Insect Control: *Challenges & Solutions*

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Chlorpyrifos Update

Aug. 2021: EPA revoked all food crop tolerances

Nov./Dec. 2023: 8th Circuit Court vacated the chlorpyrifos revocation

Current status: state-specific, evolving

ND: only Pilot 4E and Pilot 15G registered for beets in 2024

– NO other branded products, period

– NO unused, leftover product

MN: conditional registration thru Dec. 2024 (3 possible registrants)

– follow BMPs

More info.: NDSU Extension, agriculturists, consultants

Other Regulatory Updates

- Midac (imidacloprid); a neonicotinoid insecticide
  - Sept. 2022: EPA postponed imidacloprid review completion to 2024
  - Paused Vive's sale of Midac to retailers
  - Midac in supply chain can be sold & applied to sugarbeet
  - Vive anticipates newly labeled product for 2025

Springtail Trial

Location: Prosper, ND

Planting Date: July 7

Plot size: 2 rows X 25 ft long

Design: Randomized Complete Block; 4 replications

Assessments: plant stand counts, yield, revenue

Insecticide Programs for Springtail Control – Prosper, ND, 2023

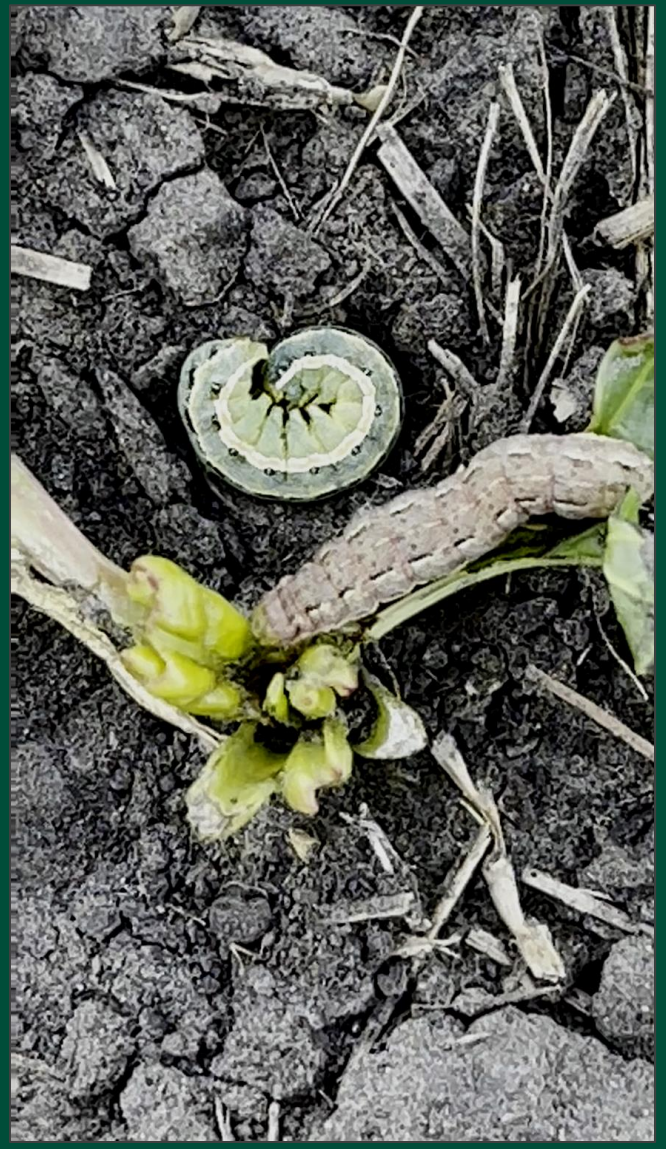
Planted: July 7, 2023 Treatment	RSA (lb/ac)	Root yield (tons/ac)	Revenue/ ac	Gain over Check
Poncho Beta + Mustang Maxx 4 fl oz DIF	6,586 a	26.2 a	$937	$595
Counter 20G 8.9# Band	5,054 ab	19.9 ab	$733	$391
Counter 20G 5.9# Band	4,735 b	19.5 b	$641	$299
Poncho Beta + Movento HL 2.5 fl oz 10” Post Band	4,671 b	18.9 b	$650	$308
Counter 20G 4.5# Band	4,523 b	18.5 b	$615	$273
Poncho Beta + Midac FC 13.6 fl oz DIF	4,447 b	18.5 b	$588	$246
Mustang Maxx 4 fl oz DIF	4,354 b	18.3 b	$564	$222
Midac FC 13.6 fl oz DIF	4,093 bc	17.1 b	$539	$197
Poncho Beta	3,552 bc	15.4 bc	$438	$96
Check	2,553 c	10.5 c	$342	---
LSD (0.10)	1,724.7	6.54		

NS

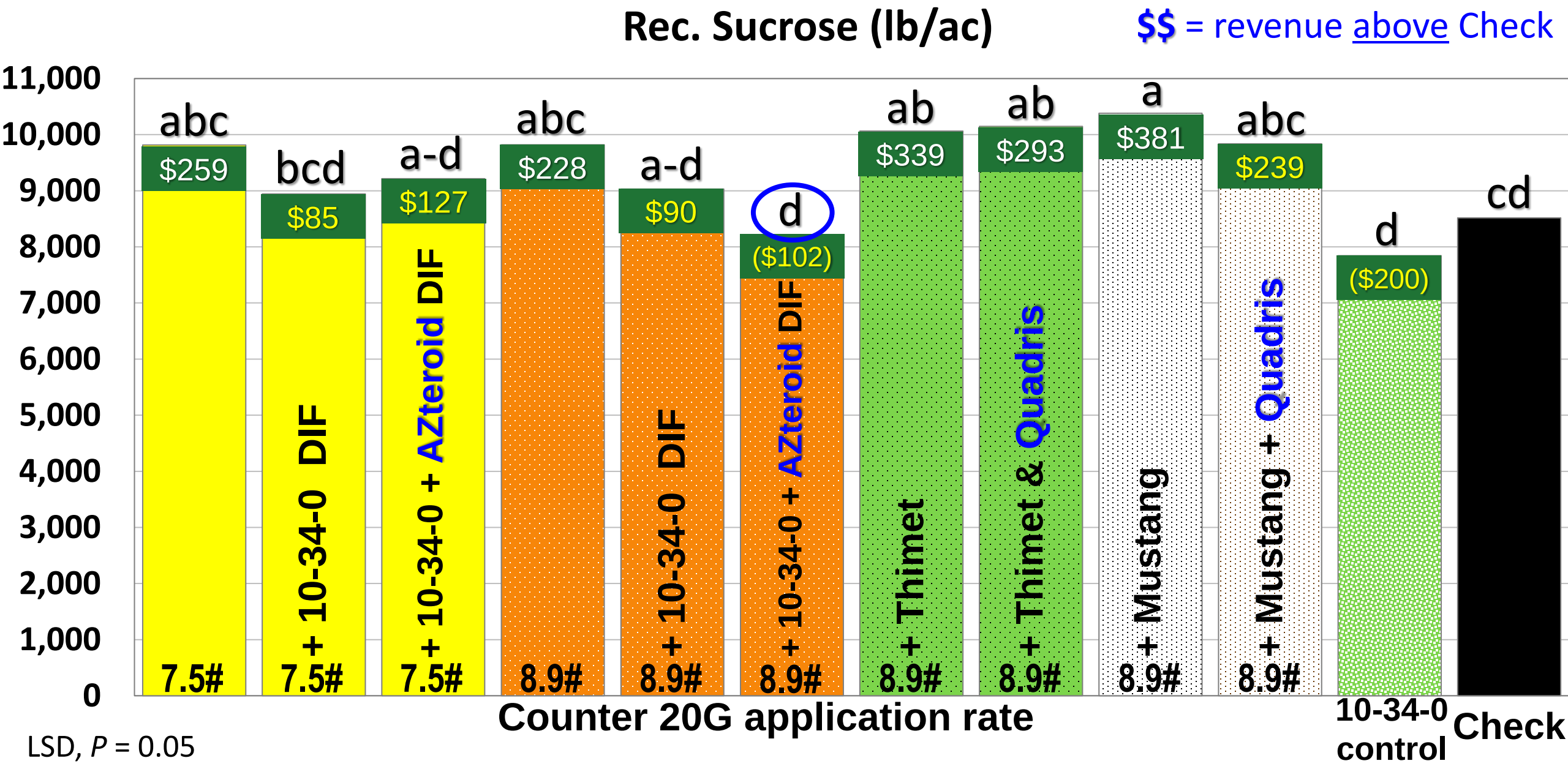
Summary: springtail trial

- Best plant stand protection & yield:
  - Poncho Beta + Mustang Maxx 4 oz DIF
  - Counter 20G @ 8.9 lb
- Poncho Beta alone vs. P. Beta + Movento (10” POST Band):
  - Numerical (NS) increases in stands & yield; $212/ac revenue increase
- Poncho Beta + Mustang Maxx:
  - greater stands & yield than either product alone
  - over $200/ac greater revenue than any other treatment
- Poncho Beta + Midac:
  - greater stands & yield than either product alone
  - ~$50 to $150 more rev. “ “ “ “

Sugarbeet Root Maggot Control



Combining Insecticides and Azoxystrobin Fungicide Applications
Root Maggot site, St. Thomas, ND, 2022-2023



LSD, *P* = 0.05

Single Post Sprays to Control SBRM: (*high* infestations, 2015-2020)

At-plant	Post Spray	RSA	$$/ac above check
Counter 8.9# B	chlorpyrifos 2 pts	9,059 a	$340
Counter 8.9# B	chlorpyrifos 1 pt	8,850 ab	$312
Counter 7.5# B	chlorpyrifos 2 pts	8,674 ab	$258
Poncho Beta	chlorpyrifos 2 pts	8,654 ab	$281
Counter 7.5# B	chlorpyrifos 1 pt	8,445 bc	$260
Poncho Beta	chlorpyrifos 1 pt	8,417 bc	$261
Counter 8.9# B		8,042 cd	$203
Counter 7.5# B		8,036 cd	$195
Poncho Beta		7,842 d	$176
Check		6,526 e	---
	LSD (0.05)	**567.5**	

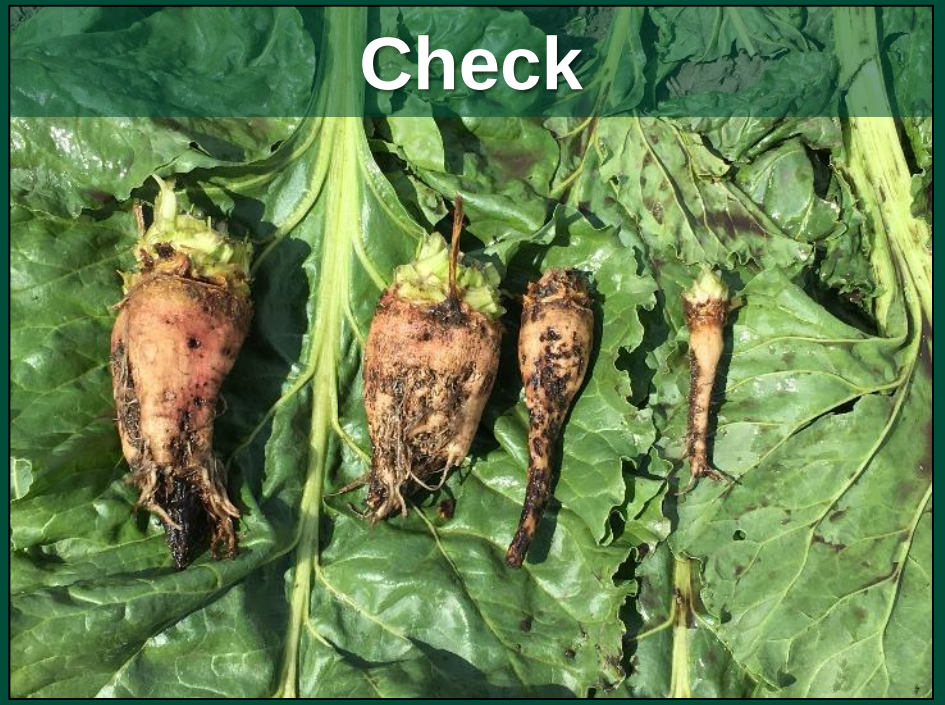
NS

Counter 8.9 lb

Ctr 8.9 lb + Lor Adv 2 pts

P-Beta + Lor Adv 2 pts

Check



Single, Dual & Triple Applications for SBRM Control: 2016 – 2020

At-plant		Post	RSA (NS)	$$/ac above check
Poncho Beta	Counter 8.9#	Lorsban Advanced 1 pt	9,569 a	$402
Poncho Beta	Counter 8.9#		9,398 ab	$398
Counter 8.9#		Thimet 7#	9,323 ab	$393
Poncho Beta		Counter 8.9#	9,222 ab	$376
Counter 7.5#		Thimet 7#	8,901 abc	$301
Poncho Beta		Thimet 7# + Lors. Adv 1 pt	8,818 bc	$301
Counter 8.9#			8,418 c	$250
Poncho Beta		Thimet 7#	8,296 c	$226
Poncho Beta			8,286 c	$240
Check			6,591 c	---
		LSD (0.05)	**677.9**	

Poncho Beta +
Counter 8.9#
At-plant Band

Poncho Beta +
Counter 8.9# Post B

P-Beta +
Ctr 8.9# At-plant +
Lors. Adv. 1pt
Post Broadcast

Check

Postemerge Insecticides & Exponent Synergist for SBRM Control
St. Thomas, ND – 2023

At-Plant	Post (6d after Peak Fly)	Feeding Injury (0-9)	Rec. Sucrose (lb/ac)	Tons/ac	$/ac above Check
Counter 20G 7.5 lb	Mustang Maxx + Exponent	1.55 cde	11,309.3 a	36.5 a	$1,177
Counter 20G 7.5 lb	Asana + Exponent	1.83 cd	10,808.8 ab	35.9 ab	$981
Counter 20G 7.5 lb	Mustang Maxx + Asana (10 d)	0.73 e	10,346.5 ab	33.5 ab	$941
Counter 20G 7.5 lb	Mustang	1.28 de	9,660.6 ab	31.8 ab	$735
Counter 20G 7.5 lb	Asana	1.48 cde	9,570.6 b	31.7 ab	$701
	Exirel 20 fl oz/ac	3.13 b	9,529.3 b	31.9 ab	$666
	Mustang Maxx	3.13 b	9,367.7 bc	31.9 ab	$592
	Exirel 13 fl oz/ac	4.20 a	9,166.5 bc	30.7 bc	$584
Counter 20G 8.9 lb		2.35 bc	9,112.3 bc	31.6 ab	$491
Counter 20G 7.5 lb		2.90 b	7,683.0 cd	26.1 c	$220
CHECK		4.93 a	6,355.1 d	20.5 d	---
	LSD (0.05)	0.98	1,714.8	5.40	NS

NS

Exirel®: cyazypyr, or cyantraniliprole

- Alt. mode of action (Diamides)
  - Recently registered for use in sugarbeet
  - Foliar application only
  - Product cost @ 20-oz rate: $60+/ac

Midac FC & Counter 20G for SBRM Control: 2020-2022

Treatment	Rec Sucrose (lb/ac)	Tons/ac	Revenue Gain ($$/ac) above check
Counter 20G Band 8.9 lb prod./ac	8,051 a	25.0 a	$365
Counter 20G Band 7.5 lb prod./ac	7,718 a	24.3 ab	$289
Midac FC **DIF*** 13.6 fl oz prod./ac	7,412 a	23.0 b	$249
Check	6,055 b	18.9 c	---
LSD (0.05)	**659.9**	**1.73**	

***DIF** = dribble in-furrow

Counter 7.5#

Midac DIF

Check

What if I only have *moderate* SBRM pressure?

Counter 7.5#

Ctr 7.5# + Lor Adv 2 pts

Check

Poncho Beta

PBeta + Lor Adv 2 pts

Thompson, ND, 2018

Thompson, ND, 2018 (moderate SBRM pressure)

Single Post Sprays to Manage *Moderate* SBRM Infestations: 2016-2018

Treatment	RSA	Tons/ac	$$/ac above check
	NS	NS	
Counter 7.5# B + Lorsban Adv. 2 pt	9,837 a	32.6 a	$245
Poncho Beta + Lorsban Adv. 2 pt	9,532 ab	31.4 ab	$217
Counter 7.5# B + Lorsban Adv. 1 pt	9,498 abc	31.1 ab	$224
Poncho Beta + Lorsban Adv. 1 pt	9,325 abc	30.8 abc	$187
Counter 8.9# B	8,919 bc	29.1 bcd	$159
Counter 7.5# B	8,800 bc	28.7 cde	$145
Poncho Beta	8,754 c	28.5 de	$144
Check	7,881 d	26.4 e	---
LSD (0.05)	**760.9**	**2.31**	

Summary: root maggot control

- Aggressive approach (at-plant and/or POST) pays off!
- Mustang Maxx & Asana XL: similar performance
  - Numerical (NS) increases when tank-mixed with Exponent synergist (at-plant or postemergence)
  - Additive control when repeated or alternated

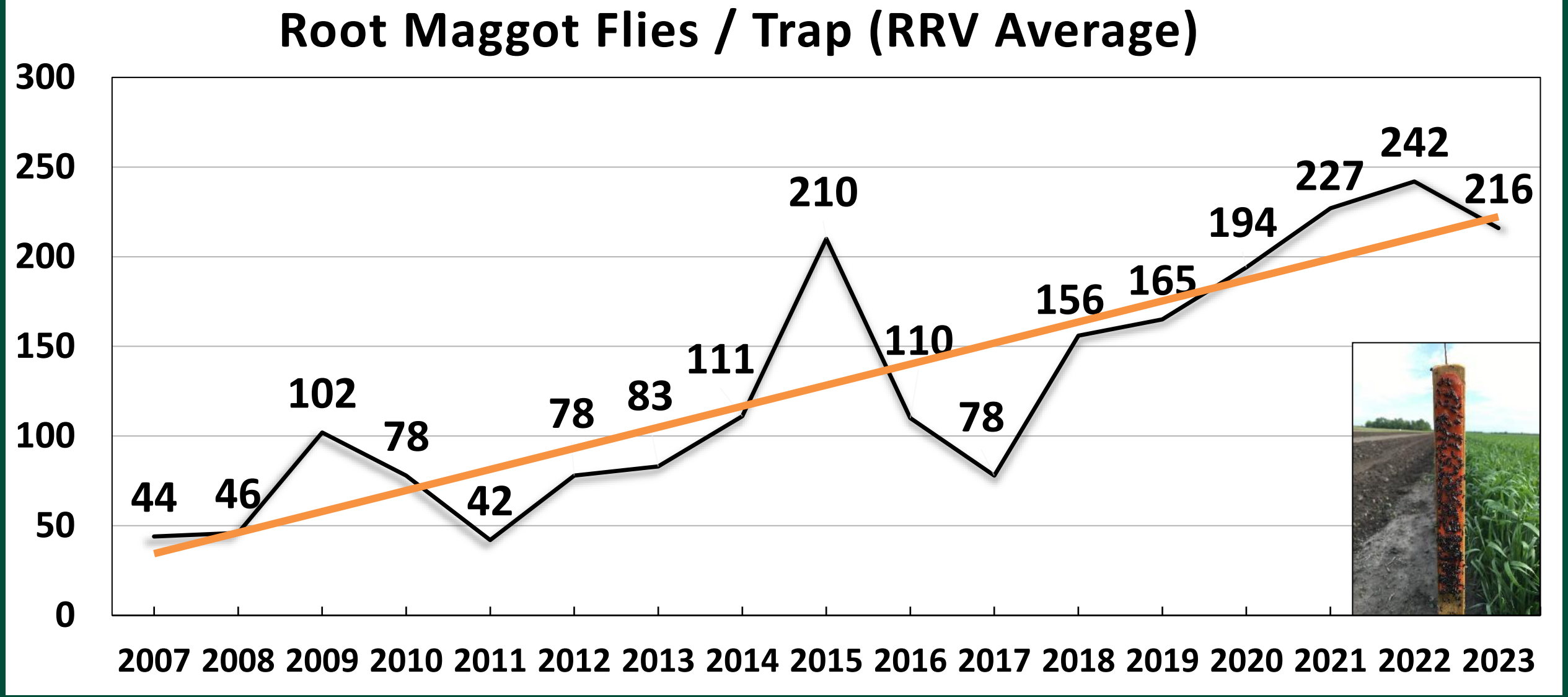
Summary: root maggot control

- Seed treatments perform similarly to 7.5 lb of Counter
- Midac:
  - similar to Counter at 7.5 lb
  - Midac safe when combined w/ Poncho Beta
- Exirel:
  - 20 fl oz better than 13 oz
  - more research needed

Sugarbeet Root Maggot *Population Trends & the 2024 Forecast*

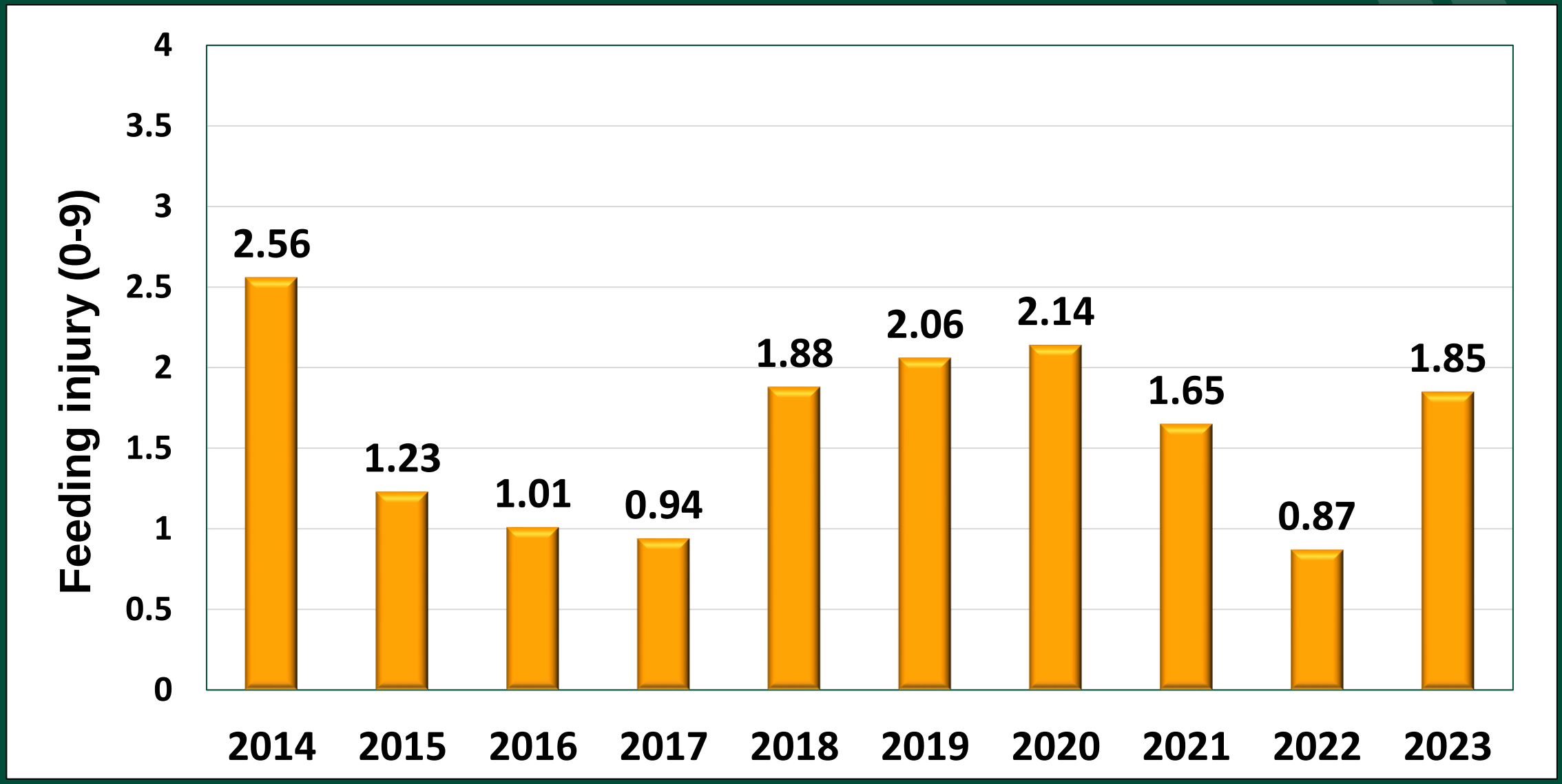
NDSU | EXTENSION

RRV Sugarbeet Root Maggot Populations



Boetel et al. 2024, NDSU

SBRM Feeding Injury in Grower Fields that Reached Fly Threshold*

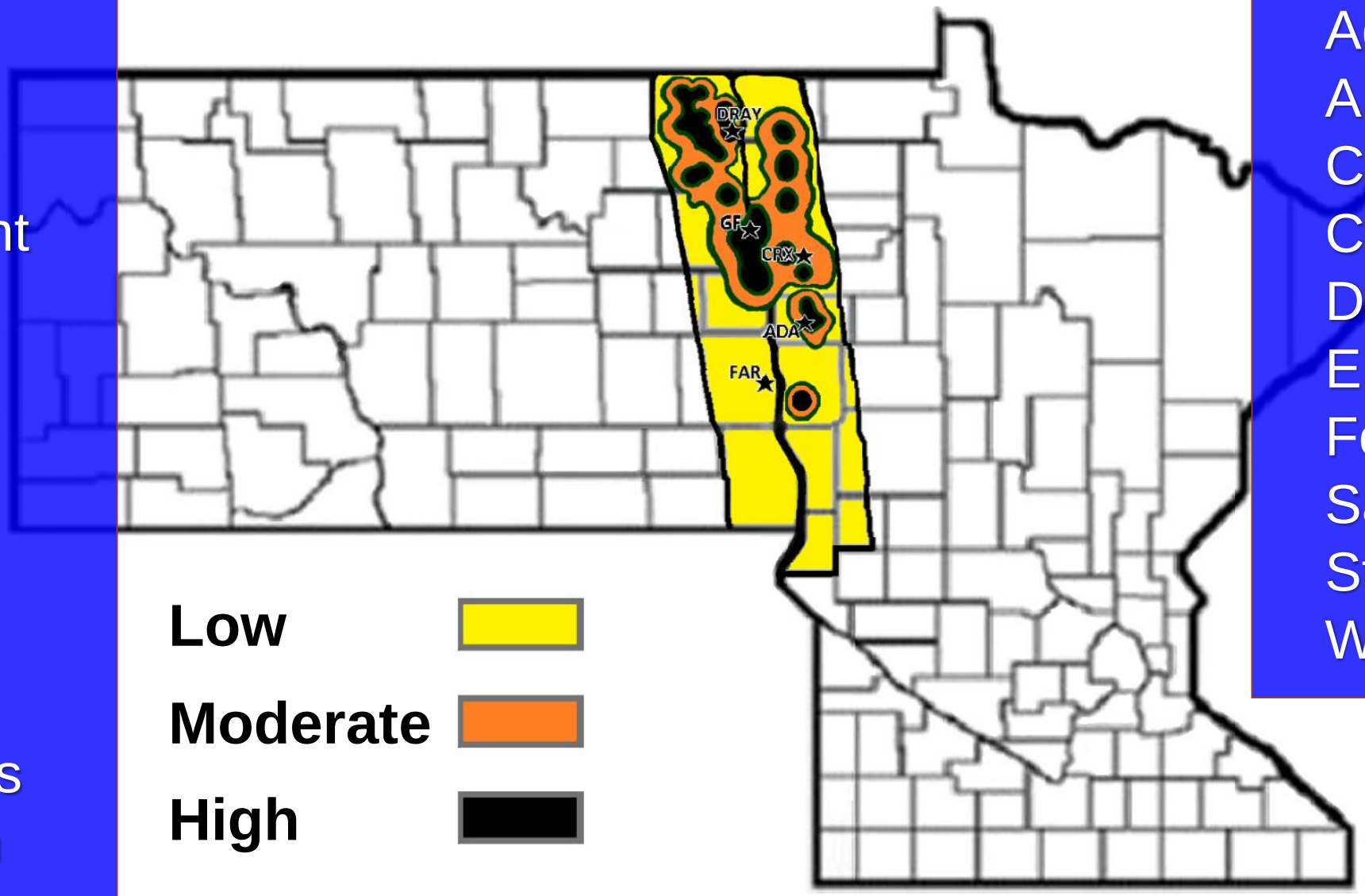


***Economic Threshold:** 43+ cumulative flies/trap (if no at-plant insecticide used)

2024 Root Maggot Forecast*

ND *high* risk:

- Auburn
- Backoo
- Bathgate
- Bowesmont
- Buxton
- Cavalier
- Crystal
- Drayton
- Hensel
- Oakwood
- Reynolds
- St. Thomas
- Thompson
- Veseleyville
- Voss



MN *high* risk:

- Ada
- Argyle
- Climax
- Crookston
- Donaldson
- E. Grand Forks Oslo
- Sabin
- Stephen
- Warren

Moderate Root Maggot Risk in 2024

North Dakota:

- Forest River
- Glasston
- Grand Forks
- Hamilton
- Manvel
- Merrifield
- Minto

Minnesota:

- Angus
- Borup
- Eldred
- Euclid
- Fisher
- Kennedy
- Tabor

Concerns for 2024:

- Past 5-6 years:
  - early fly emergence
  - double peaks
- Some unsatisfactory control in 2023
- Many locations at risk for high SBRM pressure in 2024
- Don’t be passive under moderate infestations
- Strong at-plant protection will prevent lost $$ from early high pressure

Keys to successful SBRM Control:

- Know your risk
  - Forecast map
  - Online fly counts: https://tinyurl.com/SBRM-FlyCounts
- Moderate to high risk?
  - Be aggressive (at-plant & postemergence)
- Use NDSU Model info. (NDAWN, Crop & Pest Report, radio)
  - Peak fly & POST insecticide timing

Root Maggot Insecticide-Use Tips

- Post insecticides = excellent control & major revenue benefits

  Liquids – apply 2-5 d ahead of peak fly (alternate chemistries)

  Granules – apply 5-13 d pre-peak

- Not set up for post granules?

  Combine at-plant insecticide w/ insecticide-treated seed

  Plan on post spray

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Thank you!

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