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Sugarbeet response to zinc in Michigan.

ABSTRACT

Zinc's availability decreases as soil pH increases. "Deficiency is especially noted on crops growing on spoil-banks, over tile lines where calcareous sub-soil is mixed in, or where high rates of phosphorus are applied." The objective of this research was to determine if sugarbeet yield or quality responded to soil applied zinc under high soil pH conditions coupled with elevated phosphorus levels. This research was conducted at three locations within each of three years (nine location-years). Zinc was applied broadcast at planting time by spraying a soluble zinc source dissolved in water onto the soil surface. Zinc rates were 0 (untreated check), 5, 10, 20 lb Zn/acre. Over the nine location-years, soil pH ranged from 6.8 to 7.8; phosphorus (P_2O_5) ranged from 76 to 434; and zinc (ppm) ranged from 3.9 to 14.0. Yield (tons/a) and harvest population (B/100) were determined from 27 feet of harvested row. Percent sugar (% sugar) and amino-nitrogen (NH_2-N) were determined from a frozen juice sample taken from plot sub-samples. No interactions existed between zinc rate and location-year. Treatments averaged 5868 recoverable white sugar per acre (RWSA); 21.7 tons/a; 19.0 % sugar; 108 B/100 ft and 10.2 meq/100g sugar NH_2-N . Sugarbeets did not respond in yield or quality to 5, 10, 20 lb Zn/acre applied under high soil pH conditions coupled with elevated phosphorus levels compared to the untreated check.