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Glyphosate, Manganese, and Zinc Soybean Trial

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Abstract

Often there is yellowing of soybeans following glyphosate applications that has been attributed by some as manganese or zinc deficiency. There have been varied reports of impacts of this 'yellow flash' on soybean yields. The trial was conducted to investigate such claims.

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Glyphosate, Manganese, and Zinc Soybean Trial

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Introduction

Often there is yellowing of soybeans following glyphosate applications that has been attributed by some as manganese or zinc deficiency. There have been varied reports of impacts of this ‘yellow flash’ on soybean yields. The trial was conducted to investigate such claims.

Materials and Methods

This tillage trial was planted on May 11, 2011 at 138,000 seeds/acre with Pioneer 92Y51 in 30-in. rows. Each plot was 20 ft wide by approximately 150 ft long. A herbicide application of Dual II Magnum and glyphosate was applied on May 16 followed by a glyphosate application of Select and glyphosate on June 18. The seven treatments were applied on July 8 and included; 1) zero control, 2) 40 oz/acre glyphosate, 3) 4 qt/acre Manganese, 4) 4 qt/acre Zinc, 5) glyphosate + Mn, 6) glyphosate + Zn, and 7) glyphosate +

Mn + Zn. Soil test phosphorus and potassium was adequate and no additional phosphorus or potassium was applied. Yields were collected using a John Deere 9410 equipped with a Harvest Master weigh system. Additional data collection included pre- and post-application tissue analysis and grain moisture at harvest.

Results and Discussion

The Mn tissue analysis, both pre- and post-application, was significantly different, however the source of that significance was between replications and not between treatments. Zinc tissue test were not significantly different at either pre- or post-application.

Grain yield and grain moisture was not different for the treatments. The grain moisture was lower than desired due to dry fall conditions. The grain yield across plots averaged 60.9 bushels/acre and ranged 2.7 bushels/acre from highest to lowest.

It should be noted that a ‘yellow flash’ was not observed in either treated or control plots and no Mn or Zn deficiency symptoms were identified.

Table 1. Manganese tissue analysis, zinc tissue analysis, grain moisture and grain yield for seven treatments at the ISU Bennett Farm south of Ames, IA in 2011.

Treatment	Tissue Mn		Tissue Zn		Grain moisture	Grain yield
	Pre-trt	Post-trt	Pre-trt	Post-trt		
	ppm	ppm	ppm	ppm	%	bu/ac
Control	62	76	23	41	6.36	59.2
Glyphosate	61	59	26	44	5.64	61.6
Manganese	64	69	25	41	6.11	59.7
Zinc	71	78	25	41	5.71	60.9
Gly + Mn	67	77	25	42	5.62	60.9
Gly + Zn	60	63	24	43	5.63	62.4
Gly + Mn + Zn	64	71	27	45	6.05	61.9
PR > F	0.0010	0.0015	0.1691	0.0878	0.6793	0.2833