FERTILIZER RECOMMENDATION STRATEGIES
IN LOW CROP PRICE ENVIRONMENT

Farming at a profit is more challenging when grain prices are low. Producers with owned ground and sound management can likely farm at a profit albeit at a narrower margin than previous years. Producers shelling out high cash rents will find it more difficult to operate at a profit even with sound management. Many paying high cash rent will operate at a loss. This is especially true if looking at profitability in a “site-specific” manner — considering profit/loss variability across a field or operation.

There are varied approaches in achieving these goals. Economic environment is a key factor to evaluate when selecting approaches on different farms. Two items to consider are grain prices and land tenure.

Grain Prices: Prices impact the return on investment of any input when put on a “per/bushel” basis. An agronomically accurate fertilizer recommendation under a specific recommendation strategy may not necessarily be a profitable one. Consider grain, fertilizer, and lime unit prices and probability of yield response to the fertilizer and lime application when developing a field's recommendation.

Land Tenure: Do you “own” the farm? If so, a recommendation strategy that involves soil build and capital improvement is practical. If rented, is the rental relationship a long-term one with little worry of losing the ground? Or is the tenure on the field unknown and “year-to-year”? Land tenure drives a recommendation strategy across the spectrum from capital improvement to maintenance to sufficiency.

Fertilizer is a key cost-input in any production system. To make the most of your fertilizer investment:

1. Soil test. Develop a robust soil testing program on your farm.
2. Interpret fertilizer recommendations. Many people see the “recommendation” part of a soil test as gospel without questioning the basis of the recommendation. In practice, you need to tailor your investment based on the reality of your specific farm.

Keep in mind the goals of soil testing, fertilizer and lime application:

1. Provide adequate plant (and at a larger scale, crop) nutrition
2. Eliminate soil pH and nutrient availability as factors limiting a plant to achieve its genetic potential.

Capital Improvement
- Build soil to critical values
- Greater cost meaning greater risk that the investment won’t be profitable in the short term

Maintenance
- Maintain soil test level
- Moderate cost; more likely to be short-term profitable

 Sufficiency
- Only put on what this year's crop needs
- Low cost; most likely to be short-term profitable

Owned

Rented
Variable Rate Fertilizer and Yield Potential

Variable rate fertilizer and lime recommendations based upon soil tests alone generally derive from a “buildup and maintenance” strategy. Their objective is to increase soil test phosphorus (P) and potassium (K) concentrations to critical values and raise soil pH to optimum levels. This is a great strategy on newly purchased and already owned ground where there is little to no risk in investing dollars into capital improvement of the land. In a low grain price environment, the buildup and maintenance strategies have a risk of losing money in the short term. Consider a large part of the money spent as capital improvement — much like installing tile drainage. Yield monitors give you data that you can use to apply variable rate fertilizer based on crop removal from last year’s yield. This is different from a variable rate recommendation based off a soil test. This is a sound strategy where soil test concentrations are already at levels with low probability of response to fertilizer application and the producer desires to “maintain” soil test concentrations. Perhaps it is in the rental agreement to maintain soil test levels. Perhaps on owned ground, there is not adequate cash flow to implement a capital improvement strategy at this time.

**Critical Levels of P and K**

If your soils test shows values below these critical levels, nutrients are likely limiting yield potential. At or above these levels, consider maintenance applications.

**Table 11. Critical soil test levels (CL) for various agronomic crops.**

<table>
<thead>
<tr>
<th>Crop</th>
<th>P, ppm (lb/acre)</th>
<th>K at 0 CE™ ppm (lb/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>15 (30)</td>
<td>88 (175)</td>
</tr>
<tr>
<td>Soybean</td>
<td>15 (30)</td>
<td>88 (175)</td>
</tr>
<tr>
<td>Wheat</td>
<td>25 (50)</td>
<td>88 (175)</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>25 (50)</td>
<td>88 (175)</td>
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</tbody>
</table>

1 Critical level for ppm K + 15 + (2.5 x CEC) for all crops.

Note: A CEC of 15 is used to calculate the K0 recommendation for calcareous soils (soils with pH equal to or greater than 7.5 and a calcium saturation of 80 percent or greater) and organic soils (soils with an organic matter content of 20 percent or greater or having a specific density of less than 0.8 grams per cubic centimeter).

**FARMserver® ROI Tool**

The three maps are images of the same field analyzed using the FARMserver® ROI tool. Areas in red are negative return on investment; black is positive. The ROI tool allows you to change input prices like rent, fertilizer price and seed cost then it combines those input costs with yield and a grain price that you choose. Use the FARMserver ROI tool to predict profitability based on this year’s planned inputs, grain prices, and historical yields. The three maps hold all costs constant and change only the rate of fertilizer applied, illustrating the impact that changing fertilizer recommendation strategy from full build (1) to more of a sufficiency approach (2) to no application (3) could have on annual field ROI. Reducing the fertilizer application rate increases farm profitability for the current crop, but will have long-term consequences for whole farm productivity and profitability. Visit farmserver.com to learn more about yield mapping, management zones and the FARMserver ROI tool.