



# IMPACTS OF FUNGICIDE SELECTION AND PLACEMENT IN BEAN ROOT ROT MANAGEMENT



Department of Plant Pathology  
UNIVERSITY OF WISCONSIN-MADISON

# Root Rot & Damping Off Diseases

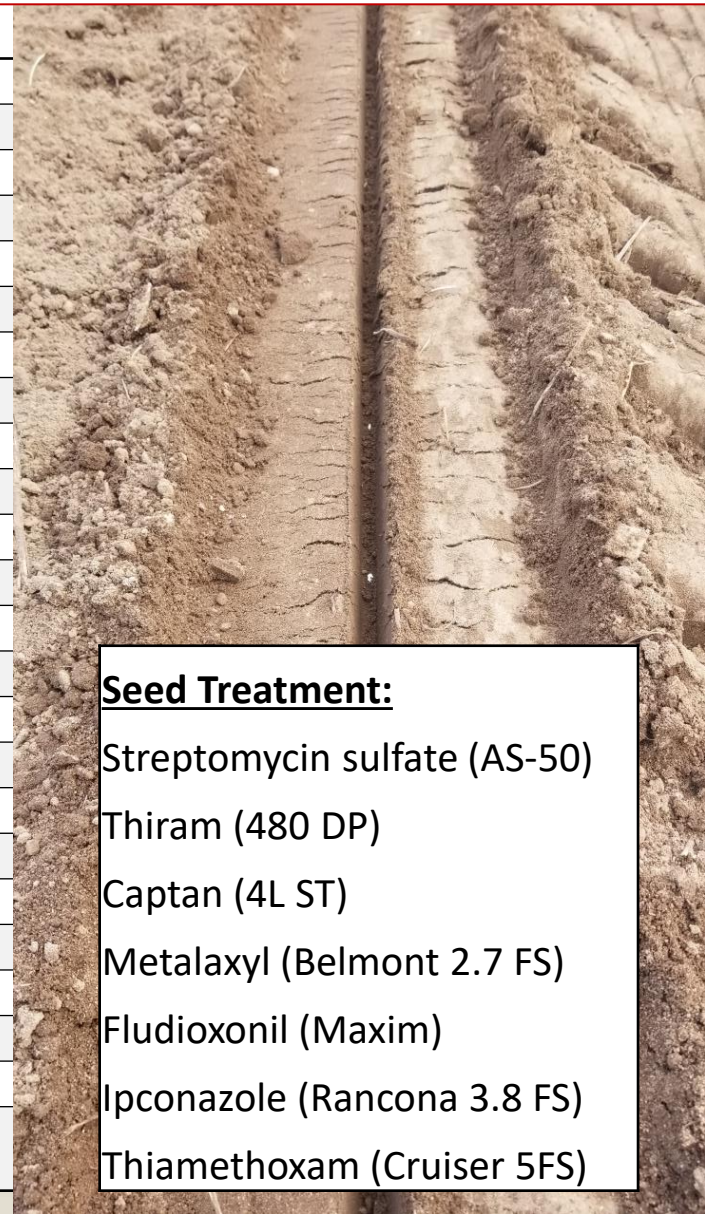
## 2023 Trt List Hancock ARS C20- *Fusarium* inoculated 'Hystyle'

Trt #	Treatment	Seed Treatment	rate/1000 rf	Timing <sup>z</sup>	
1	Control	No	Non-Inoculated	NA	NA
2	Control	No	Inoculated	NA	NA
3	Ridomil Gold	No	0.42 fl oz	IFAP	Mefenoxam
4	Ridomil Gold + Quadris	No	0.42 fl oz + 0.8 fl oz	IFAP	Mefenoxam and Azoxystrobin
5	Quadris	No	0.8 fl oz	IFAP	Azoxystrobin
6	Velum Prime	No	0.45 fl oz	IFAP	Fluopyram
7	Proline	No	0.192 fl oz	IFAP	Prothioconazole
8	Propulse	No	6.0 fl oz/A	IFAP	Fluopyram and Prothioconazole
9	Propulse	No	8.0 fl oz/A	IFAP	Fluopyram and Prothioconazole
10	Propulse	No	10.0 fl oz/A	IFAP	Fluopyram and Prothioconazole
11	Minuet	No	12.0 fl oz/A	IFAP	<i>Bacillus subtilis</i> QST713
12	XSK03	No	8.5 fl oz/acre.	IFAP	Pre-commercial plant health
13	Howler EVO	No	2.5 lb/A	IFAP	<i>Pseudomonas chlororaphis</i>
14	Hower EVO	No	1.25 lb/A	IFAP	<i>Pseudomonas chlororaphis</i>
15	Theia	No	1.5 lb/A	IFAP	<i>Bacillus subtilis</i>
16	Control	Yes	Non-Inoculated	NA	NA
17	Control	Yes	Inoculated	NA	NA
18	Ridomil Gold	Yes	0.42 fl oz	IFAP	Mefenoxam
19	Ridomil Gold + Quadris	Yes	0.42 fl oz + 0.8 fl oz	IFAP	Mefenoxam and Azoxystrobin
20	Quadris	Yes	0.8 fl oz	IFAP	Azoxystrobin
21	Velum Prime	Yes	0.45 fl oz	IFAP	Fluopyram
22	Proline	Yes	0.192 fl oz	IFAP	Prothioconazole
23	Propulse	Yes	10.0 fl oz/A	IFAP	Fluopyram and Prothioconazole
24	Propulse + Ridomil Gold	Yes	10.0 fl oz/A + 0.42 fl oz/1000rf	IFAP	Fluopyram and Prothioconazole, Mefenoxam

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22	Proline	Yes	0.192 fl oz
23	Propulse	Yes	10.0 fl oz/A
24	Propulse + Ridomil Gold	Yes	10.0 fl oz/A + 0.42 fl oz/1000rf



### Seed Treatment:

Streptomycin sulfate (AS-50)

Thiram (480 DP)

Captan (4L ST)

Metalaxyl (Belmont 2.7 FS)

Fludioxonil (Maxim)

Ipconazole (Rancona 3.8 FS)

Thiamethoxam (Cruiser 5FS)

# Root Disease Rating

## *Fusarium inoculation study on 'Hystyle'*



**Fusarium severity scale (0-5):** Photograph and scale description adapted from--Hegde, N. P. 2014. Evaluating Chemical Seed Treatments for Fusarium Root Rot Control in Dry Beans and Field Peas. Page 23. North Dakota State University, Fargo, North Dakota.

0 = no visual symptoms

1 = 1-20% discoloration with individual lesions

2 = 21-40% discoloration with coalesced lesions but tissues are firm with some reduction in root mass

3 = 41-60% discoloration and root tissue lesions combined with considerable softening

4 = 61-80% discoloration and internal pith tissues of roots affected

5 = 81-100% discoloration, root softening and rotting along with heavy reduction in root mass

# Results of In-furrow & Seed-applied Fungicides on 'Hystyle' 2023

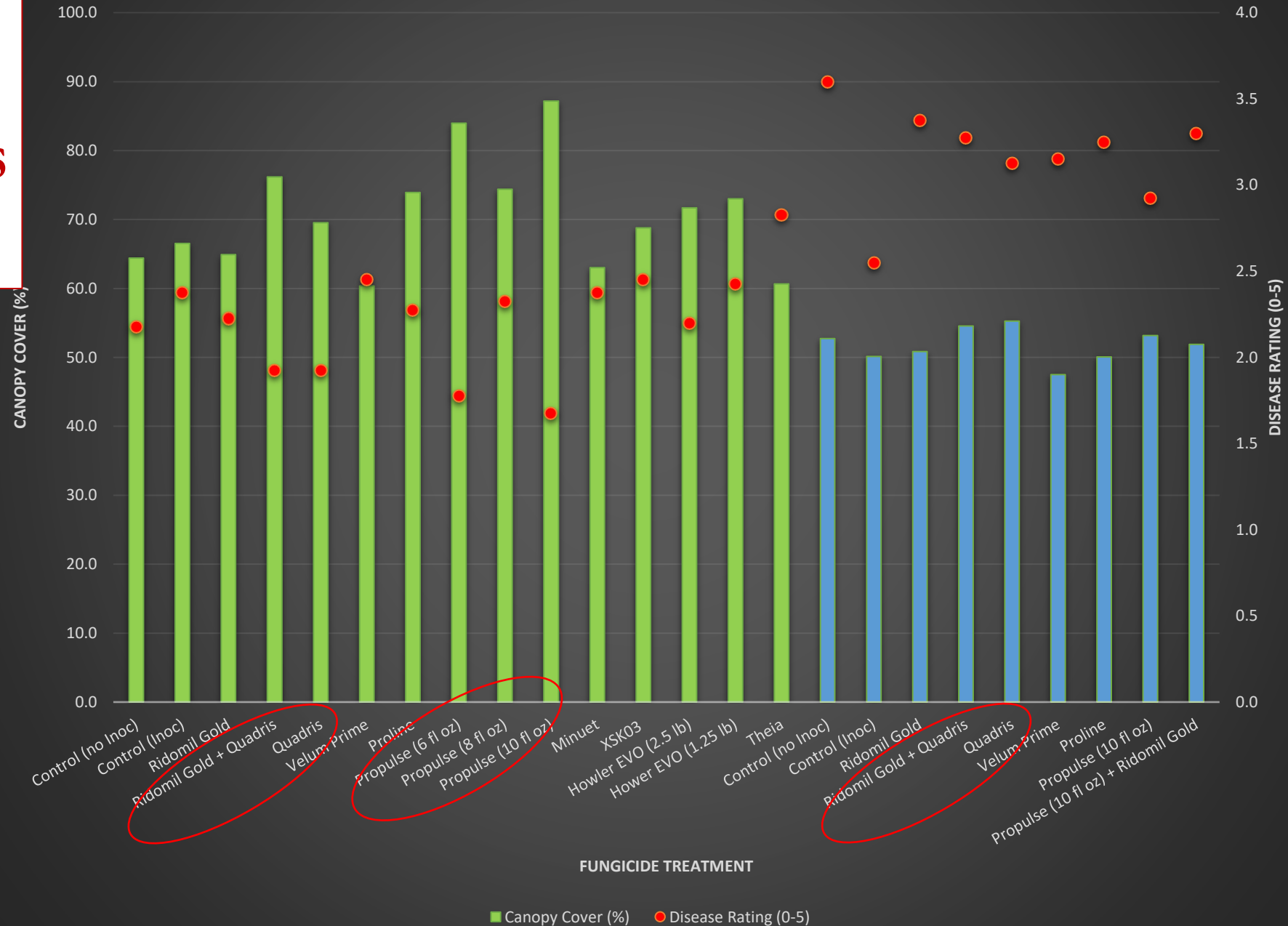
- Root rot and emergence ratings were significant
- Yields were not significantly different across in-furrow and seed-applied treatments
  - *Trial was inoculated with Fusarium oxysporum (root rotter)*
  - *Natural soilborne disease pressure was **very high** (Rhizoctonia was esp. high)*



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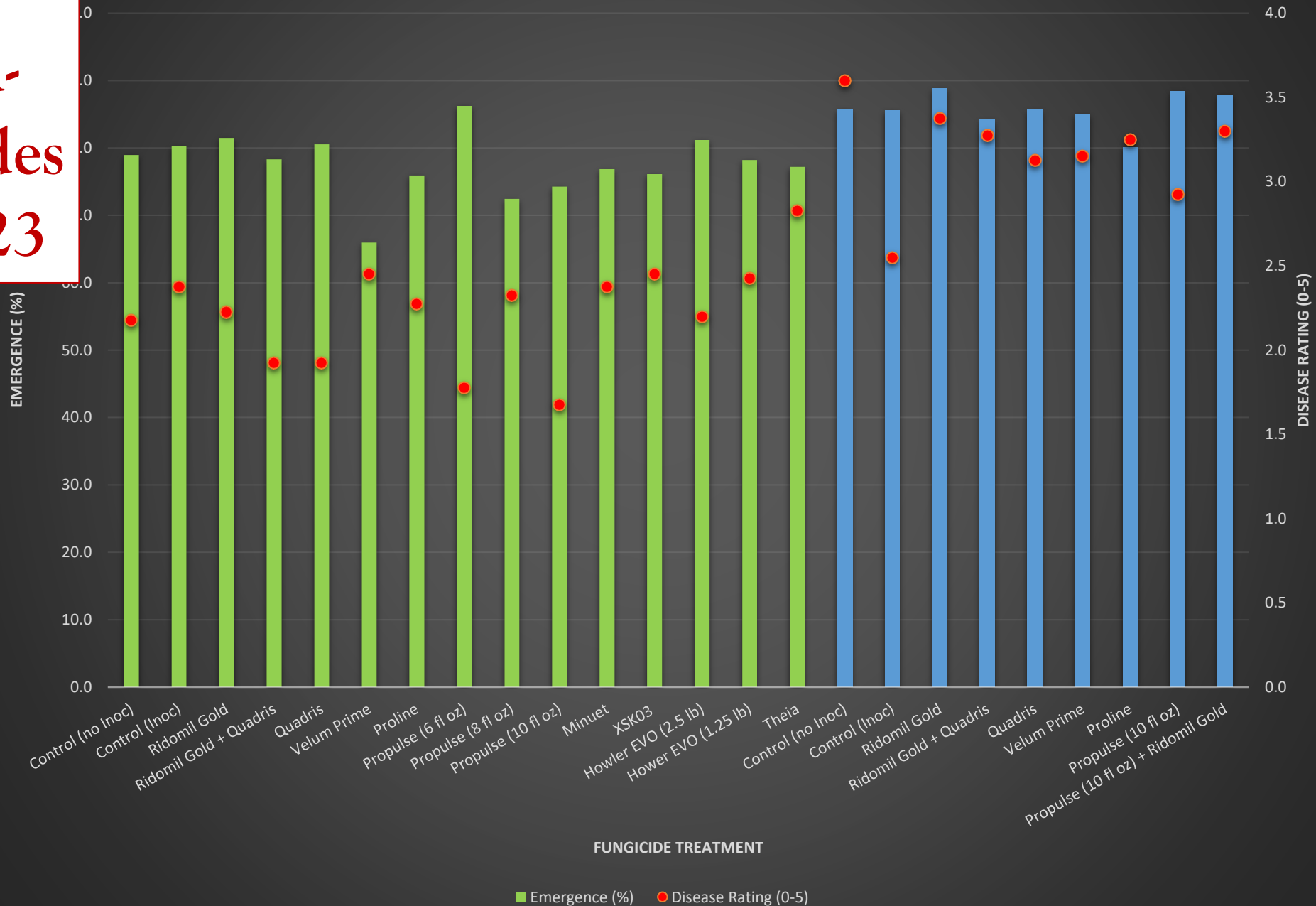
- Canopy cover was numerically greater for in-furrow treatments than seed-applied
- Canopy cover was greater when disease pressure was reduced

Canopy cover and Disease Rating for In-Furrow Fungicides Without (green bars) and With (blue bars) Seed Treatment



# Results of In-furrow & Seed-applied Fungicides on 'Hystyle' 2023

Emergence and Disease Rating for In-Furrow Fungicides Without (green bars) and With (blue bars) Seed Treatment



- Seed-applied treatment improved emergence (=less damping off)
- Root rot ratings were higher with seed-applied treatments than with in-furrow treatments (in-field soilborne disease pressure was high)

# Comparing 2023 to Past Research

- In 2018-2021 trials, Quadris and Ridomil in-furrow performed better than seed-applied fungicides
- In 2022, seed-applied fungicides best controlled soilborne disease, esp. *Fusarium oxysporum* compared to in-furrows
- In 2023, very high disease pressure in field. Notable field effects on seed-applied trts. Propulse, Quadris, Ridomil were best in-furrow trts.





# KIDNEY BEAN ROOT ROT CONTROL STUDY 'MONTCALM' - 2023

Trt #	Treatment	Seed Treatment	rate/1000 rf	Application Timing <sup>z</sup>
1	Control	No	Non-Inoculated	NA
2	Control	No	Inoculated	NA
3	Ridomil Gold + Quadris	No	0.42 fl oz + 0.8 fl oz	IFAP
4	Propulse + Ridomil Gold	No	10.0 fl oz/A + 0.42 fl oz/1000rf	IFAP
5	Propulse + Quadris	No	10.0 fl oz/A + 0.8 fl oz	
6	XSK03	No	8.5 fl oz/acre.	IFAP
7	Control	Seed Treatment 1	Inoculated	NA
8	Ridomil Gold + Quadris	Seed Treatment 1	0.42 fl oz + 0.8 fl oz	IFAP
9	Propulse + Ridomil Gold	Seed Treatment 1	10.0 fl oz/A + 0.42 fl oz/1000rf	IFAP
10	Control	Seed Treatment 2	Inoculated	NA
11	Ridomil Gold + Quadris	Seed Treatment 2	0.42 fl oz + 0.8 fl oz	IFAP
12	Propulse + Ridomil Gold	Seed Treatment 2	10.0 fl oz/A + 0.42 fl oz/1000rf	IFAP



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Trt #	Treatment	Seed Treatment	rate/1000 rf
1	Control	No	Non-Inoculated
2	Control	No	Inoculated
3	Ridomil Gold + Quadris	No	0.42 fl oz + 0.8 fl oz
4	Propulse + Ridomil Gold	No	10.0 fl oz/A + 0.42 fl oz
5	Propulse + Quadris	No	10.0 fl oz/A + 0.8 fl oz
6	XSK03	No	8.5 fl oz/acre.
7	Control	Seed Treatment 1	Inoculated
8	Ridomil Gold + Quadris	Seed Treatment 1	0.42 fl oz + 0.8 fl oz
9	Propulse + Ridomil Gold	Seed Treatment 1	10.0 fl oz/A + 0.42 fl oz
10	Control	Seed Treatment 2	Inoculated
11	Ridomil Gold + Quadris	Seed Treatment 2	0.42 fl oz + 0.8 fl oz
12	Propulse + Ridomil Gold	Seed Treatment 2	10.0 fl oz/A + 0.42 fl oz

## Seed Treatment #1

Maxim (Fludioxonil)  
 Apron XL (Mefenoxam)  
 Rancona (Ipicanazole)  
 Vibrance (Sedaxane)  
 Dynasty (Azoxystrobin)  
 Polymer seed coating  
 Cruiser (Thiamethoxam)

## Seed Treatment #2

Plant Hormone Supplement (CHS  
 unlocked)  
 Imidacloprid  
 Metalaxyl  
 Thiophanate-Methyl  
 Rancona (Ipconazole)



# Results of In-furrow & Seed-applied Fungicides on 'Montcalm' 2023

- Emergence was highest with seed treatment #2
- No significant differences in yield
- Strong field effects (high levels of soilborne pathogens)

