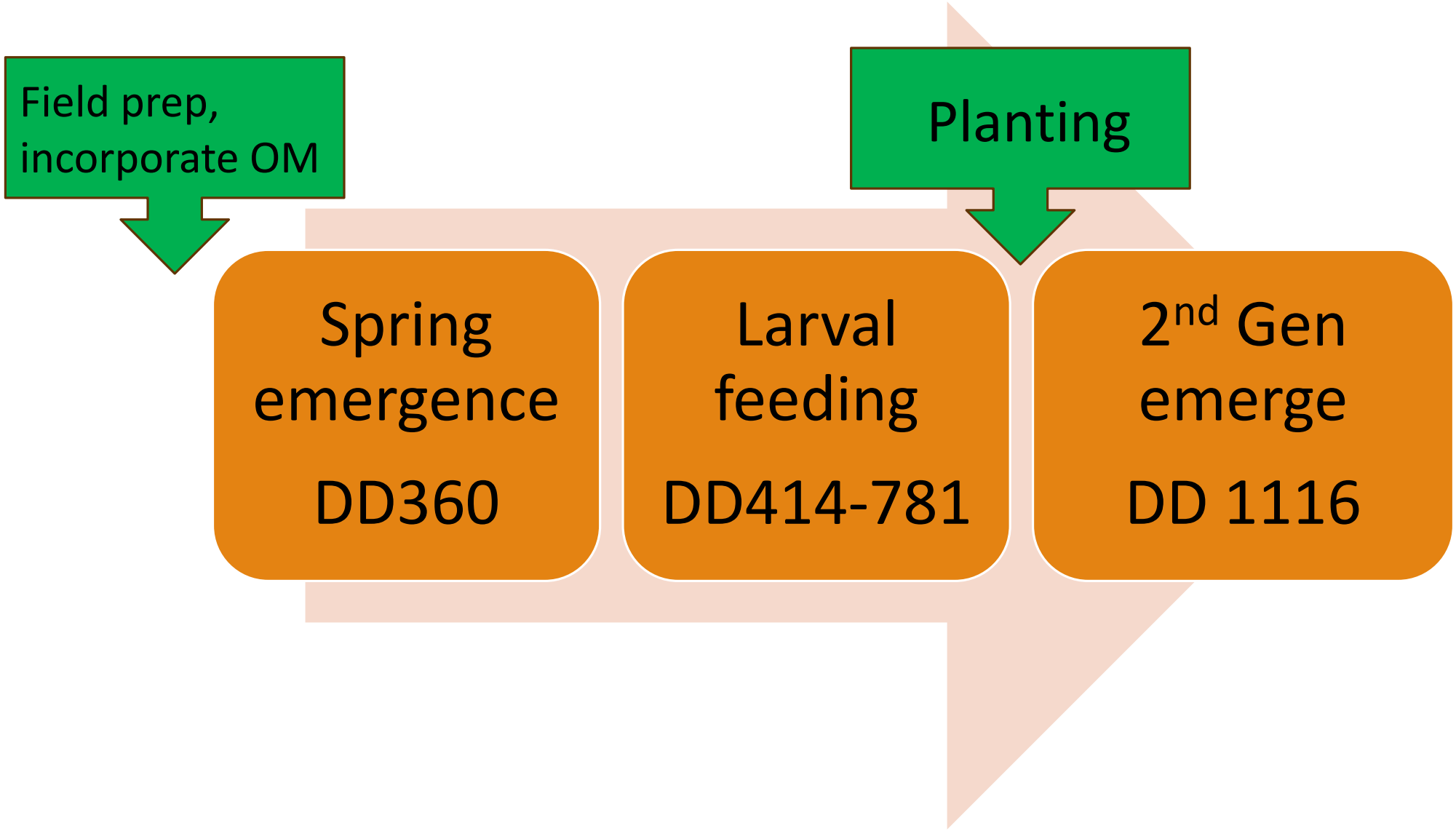
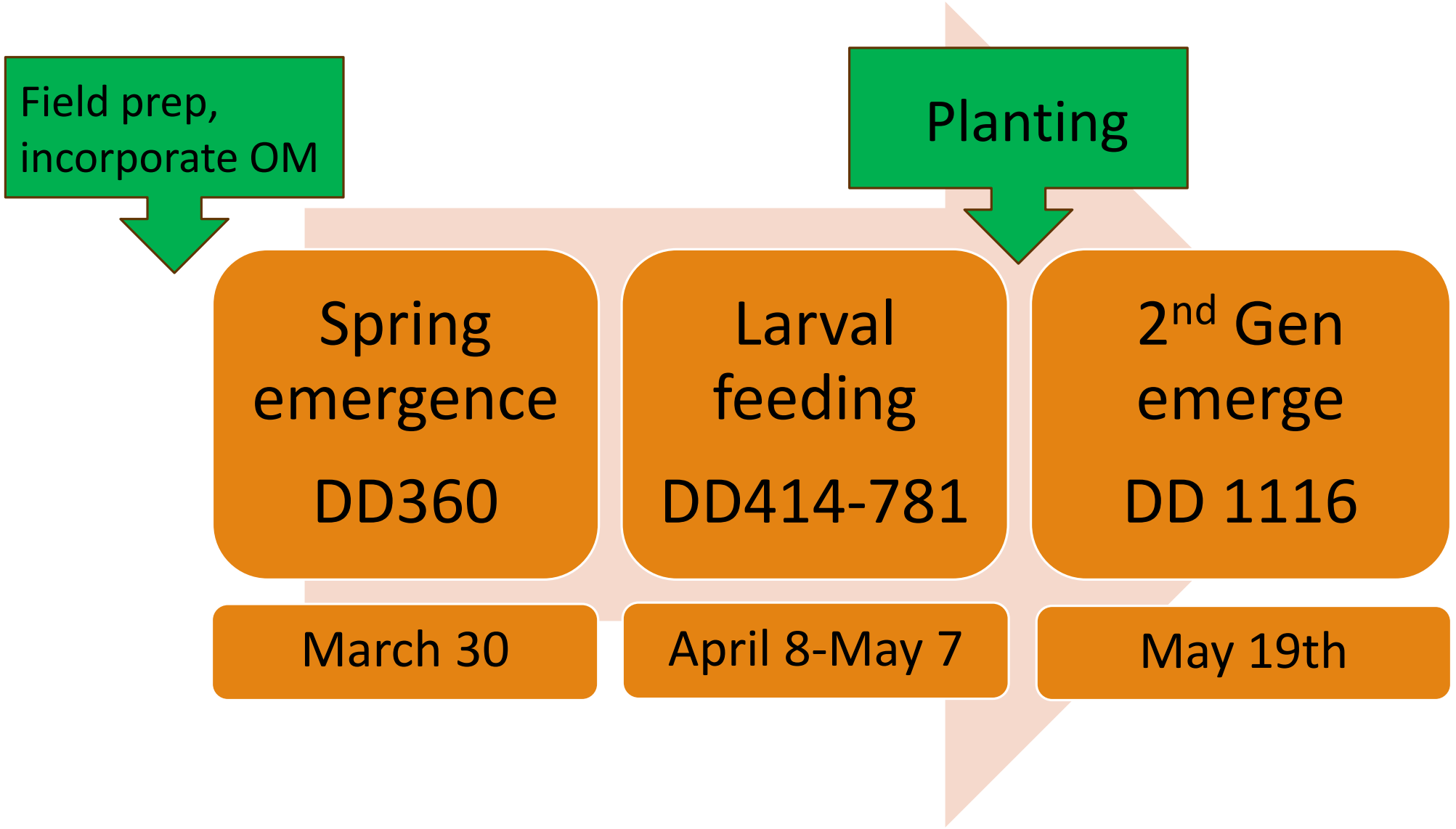
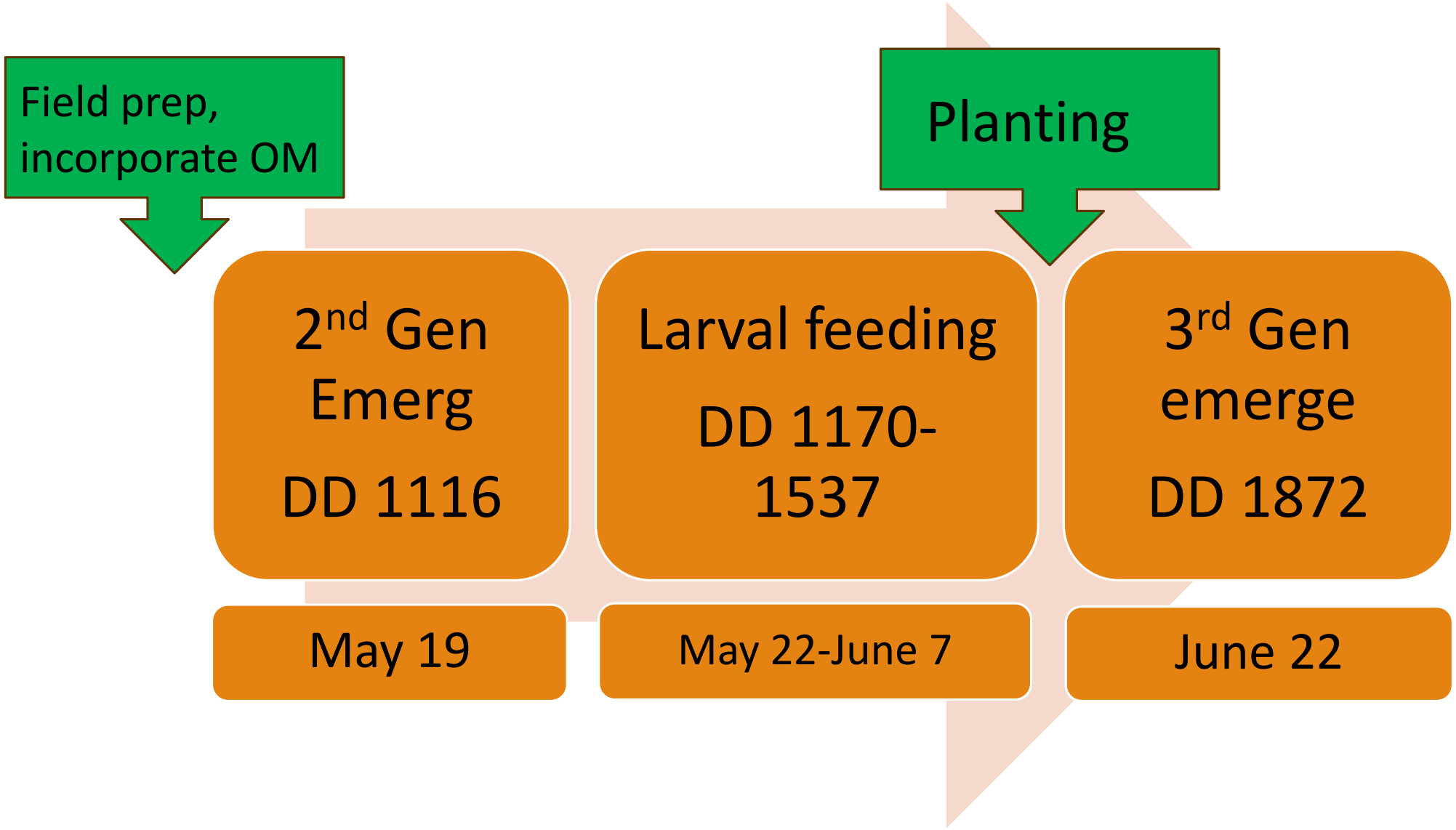

Field prep, incorporate OM
Planting
Spring emergence
DD360
Larval feeding
DD414-781
2nd Gen emerge
DD 1116

2023 Example—Willamette Valley Early Season



2023 Examples Continued Willamette Valley Late Spring



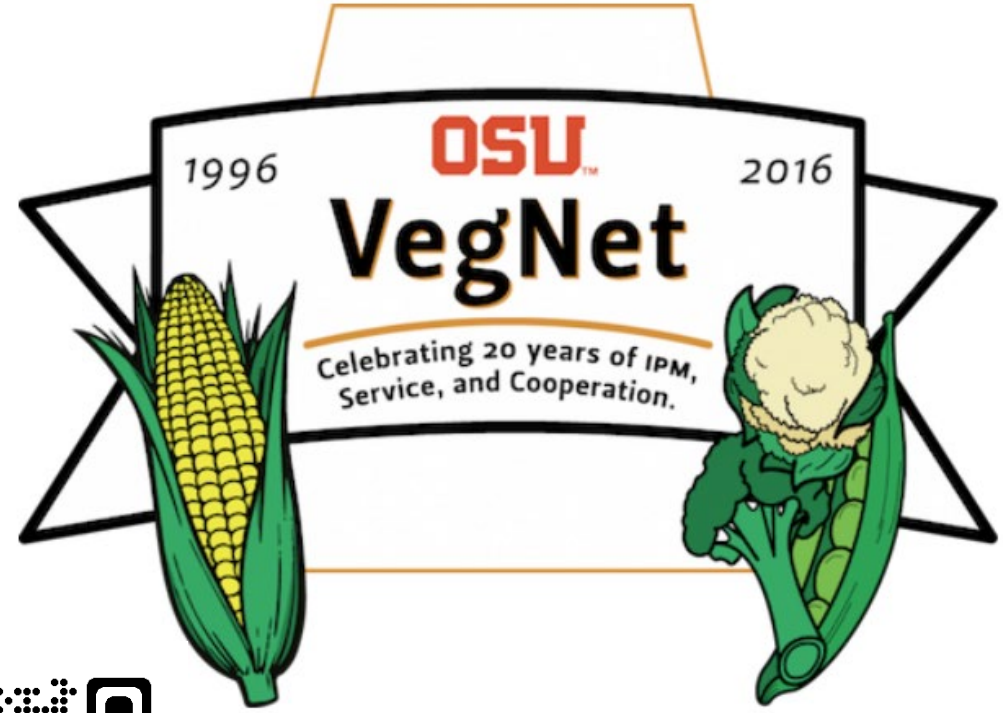
Take-aways

1st generation might be difficult to provide sufficient field prep before emergence

Planting between pupal stage and next generation emergence seemed to work well in 2021 and 2022 (Willamette Valley and Hermiston fields).

Ideally, keep up to date with online DD model as spring progresses

Two regional pest monitoring options



WASHINGTON STATE UNIVERSITY
EXTENSION

WSU VEGETABLE ALERTS

For best results,
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IR-4 Work

- Parsnip
  - Small seeded
  - Very slow emergence
  - Highly susceptible to SCM damage
- Some evidence in snap beans of higher stand counts with Spinosad seed treatment as an option for organic growers
- Sampled for:
  - Emergence
  - Early infestations

Product (EPA Reg. No.)	A.I.	Application Method[1]
Untreated (N/A)	N/A	N/A
Diazinon AG500 (66222-9; SLN OR 180003)	Diazinon	In-furrow
MBI-306 (N/A)	Burkholderia spp Strain A396	Seed treatment
Entrust (62719-282)	Spinosad	Seed treatment
Capture LFR (279-3302)	Bifenthrin	In-furrow

Capture LFR provided highest stand count

Results were variable between sample dates

Treatment means for emerged parsnip seedlings in 2022

Treatment	Cotyledon stage*	% above UTC	True leaf stage*	% above UTC
Untreated	3.62 ab	--	4.62 a	--
Diazinon AG500	5.81 bc	60%	4.62 a	--
MBI-306	3.25 a	--	4.94 ab	7%
Entrust	3.50 ab	--	4.88 ab	5%
Capture LFR	7.69 c	112%	7.62 b	65%

* Means with different letters are significantly different within sample date using Tukey-Kramer adjustment for multiple means comparisons.

Conclusions

- Seed corn maggot can be a pest in many vegetable crops
- Most susceptible are crops that are slow to germinate and emerge
- Organic crops may benefit from Spinosad seed treatment
- High organic matter inputs can be a source of attraction
- Degree day modeling can reduce risk

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