

NITRIFICATION INHIBITORS SHOW VALUE IN DRYLAND WINTER WHEAT PRODUCTION

COLFAX, Wa. – Nitrogen is arguably one of the most yield limiting factors in crop production across the nation. Although it is the most prevalent element in Earth's atmosphere, nitrogen is highly susceptible to loss through volatilization, denitrification, and leaching. Proper nitrogen management is vital to ensuring higher yields, protein content, and good economic benefit to growers.

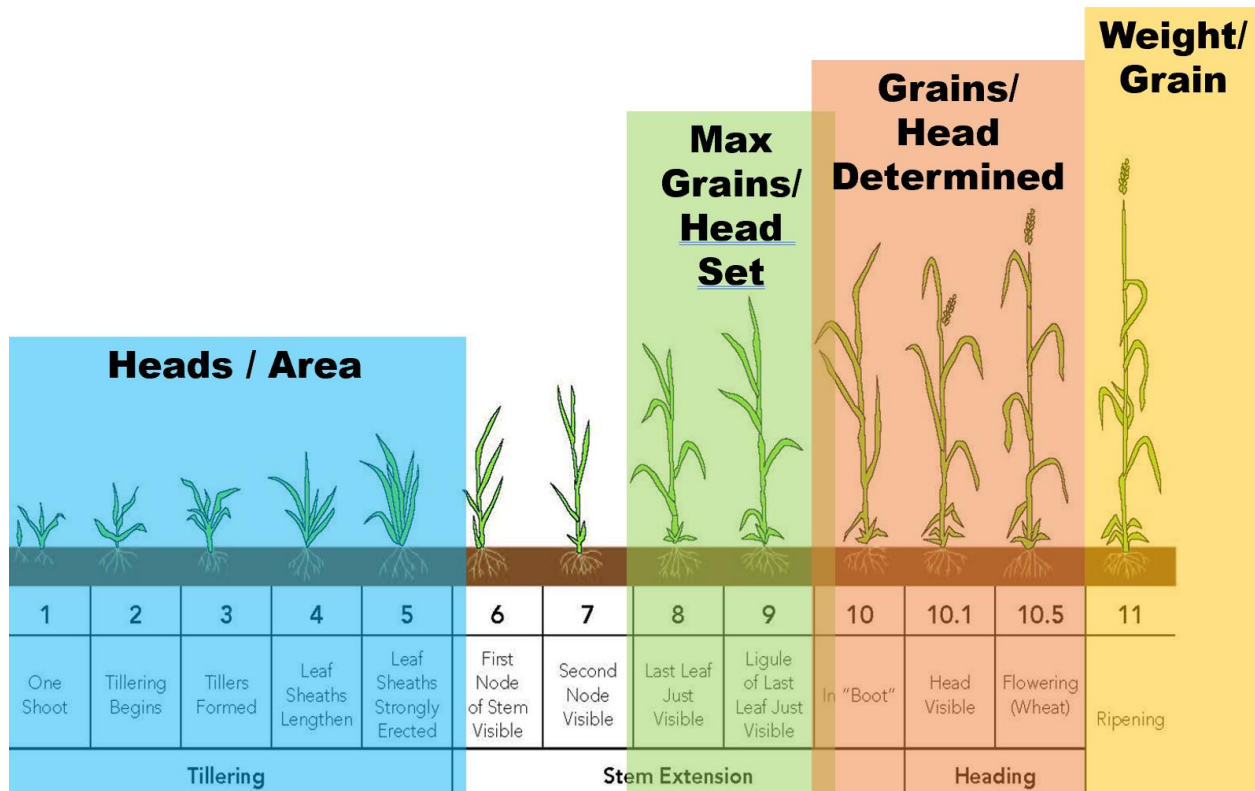
Nitrogen effects yield building potential at every growth stage of the crop's lifecycle. Early in the growing season, access to nitrogen helps determine tillers and number of heads, while nitrogen availability during stem elongation drives the number of grains per head. After heading nitrogen supports grain weight and protein content. "The trick is in keeping that huge nitrogen investment not only where you need it, but also available when you need it," says Cat Salois, Director of Research and Technology for The McGregor Company, "it is crucial that nitrogen availability is well timed to that crop's demand curves for optimal nitrogen use efficiency."

Three primary forms of nitrogen are applied to crops – nitrate, urea, and ammonia. Spring rains plus warming soils push fall-applied nitrogen deep into the soil profile and further from plant roots. "In a dryland rain fed cropping system, we want to be able to manage where the nitrogen is in our soil profile to hit the appropriate yield component," says Salois, "By slowing the conversion of ammonia to nitrate the applied nitrogen more closely matches the nitrogen use curve in winter wheat. We are able to effect the critical yield building components of grains per head, weight per grain, and protein content beyond just increased tiller count."

One of the most effective tools available to slow nitrogen leaching is the use of denitrification products, which prevent microorganisms in the soil from converting immobile ammonium into mobile nitrate. Proven denitrification products such as N-Serve (for use with anhydrous ammonia) and Prolong N (for use with UAN and urea) effect the Nitrosomonas bacteria, which are responsible for this conversion process. These products work below ground, where up to 70% of nitrogen loss can occur. With reduced risk of loss through leaching and denitrification, the grower's nitrogen investment remains high in the root zone to maximize nitrogen use efficiency during peak demand.

Commonly there are two approaches to nitrogen application in winter wheat – 100% Fall-applied, or a split application with a Spring top dress. Both strategies have advantages as well as significant risk for nitrogen loss. Regardless of the timing or the nitrogen source, all nitrogen is susceptible to loss through leaching or denitrification. Matching the nitrogen availability to the plant demands throughout the growing season is essential to maximizing yield potential and profitability on the farm. "The use of nitrogen stabilizing products allows the grower to keep nitrogen in the right place at the right time," emphasizes Salois, "proper nitrogen management is fundamental to plant health, achieving optimal yield, and delivering the maximum profit opportunity to the farm."

When is Yield Determined?



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