Yield Goal Versus Delta Yield to Predict Nitrogen Need in Corn. (A08-lory173111-Oral)

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Abstract:

Many states use a yield goal to identify differences in fertilizer N need combined with an N credit system to adjust for N provided by the soil from sources such as soil organic matter and crop residues. Some question yield-goal derived fertilizer N recommendations because of the poor correlation of yield and fertilizer N need, leading some states to eliminate yield goal from their N recommendation system. In this study, data from 298 previously reported experiments in five states (IL, MN, MO, PA and WI) were combined to evaluate fertilizer N response of corn. Corn grain yield at the economically optimum N rate was poorly correlated with fertilizer N need (r2=0.02). Most locations required a reduction in recommended N to account for N supplied by the soil or previous management. Delta yield (grain yield at optimum N rate minus grain yield with 0N applied) at the same locations was positively correlated with fertilizer N need and a much better predictor of fertilizer N need (r2=0.47). These results imply that fertilizer recommendation systems that rely solely on yield or ignore yield entirely are limited to explaining no more than 50% of the variation in fertilizer N need of corn.

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