USING YIELD VARIABILITY TO EVALUATE THE ECONOMIC POTENTIAL FOR PRECISION TECHNOLOGIES IN COTTON

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ABSTRACT

When asking the question "Will precision technologies pay on my farm?", one the of the first things to consider is the level of within-field yield variability present – if the field conditions are uniform there is no benefit from variable rate management. In order to estimate the level of yield variability needed to signal an economic benefit, a simple decision aid was developed. The decision aid requires a minimal amount of input information: high and low yields within a given field; total production costs; lint price; and size of the field being considered. Assuming yield variation in the field is normally distributed (user supplied yield range is assumed to encompass 95% of the yield variability present), 100 yield observations are generated and then the percentage of the field that has a positive net income is calculated. To make an estimate of potential savings from precision farming, the current analysis assumes those areas with a negative net income are not planted and thus the savings is equal to the sum of areas with negative net incomes. The predicted precision savings from the decision aid were compared to data from five actual cotton yield maps (one from Arizona, and four from southern Georgia) at a fixed lint price of \$0.52 per acre across a range of production costs. In most cases, the difference in predicted precision savings based on the decision aid results were a reasonable estimate of those from the yield maps (errors rarely greater than \$4.00 per acre).