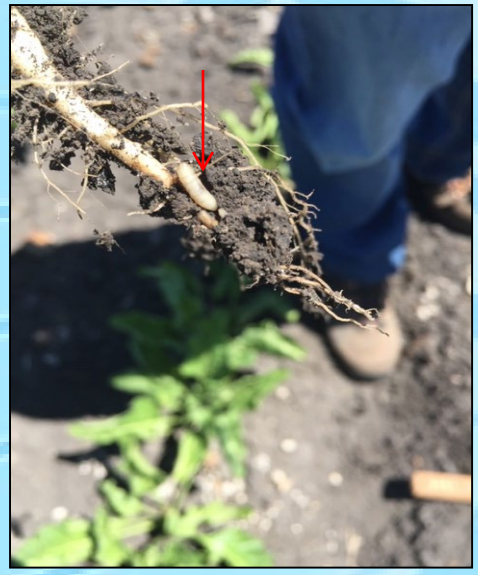
Sugarbeet Root Maggot

Sugarbeet Root Maggot
(SBRM)

Adult Fly

Maggot (larval stage)

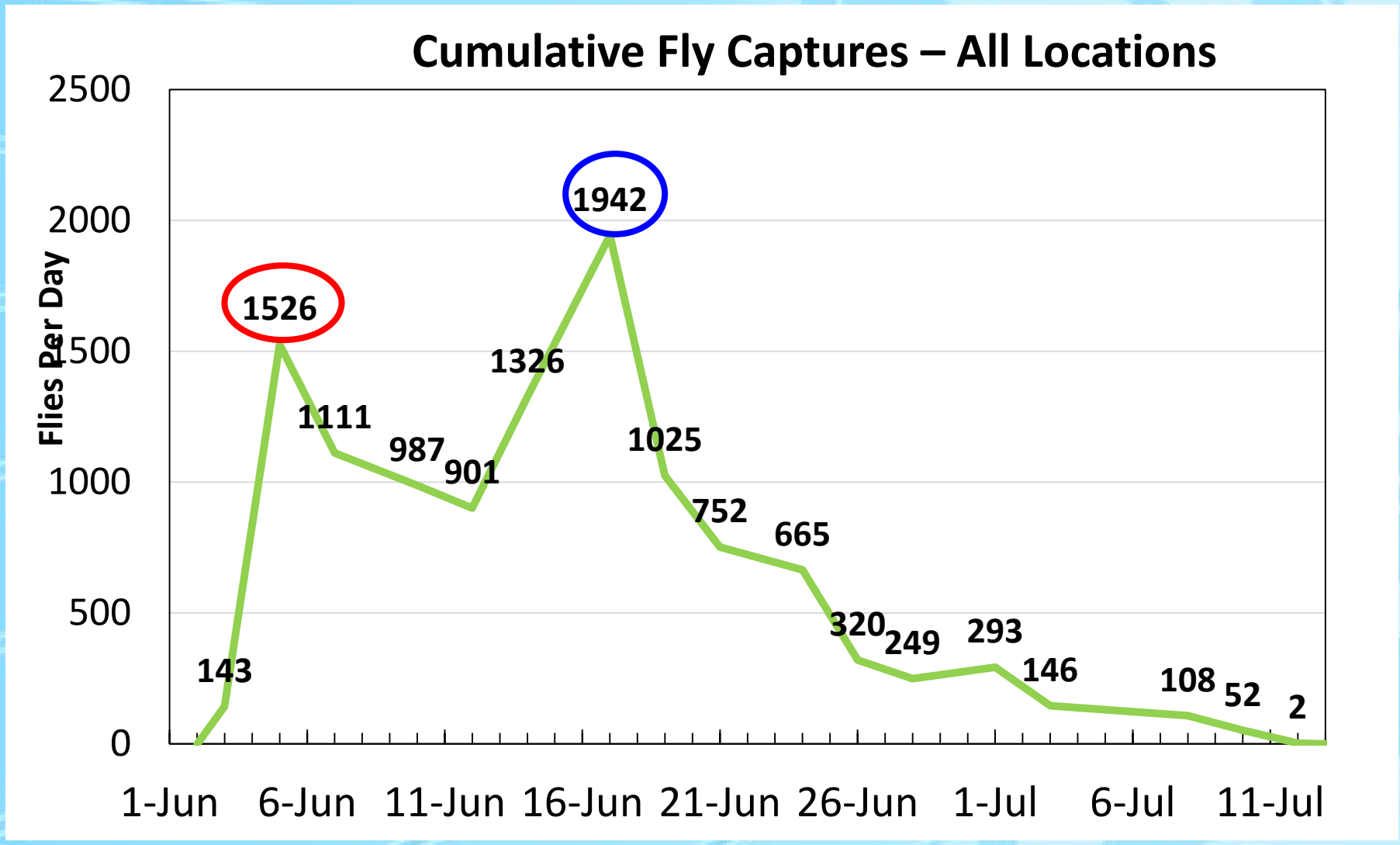


- Maggots overwinter as larvae, pupate and emerge in spring as flies in previous years beet fields
- Adult flies are monitored in current year beet fields with sticky stakes

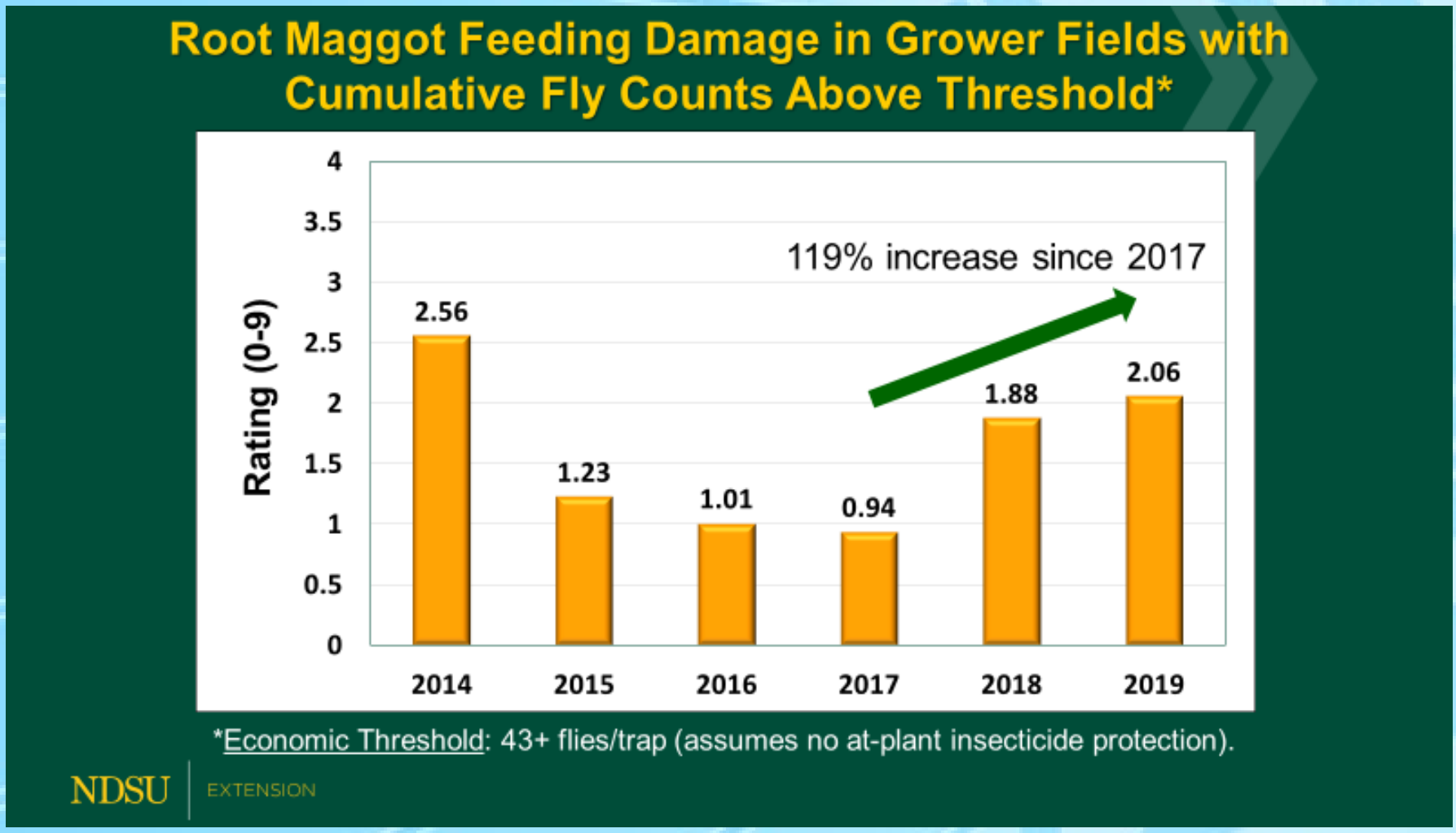
Sugarbeet Root Maggot

- Peak fly activity can occur anytime after 600 Degree Days are accumulated, on average, this occurs at 650 Degree Days
  - Degree Days are monitored at each NDAWN site in the RRV
  - NDSU and ACSC staff monitor sticky stakes 3x/week during fly activity weeks
- It is important to know that warm weather (around 80^{o} F), and calm to low wind conditions are most conducive for fly activity
- Flies will remain fairly inactive in cool, rainy, or windy conditions
- Saturated soils

Sugarbeet Root Maggot Fly Activity in RRV – 2019

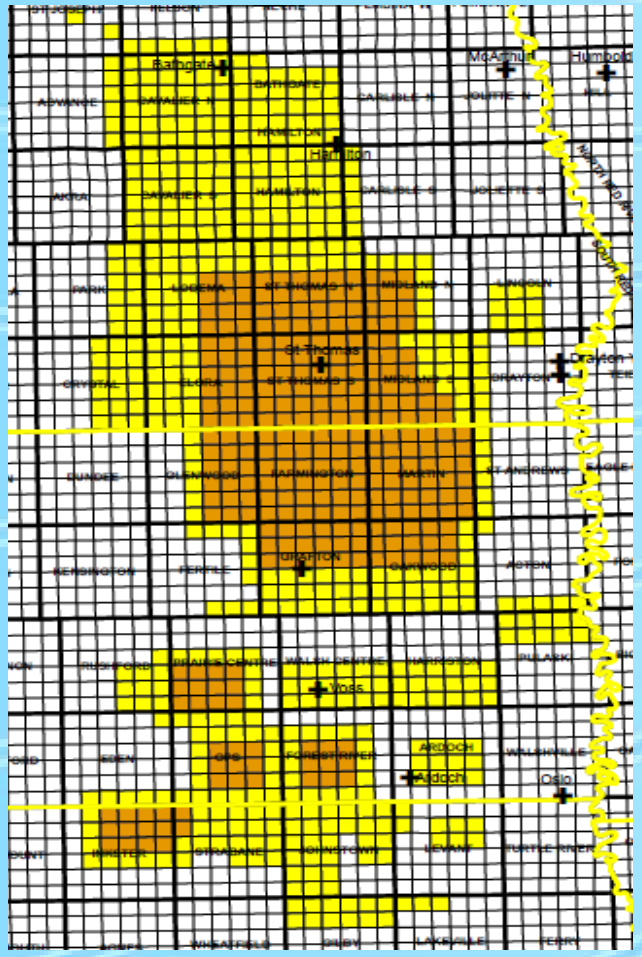


Average Root Maggot Damage in Grower Fields with Cumulative Fly Count Above Threshold*

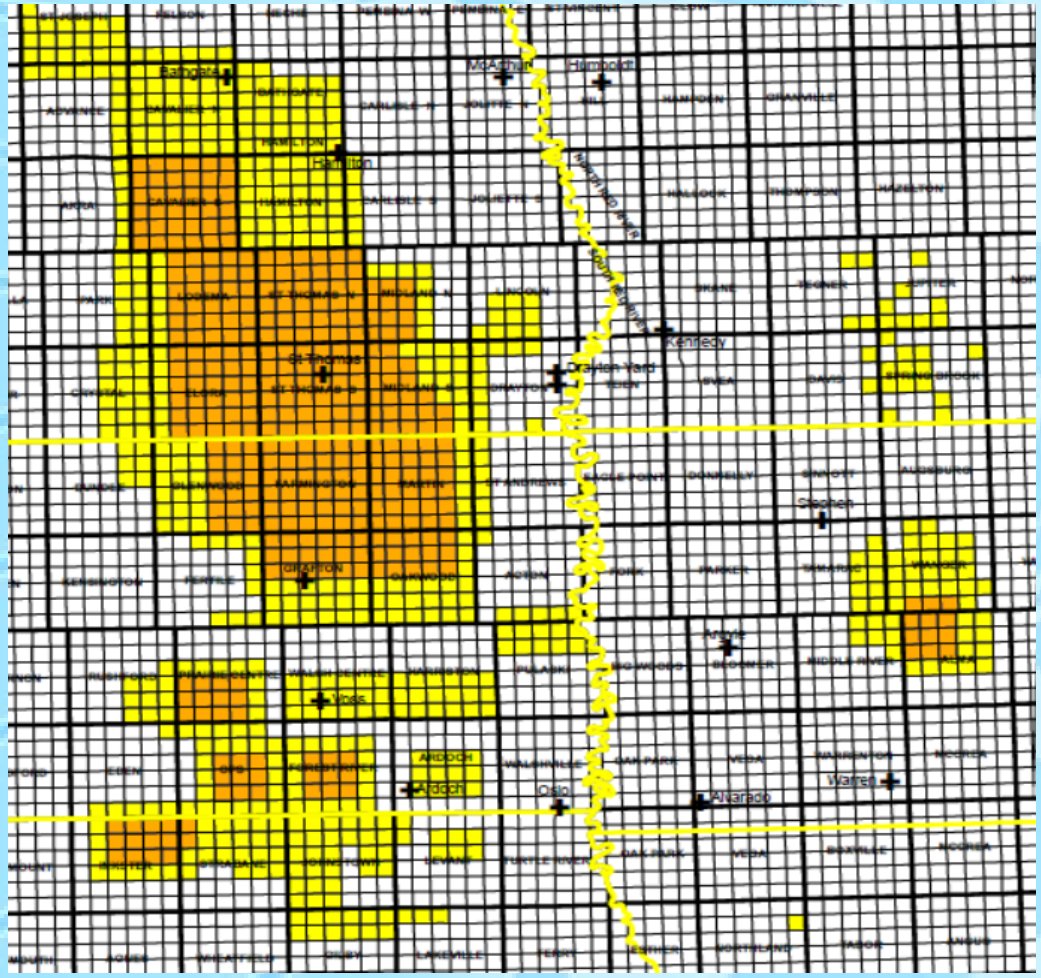


Dr. Boetel - NDSU

Maggot fly observations 2015 vs 2019 in the Northern Valley area

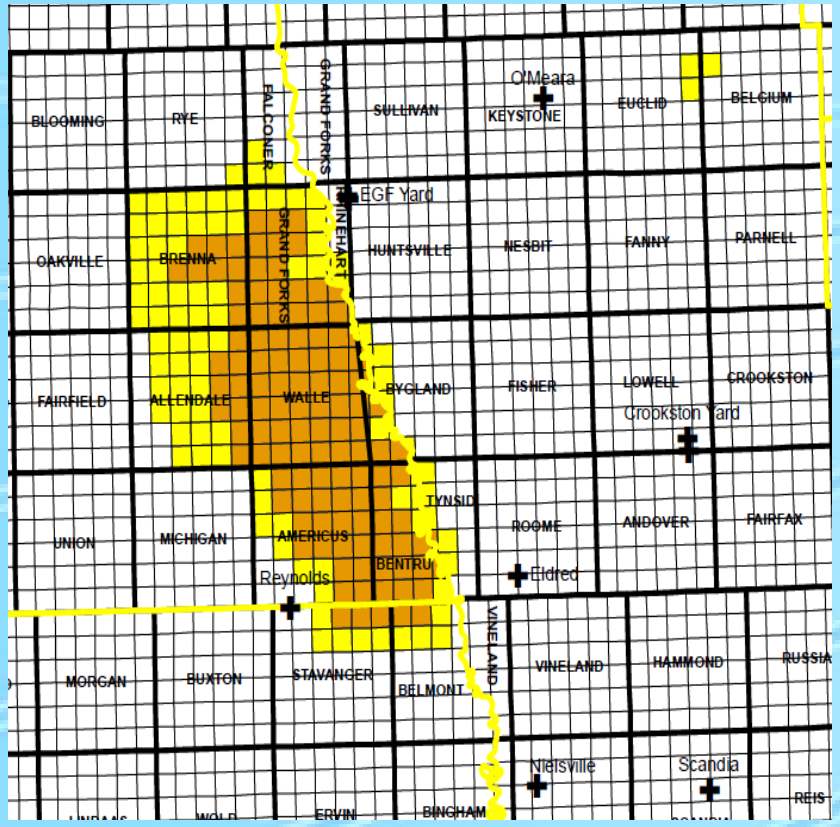


2015 crop year

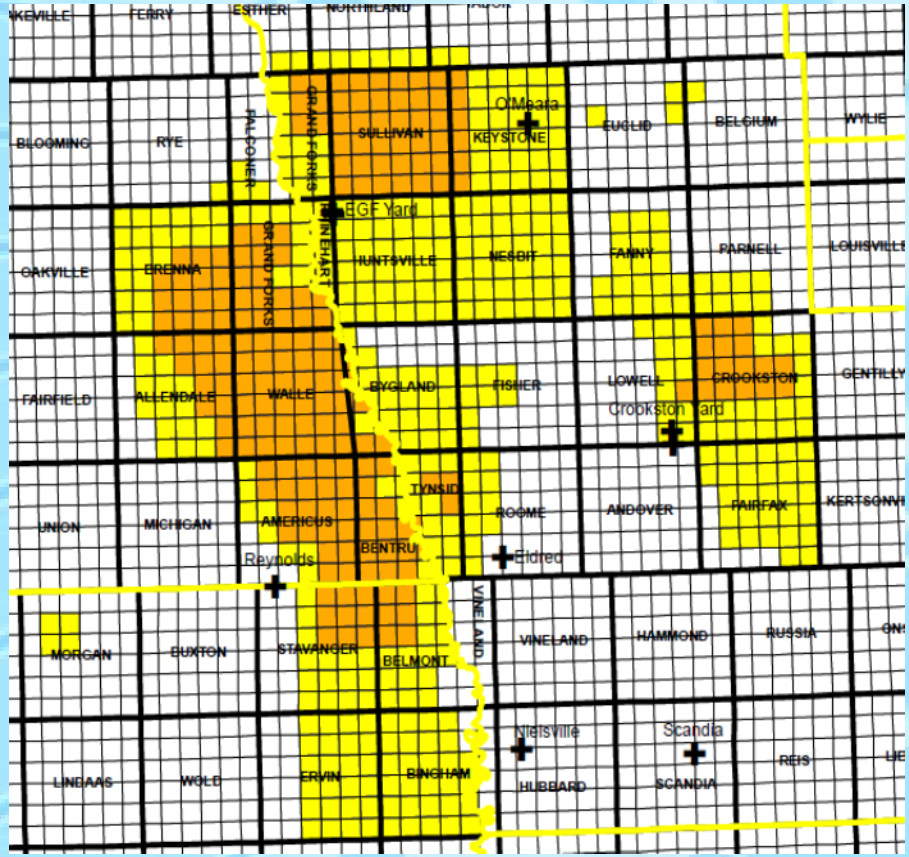


2019 crop year

Maggot fly observations 2015 vs 2019 in the Central Valley area

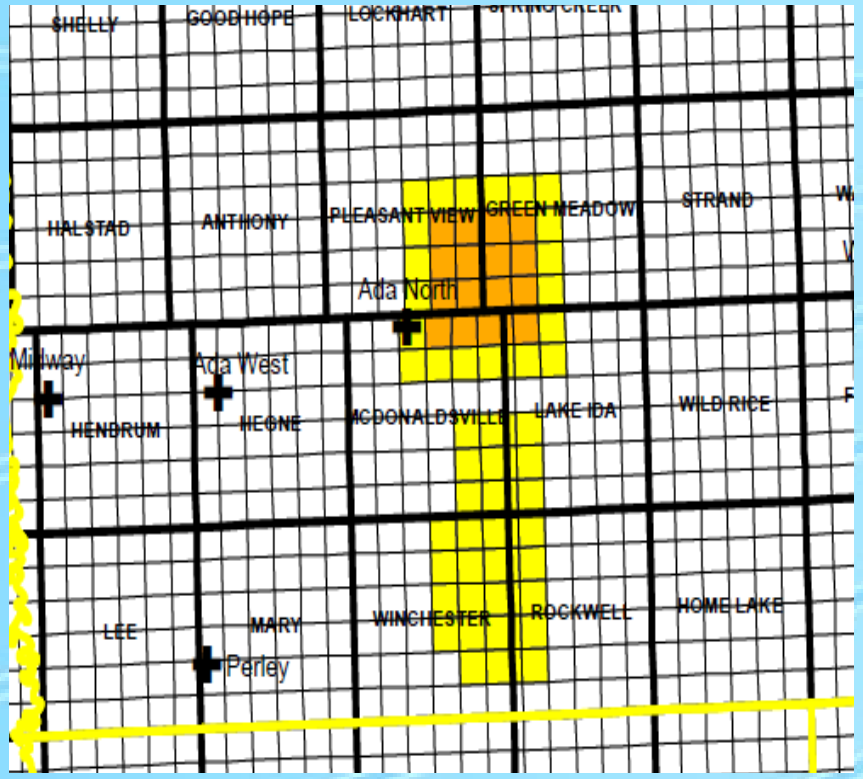


2015 crop year

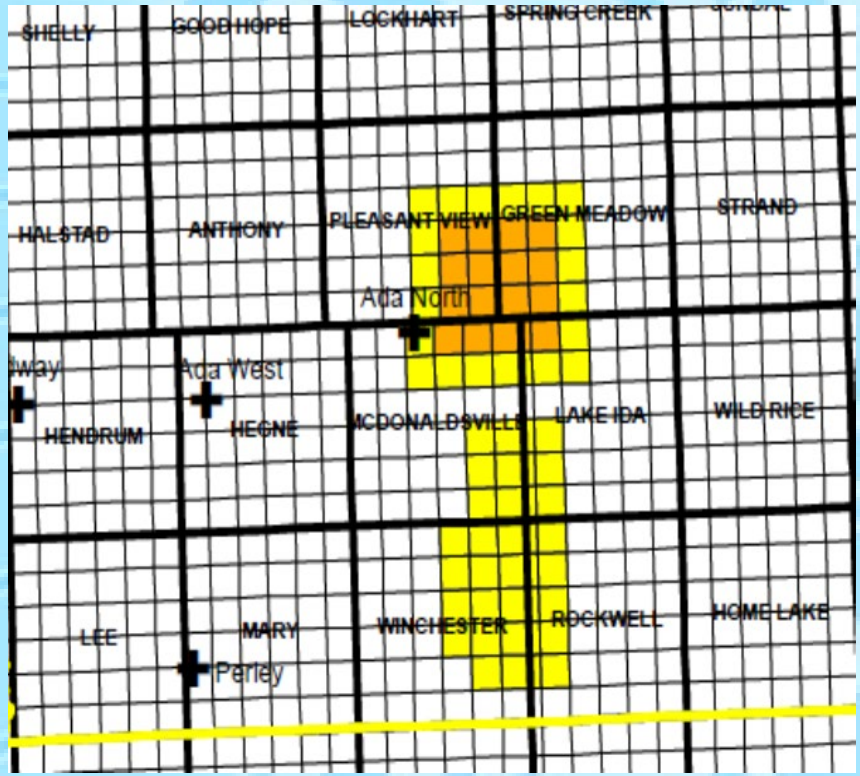


2019 crop year

Maggot fly observations 2015 vs 2019 in the Ada-Borup area



2015 crop year

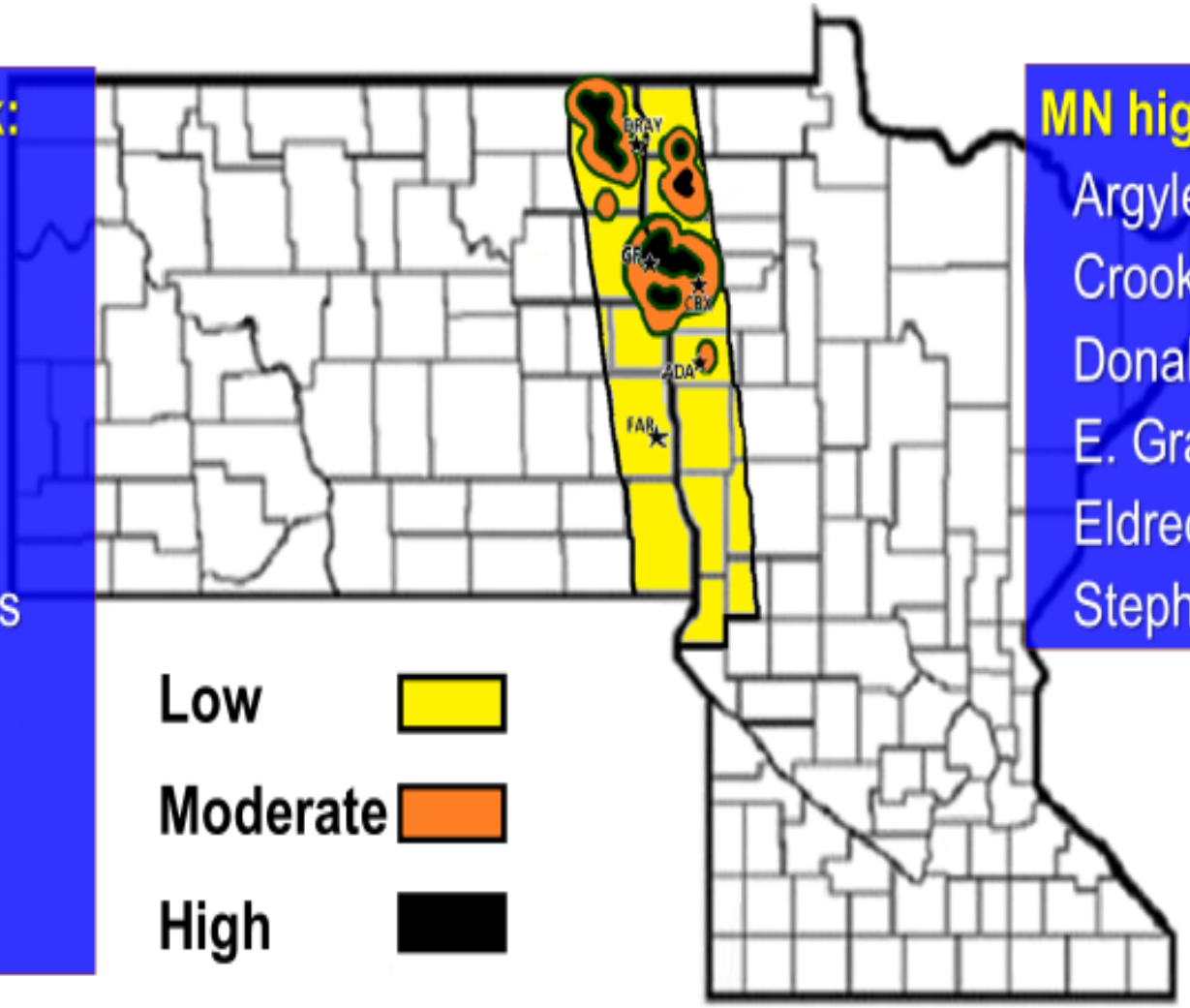


2019 crop year

2020 Root Maggot Forecast*

ND high risk:

- Auburn
- Bathgate
- Cavalier
- Crystal
- Glasston
- Grand Forks
- Merrifield
- St. Thomas
- Thompson
- Walhala



MN high risk:

- Argyle
- Crookston
- Donaldson
- E. Grand Forks
- Eldred
- Stephen

*Based on fly counts & *root maggot feeding injury* ratings

Slide from Dr. Boetel - NDSU

Other Potential Root Maggot Risk Areas

Moderate Risk

North Dakota:

- -Buxton
- -Drayton
- -Forest River
- -Hamilton
- -Nash
- -Oakwood
- -Reynolds
- -Cashel*
- -Grafton*
- -Crystal**

* Was on the list after 2018 growing season but not after 2019

** Was moved to a high risk area for the upcoming season

Minnesota:

- -Ada
- -Eldred
- -Fisher
- -Crookston

Single Post Sprays for SBRM Control

St. Thomas, ND, 2015 – 2018

Treatment	RSA (lb/ac)	Tons/ac	$$ above Check
Counter 8.9# B + Lorsban Adv. 2 pts	8,824 a	29.8 a	$429
Counter 8.9# B + Lorsban Adv. 1 pt	8,580 ab	29.1 ab	$392
Counter 7.5# B + Lorsban Adv. 2 pts	8,398 ab	29.3 ab	$333
Poncho Beta + Lorsban Adv. 2 pts	8,181 ab	28.6 ab	$309
Poncho Beta + Lorsban Adv. 1 pt	7,971 bc	27.6 bc	$300
Counter 7.5# B + Lorsban Adv. 1 pt	7,962 bcd	27.3 bcd	$310
Counter 7.5# B	7,419 cd	25.7 cde	$238
Poncho Beta	7,385 cd	25.5 de	$240
Counter 8.9# B	7,318 d	25.3 e	$231
Check	5,617 e	20.4 f	
LSD (0.05)	**648.8**	**2.03**	---

NS

NS

Postemergence Spray Timing for SBRM Control

St. Thomas, ND: Combined Analysis (2015-2018)

Treatment	Timing (from peak fly)	RSA (lb/ac)	$$ above Check
Counter 7.5 lb + Lorsban Adv. 2 pts **2X**	7 days pre / 4 days post	9,132 a	$436
Counter 8.9 lb + Lorsban Adv. 2 pts	2 days pre / 4 days post	8,764 ab	$330
Counter 7.5 lb + Lorsban Adv. 1 pt **2X**	7 days pre / 4 days post	8,593 abc	$361
Counter 7.5 lb + Lorsban Adv. 1 pt + Mustang Maxx 4 fl oz	2days pre	8,557 abc	$292
Counter 7.5 lb + Lorsban Adv. 2 pts	2days pre	8,352 bc	$296
Counter 7.5 lb + Mustang Maxx 4 fl oz	2days pre	8,113 c	$304
Counter 7.5 lb + Lorsban Advanced 1 pt	2days pre	8,038 cd	$267
Counter 20G 8.9 lb		7,451 de	$180
Counter 20G 7.5 lb		7,090 e	$136
Check	---	5,884 f	---
LSD (0.05)		**639.6**	

NS

Dr. Boetel - NDSU

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

Treatment	RSA (NS)	Tons/ac (NS)	$$/ac above check
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**	

Midac FC Insecticide

- **Active Ingredient:**

  Imidacloprid, 1-[(6-Chloro-3-pyridinyl)methyl]-*N*-nitro-2-imidazolidinimine

- **Use Rate and Application**

  13.6 fluid oz product/acre

  Used in furrow

Midac FC disperses finely in liquid fertilizer and micronutrient products without prior dilution with water. However, due to the wide variability in the composition and consistency of liquid fertilizers, it is recommended a jar-test be performed. (Midac FC label page 3)

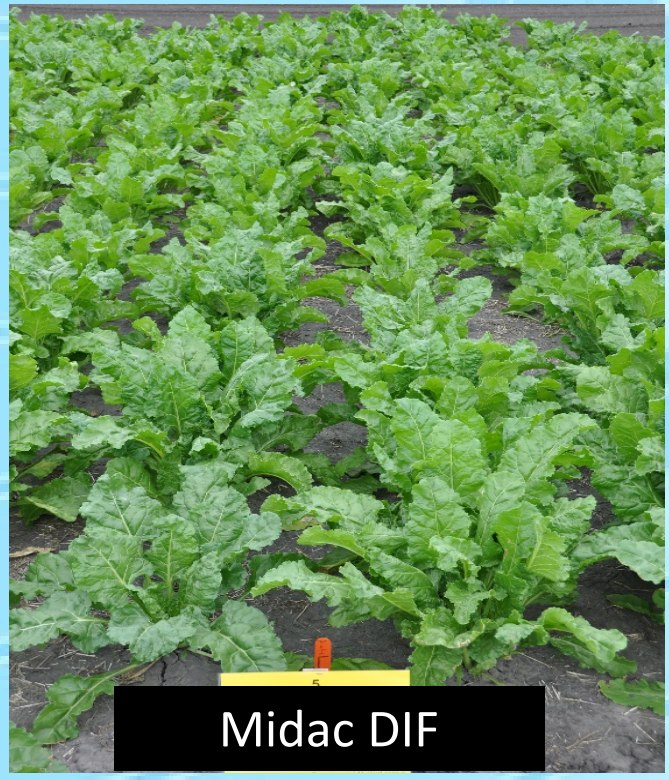
Midac FC At Planting for SBRM Control: 2018-2019

	RSA	Tons/ac	$$/ac above check
Midac DIF 0.18 lb ai/ac (13.6 fl oz)	8,009 b	27.7 ab	$176
Counter 20G Band 7.5 lb prod./ac	7,904 b	27.5 b	$159
Check	6,991 c	25.2 b	---
LSD (0.05)	748.7	2.54	

DIF = dribble in-furrow

*Two years of data

Dr. Boetel - NDSU



Dr. Boetel - NDSU

Root Maggot Control Recommendations

- High risk areas
  - High rate of Counter (8.9# of 20G) at plant fb,
  - Thimet (7.0#) post application fb,
  - Lorsban at 2 pints/ac about 7 days pre peak fly fb,
  - Lorsban at 1-2 pints/ac about 4 days post peak fly

An application of Asana or Mustang Max may be used as the second application if needed sooner than 10 days after 1st Lorsban or to help introduce a different MOA for resistance management

For additional protection a seed treatment at plant may be included

Root Maggot Control Recommendations

- Moderate risk areas
  - Moderate rate of Counter (7.5# of 20G) at plant fb,
  - Lorsban at 2 pints/ac about 2-4 days pre peak fly with a possible second Lorsban application (1 pint/ac) 11 days after first
  - An application of Asana or Mustang Max may be used as the second application if needed sooner than 10 days after 1st Lorsban or to help introduce a different MOA for resistance management
    - **OR**
  - A seed treatment or Midac FC* at plant fb,
  - Lorsban at 2 pints/ac about 2-4 days pre peak fly with a possible second Lorsban application (1 pint/ac) 11 days after first.
  - An application of Asana or Mustang Max may be used as the second application if needed sooner than 10 days after 1st Lorsban or to help introduce a different MOA for resistance management

++Thimet may be an option between planting and the first Lorsban application

+++ Counter treatments tend to lead to higher returns

*Only a couple years of testing in data

Root Maggot Control Recommendations

- Light populations
  - A moderate at plant application of Counter (7.5# of 20G) or a seed treatment or Midac FC* fb,
  - Monitoring during the growing season to see if a post application of Lorsban at 1 pint/ac is needed

* Only a couple years of testing in data

Summary – Root Maggot Control

- Average population has increased in 2018 and 2019. Additionally there is an increase in number of areas affected
    - Populations need to be monitored and proper management control measures implemented
- Aggressive control efforts will be needed in 2020

Summary – Root Maggot Control

- Multiple applications of **any** chlorpyrifos (e.g., Lorsban) liquid:
  – Requires 10 days between applications
- **Mustang Maxx or Asana XL** - can be used as 2nd or 3rd applications if flies resurge before 10 day minimum is met for Lorsban (Chlorpyrifos)
- Tank mixing Lorsban sprays w/ Roundup?
  – 2 yrs of testing: No crop injury or reduced SBRM control
  – Not warranted on label (grower incurs the risk)
- Only use Lorsban 4e if tank mixing with Roundup (Glyphosate).
- Tank mixes of Lorsban and Quadris have shown sugarbeet injury in some cases

Summary – Root Maggot Control

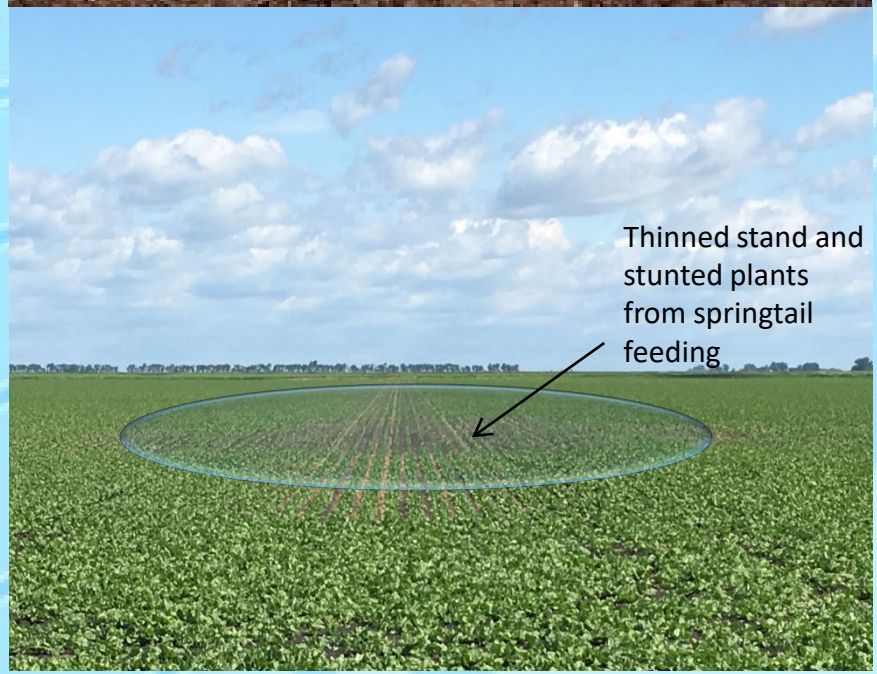
- At-plant granules or seed treatment insecticides pay for themselves under moderate SBRM pressure
- Under moderate and high SBRM pressure, granules or seed treatments should **not** be relied on as stand-alone tools
- Post insecticide applications provide good SBRM control & revenue benefits that optimize economic return. They are the keys to success
- Keys to success with seed treatments:
  – Know your acres / risk
  – Vigilance in fly monitoring
  – Good postemergence control (mod./high populations)

Questions?

Springtails

- Tiny wingless primative animals. (very small, nearly microscopic)
- They are adapted to and reproduce more rapidly in soil moisture levels at or near saturation.
- Although feeding may occur on mature sugarbeet roots, injury is most apparent and harmful in seedlings.
- Above ground symptoms of springtail injury to sugarbeet seedlings include wilting plants and reduced plant stand.

Photo:NDSU.ag.edu



NDSU extension bulletin March 2001

Springtails

- Not much known about rotational crop management of springtails to help control in sugarbeet crop year.
- Hard to predict because pressure is variable from year to year and field to field. Fields with fine-textured soils (i.e., clay or silty clay) are more likely to have problems.
  (NDSU extension bulletin March 2001)

Springtails

Management

- Best line of defense is usually a moderate rate of Counter but not always statistically better than the seed treatments.
- Midac FC?
  - Dr. Boetel –"We haven't been able to test it on springtails yet, but I would expect it to do okay, or probably at a similar level to maybe slightly better than a neonic seed treatment (this is speculation; I have no data to back that up)".
  - Springtails are not listed as a controlled pest in sugarbeets on the label or the 2(ee).

Questions?