

Red Sunflower Seed Weevil: Insecticide Testing

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2025 NSA Research Forum

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NDSU

EXTENSION



Red Sunflower Seed Weevil

Smicronyx fulvus LeConte



Red Sunflower Seed Weevil – 2024

IPM Crop Survey in ND



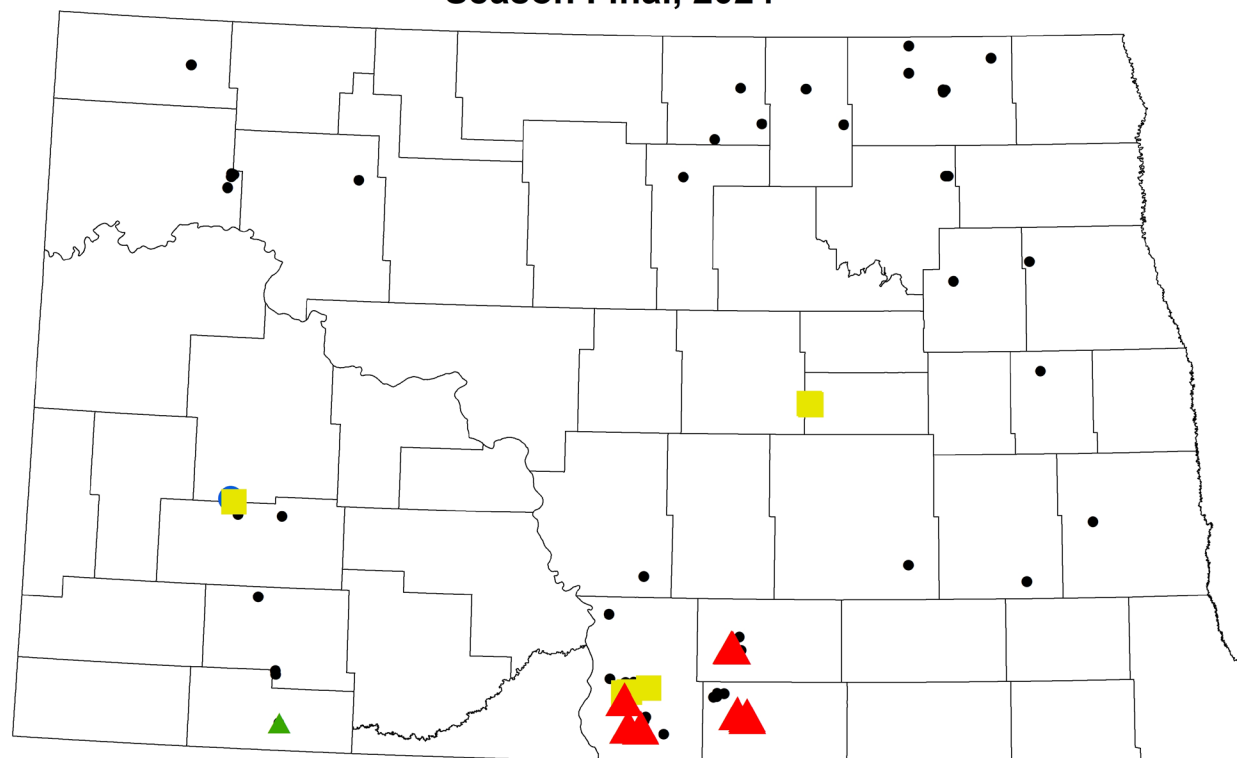
2024:
90 fields scouted in
23 counties

Average # weevils per
head = 1 to 25

71% of the weevils found
in the field edge and 29%
within field.

Red Sunflower Seed Weevils in Sunflower

Season Final, 2024



Average number of weevils per head

- 0
- ▲ 0.1-1
- 1.1-4
- 4.1-8.9
- ▲ 9 or more (economic threshold for 2024 oilseed sunflowers)

Sunflower

Foliar Insecticides

Registered Insecticides – 2024-2025

Red sunflower seed weevil

** Restricted Use Pesticide*



Pyrethroids (Group 3A)

Asana*, Baythroid XL*, Tombstone*, Delta Gold*, Asana XL*, Lambda-Cy*, Warrior*, Mustang Maxx*

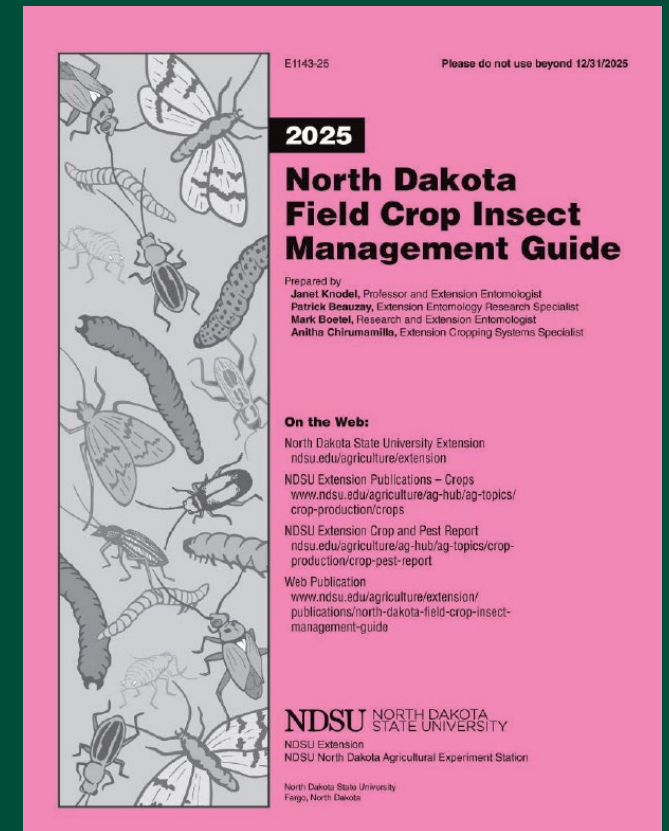
Carbamates (Group 1A)

Sevin 4F, Sevin XLR Plus

Premixes:

Besiege*
(Coragen 28 + Warrior 3A)

*Always Read and
Follow Labels.*



2024 NSA RSSW Insecticide Study – ND

Site	Planting Date	Spray Date	Harvest Date
NCREC, Minot, ND	June 5	August 16	October 16

- **Nuseed N4H470 CLP hybrid sunflower**
- **Target stand = 24,000 plants per acre**
- **ND - Plots 10 x 25 feet, 4 rows, 30-inch row spacing**



2024 NSA RSSW Insecticide Study – ND

- **Spraying**
 - Tractor mounted CO₂ boom sprayer, 40 PSI, 22 GPA (ND)
 - Spray timing – R 5.3 growth stage (30% florets open)
- **Yield – 10 heads per plot**
 - Hand-threshed heads
 - ‘South Dakota’ benchtop seed cleaner
 - A 100 seed subsample from each head for assessment of RSSW damaged seeds



2024 NSA RSSW Insecticide Study – ND

Treatment Name	Rate(s) fl oz /acre	Active Ingredient(s)	Chemical Class (IRAC Group)
Asana XL	9.6	esfenvalerate	pyrethroid (3A)
Asana XL	9.6	esfenvalerate	pyrethroid (3A)
Exponent	8	piperonyl butoxide	
Warrior II	1.92	lambda-cyhalothrin	pyrethroid (3A)
Warrior II	1.92	lambda-cyhalothrin	pyrethroid (3A)
Exponent	5	piperonyl butoxide	
Baythroid XL	2.8	beta-cyfluthrin	pyrethroid (3A)
Baythroid XL	2.8	beta-cyfluthrin	pyrethroid (3A)
Exponent	3.5	piperonyl butoxide	
Entrust	12	spinosad	spinosyn (5)
Malathion	32	malathion	organophosphate (1B)
Pilot 4E	24	chlorpyrifos	organophosphate (1B)
Plinazolin (mid rate)	1.03	isocycloseram	isoxazoline (30)
Plinazolin (high rate)	1.54	isocycloseram	isoxazoline (30)
Sefina	10	afidopyropen	pyropene (9D)
Untreated Check	---	---	---

****Red box indicates product is NOT labeled in sunflowers***

New Insecticide - Plinazolin



- Syngenta Crop Protection
 - Plinazolin technology; active ingredient Isocycloseram
 - Group 30 Isoxazolines
 - GABA receptor antagonist
- Foliar – soybean (stink bugs, stem borers), potato (Colorado potato beetles)
- Soil-applied – corn (corn rootworms)
- Seed-treatment – wheat (wireworms), pulse crops (wireworms, seed corn maggots)

Adult RSSW Percent Mortality at 24 hours for Four Rates of Plinazolin in Glass Vial Bioassay, 2022

■ Cass County, ND ■ Hughes County, SD

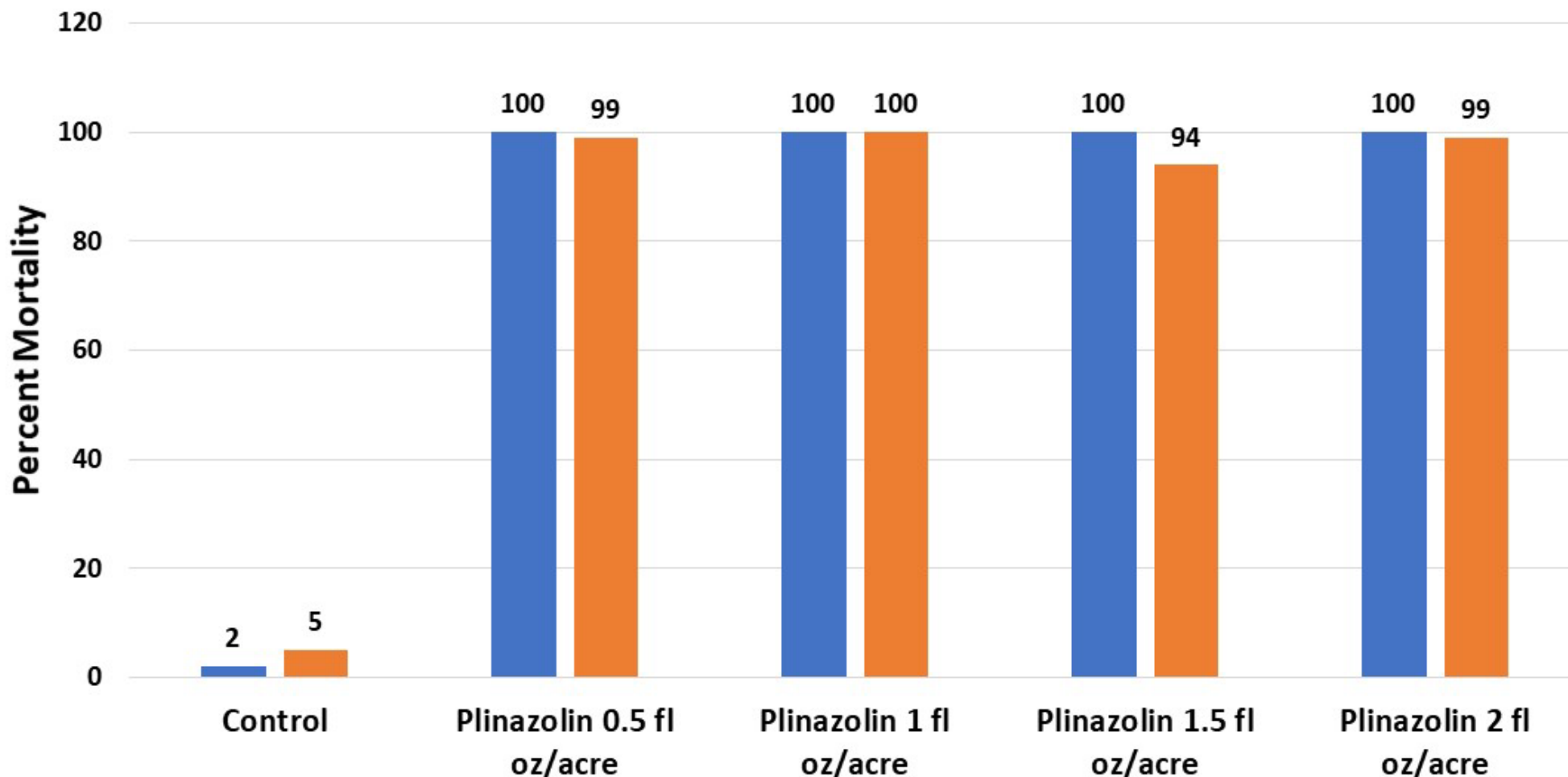
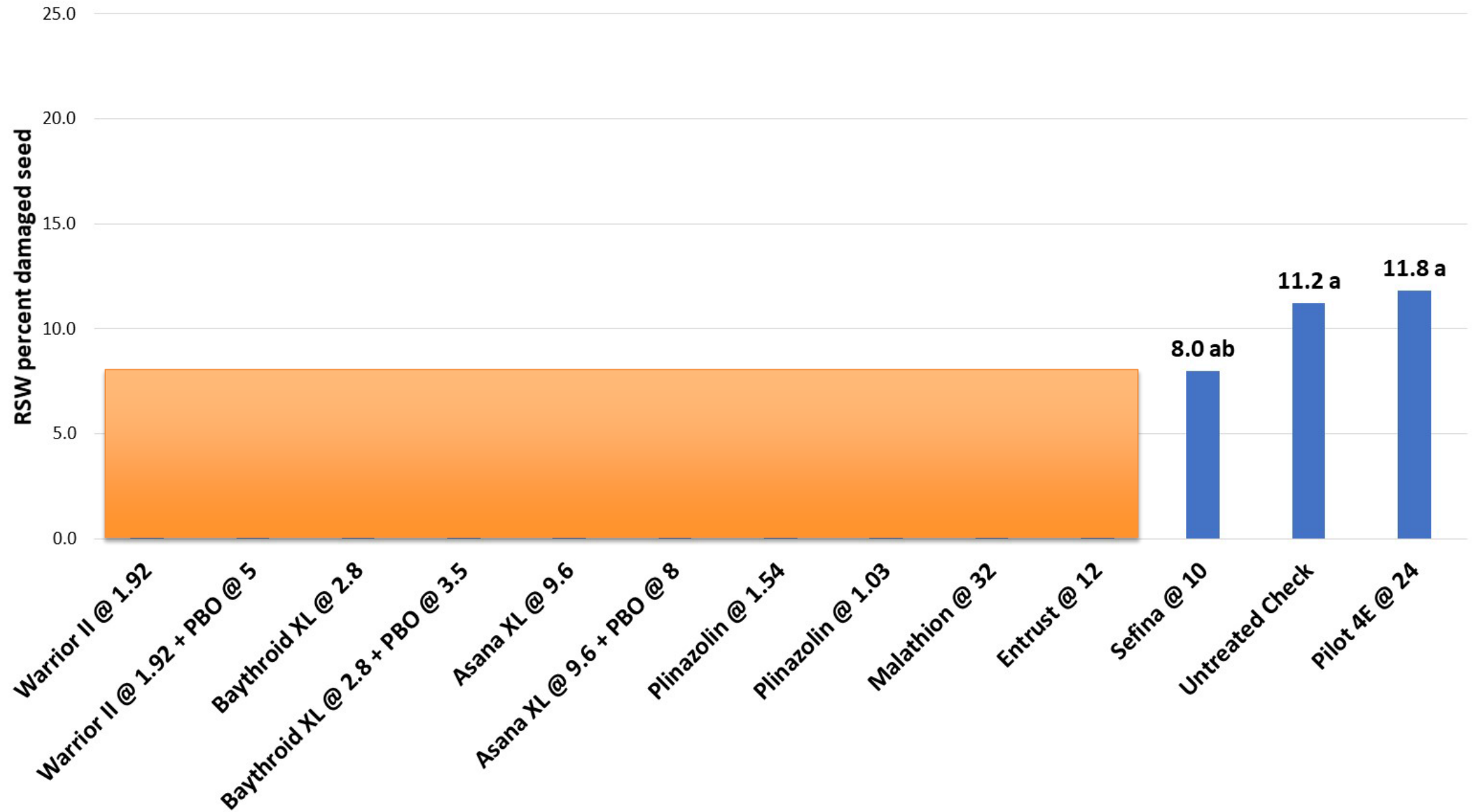
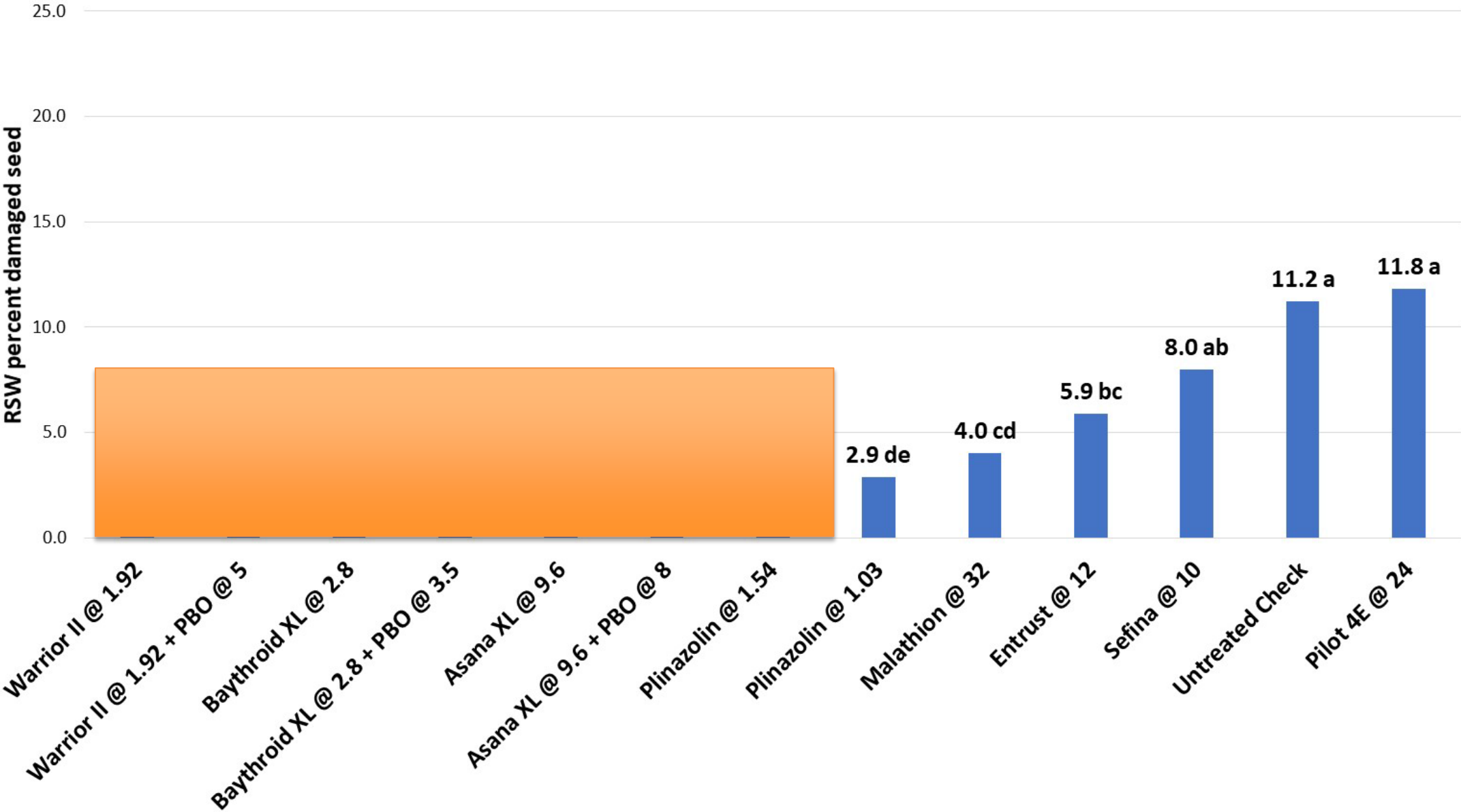


Photo by A. Hargens, SDSU

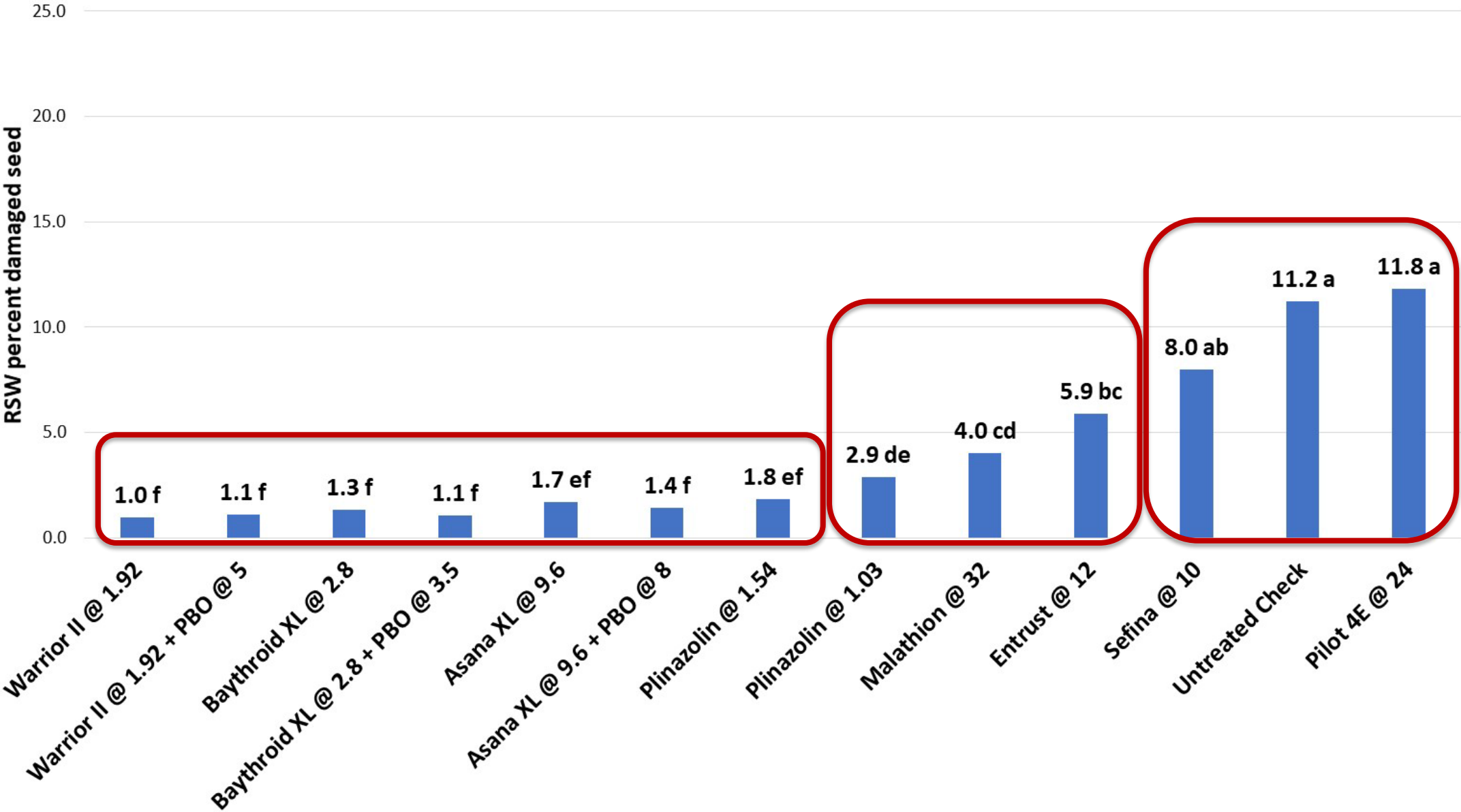
Treatment Means for Red Sunflower Seed Weevil Percent Damaged Seed and Yield at Minot, 2024



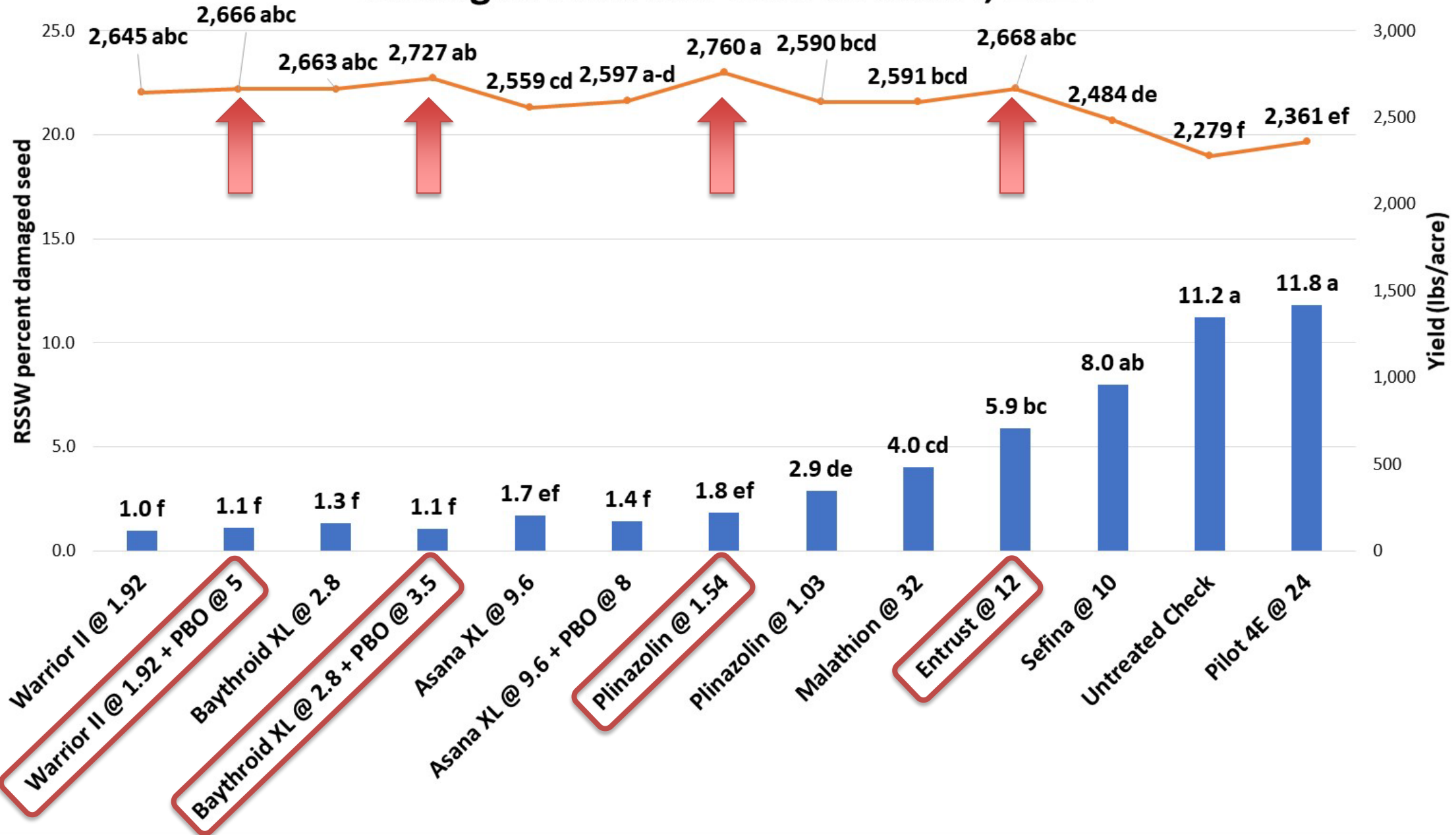
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Treatment Means for Red Sunflower Seed Weevil Percent Damaged Seed and Yield at Minot, 2024



Treatment Means for Red Sunflower Seed Weevil Percent Damaged Seed and Yield at Minot, 2024



2024 NSA RSSW Insecticide Study



Product(s)	Rate (fl oz/acre)	Cost per fl oz	Cost/acre
Asana XL	9.6	\$0.61	\$ 5.86
Asana XL + Exponent	9.6 + 8	\$0.61 + \$1.50	\$ 17.86
Warrior II	1.92	\$3.08	\$ 5.91
Warrior II + Exponent	1.92 + 5	\$3.08 + \$1.50	\$ 13.41
Baythroid XL	2.8	\$3.17	\$ 8.88
Baythroid XL + Exponent	2.8 + 3.5	\$3.17 + \$1.50	\$ 14.13
Entrust	12	\$17.14	\$205.68
Malathion	32	\$0.59	\$ 18.88
Pilot 4E	24	\$0.38	\$ 9.12
Plinazolin Mid	1.03	UNK	
Plinazolin High	1.54	UNK	
Sefina	10	\$2.73	\$ 27.30
Untreated Check		-	\$ -

****Red box indicates product is NOT labeled in sunflowers***

Insecticide Summary for RSSW Control



- Continue field efficacy testing in 2025
- Support registration of Plinazolin in sunflower for RSSW control
 - Not labeled in sunflower – Plinazolin Group 30, IRAC Group 5
 - Efficacy results look promising



Dose-response Glass Vial Bioassay

– RSSW Minot

- Collected adult RSSW from untreated sunflowers on August 22
- 20 RSSWs were introduced to each vial for a total of 120 RSSWs insecticide dose
- Mortality was assessed at 24 hours



Product Name	Active Ingredient(s)	Doses Tested (ug/vial)	High Field Rate (fl oz/acre)
Asana XL	Esfenvalerate	21.18, 10.59, 5.3, 2.65, 1.32, 0.66	9.6
Baythroid XL	Beta-cyfluthrin	9.36, 4.68, 2.34, 1.17, 0.59, 0.29	2.8
Delta Gold	Deltamethrin	7.52, 3.76, 1.88, 0.94, 0.47, 0.24	1.5
Warrior II	Lambda-cyhalothrin	13.35, 6.68, 3.34, 1.67, 0.83, 0.42	1.92

Percent mortality of each Dose of Insecticide - Minot RSSW population, 2024

- Untreated check vials = 1.7% mortality in the at 24 hours
- All insecticide and doses = 100% mortality in the at 24 hours
- Unable to calculate LD50 values for each insecticide
- Minot RSSW population is extremely susceptible to all pyrethroid insecticides tested

Product	Active Ingredient	Dose (ug/vial)	Field Rate (fl oz/acre)	Percent Mortality
---	Untreated Check	---	---	1.7
Asana XL	Esfenvalerate	21.18	9.6	100
Asana XL	Esfenvalerate	10.59	4.8	100
Asana XL	Esfenvalerate	5.3	2.4	100
Asana XL	Esfenvalerate	2.65	1.2	100
Asana XL	Esfenvalerate	1.32	0.6	100
Asana XL	Esfenvalerate	0.66	0.3	100
Baythroid XL	Beta-cyfluthrin	9.36	2.8	100
Baythroid XL	Beta-cyfluthrin	4.68	1.4	100
Baythroid XL	Beta-cyfluthrin	2.34	0.7	100
Baythroid XL	Beta-cyfluthrin	1.17	0.35	100
Baythroid XL	Beta-cyfluthrin	0.59	0.18	100
Baythroid XL	Beta-cyfluthrin	0.29	0.09	100
Delta Gold	Deltamethrin	7.52	1.5	100
Delta Gold	Deltamethrin	3.76	0.75	100
Delta Gold	Deltamethrin	1.88	0.38	100
Delta Gold	Deltamethrin	0.94	0.19	100
Delta Gold	Deltamethrin	0.47	0.09	100
Delta Gold	Deltamethrin	0.24	0.05	100
Warrior II	Lambda-cyhalothrin	13.35	1.92	100
Warrior II	Lambda-cyhalothrin	6.68	0.96	100
Warrior II	Lambda-cyhalothrin	3.34	0.48	100
Warrior II	Lambda-cyhalothrin	1.67	0.24	100
Warrior II	Lambda-cyhalothrin	0.83	0.12	100
Warrior II	Lambda-cyhalothrin	0.42	0.06	100

Chlorpyrifos Update - January 2025



- Reinstated tolerance for all food uses in 2024 in response to a ruling by the Eighth Circuit Court of Appeals
 - OK to apply chlorpyrifos products during the 2024 season for any labeled use including sunflowers
 - June 30, 2025 is the last date to use of existing stocks
 - Retailers, distributors and suppliers may sell currently registered chlorpyrifos until April 30, 2025

Chlorpyrifos Update - January 2025



- After June 30, 2025 – only 11 uses approved
 - Alfalfa, soybean, sugarbeet, wheat (spring + winter)
 - Sunflower **NOT** included
 - EPA denied a 24c SLN label for RSSW in sunflowers in SD
 - Reason for denial is that the food tolerances will be revoked due to the Federal Court Order. The court order would need to be reversed in order for sunflower tolerances to be reinstated and to have a sunflower label for chlorpyrifos.
 - EPA would consider approving a 24c for another active ingredient.
 - Source: Tom Gere, Environmental Scientist Manager, SD Department of Agriculture and Natural Resources

IPM Toolbox – RSSW

**Pest
Identification**

**Pest
Monitoring**

**Economic
Thresholds**

**Predictive
Models**



**Cultural
Control**

**Biological
Control**

**Host Plant
Resistance**

**Chemical
Control**



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