



Summer 2003, No. 2

IN-SEASON NUTRIENT APPLICATIONS

In-season fertilizer application has become a hot topic of discussion among farmers. The issue has grown in interest as a result of the drought conditions experienced in many parts of North America in 2001 and 2002. When spring soil moisture conditions are poor, applying only a portion of the crop nitrogen requirements at seeding can be an effective risk management tool. The question becomes, when do I apply the rest of the nitrogen to achieve optimum crop yield and quality?

Timing is everything when post-emergence nitrogen is considered. This means understanding the pattern of growth and nutrient uptake by the crops you have seeded. Because of the short growing season in the northern Great Plains, timing nutrient applications is critical to crop uptake. For example, 80 to 90 percent of the total nitrogen is taken up by cereal crops at the start of heading, and for canola by the start of flowering. This rapid nitrogen uptake corresponds to stem elongation of the crops and biomass accumulation. If sufficient nitrogen is not available for the crop during this stage then yield potential may be negatively impacted.

In-season fertilizer application is limited to certain nutrients. Split application as a risk management tool is appropriate for those nutrients which are mobile in the soil. For example, post-emergence application of less mobile nutrients like phosphorus and potassium cannot be expected to have the same effect as application close to the seed row at seeding. Alternatively, nutrients mobile in the soil like nitrogen and sulfur can be applied during the growing season and effectively taken up by the crop.

Building wheat grain protein is another option for in-season nitrogen application. In regions where growing conditions result in a higher grain yield potential than planned for, a wheat crop may not have sufficient nitrogen to support both high yield and high grain protein. When this occurs, nitrogen can be broadcast or dribble banded into the canopy of a wheat crop at flowering, providing additional nitrogen to increase grain protein. Given that almost all of the nitrogen is taken up through the crop roots, moisture is required to move the fertilizer into the soil and avoid stranding it away from the actively growing plant roots.

Successful in-season application builds on a nutrient balance at seeding. When using in-season nitrogen application to minimize risk in drought prone areas, be sure that you have set the stage for season-long yield responses. That means ensuring that you have met the crop's phosphorus and potassium requirements at seeding. A crop which is deficient in phosphorus or potassium will not provide the full response to in-season nitrogen application, reducing the opportunity to capture additional yield when environmental conditions improve. Sulfur can be effectively applied with nitrogen as an in season treatment, a practice which has been used effectively to rescue sulfur-deficient canola.

Remember, planning is critical if you are going to use in-season nutrient application. This means determining crop nutrient requirements with a soil test suitable for your region, and starting with enough nutrients applied at seeding to assure early season growth of the crop is not limited. Only then will you be able to take action to 'top-up' the crop nitrogen supply when environmental conditions improve.

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For more information, contact Dr. Adrian M. Johnston, Western Canada Director, PPI, 12-425 Pinehouse Drive, Saskatoon, Saskatchewan, Canada S7K 5K2. Phone: (306) 956-0619. E-mail: ajohnston@ppi-ppic.org.