There are several benefits of split applications (fall + spring) of nitrogen to small grains. When compared to single, pre-plant N applications, split applications make more efficient use of N and allow the producer to better gauge the yield potential of his/her crop prior to deciding on an N top-dress rate. Once farmers have made the decision to split-apply their N fertilizer, however, many are left with the question of how to allocate nitrogen in a split application. Apply too much in the fall and lose some of the efficiencies offered by the split application. Apply too little in the fall and one runs the risk of the crop “running out” of N prior to top-dress applications in the spring. In this publication we will provide some guidelines regarding the fall N requirement of wheat and discuss how your management system will influence this decision.

So, how much fall nitrogen does winter wheat in the Southern Great Plains require? Just like the total N requirement for wheat varies from year to year, the fall N requirement varies too. Factors such as the amount of N mineralized from soil organic matter, residual soil nitrate N, previous crop, and whether or not the crop will be grazed influence fall N requirement for wheat. Among these, whether or not the crop will be grazed probably has the biggest influence on fall N requirements for wheat.

Success of dual-purpose wheat depends on having enough N to fuel rapid leaf expansion and biomass production, re-growth during grazing, and re-growth after grazing. The N requirement for wheat in this system depends largely upon how much forage is produced. Preliminary research at OSU, however, indicates that around 60 to 70 lb/ac of nitrogen is generally enough to produce ample fall forage and carry the crop through until top-dress time in February.

In grain-only wheat production, the objectives are slightly different. In fact, the prolific tillering and canopy expansion that are desirable in dual-purpose wheat can be detrimental to grain-only production in a dry year. The goal in grain-only production is for the crop to have enough N to produce 2-3 large tillers per plant and keep these tillers healthy and viable until top-dress time in February. This can usually be accomplished by having around 30 to 40 lb/ac of fall N available to the crop. In some years this might already be present in the soil profile and no supplemental fertilizer will be required. Most years, however, a small amount of supplemental N fertilizer will be required at the time of planting.
The fact that we use the terms “around” and “approximately” prior to our estimates of fall N requirements for wheat illustrates that there is no one-size-fits-all recommendation regarding N fertilization of wheat. If there is a large amount of crop residue on the soil surface, for example, more N than indicated in the previous paragraph could be required due to immobilization of N during the microbial decomposition of crop residue. Likewise, a bumper fall-forage crop would likely benefit from higher pre-plant N rates than a mediocre crop.

So, how can the individual producer fine-tune his/her fall N program to adapt to these changing situations? The answer is to use a three-pronged offensive consisting of:

1. A recent soil test that includes surface (0-6”) and sub-surface (6-24”) nitrate nitrogen levels. Whatever soil N is present can be subtracted from the approximate fall nitrogen requirements listed on the previous page.

2. A nitrogen-rich strip (a.k.a. N-Rich Strip, RAMP Strip, or Greenseeker Strip). An N-rich strip is simply an area where N is not limiting, and having an N-rich strip is essential to accurately gauge if the pre-plant application was “enough” or if it is “running out”. Gauging the difference (or lack thereof) in color between the N-rich strip and the rest of the field will let the producer know if supplemental N is needed and how early it is needed. Hand-held Greenseeker sensor readings taken in February from the N Rich Strip and the farmer practice will let the producer know how much additional todress N is needed. For more information contact your local extension office and ask for publication # PT 2005-3 Get your nitrogen-rich strips out early or visit www.nue.okstate.edu for a downloadable copy.

3. The third and final component is commitment on the part of the farmer. Similar to providing mineral supplementation to beef cattle, the easy approach to N fertility is to “put plenty out there”. This is, however, not the most economical nor environmentally-friendly approach. Just like a good herd manager, a well-trained agronomist will use the tools available to them to determine what the crop needs and how to supply that need. Whether we are talking about cattle or wheat, this takes commitment, dedication, and perseverance.