

Copper Fertilizer Management For Optimum Crop Yield And Quality In The Canadian Great Plains

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Summary

Field experiments conducted in western Canada indicated that broadcast-incorporation of granular Cu fertilizers prior to seeding at 3-5.6 kg Cu ha⁻¹ rate was usually sufficient to prevent Cu deficiency in wheat, and improve seed yield and quality. At lower rates (<2.0 kg Cu ha⁻¹), broadcast-incorporation of granular Cu fertilizers was not effective while surface spray-broadcast followed by incorporation of liquid Cu fertilizers was much more effective in preventing Cu deficiency in wheat and increasing seed yield in the first year of application. Surface-broadcast without incorporation or seedrow-placed granular Cu fertilizers were much less effective in improving seed yield of wheat than their foliar or soil incorporated applications. In the growing season, foliar applications of Cu at 0.20-0.28 kg Cu ha⁻¹ to wheat at first node, flag-leaf and early boot growth stages were very effective in restoring seed yield, while Cu applications at 4-leaf or complete heading stage did not have consistent effect to correct damage caused by Cu deficiency. Some Cu fertilizers were less effective than others in preventing/correcting Cu deficiency in wheat. Stem melanosis in wheat was associated with deficiency of Cu in soil and the disease was reduced substantially with Cu application. High level of available P in soil was observed to induce/increase severity of Cu deficiency in wheat. Soil analysis for DTPA-extractable Cu in soil can be used as a good diagnostic tool to predict Cu deficiency, but there was a poor relationship between total Cu concentration in shoots and degree of Cu deficiency in crops.