



Top-Dress Nitrogen

Application in Wheat

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With increased fertilizer prices, it is critical for producers to maximize their yields for each unit of nitrogen applied, also known as nitrogen use efficiency. One of the best ways to maximize nitrogen use efficiency is to apply nitrogen when it is most needed by wheat crop. Nitrogen fertilizer applied too early can increase nitrogen losses to leaching, denitrification, and luxury consumption. However, wheat receiving nitrogen fertilizer too late, after jointing stage, does not have a strong yield response. So, timing is critical.

There are several advantages to applying a one-half to two-thirds of the nitrogen at the top-dress timing. First, producers have a better idea of the crop yield potential in February than at planting time. Second, wheat plants do not need much nitrogen in the fall or winter due to limited plant growth. However, wheat plants require a lot of nitrogen for growth after breaking winter dormancy and for grain development. It is very important to make the nitrogen fertilizer applications one to several weeks prior to jointing to allow time for the nitrogen fertilizer to be moved into the soil by a rainfall event and become plant available. Last, the nitrogen is less likely to be lost to leaching, denitrification, luxury uptake, and run-off when it is applied at the time the plant needs the nutrient.

When making nitrogen top-dress applications to wheat the following items should be considered: A realistic yield goal, residual N present, whether the wheat is grazed or not, and the amount of preplant fertilizer applied.

Consider the following scenario:

| Situation | Total Nitrogen/A |
|--|------------------|
| Soil Test Residual Nitrogen | +10 lbs/A |
| Preplant Fertilizer Nitrogen | +20 lbs/A |
| Yield Goal = 40 bushels/A* | -60 lbs/A |
| Stocking Rate = 1 animal/2 acres | |
| Grazing Time = 105 days** [(Grazing Time/Stocking Rate) x (15x0.15)] | -24 lbs/A |
| Total = Amount of Actual Nitrogen to Apply (Top Dress) | -54 lbs/A |

*Equation based on 1.5 lbs of nitrogen/acre for each 1 bushel/acre of grain.

**Equation based on: 15 lbs dry matter/day/animal consumption; 0.03 lbs of nitrogen/1 lbs of forage dry matter; stocking/acre.

In this scenario, you would need to apply an additional 54 lbs/acre of actual nitrogen to adequately supply the wheat crop with the N it needs for a 40 bushel yield goal. A top-dress nitrogen application should be applied prior to the wheat jointing stage (Feekes 6). Top-dressing with N beyond the jointing stage will likely increase grain protein but not grain yields.

Additional considerations:

Leaf burn from liquid nitrogen application is often a concern with growers applying relatively high rates. The level of leaf burn is dependent on several factors, but high use rates 40+ lbs/a and high air temperatures increase the risks of leaf burn. Despite some initial leaf burn, no yield losses can be expected from the application of liquid nitrogen applications.

If tankmixing liquid nitrogen fertilizer with herbicides, it is important to read the herbicide label to prevent crop injury and to insure compatibility. There are some herbicides that should not be mixed with fertilizer and several others that should only be mixed with 50% liquid nitrogen or less.

