



Extension FactSheet

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Spring Nitrogen Management for Wheat in Years of High Nitrogen Prices

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During years of high nitrogen fertilizer prices, nitrogen management becomes more challenging for wheat production. Wheat yields will be greatly affected without adequate nitrogen, but what is adequate?

Nitrogen recommendations for Ohio wheat have been based on the rate equation shown here (mineral soils, which have both 1–5% organic matter, and adequate drainage):

$$40 + [1.75 \times (\text{yield potential} - 50)]$$

This equation shows that a realistic yield goal should be the first place to consider rate adjustments. For example, if the yield goal has been 100 bushels per acre but yields have actually been 90, then the crop has received 20 pounds that were not needed for yield. If the goal has been 100 bushels and average yields have been 80, 35 pounds of extra nitrogen have been applied each year.

Another area for potential savings should be credit for fall-applied nitrogen. For example, 130 pounds of nitrogen would be required for a yield potential of 100 bushels. If 30 pounds of nitrogen have been applied in the fall, only 100 additional pounds should be applied in the spring. If the yield potential would have been 90 or 80 in the same scenario, the spring nitrogen rate should be 80 and 60 pounds, respectively. Credits are not given for previous crops. A legume, such as soybeans, would eventually provide available nitrogen to the soil, but often too late for the wheat crop.

Besides the rate of nitrogen, application time is also important. In most years, nitrogen may be applied between early March and early April. A split spring-application program may be a benefit in poorly drained fields that are prone to nitrogen loss. For these programs, it is important that the first application occurs soon after initial green-up and the second application at initial jointing (Feeke's Growth Stage 6). The time of application is not as critical in a single topdress (providing some nitrogen was applied in the fall), but applications should be made after initial green-up and before the second visible node on the stem.

Most sources of nitrogen are satisfactory for wheat, but price and availability may limit some products in a given year. Urea and urea-ammonium nitrate solutions (UAN) are often the most common. Urea has the least potential to cause damage to the crop. Damage is generally insignificant from broadcast applications of UAN solutions applied early, but the potential for damage increases as the crop develops. Dribble-band applications will minimize damage from UAN solutions. Urea-ammonium nitrate solutions will have some nitrogen available immediately at application time; urea will have a short lag as it converts to ammonium and nitrate forms of nitrogen. Generally, UAN solutions have the greatest potential for nitrogen losses, since part of it is immediately in the nitrate form. Urea may have volatilization losses if temperatures are exceedingly warm.

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