10-34-0 Starter Safety on 2023 Spring Canola in the Palouse

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Introduction

10-34-0, or liquid ammonium polyphosphate, is one of the most widely available and affordable sources of phosphorus. 10-34-0 is generally considered a "safe" product, with salt index of 2.28 lb/gal. Salt causes phytotoxicity by desiccating tissues; if the salt content in the surrounding soil moisture is greater than the germinating seed cells, water will move out of the cells. Dry conditions and light soil textures will exacerbate phytotoxicity, while phytotoxicity is less severe in wet years and in locations with heavier soil types. Canadian research has determined safe ranges of 10-34-0 starter applications to be 15-25 lb P_2O_5 per acre at 9" row spacing, depending upon soil type, but it has not been studied in the Palouse region of the Pacific Northwest.

Materials and Methods

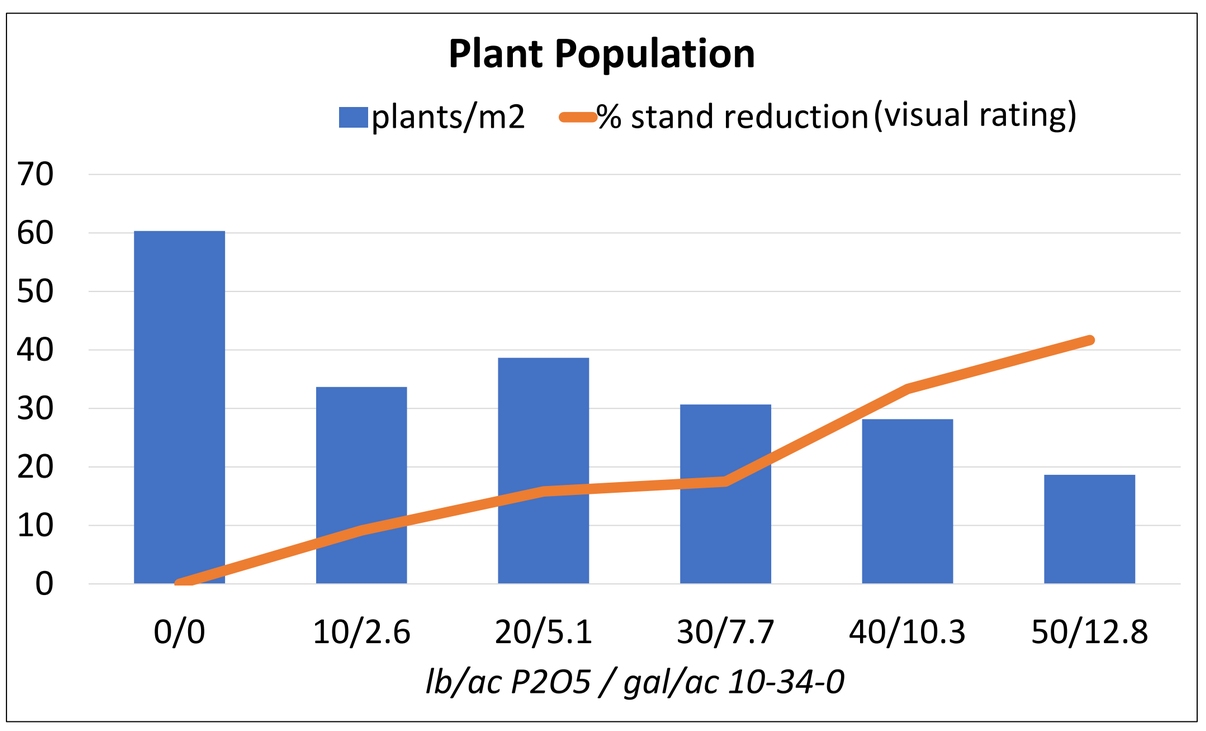
On May 11, a Great Plains 3P606NT plot drill was used to seed 5' x 20' plots. 9978TF (Winfield) was planted in 7.5" rows at 5 lb/ac seeding rate. Treatments were replicated six times and arranged in a randomized complete block design. 10-34-0 was applied in 14 gal/ac total volume via the in-furrow starter system on the drill, which places product directly with the seed. Stand counts in 1 square-meter were conducted in each plot on May 28 and June 8, and whole-plot stand reduction was visually estimated. Plots were harvested on September 11 with a Zurn 150 plot combine.

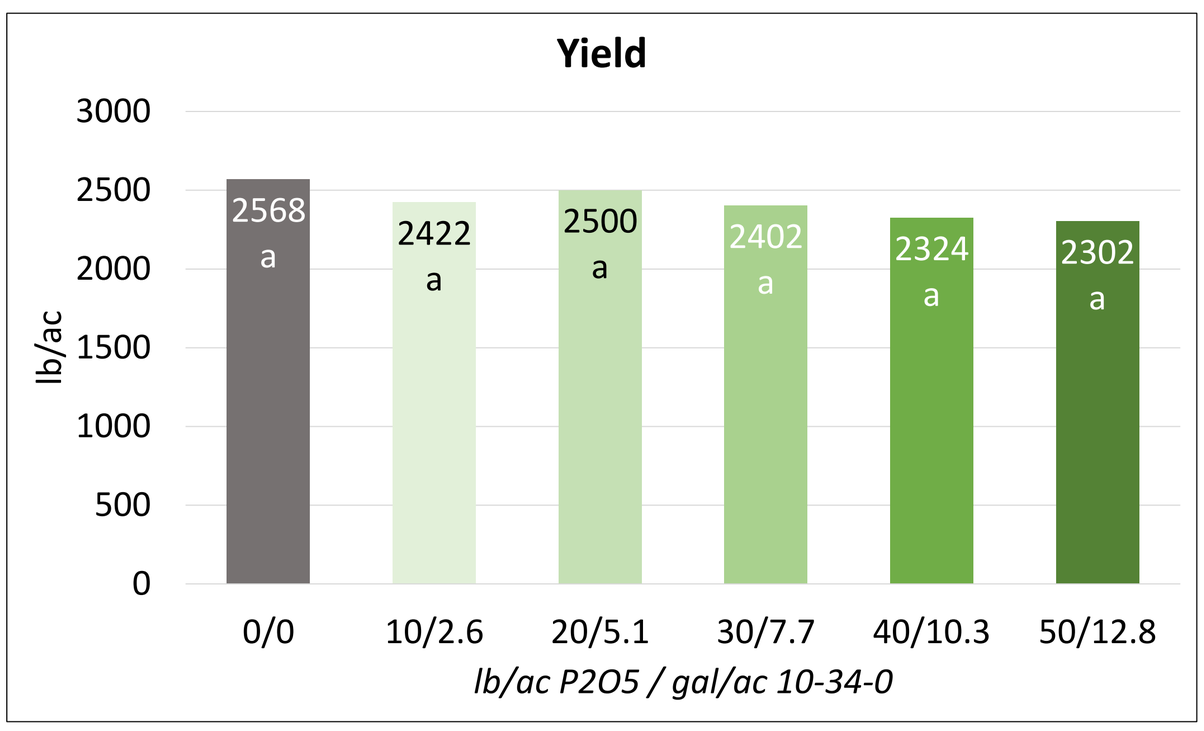
Trial Treatments

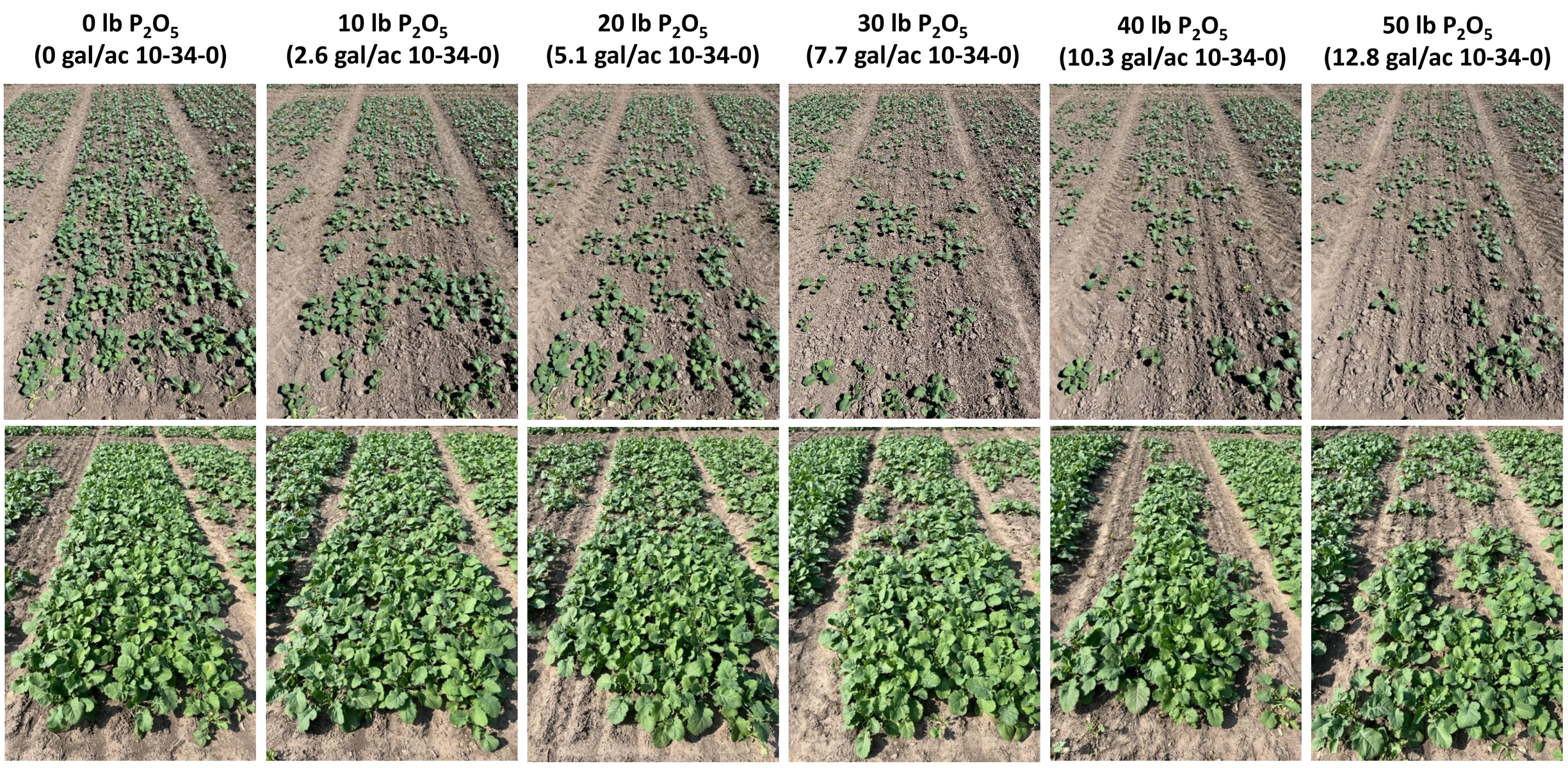
Treatment (*lb of P_2O_5/10-34-0 rate*)	*10-34-0 Concentration at*		
	7.5" Row Spacing	*10" Row Spacing*	*12" Row Spacing*
10 lb (2.6 gal/ac)	1X	1.33X	1.6X
20 lb (5.1 gal/ac)			
30 lb (7.7 gal/ac)			
40 lb (10.3 gal/ac)			
50 lb (12.8 gal/ac)			
Untreated	N/A		

Results

Clear phytotoxicty was evident in all 10-34-0 treatments. Even the lowest 10 lb/ac P_2O_5 rate reduced plant stand relative to untreated. Yield generally followed a numerically decreasing trend with increasing 10-34-0 rate. Interestingly, canola in all treatments overcame the early stand damage and did not yield statistically less than control. Despite the lack of statistical separation, there is a convincing trend that 10-34-0 starter applications over 20 lb/ac have the potential for depressing yield. It is important to note that all results are presented given 7.5" row spacing and with-seed application placement. Wider rows would have caused even greater injury, while separation between seed and product would have lessened the impact.







This research was funded by the Idaho Oilseed Commission.