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### IN-SEASON FERTILIZATION ON WINTER WHEAT

**Splitting applications of some nutrients between preplant and late winter or early spring can add yield and profit to winter wheat production.** The most common fertilizer element applied to winter wheat in-season is nitrogen. However, the need for other nutrients, especially those susceptible to leaching from soils, should be considered as well. These include chloride, sulfur, and in some cases, potassium.

**Wheat takes up about 2.0 to 2.5 pounds of nitrogen per bushel of grain produced.** Wheat forage will take up about 40 pounds per ton, assuming 2% nitrogen in the tissue. Where wheat is grazed, it takes about 1 pound of nitrogen for each 3 pounds of animal gain per acre. Adequate nitrogen must be available to the plant at all phases of development. Shortages of nitrogen will ultimately result in reduced tillering, reduction in head size, poor grain fill, reduced yields, and low protein content.

**Splitting nitrogen applications generally improves use efficiency, minimizes risk, and safeguards the environment.** This is especially true in medium to light textured soils and in higher rainfall regions where the risk of nitrogen leaching is increased. Topdress applications should be made early, prior to jointing, to maximize production efficiency. Timing and nitrogen source should be managed to fit climatic conditions, soil type, and tillage system.

**Another nutrient that should be considered in topdressing winter wheat is chloride.** There have been many studies across North America that have evaluated wheat response to chloride. Chloride is essential for photosynthesis, it is important in controlling the opening and closing of leaf stomata (pores), it influences the nitrogen nutrition of plants, and also advances plant maturity and improves overall disease resistance. Wheat response to chloride is usually expressed in improved color, suppression of fungal diseases, and increased yield. The average yield increase due to chloride is usually about 5 bushels per acre in responsive conditions, although yield increases as high as 23 bushels have been observed. Chloride is highly mobile in soils, so split or topdress application may be beneficial.

Several factors and tools can be used to determine whether a specific situation is likely to be responsive to chloride fertilization.

- **Soil testing**—When soil test level is below about 30 pounds of chloride per acre (2 ft. sample depth) response is likely. The optimum level of soil chloride is at least 60 pounds per acre (2 ft. depth).
- **Tissue testing**—Chloride level below 0.1% at the boot stage is considered very low.
- **Wheat variety**—Some varieties are more responsive than others. Contact the appropriate university extension specialist to determine which varieties are likely to be responsive in a specific area.

**In sandy, well-drained soils, and low organic matter soils, sulfur may limit wheat yield and profitability.** Inorganic sulfur (sulfate) in soils, like chloride, is an anion and therefore mobile and subject to leaching. Because of its mobility, topdress applications may be effective in addressing sulfur needs. Also, in sandy, well-drained soils, potassium may also be limiting. If sufficient preplant potassium was not applied, or if excessive leaching has occurred, topdress application of potassium can be effective in correcting deficiencies.

**Providing winter wheat with adequate fertility is important in producing optimum yield and maximum profit.** In-season or topdress application in the spring with certain nutrients is agronomically sound because of the tendency of these nutrients to leach from the root zone. So, look beyond nitrogen this topdress season and consider the need for other nutrients such as chloride in wheat production.

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