

Public Abstract

First Name:Christopher

Middle Name:James

Last Name:Dudenhoeffer

Adviser's First Name:Kelly

Adviser's Last Name:Nelson

Co-Adviser's First Name:Peter

Co-Adviser's Last Name:Motavalli

Graduation Term:SP 2012

Department:Soil, Environmental & Atmospheric Sciences

Degree:MS

Title:Enhanced efficiency phosphorus application for corn

Farmers are interested in the use of enhanced efficiency phosphorus (P) fertilizer applications or treatments. The objectives of this research are (1) to determine the effects of tillage/fertilizer placement [no-till (NT)/surface broadcast or strip-till (ST)/deep banding], monoammonium phosphate rate [0, half the recommended rate, and the recommended rate], and the presence and absence of two enhanced phosphorus efficiency products [Avail[®] (Specialty Fertilizer Products, Leawood, KS) and P2O5-Max[®] (Rosen[™]s Inc., Fairmont, MN)] for corn conducted at Novelty and Albany, MO; and (2) to determine the effect of lime application (0 and recommended rate), P source [non-treated control and a broadcast application of diammonium phosphate or triple superphosphate], and the presence and absence Avail[®] or P2O5-Max[®] for corn conducted at Novelty and Portageville, MO. The two P enhanced efficiency products did not consistently increase corn grain yield, including apparent P recover efficiency, in interaction with several fertilization, liming, and tillage practices at the sites and environmental conditions evaluated in this research. Triple superphosphate treated with Avail[®] increased P uptake 8.6 kg ha⁻¹ compared to the non-treated control at Novelty, but not at Portageville. Strip-till/deep banding increased plant populations 15,500 plants ha⁻¹ at Novelty and 3,500 plants ha⁻¹ at Albany compared to NT/broadcast. Yields increased 1.57 Mg ha⁻¹ with use of ST/deep banding over NT/broadcast at Novelty. The recommended amount of lime increased grain yields 0.77 Mg ha⁻¹ at Portageville.