Trial Summary

Seed Placed Fertilizer Toxicity Trial

Research Question:

Are Seed-Placed fertilizer (SPF) applications being used across Manitoba safe for canola plant stand establishment and what are the major factors influencing seed safety?

Treatments:

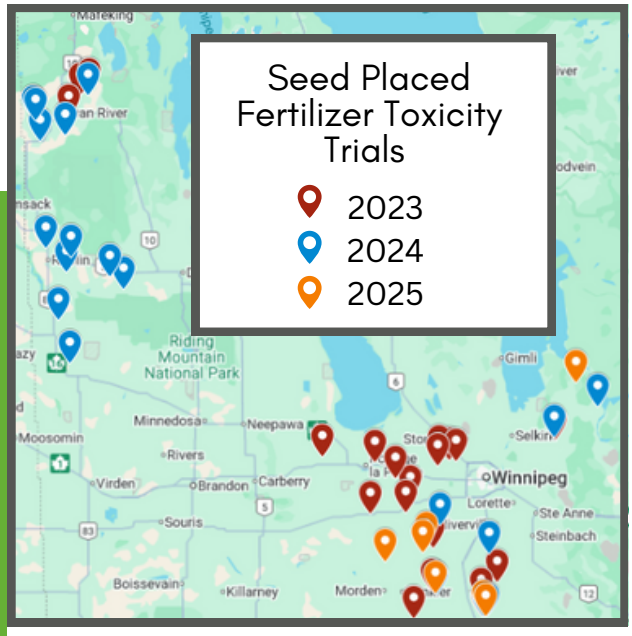
1. No Seed-Placed Fertilizer
2. Standard Seed-Placed Fertilizer (100%)
3. High Seed-Placed Fertilizer (150%)

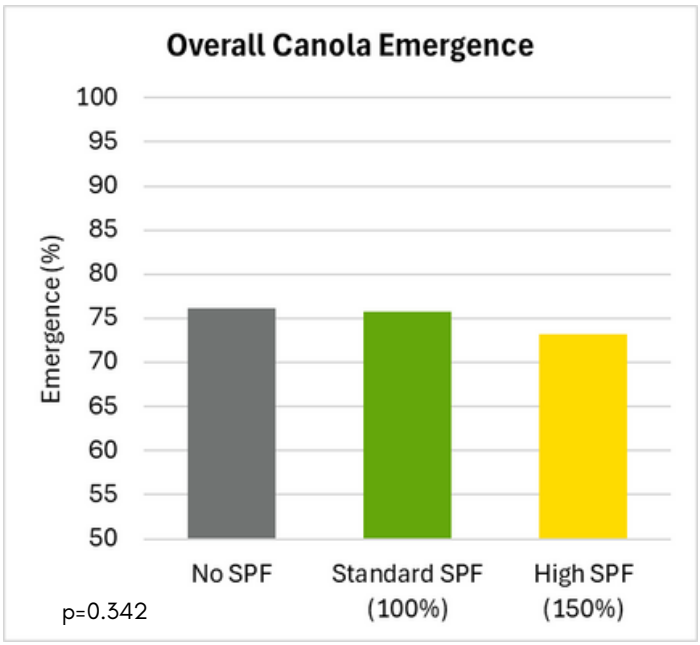
Trial Setup:

One replicate of each treatment (replicated by locations). This is to allow for a wider range in testing environments (soil/rainfall), equipment (row spacing, openers, SBU), and agronomic practices (fertilizer sources and rates). This allows for the examination of the relationships between these testing factors and seed safety.

Data Collection:

Plant Counts (4-leaf), Emergence (%)





Background: Current recommendations for seed-safe levels of P and S fertilizers are much lower than crop uptake requirements. This paired with an increase in single pass seeding systems and low disturbance openers had resulted in farms pushing to increase seed applied fertilizer levels. Fertilizer toxicity is highly dependent on a number of environmental and management factors and their interactions that can vary with the growing season.

2023 - 2025 Summary:

After three years we have tested 70 locations across MB, which is not yet enough data points to conduct multivariate analysis to examine interactions between factors. Please note that the following is preliminary and does not account for multiple factors influencing toxicity and results should be interpreted with caution.

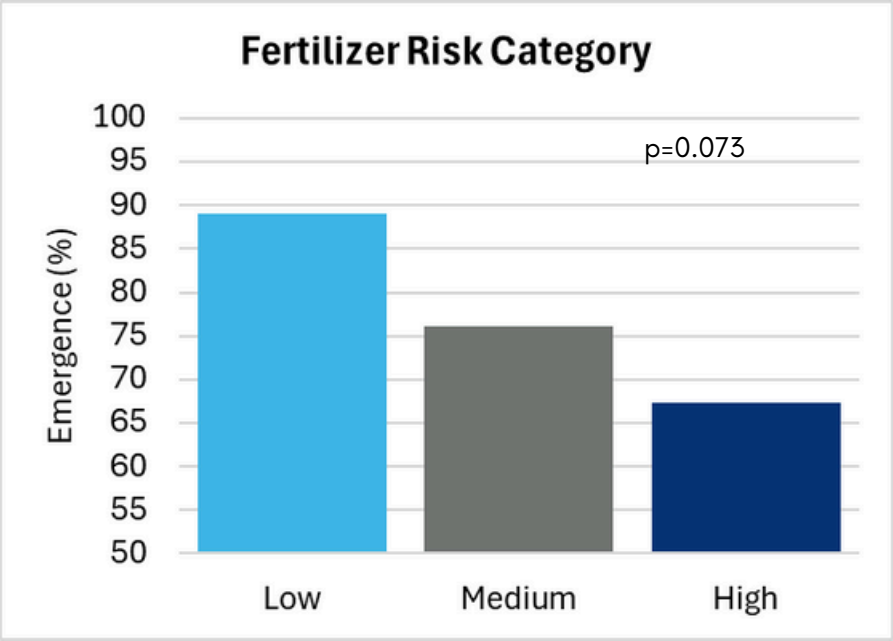
Emergence (%) = (Plants per acre at 4-leaf / seeds planted per acre) * 100

Each farm was categorized based on the farm's standard SPF Rates into the following fertilizer risk category:

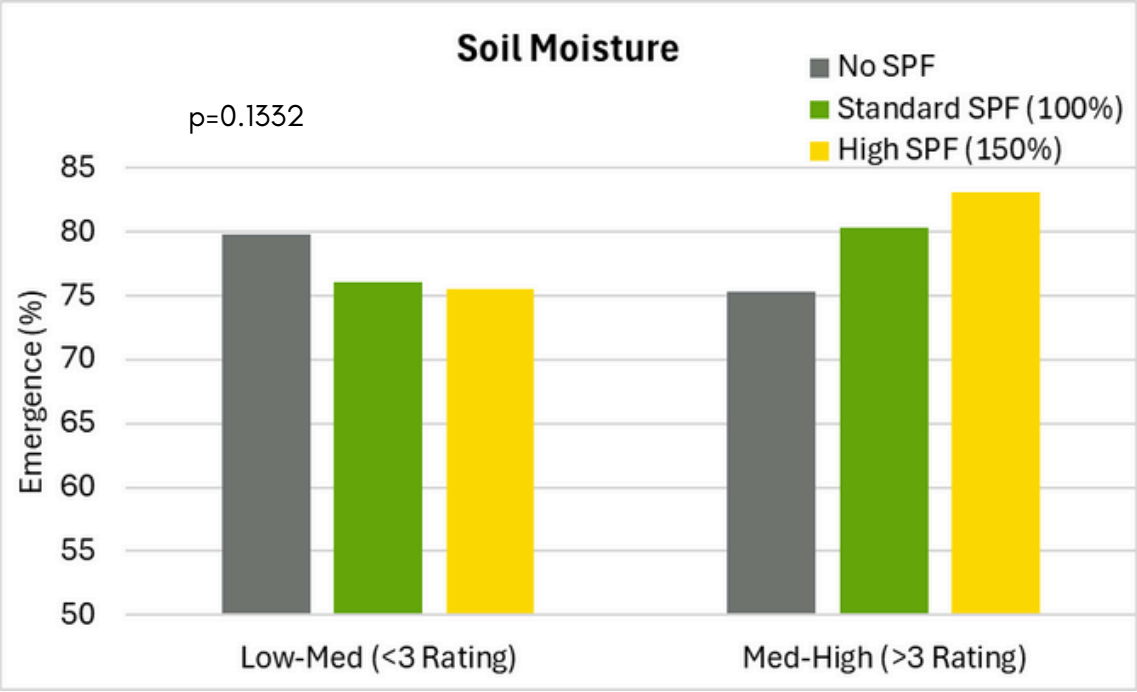
- High Risk = All three of N, P, **and** S rates above recommended safe levels,
- Med Fertilizer Risk = N, P, **or** S rates above recommended safe levels
- Low Risk = All SPF fall below recommended safe levels.

2025 Results Summary

Seed Placed Fertilizer Toxicity Trial



Summarizing data from all farms, there was a slight, non-significant decrease in emergence with high rates of SPF (150%), relative to the farm standard practice (100%), and untreated check.



There was a general trend for reduced emergence with high rate of SPF when soil moisture levels were rated low-medium. When soil moisture at seeding was rated med-high there was a trend for increased emergence as SPF rates increase.

Although not conclusively significantly different, sites whose standard rates exceeded the recommended safe levels of N, P, and S showed approximately 21% lower emergence than sites in the low risk category (N, P, and S within recommended level). Fertilizer risk category of a farm had a larger influence on emergence than the rate of SPF at any particular farm.

2025 Trial Sites

							Emergence		
Trial ID	**Location**	**Seeding Equipment**	**SBU**	**SPF Analysis**	**SPF Sources**	**Standard SPF Rate**	**No SPF**	**Standard SPF**	**150% SPF**
			(%)	**(N-P-K-S)**		**(Lbs. product/ac)**	**(%)**		
SPF_55	Alexander	Horsch Avatar Disc Drill	7.5	13-33-0-15	MES15	100	40.4	70.8	52.9
SPF_56	Thompson	Disc Drill	10	9-43-0-16	BLEND	81	70.6	63	64.3
SPF_57	Morris	John Deere N560F Disc Drill	7.5	11-52-0 13-33-0-15	MAP/MES15	100	53.9	74.8	33.9
SPF_58	Morris	John Deere Disc Drill	6.67	9-43-0-16	MST	50	92.6	89.4	91.5
SPF_59	Rhineland	John Deere 1830 Hoe Drill	10	9-25-0-5	MAP/AMS	69	78.6	85.2	81.4
SPF_60	Emerson-Franklin	Disc Drill	6.67	13-33-0-15	MES15	100	81.4	71.1	81.4
SPF_61	Emerson-Franklin	Disc Drill	6.67	13-33-0-15	MES15	100	75	76.6	66
SPF_62	Rhineland	Disc Drill	5	13-33-0-15	MES15	120	120	77.2	69.8
SPF_63	Swan River	Vaderstaad 70-10 Knife	7.5	0-40-0	MAP	115	64.9	62.7	63.4
SPF_64	Swan River	Seedhawk Knife	6.25	10-50-25	MAP, POTASH	96	66.2	64.4	68
SPF_65	Swan River	Bourgault 3320 XTC Single Shoot	20	13-33-0-15	MES15	111	69.3	78.9	71.5
SPF_66	Swan River	Bourgault 5710 Single Shoot	30	25-33-0-15	MAP/ESN/AMS	137	62.3	57.9	60.1
SPF_67	Minitonas	Dual Shank	6.25	0-40-30	POTASH/MAP	120	69.3	73.5	87
SPF_68	Swan River	Vaderstaad Drill	2.5	11-52-0	MAP	67	60.3	67.2	59.6
SPF_69	Russell-Binscarth	Drill	10.8	11-52-0	MAP	67	54.4	37.2	51
SPF_70	Roblin	Bourgault	10.8	11-52-0	MAP	67	60.6	47.5	52.3