



# SOIL

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## Fertilizing Winter Wheat

no. 0.544

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### Quick Facts...

Nitrogen is the most limiting nutrient for winter wheat production.

Apply nitrogen fertilizers at rates based on expected crop yields minus credits for residual soil nitrates and nitrogen mineralized from organic matter, manure, and previous legume crops.

Apply phosphate fertilizers at rates based on soil test results. Band applications are more effective than broadcast applications.

Most Colorado soils contain sufficient available potassium for dryland winter wheat production.

Adequate soil fertility is one of the requirements for profitable winter wheat production. Nitrogen (N) is the most yield-limiting nutrient. Phosphorus (P) is the next most limiting nutrient, and sulfur (S) may be limiting in rare situations on some soils. Levels of potassium (K) and micronutrients generally are sufficient for wheat production in Colorado soils.

### Soil Sampling

The value of a soil test in predicting nutrient availability during the growing season depends on how well the sample collected represents the area sampled. Take surface samples from the tillage layer (4 to 8 inches) or the 1-foot soil depth. Take subsoil samples to a depth of 2 feet for determination of available  $\text{NO}_3\text{-N}$ . If the field has been in no-till, reduce the sampling depth to the tillage layer.

A good sample is a composite of 15 to 20 soil cores taken from an area uniform in soil type. This number of soil cores is especially important in sampling fields where P fertilizers were band applied in previous years. Sample areas with major differences in soil properties or management practices separately.

Thoroughly air dry all soil samples within 12 hours after sampling by spreading the soil on any clean surface where the soil will not be contaminated. **Do not oven dry the soil** because this can change the soil test results. Place the air-dried soil in a clean sample container for shipment to the soil test laboratory.

Submit a carefully completed information form with the soil sample. This form provides information so fertilizer suggestions can be tailored to your specific situation. Take soil samples for  $\text{NO}_3\text{-N}$  analysis every year for optimum N fertilization of crops. Soil analyses for availability of the other nutrients, pH, and organic matter content may be sufficient every three to four years.

For more detailed explanations of the importance of taking proper soil samples contact the Colorado State University Soil, Water, and Plant Testing Laboratory in Room A319, Natural and Environmental Sciences Building, Colorado State University, Fort Collins, CO 80523; (970) 491-5061; <http://www.extsoilcrop.colostate.edu/SoilLab//soillab.html>.

### Nitrogen Suggestions

Base nitrogen rates for winter wheat on the expected yields for each field. Nearly all wheat requires some N fertilizer, unless there is a substantial release of available N in the soil prior to planting.

Other credits for N include the amounts expected to become available during the season from mineralization of soil organic matter, manure and previous legume crops. Subtract these credits from the total crop needs to determine the suggested N fertilizer rate for the expected yield.

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Extension. 3/96. Revised 5/09.  
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