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BIOFUELS' POTENTIAL IMPACT ON NUTRIENT USE IN THE U.S.

Biofuels. They are changing agriculture in the Midwest so rapidly that no one can really say for sure just what the future holds. One thing is sure, though. We had better get it right. We need to feed the hunger for energy with responsible crop production. That means making sure approaches used are sustainable for the long term.

A substantial increase in corn production has been forecast for 2007. Predictions are a 10 to 15% increase over the 2004 to 2006 average. Much of this increase is expected to come from corn-soybean systems in the Corn Belt. That means more acres of corn following corn.

So what's the potential impact on fertilizer use? Let's assume that 5 million more acres of corn will be planted on acres that used to be grown to soybean following corn. Considering average fertilizer use per acre of corn surveyed by the USDA, fertilizer N use could increase by 3.8% in the U.S., compared to 2004 to 2006 average levels. Increases of P and K are projected to be 1.7 and 1.3%, respectively.

Now many are asking about harvest of crop residues. Currently, ethanol is made from corn grain, but commercialization of cellulose-based ethanol production is being researched. In this other type of production, corn stover, or the plant parts other than the grain, is expected to be a major feedstock early on. When stover gets harvested as well as the grain, some significant changes in the amount of nutrients removed from the soil occur.

So let's consider what would happen for a 150 bu/A corn crop where 40% of the stover is successfully harvested. The biggest news for nutrient removal is K – a 110% increase in removal. This is expected, since most of the K is found in corn stover. Phosphorus is less severe, with only a 14% increase projected. Unlike K, most of the P is contained in the grain, so stover harvest doesn't produce as large an increase in removal of that nutrient.

The projections here are tentative, and other assumptions would produce different numbers. But the trend is revealed – more nutrients will be used when more corn is grown, and the effect of crop removal on soil nutrient levels will need to be watched closely when stover comes online as a feedstock.

With more nutrient use comes more responsibility. This is indeed an opportune time for agriculture. But we must realize our opportunities not only for profit, but for the role we can play in producing fuel in a way that protects the environment.

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For more information on this topic, see the article in *Better Crops with Plant Food*, issue No. 2, 2007, entitled "Potential Biofuels Influence on Nutrient Use and Removal in the U.S.," written by Dr. Paul E. Fixen, Senior Vice President, Americas Group Coordinator, and Director of Research for IPNI. Access the article as a PDF file at this URL: >www.ipni.net/bettercrops<

Abbreviations in this article: N = nitrogen; P = phosphorus; K = potassium.