

GREEN AND GROWING

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Managing Fertilizer inputs are especially important when field crop costs are high and commodity prices are dropping. Field crops require adequate nutrients for producing good yields, and desirable crop quality. Crops grown with adequate nutrient levels will also mature sooner than fields where fertilizers are short. Farmers can optimize their fertilizer inputs by adapting the following suggestions.

Soil testing is the basis for good fertilizer management. Research shows that, in the short run, fertilizer programs that fertilize to meet crop needs are more profitable than those strategies that replace crop nutrient removal. In other words, it is better to feed the crop than to feed the soil. Soil testing allows crop producers to compare field fertility levels against the probability that adding any one nutrient will increase crop yields in that field. The critical (Olsen P) soil test level for phosphorus for corn is 10 parts per million (ppm). This test level and below is where there is a good probability for increasing corn yields (and profits) with phosphorus fertilizer applications. Soil testing above this level are not likely to benefit from phosphorus applications. Likewise, the critical level for potassium is 125 ppm. Eliminate unnecessary use of fertilizers that have no or very low chances of adding to crop yields.

Testing irrigation water is another way to optimize fertilizer efficiencies. Some fertilizer nutrients are present in sufficient quantity in irrigation water to supply crop needs even if soils are short. Irrigation water often supplies adequate sulfur and boron especially when it arises from groundwater wells and sometimes from surface supplies. Similarly, irrigation water may also provide a little of the crop nitrogen requirement.

Setting a realistic crop yield goal is important for managing nitrogen fertilizer inputs. The best fertilizer input for increasing irrigated corn profits are usually from

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nitrogen because this nutrient is nearly always deficient in soils. Nitrogen fertilizer recommendations are based on crop yield goals, soil & water test levels, previous crops and manure applications. A Nebraska nitrogen yield comparison showed that on an overly optimistic yield goal decreasing yields by 10 bushels per acre saved \$7.50/acre savings.

Managing nutrient timing and placement can also improve fertilizer use optimization. Placing phosphorus with or very near the seed of annual crops is best because plants absorb and use most of this nutrient at their initial growth stages. Yields are best when phosphorus is absorbed into plant tissues early. Phosphorus fertilizer, when applied too late or too far from plant roots is not available when plants need it.

Nitrogen, by contrast, is absorbed and used during plant growth. Germinating seeds have adequate nitrogen levels and small seedlings require very little especially when growth is slow. Nitrogen fertilizer should be made available when plant growth rates begin to peak. For corn, the rapid growth period begins about the 4th to 5th leaf stage. Nearly all corn nitrogen needed for yield occurs before the tassel and silking growth stages.

Managing irrigation is also critical for fertilizer optimization. Nitrogen leaching is a problem on sandy soils especially if fertilizer is applied at high amounts before crops begin their rapid growth phase. Irrigation in the spring also cools soils reducing plant root growth and nutrient absorption. Frequent spring irrigations can reduce phosphorus uptake by plants through soil cooling. Reduce fertilizer losses and cool soil absorption problems through using good irrigation practices and optimum nutrient placement and application timing.

Please contact me, Bruce Bosley about this or other cropping systems or natural resource topics at 522-3200, extension 285 in Sterling or 542-3540 in Fort Morgan.

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