

Immediate release

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### Increasing Wheat Yield

High wheat prices are causing farmers to strive to optimize wheat yields. High yields are dependent upon maximizing wheat grain kernels per foot and increasing grain weight. High yields come from achieving the correct leaf and shoot numbers, maintaining a green leaf canopy through grain fill, increasing grain numbers/head and increasing grain size. Good fertility increases yields by getting adequate amount of all essential macro- and micronutrients.

Wheat also grows best when there is adequate soil moisture to develop a well branched root system. If wheat has enough water during the early growing season, it will form the necessary roots. A good root system is critical for obtaining adequate and balanced crop nutrients. Adequate drainage, both surface and subsurface, helps improve wheat yields.

Nitrogen and potassium are the nutrients required in the highest quantity for maintaining high wheat yields. Wheat utilizes 60% more potassium than nitrogen. For nitrogen, the best time to apply N is before wheat breaks dormancy. This promotes about a 15-30% increase in yield by increasing florets for more wheat kernels. Applying too much N after wheat reaches 4 leaf stage may reduce florets and increase lodging. Dry urea or liquid UAN sources of N both perform equally well. Nitrogen stabilizers prevent volatilization and denitrification losses, making more N available when the plant needs it most. The goal of spring N wheat fertilization is to have adequate N in the rooting zone before jointing begins, when N uptake rates begin to increase dramatically. Phosphorus and sulfur requirements are similar. Add sulfur like AMS or ATS to maximize yield at 0.2# S/bu yield goal. It is during rapid spring growth that the demand for all macronutrients occurs.

All nutrients must be present in sufficient quantities to maximize wheat yields. If one is lacking, it often negates the value of the others. Micronutrients are required in lower amounts and may account for only 1% dry weight of crop yield. Micronutrients form enzymes needed to increase crop yields. Nutrients removed with high wheat yields, 100 bushel per acre, includes 62# N, 11# P, 15.4# K, 12# S, 8# Ca, 3# Mg, .8# Fe (iron) and small amounts of Mn .42#, Zn .31#, B .15#, and Cu (copper) .06 #.

Many producers have not applied enough micronutrients to keep up with crop removal for several years. Losses of soil organic matter and soil erosion create many micronutrient deficiencies. Low soil organic matter or sandy soils often exhibit micronutrient deficiencies. No-

till field typically have lower soil temperatures in early spring, especially iron and magnesium. Most micronutrients are less available in cooler soils, plus many of the plant-immobile nutrients, such as copper and zinc, are less soluble and can be tied up for 2-5 years in surface residue. Only about 5% of soil copper is plant available.

All micronutrients (except calcium, magnesium, and molybdenum) are less available at higher pH levels. Most micronutrients are less available in dry soils because nutrients move into roots by diffusion and drier soils limit root growth. These several factors together may greatly increase micronutrient deficiencies, such as wheat grown in high pH soil, in a lower rainfall environment or in no-till.

The best way to determine if micronutrients need to be applied is with a soil or tissue test. For no-till, take a 4-inch soil sample and on conventional soils a 6-inch soil sample to test for micronutrients. If using tissue tests, sample actively growing crops around the 4-leaf stage. Micronutrients can be applied to help boost grain numbers per head, before yield is determined around the 4-5 leaf stage. Compare healthy wheat samples to areas with poor wheat growth. Difference in nutrient levels between healthy and less healthy areas is more important than the actual tissue test numbers. Check with each lab for how to take a good tissue test. Some labs require the whole plant, others just upper leaves for any plant tissue submitted.

Wheat yields are most responsive to low zinc, copper and manganese levels. Low boron and chloride in sandy may provide a wheat yield increase since these elements are soil mobile. Foliar applications can be used on wheat and usually the sulfate or oxide formulations are used. Add fulvic acid (1 pint/A) to increase plant absorption. Some micronutrients can be tank mixed with herbicides or fungicides to reduce application costs. Soil-applied micronutrients are the most efficient strategy for long-term management to prevent micronutrient deficiencies. If soil or tissue tests are consistently low, such as zinc or copper, then add those nutrients before or at seeding. Since wheat is actively growing now, adding micronutrients if needed may be your best option to increase wheat yields.