Neonicotinoid Education & Research

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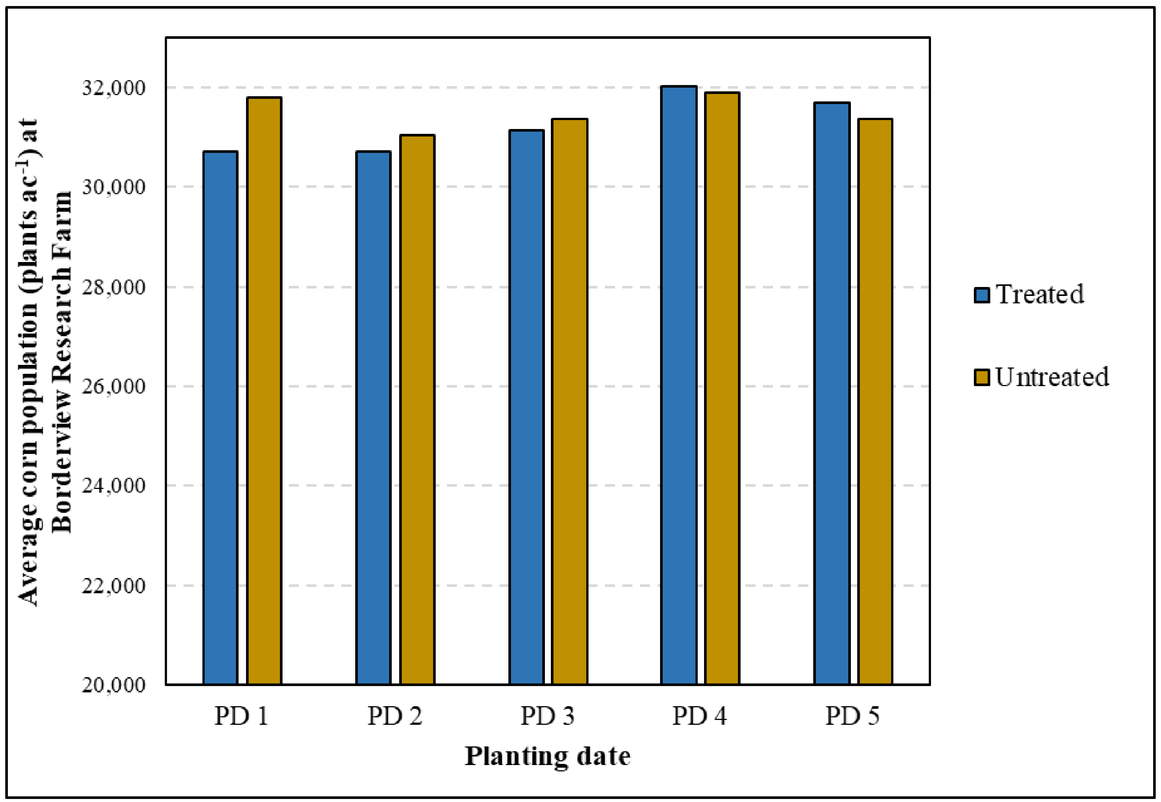
Impact of Treated Seed on Plant Stands

- **Borderview Research Farm: 2023, 2024, 2025**
  - Replicated trial
  - Two treatments: treated and untreated
  - Six planting dates
  - Soil & crop measurements

Planting date number	Planting date
PD 1	10-May
PD 2	16-May
PD 3	26-May
PD 4	1-June
PD 5	9-June
PD 6	16-June

Impact of Treated Seed on Plant Stands



No statistical difference in corn populations between treated and untreated corn seed.

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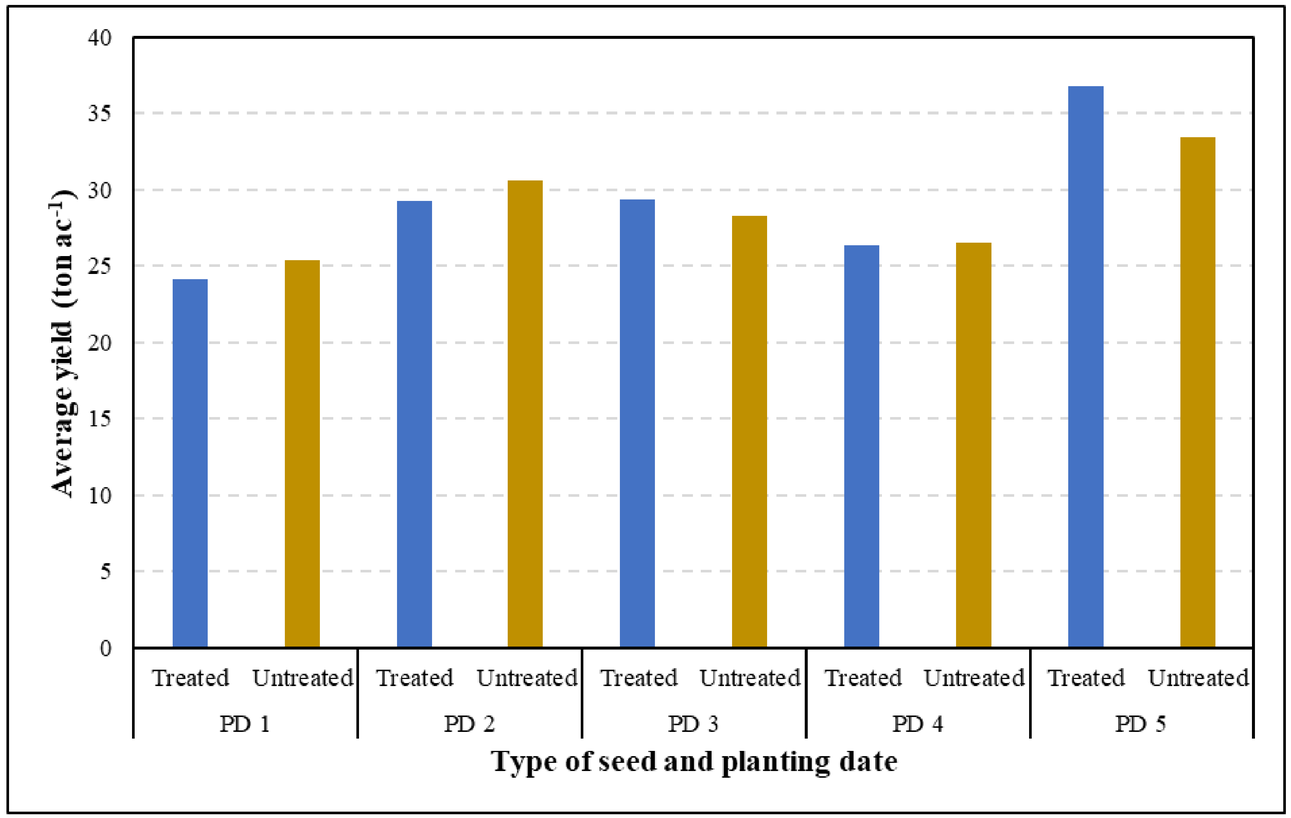
Impact of Treated Seed on Yields



No statistical difference in corn yields between treated and untreated corn seed.

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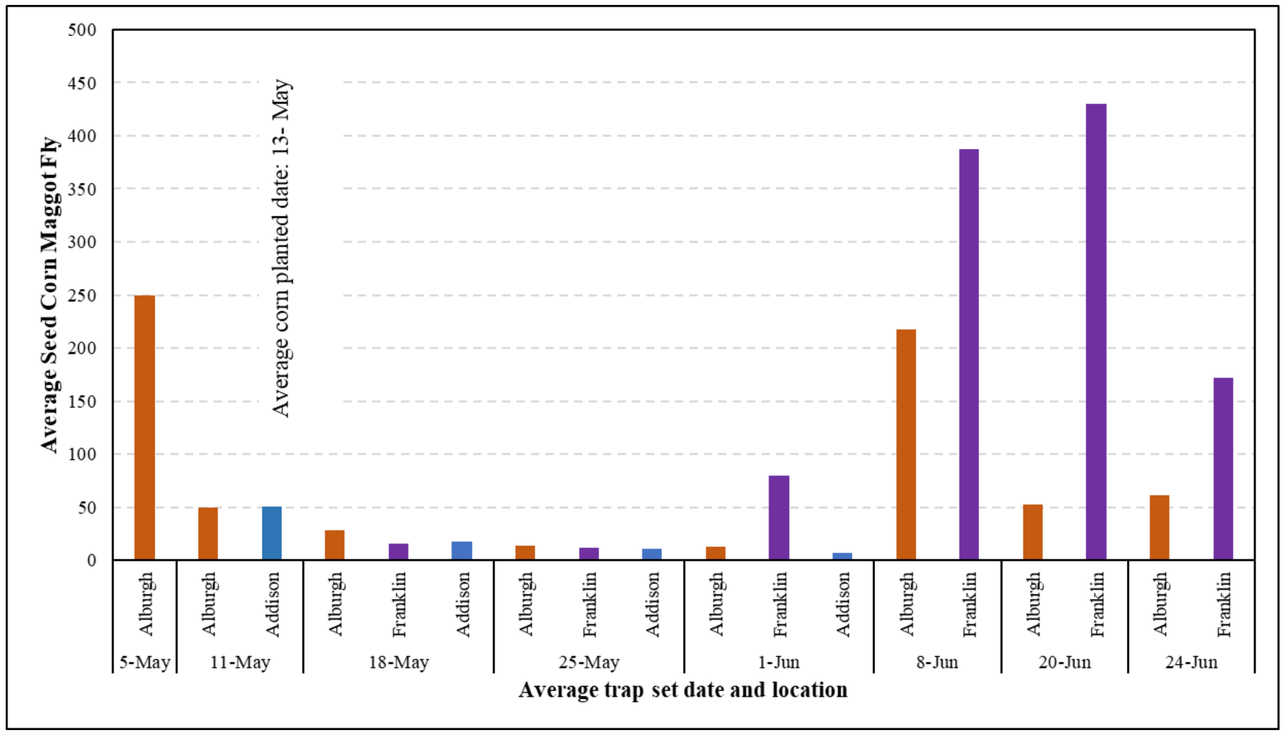
Corn Seed Maggot Flies



Seed corn maggot flight recorded on 8-Jun. Did this impact the corn yield at this planting date?

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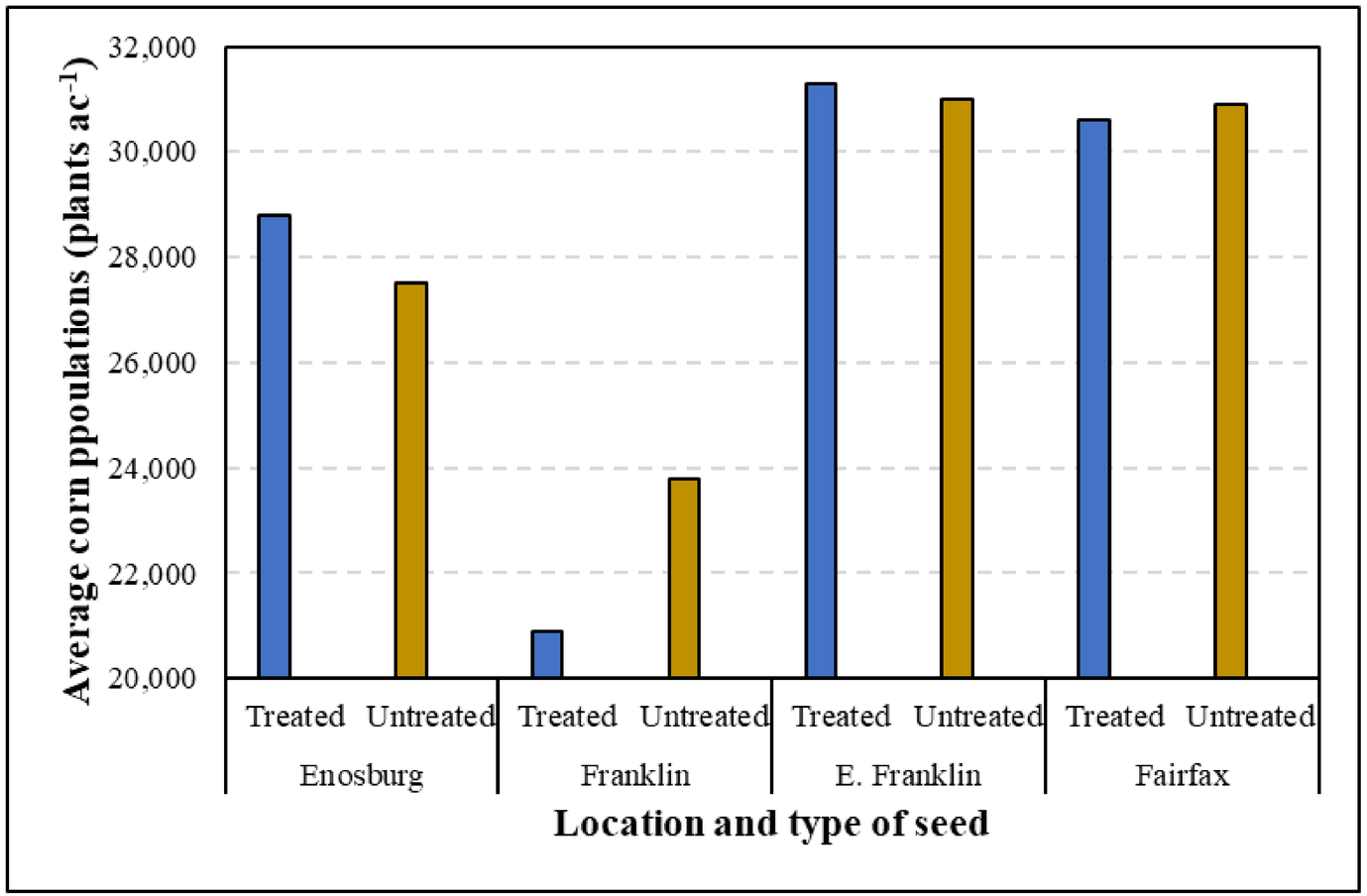
Impact of Treated Seed on Plant Stands



On-farm sites (one planting date) observes some differences in populations; however, related to bird damage and dry conditions at planting.

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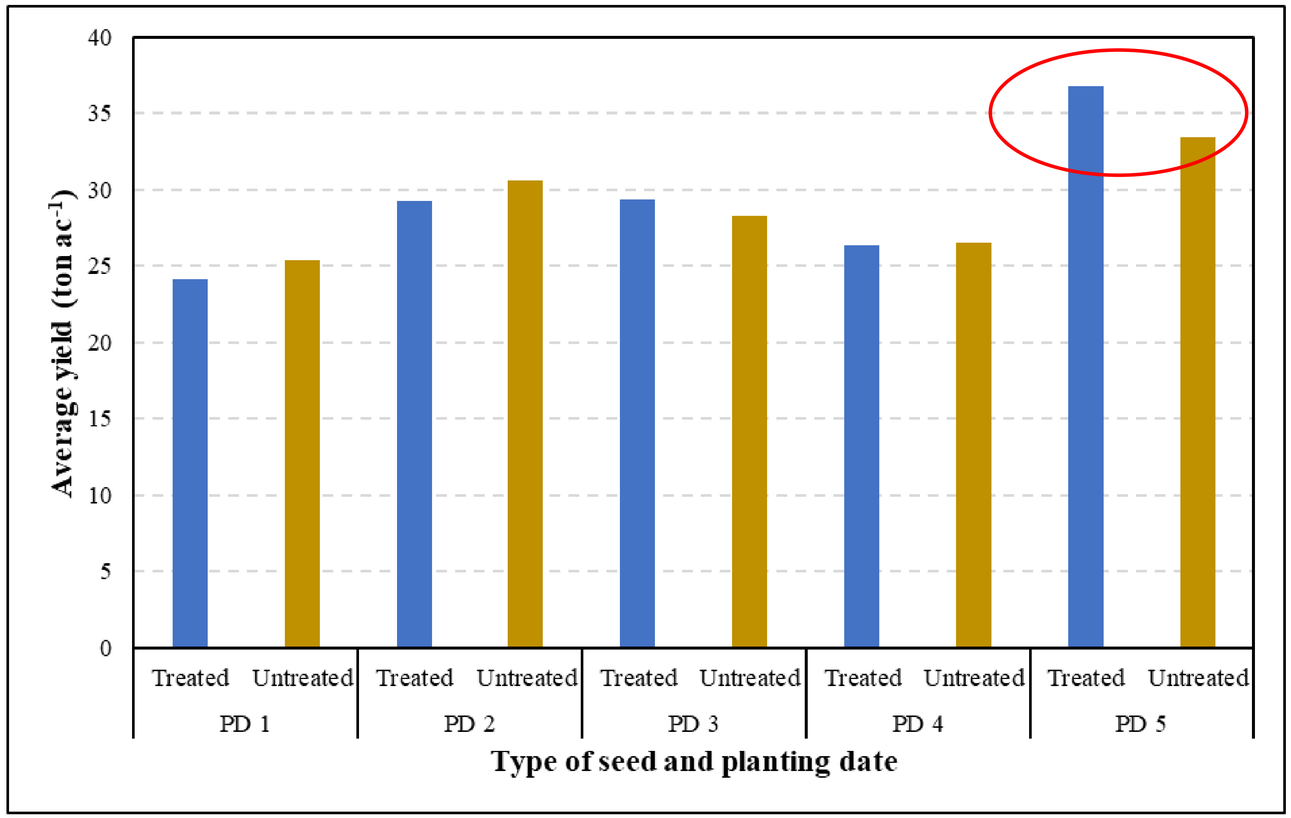
Impact of Treated Seed on Yields



What about planting date 5? This is a 4-ton yield difference!

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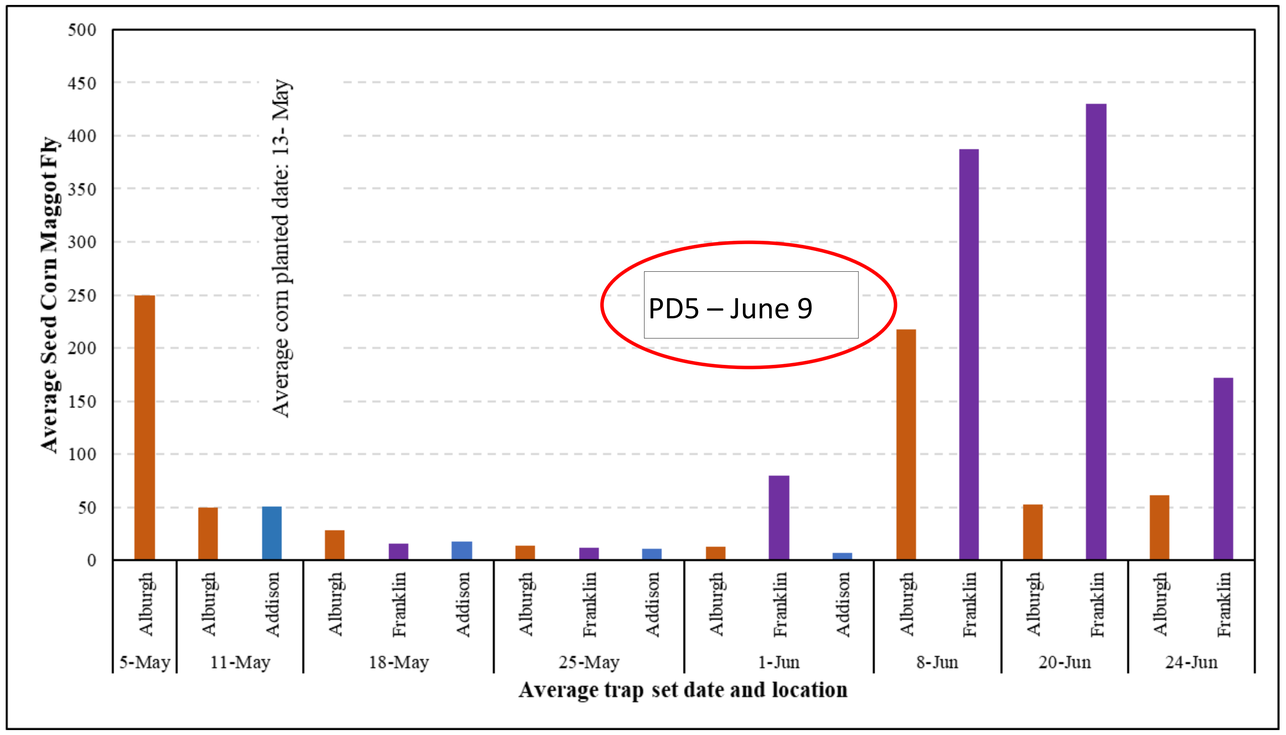
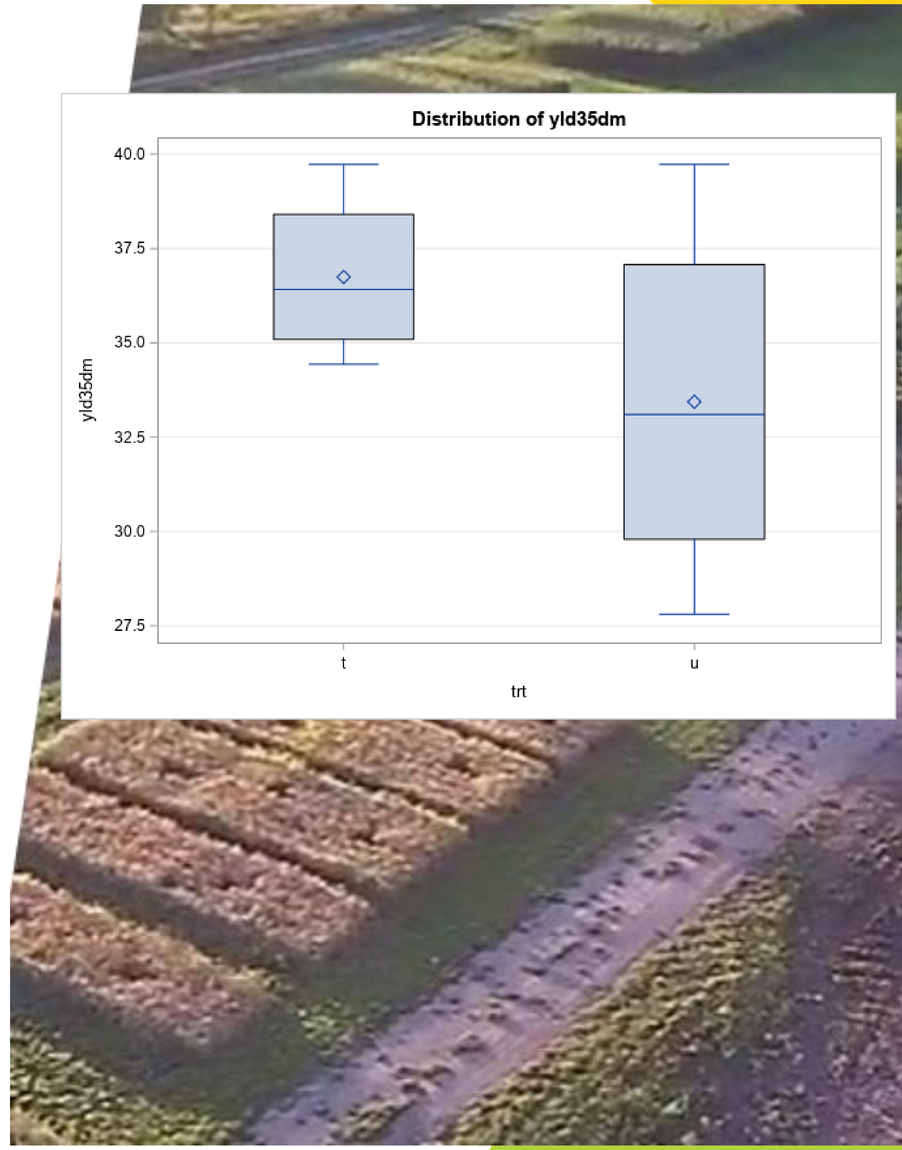
Corn Seed Maggot Flies





Seed corn maggot flight recorded on 8-Jun. Did this impact the corn yield at this planting date?

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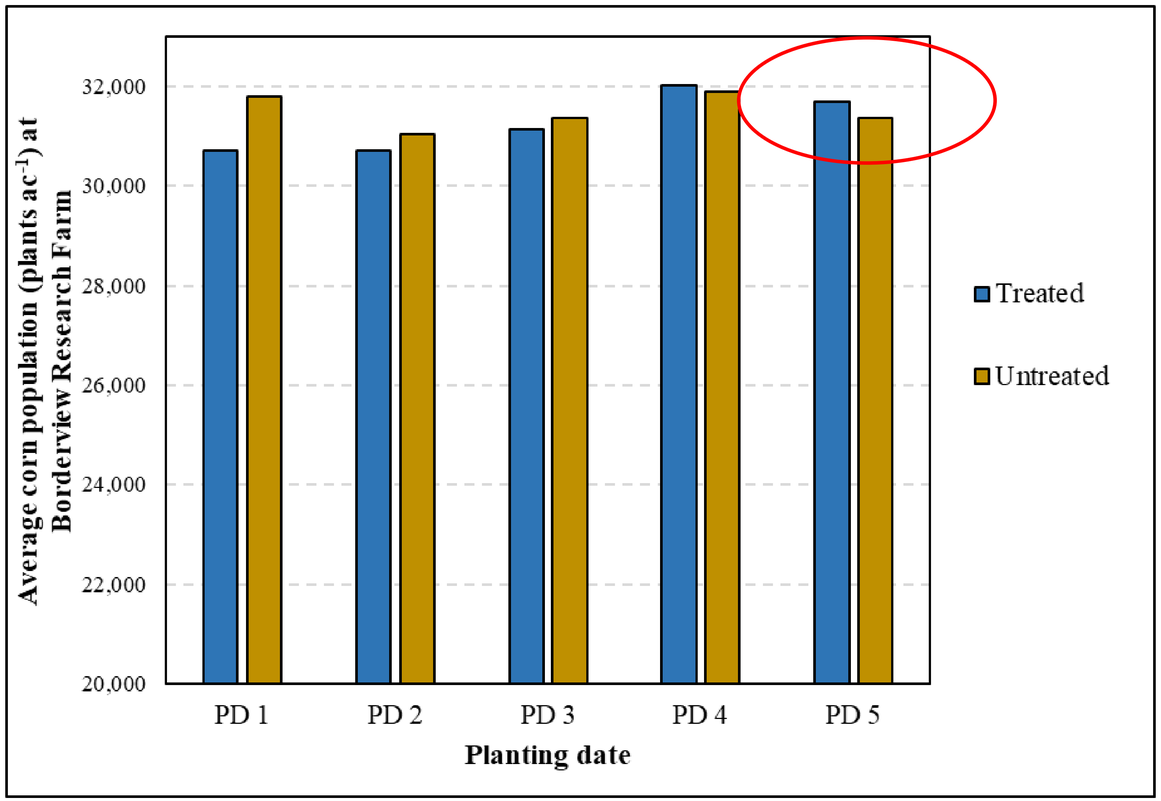

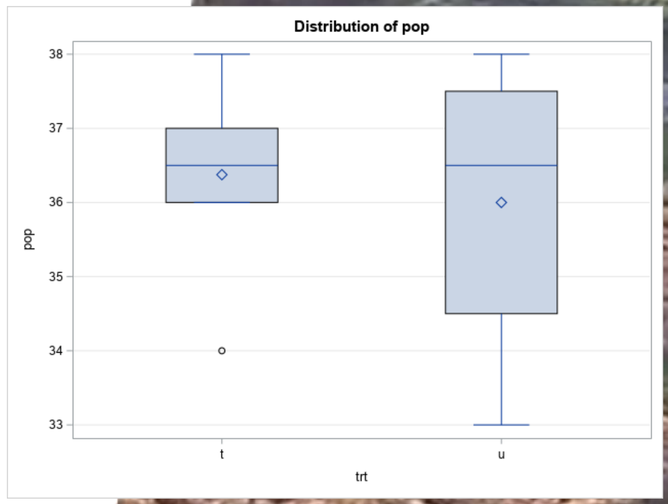

No statistical difference in corn populations between treated and untreated corn seed.

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Clothianidin in the Soil over a Year

	Replicate					
	Rep1	Rep 2	Rep 3	Rep 4	Average[£]	Detectable limit[¥]
	ug kg^{-1}					% of samples
Preplant (09-May 2023)						
0.0"-2.5"	<2.0	<2.0	<2.0	<2.0	<2.0	0
2.5" - 6.0"	6.60	2.70	<2.0	8.60	5.97	75
7 DAP[€] (18-May 2023)						
0.0"-6.0"	<2.0	<2.0	2.30	2.70	2.50	50
42 DAP (21-Jun 2023)						
0.0"-6.0"	19.80	11.40	2.00	2.00	8.80	100
147 DAP (02-Oct 2023)						
0.0"-6.0"	<2.0	2.30	<2.0	<2.0	2.30	25
178 DAP (03-Nov 2023)						
0.0"-2.5"	2.20	<2.0	<2.0	<2.0	2.20	25
2.5" - 6.0"	<2.0	3.60	<2.0	2.70	3.15	75
353 DAP (26-Apr 2024)						
0.0"-2.5"	<2.0	<2.0	<2.0	<2.0	<2.0	0
2.5" - 6.0"	<2.0	<2.0	<2.0	<2.0	<2.0	0

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Long-Term Use of Clothianidin and Soil Residues

	Micro Watershed†					
	North Surface	North Tile	South Tile	South Surface	Average (n=16)£	Detectable limit¥
	ug kg^{-1}					% of samples
2023 Preplant (13-Apr)						
0.0"-2.5"	3.78	4.60	3.70	3.70	3.94	88
2.5"-6.0"	5.40	5.65	3.15	4.45	4.66	44
2024 Preplant (26-Apr)						
0.0"-2.5"	6.00	3.25	3.35	<2.0	3.30	44
2.5"-6.0"	5.80	2.67	2.55	<2.0	2.61	44

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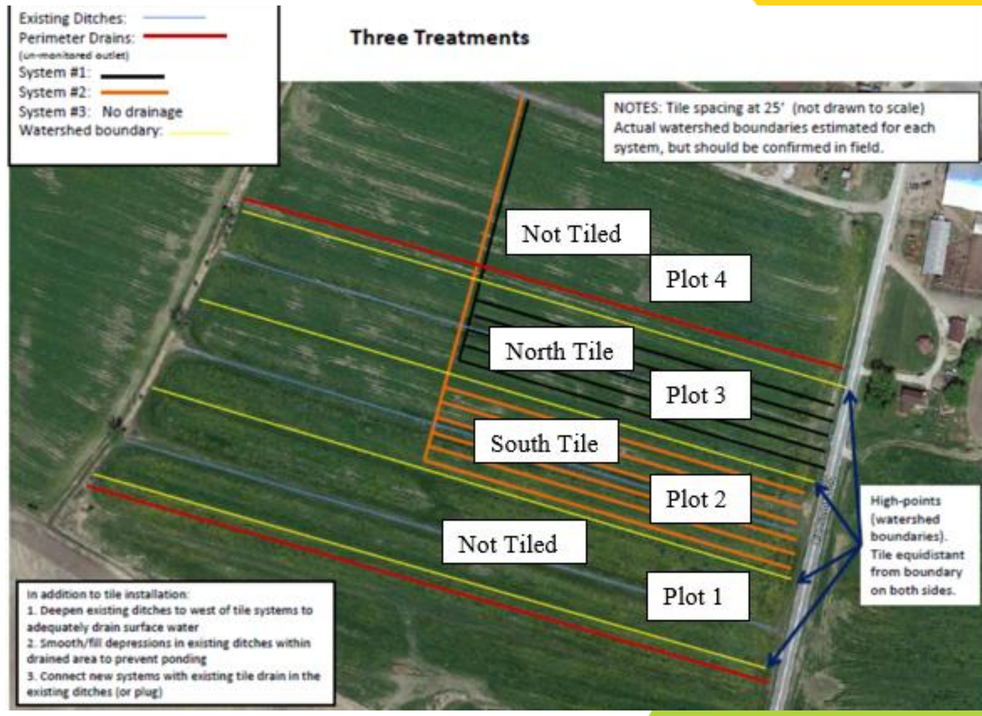
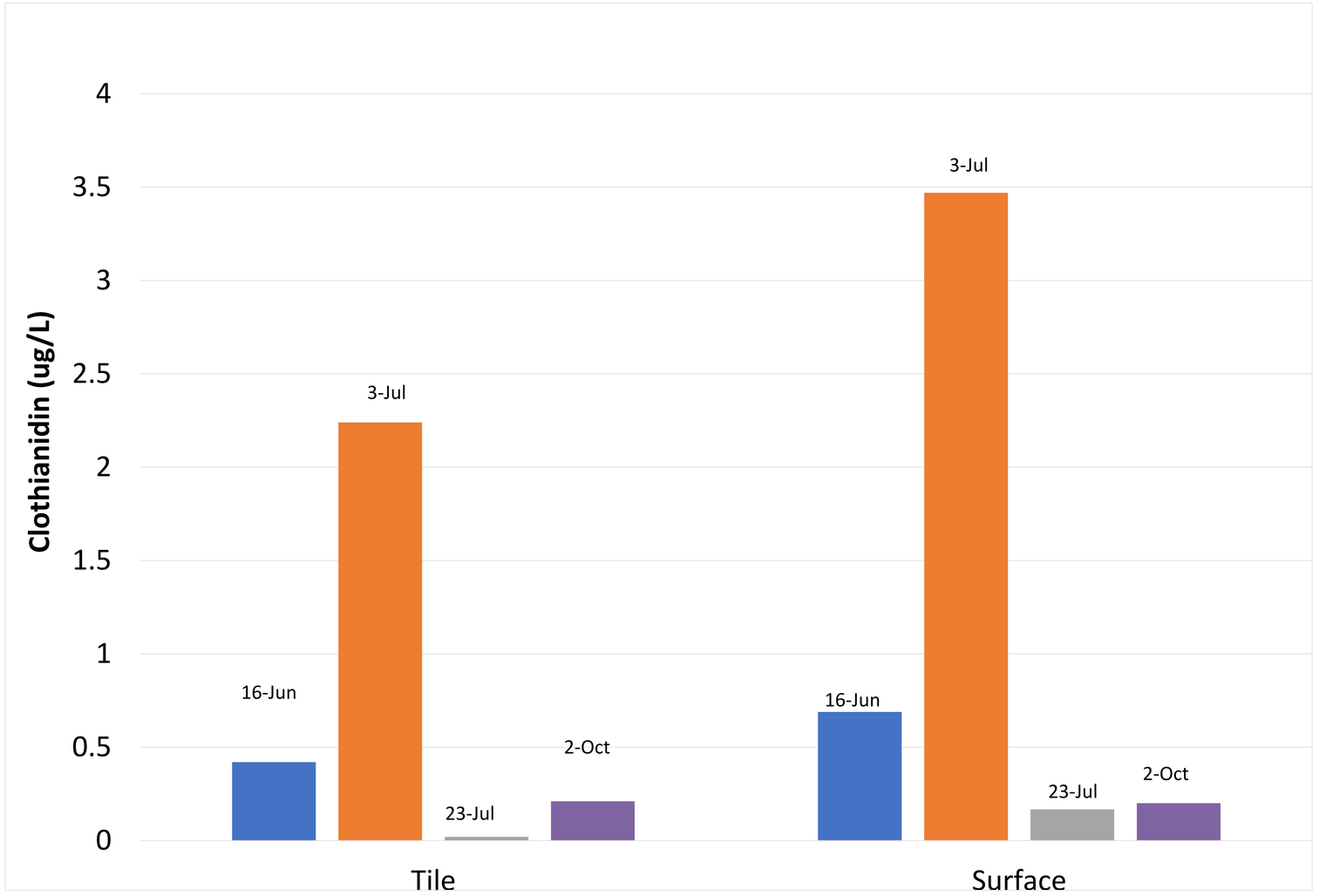
Scope of Work: VAAFM & LCBP

- **Discovery Acres**
  - Assess the impact of management methods on water quality (N&P).
  - Neonicotinoid movement in surface and subsurface water.



Concentration of clothianidin in Tile & Surface water post corn planting, St. Albans, VT, 2023.



Samples with concentration greater than reporting limit (0.0500 ug/L).

*This is not the loading rate just concentrations from single samples taken from surface or tile when there was water moving off from surface or out of the tiles.

DISCOVERY ACRES VERMONT

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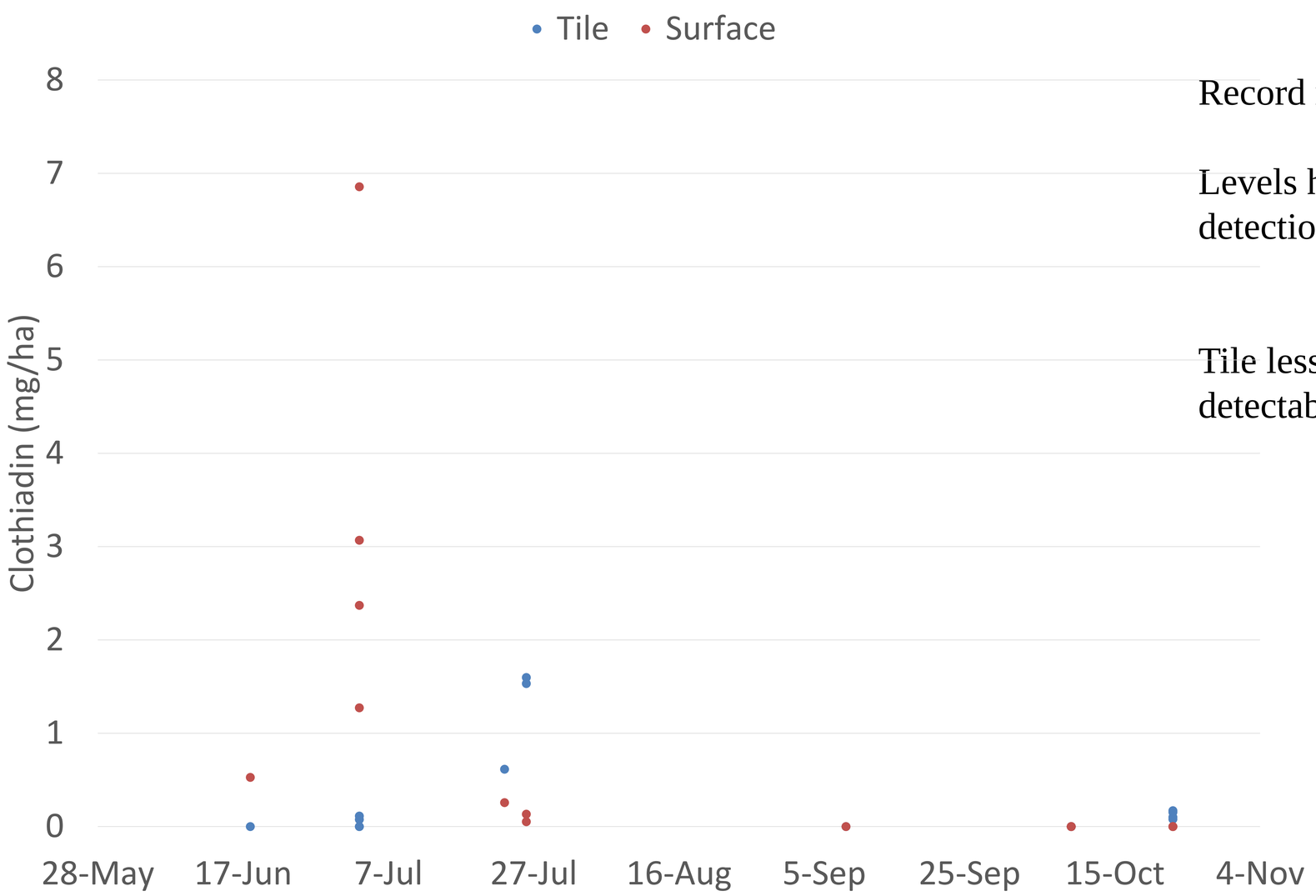
Loading of clothianidin in Tile & Surface water post corn planting, St. Albans, VT, 2023.



Record rainfall in 2023

Levels higher from surface runoff & detection 47% of the time.

increase infiltration rate

Tile less detection – 43% of samples had detectable levels.

DISCOVERY ACRES VERMONT

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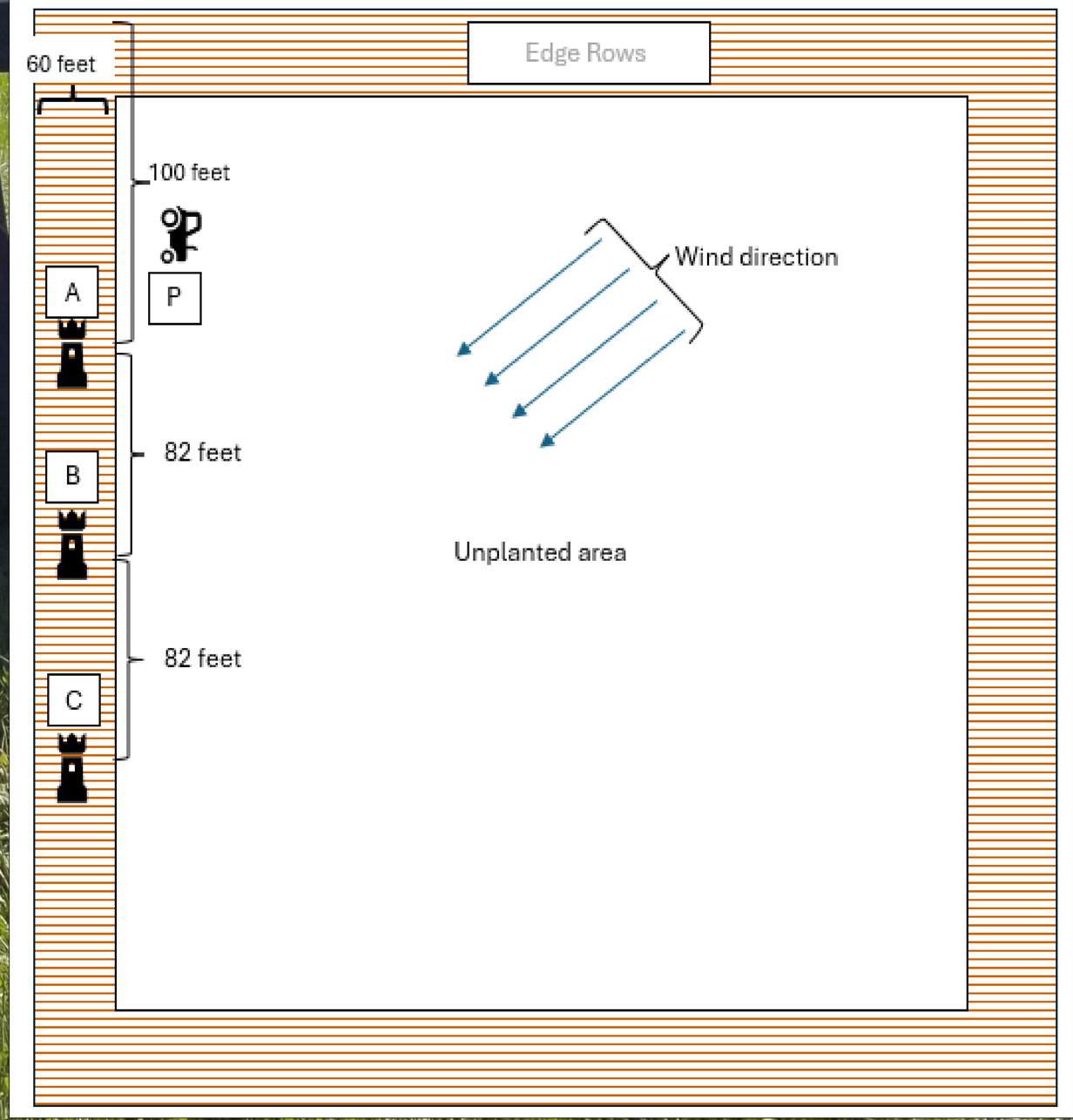
Planter Dust

Image 1. Tower with slide panels

Image 2. Transport box for



r parameters at the time of dust collection at each on-farm location in Vermont, 2024.

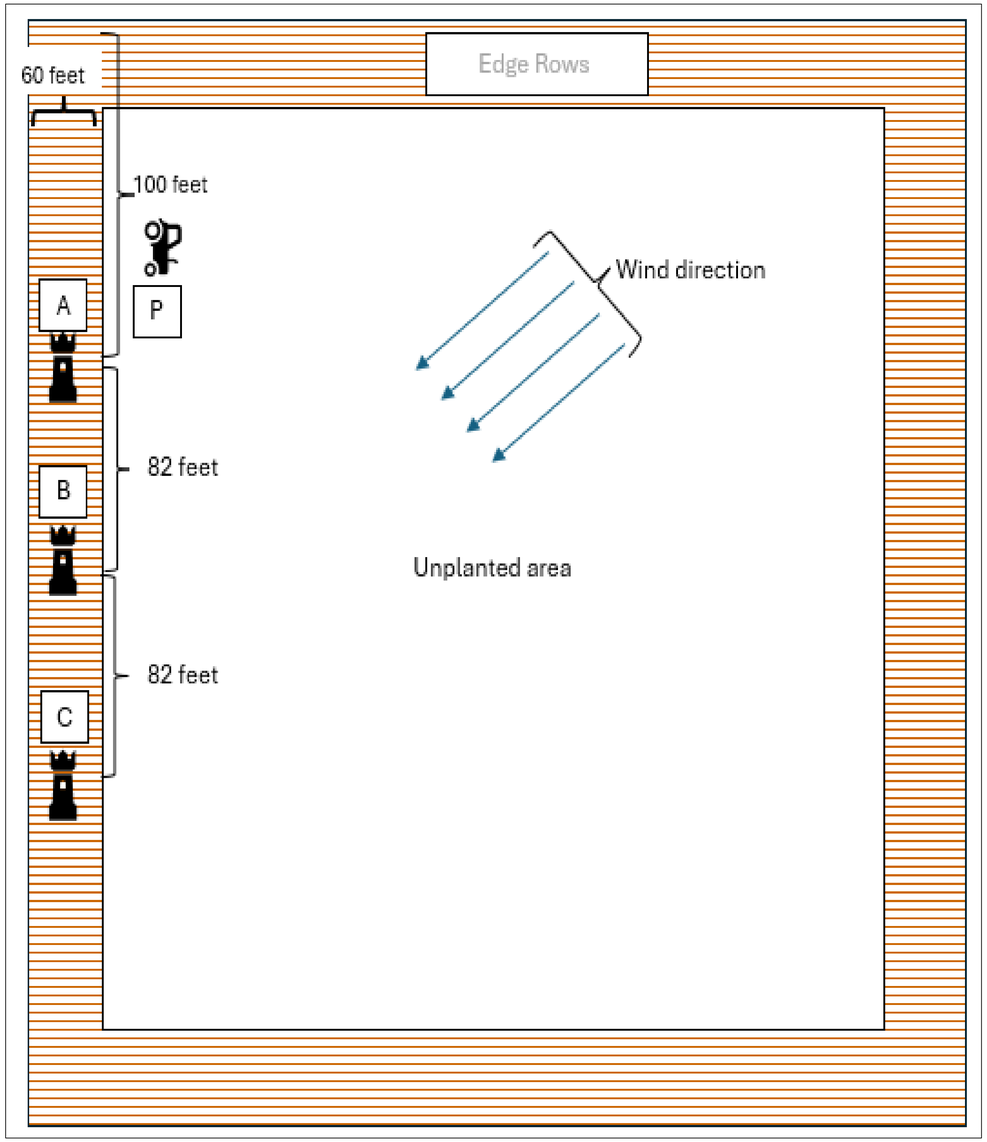
Collection date	Wind speed (mph)	Wind direction	Humidity (%)	Temperature (°F)	Soil moisture (%)	Soil Type
20-May	7.4-9.4	SE	41.2	64.0	7.30	Missisquoi loamy sand 3-8% slope Wareham loamy fine sand
11-May	4.5-6.5	E	72.3	64.7	41.0	Missisquoi loamy sand 0-3% slope & 25-60% slope
13-May	2.5-3.6	SW	34.4	66.0	36.0	Copake fine sandy loam 2-8% slope
16-May	5.1-6.3	W	56.5	62.4	18.1	Cabot Silt Loam 3-8%, Westbury stony fine sandy loam 3-8% & 8-15%
21-May	0.4-4.5	E-SE	47.0	88.0	46.6	Covington and Panton silty clay, 0-3%

rection, humidity and temperature were collected with a HoldPeak® digital anemometer. Soil moisture was taken with General Tools
al Soil Moisture Meter with Probe. Model DSMM500.

Neonicotinoid Dust Captured at On-Farm Locations

¥<0.43 is below the detectable limits.

Location (city)	Collection height (cm)	Clothianidin (ng cm^{-2})	Thiamethoxam (ng cm^{-2})
Highgate	200	<0.43¥	<0.43
	30	<0.43	<0.43
	0	<0.43	<0.43
Swanton	200	<0.43	<0.43
	30	<0.43	<0.43
	0	<0.43	<0.43
St. Albans	200	<0.43	<0.43
	30	<0.43	<0.43
	0	<0.43	<0.43
Franklin	200	<0.43	<0.43
	30	<0.43	<0.43
	0	<0.43	<0.43
Middlebury	200	<0.43	<0.43
	30	<0.43	<0.43
	0	0.7	<0.43



Dust Collection – Direct from Planter

Fluency Agents

Fluency agents often used to help seed flow through the planter.

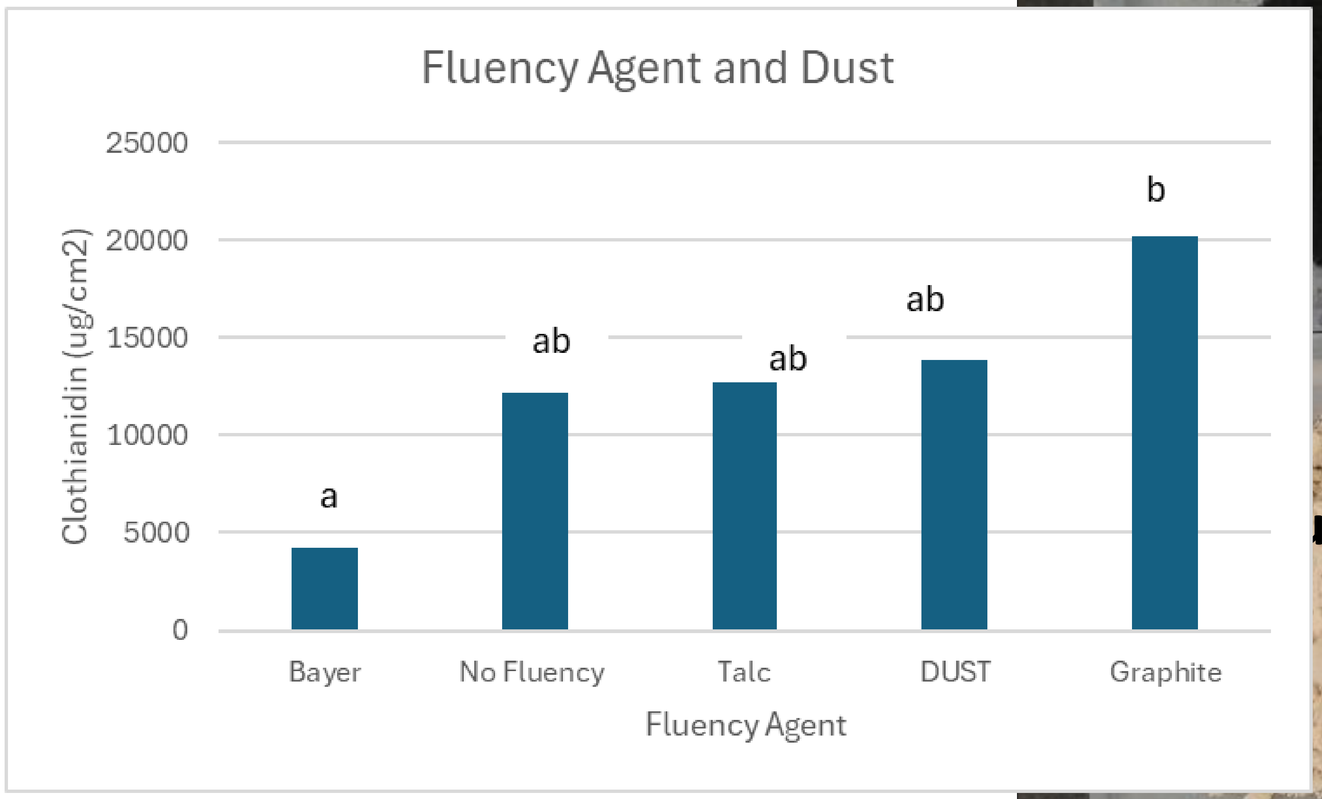
Fluency agents thought to be abrasive to the seed coatings/treatment.

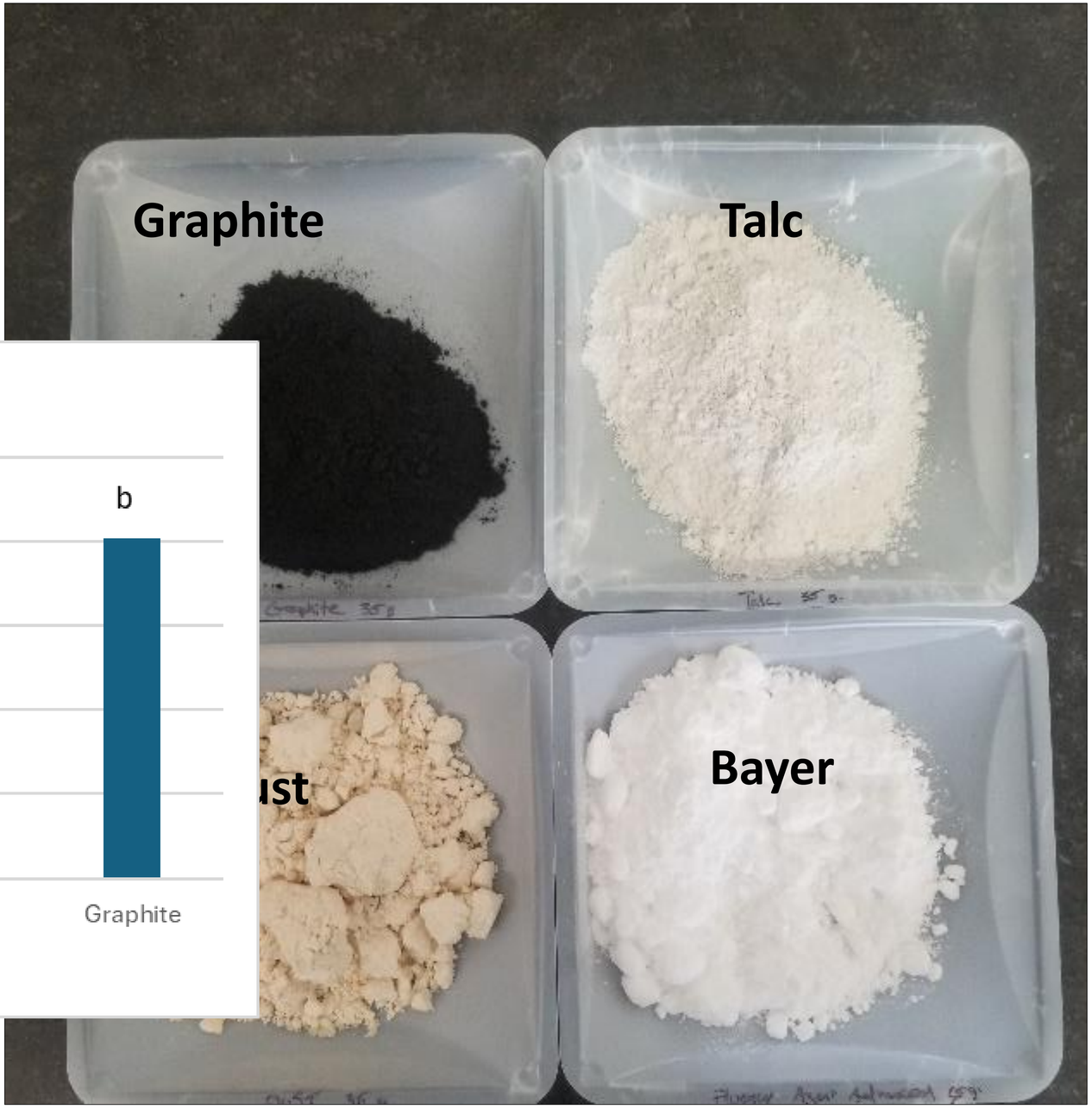
Alternative fluency agents developed to reduce “dust-off” during planting.

DUST – Soybean based product

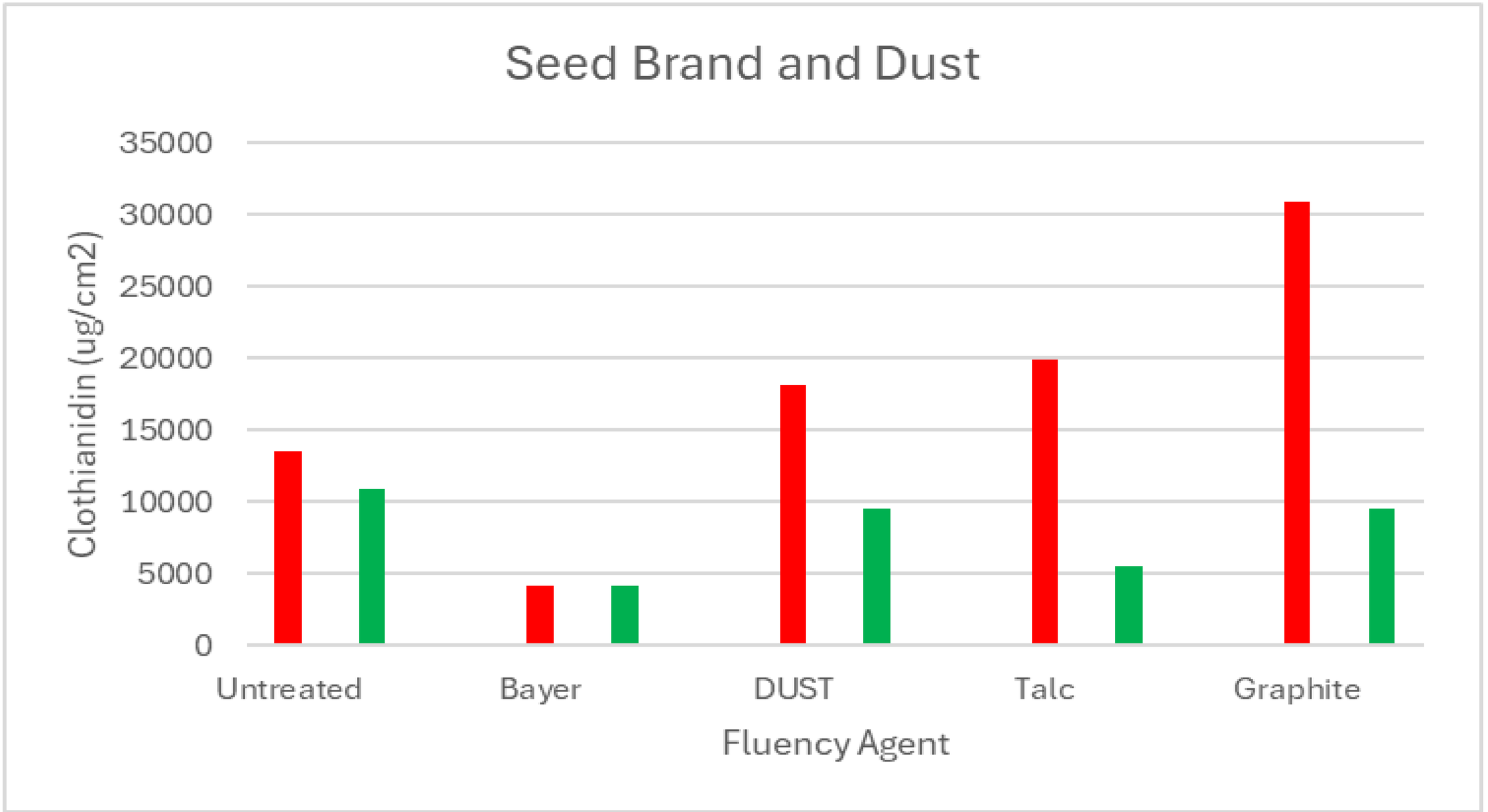
Bayer Fluency Agent – Polyethylene wax based

Fluency Agents





Seed Brand


Seed Brand and Dust
35000
30000
25000
20000
15000
10000
5000
0
Clothianidin (ug/cm2)
Untreated
Bayer
DUST
Talc
Graphite
Fluency Agent

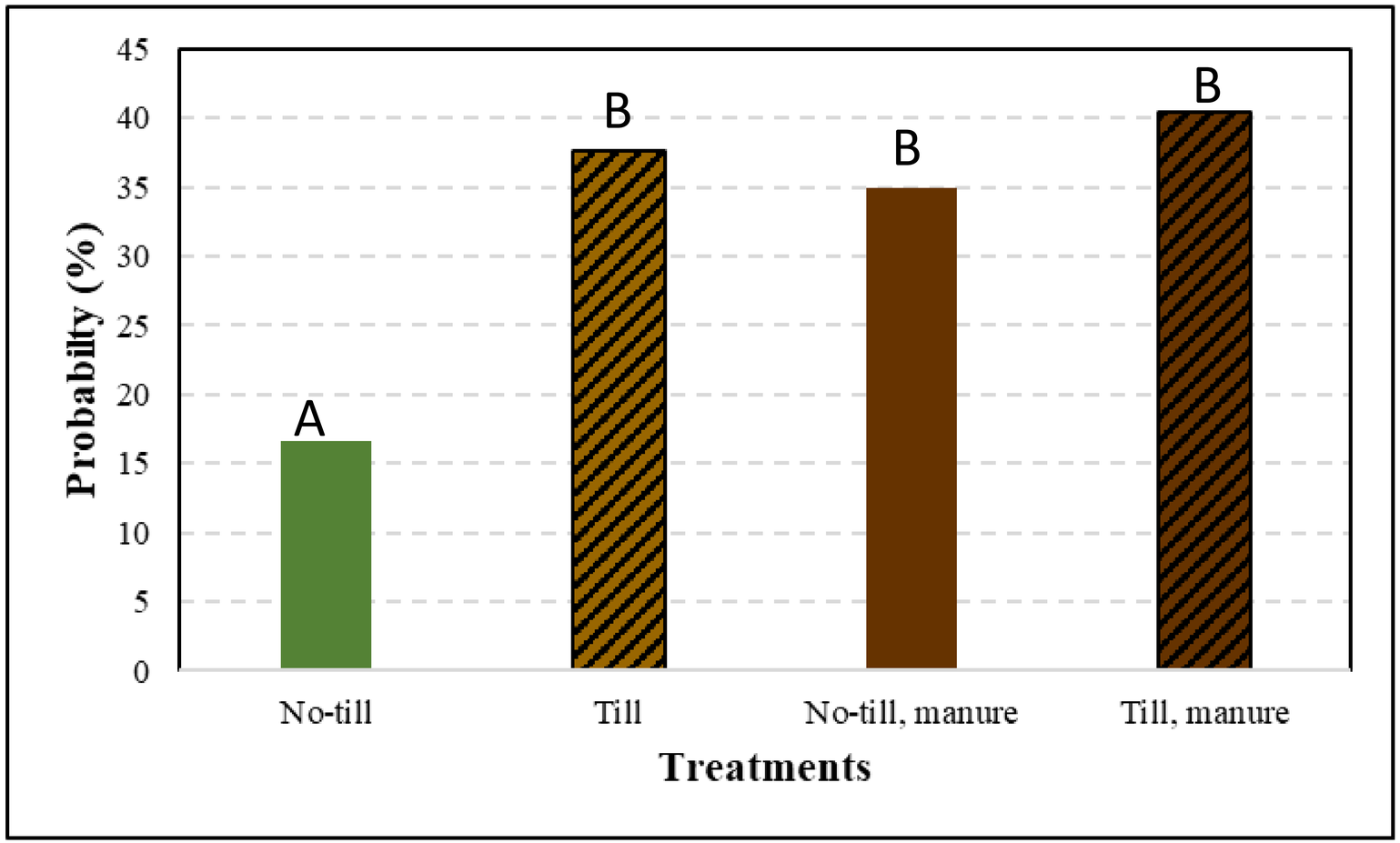
Conservation Practices and Seedcorn Maggot

Study to evaluate if practices associated with conservation increase risk of seedcorn maggot.

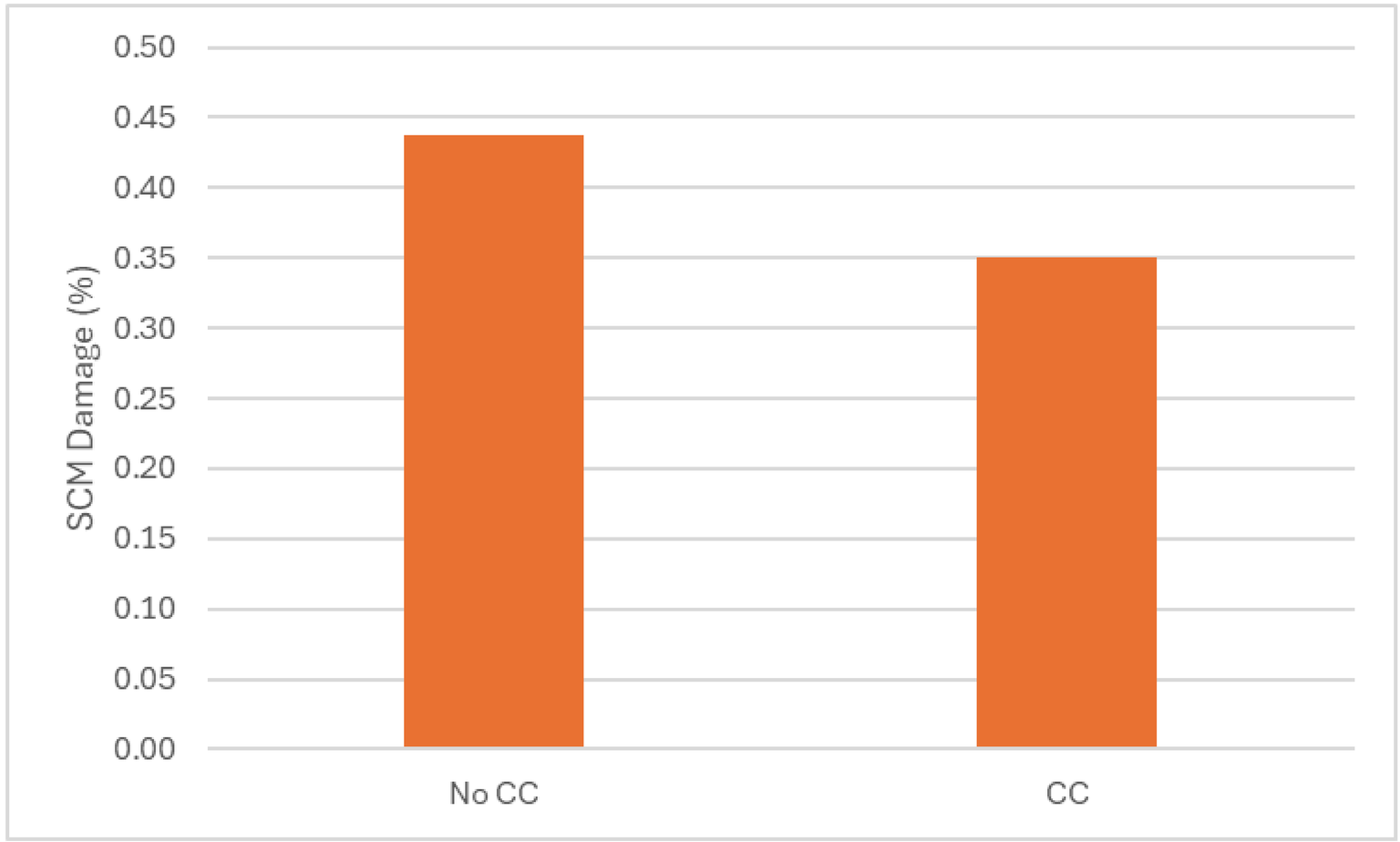
Table 1. Corn cropping system specifics for corn yield and soil health, Alburgh, VT, 2023.

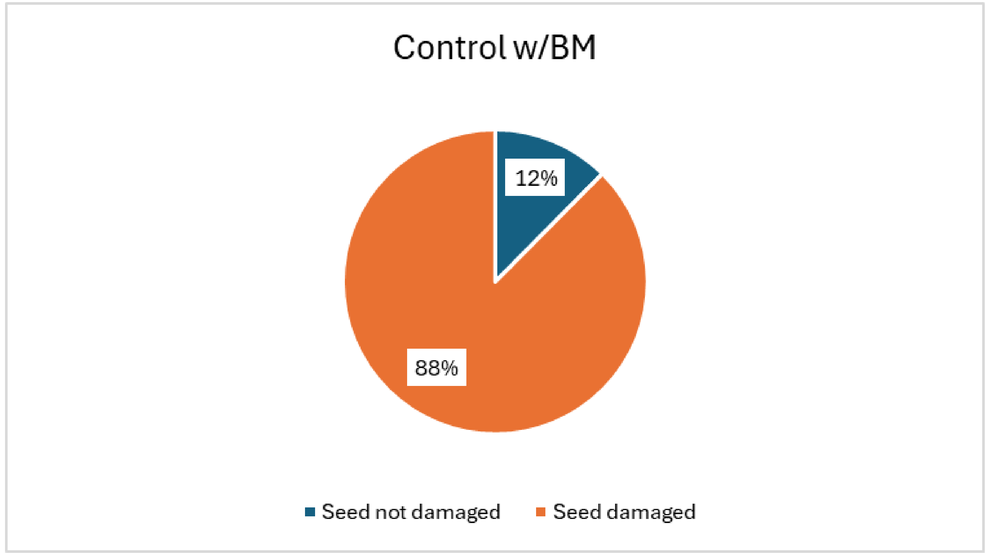
Management method	Treatment abbreviation
Tilled	T
No-till	NT
Broadcast manure	BM
Broadcast manure, incorporated with tillage	TM
Injected manure	IM
Cover crop, tilled	CCT
Cover crop + no-till	CCNT
Cover crop + broadcast manure	CCBM
Cover crop + broadcast manure, incorporated with tillage	CCTM
Cover crop + injected manure	CCIM

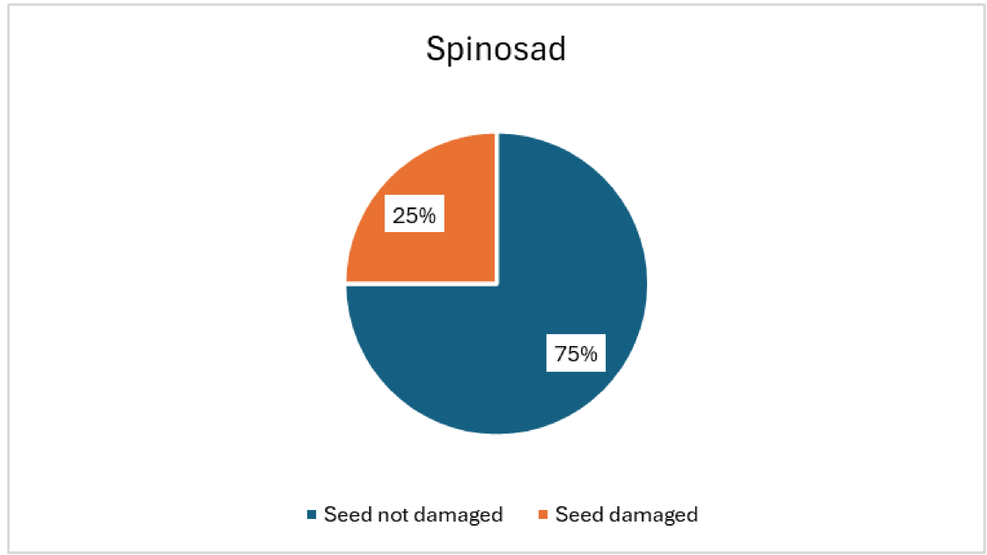
Impact of Tillage & Manure

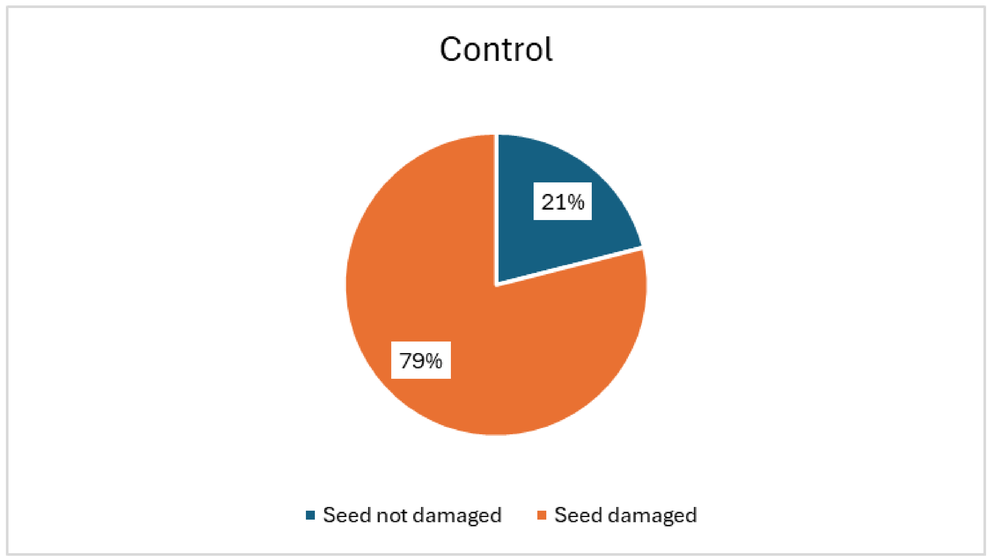


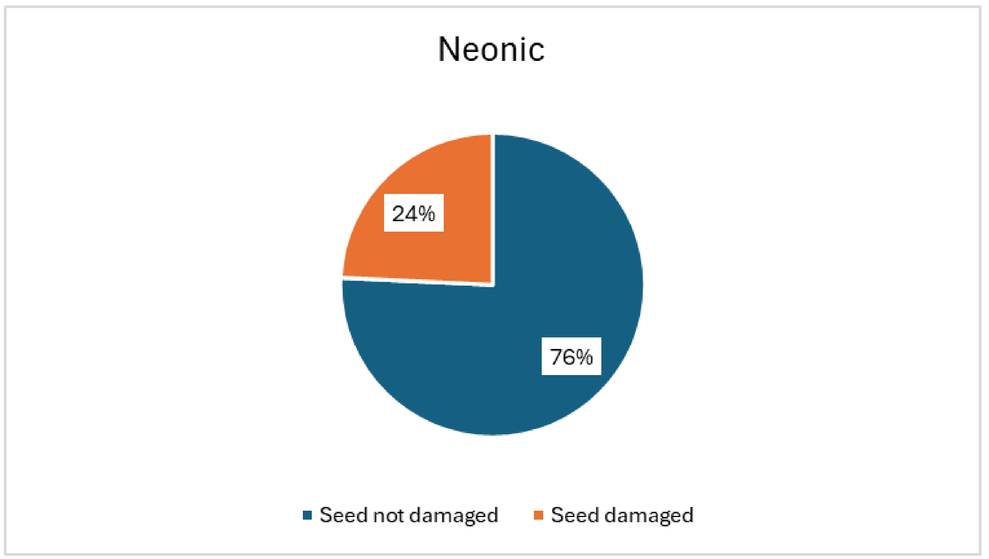
Impact of Cover Crops

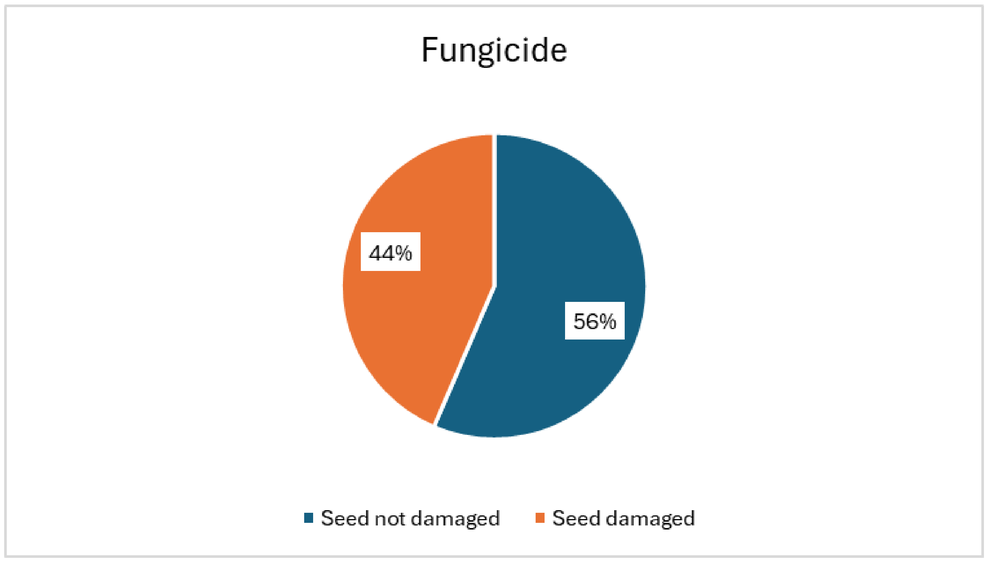


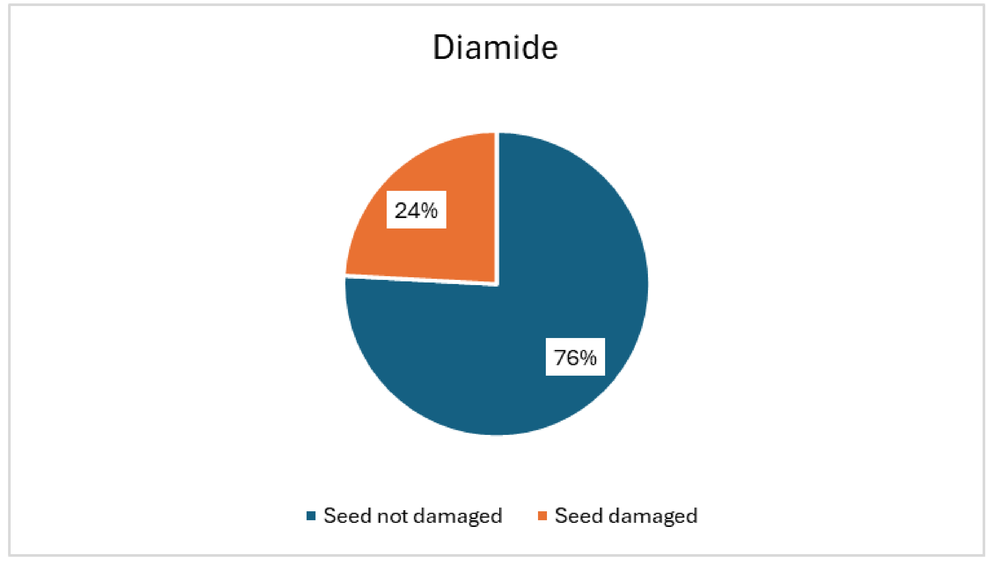

Control w/BM
12%
88%
Seed not damaged
Seed damaged


Spinosad
25%
75%
Seed not damaged
Seed damaged


Control
21%
79%
Seed not damaged
Seed damaged


Neonic
24%
76%
Seed not damaged
Seed damaged


Fungicide
44%
56%
Seed not damaged
Seed damaged


Diamide
24%
76%
Seed not damaged
Seed damaged