

On-farm Micronutrient Fertilization of Corn Trials

RFR-A1306

Methods

Five side-by-side micronutrient trials were conducted on corn in 2013 (Table 1). Foliar applications of a mixture containing boron, zinc, and manganese were applied to approximately V6 corn and compared with an untreated control in Trials 1 through 4. The mixture was one part Winfield® Max-in ZMB (1 qt/acre) and one part Max-in Boron (1 pt/acre) applied in 15 gallons of water/acre. In Trial 5, Max-in Boron only (1 pt/acre) was compared with an untreated control. Soil and plant samples were collected before spraying near the time of the foliar application and analyzed for nutrients. Treatments were replicated three or more times in all trials.

Results

Soil and plant tissue sample results can be found in Table 2. Also, soil phosphorus and potassium analyses were at optimum level or higher (not shown). None of the yields in the micronutrient-treated plots were statistically greater than the control plots (Table 3).

According to Iowa soil-test interpretations for zinc in corn, we could have seen a small yield increase in Trial 2 and no increase in Trial 3. There are no interpretations for boron or manganese for Iowa. No response to manganese was expected according to soil-test interpretations from other north-central states. We should have seen a yield increase from boron in all trials according to interpretations from Illinois, but no increase from boron in any trial according to interpretations from South Dakota. There are no interpretations from Iowa or the north-central states for plant-tissue analysis at this growth stage. Results will be used with other ongoing research to establish interpretations for Iowa.

For further information on these trials and other information regarding micronutrient research, contact Antonio Mallarino, professor, Iowa State University Extension and Outreach (apmallar@iastate.edu).

Table 1. Hybrid, row spacing, planting date, planting population, previous crop, and tillage practices for corn micronutrient trials.

Exp. No.	Trial	County	Hybrid	Row spacing (in.)	Planting date	Planting population (seeds/A)	Previous crop	Tillage
130104	1	Lyon	DKC 52-59	20	5/13/13	35,000	Corn	Stalks removed and deep ripped fall, soil finisher spring
130134	2	Osceola	DKC 5378	30	5/13/13	35,000	Soybean	Spring field cultivate
130174	3	Sioux	DKC 56-54 RIB	30	5/15/13	32,900	Soybean	Stalks removed and deep ripped fall, soil finisher spring
130613	4	Cass	DKC 6298	30	5/5/13	34,000	Soybean	No-till
130163	5	Lyon	DKC 5398	20	5/16/13	34,000	Soybean	Conventional, soil finisher spring

Table 2. Results of the soil and plant analyses corn micronutrient trials.

Exp. No.	Trial	Soil				Plant		
		Organic matter (%)	Boron (ppm)	Zinc (ppm)	Manganese (ppm)	Boron (ppm)	Zinc (ppm)	Manganese (ppm)
130104	1	--	--	--	--	--	--	--
130134	2	5.03	1.14	0.49	16.55	9	42	83
130174	3	4.12	0.88	2.28	28.19	16	75	82
130613	4	3.99	0.70	2.43	29.77	7	34	88
130163	5	--	--	--	--	--	--	--

Table 3. Yield from corn micronutrient foliar feeding trials.

Exp. No.	Trial	Treatment	Application date	Yield (bu/A)			
				Treatment	Control	Response	P-value
130104	1	Micro Mix	6/14/13	226.6	222.8	3.8	0.31
130134	2	Micro Mix	6/18/13	208.2	205.4	2.8	0.12
130174	3	Micro Mix	6/20/13	210.0	210.7	-0.7	0.87
130613	4	Micro Mix	6/27/13	155.0	156.3	-1.3	0.82
130163	5	Boron	V7	213.9	213.0	0.9	0.40