AGRI-BRIEFS
AGRONOMIC NEWS ITEMS

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DO WE REALLY KNOW THE YIELD POTENTIAL OF NEW CULTIVARS?

Conservation tillage has decreased erosion on many fields and contributed to improvements in soil physical properties, such as soil aggregation, aeration, permeability, and microbial activity. With the advent of genetic technologies and improved pest management, coupled with the benefits of improved soil physical properties and access to yield monitors, many farmers are documenting higher yields than ever before.

Historic and recent agricultural statistics reflect increases in state and national average yields of most field crops. Increasing yields and increased harvest removal of nutrients place a greater strain on the soil reservoir and the fertilization program to keep pace with the high-yield crop nutrient requirements.

Such good yields raise questions about soil productivity and the yield potential that exists on the farm today. Higher yields, through better fertility on productive soils, are vital to lowering the per-unit cost of production and raising farm profitability, especially in the current economy.

So what makes this topic worthy of discussion and attention now? Change! Today's farmers have greater access to crop cultivars with changed agronomic traits than ever before. Many times, the yield performance of these new cultivars is assumed to be similar to the modified parents. Most private company and university agronomists would prefer to evaluate the field performance of new cultivars for several years, across a range of environmental conditions, before wide-scale planting. Because of pressures associated with increased global competition and low crop prices, farmers sometimes plant large acreages to the newly released cultivars without full knowledge of their fertility requirements. In many instances, the plant breeders and crop geneticists have developed the cultivars under non-limiting fertility conditions, at a few selected locations. Consequently, there are somewhat limited data on which to guide the nutrient management under diverse field conditions.

You are probably thinking...it is virtually impossible to conduct detailed fertility studies with every new crop cultivar. Yet, it is valid to ask what the nutrient demands are with the new cultivars, with their generally improved yield potential. One thing for certain, the demands are probably not lower than the nutrient demands of older cultivars, which had a lower yield potential. Many newer cultivars have shortened growing seasons (fewer days to maturity). This means the peak demand for nutrients in the growing season may be greater than for older cultivars.

We have many questions about the nutrient requirements for today's cultivars and those we hope to plant in the future. How can we ever know the true, field yield potential if we do not have strong soil fertility research programs in place? Response of specific crop traits to nutrient levels is also a growing area of interest. Studies with improved crop genetics beg to be paralleled by improved nutrient management research, to be certain that genetic yield potential is not short-changed by inadequate soil fertility.

There is a growing challenge to "push the envelope" by going beyond the status quo, to

evaluate fertility programs which may seem futuristic to some. Without a bold vision for the future—based on solid soil fertility research—will we ever know the yield potential of the genetically improved cultivars which are certain to be made available to farmers?

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