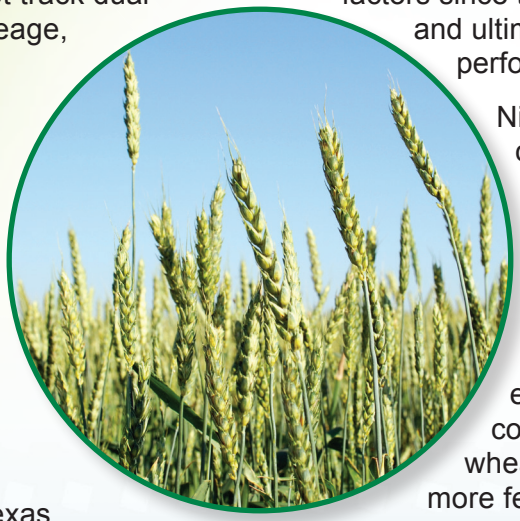
PLANT NUTRITION TODAY

2016 ISSUE 3, NO. 4

# FERTILIZING FOR DUAL-PURPOSE WHEAT

Producing winter wheat for both grazing and grain—or dual purposes—is common in the southern Great Plains, with acreage tending to decline moving northward. The dual-purpose system works well in states such as Texas and Oklahoma because temperatures favor wheat growth well into the winter months, there is relatively little snow and ice cover, and most producers have experience with livestock.

The USDA does not track dual-purpose wheat acreage, but a paper by Taylor et al. (2010) summarized some estimates along with citations. Estimates for dual-purpose wheat in the paper included two-thirds of Oklahoma wheat acres, and more than half of the wheat planted in Texas, Oklahoma, and New Mexico combined. If we assume that 50% of wheat in these three states and further assume that 20% in Kansas is grazed, and use the average of USDA wheat acres planted in the three most recent years (2013, 2014, and 2015), then the estimated area of dual-purpose wheat in these four states comes out to almost 8 million acres. This is clearly an important system in the southern Plains, as it is in other parts of the world such as Argentina, Uruguay, Australia, and Morocco.



Dual-purpose wheat is generally planted about a month earlier than for grain only production, and is seeded at about 1.5 to 2 times the density. Grazing is typically initiated about 45 to 60 days after planting, and is usually terminated by first hollow stem growth stage.

Most dual-purpose wheat is grazed by stocker cattle, or young animals that are usually bought in the fall and sold at the end of the grazing period. Thus optimizing animal gain is of upmost concern, which means that both forage quantity and quality are important factors since they affect animal, and ultimately whole system performance.

Nitrogen (N) is commonly, but not always, the most limiting nutrient in the dual-purpose system. It affects biomass production and forage quality, especially protein content. Dual-purpose wheat generally requires more fertilizer N than grain only production because of N removal (and rearrangement) by grazing. The N fertilizer adjustment is often made on the basis of desired stocker gain per acre. For example, the recommendation from Oklahoma State University soil testing lab calls for 30 lb additional N for each 100 lb stocker gain desired, while Kansas State University calls for an additional 40 lb N for each 100 lb gain. The word *additional* is important here because the recommended N per unit stocker gain is *added* to the N recommended for the system's grain yield target. Split N applications are well suited for the dual-purpose system since

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**PLANT NUTRITION TODAY** is a quarterly publication of compiled scientific information developed by the International Plant Nutrition Institute (IPNI). Website: http://www.ipni.net/pnt

*“ Among the components of a successful dual-purpose system is an effective fertility program that accounts for optimizing both animal performance and grain yield. ”*

adjustments can be made for forage removal and environmental conditions.

All too often wheat used for grazing in the southern Plains does not receive sufficient phosphorus (P). Remember that P plays many important roles such as enhancing rooting and tillering, and perhaps most importantly sufficient P helps to get the most out of applied N fertilizer. For example, in a Texas study the addition of 40 lb $P_2O_5$/A to 160 lb N/A increased forage yield by 68% over the N only treatment. Soil testing is a useful tool in determining the need for P input.

The potential benefit of other nutrients such as sulfur (S) should not be overlooked. For example, in one Kansas study where 100 lb N/A was applied the addition 7.5 lb S increased forage crude protein by 4.6% (Feekes 3-5) when averaged over four site years and two S sources.

Producing winter wheat for grazing and grain requires considerable skill and balancing of many moving parts. Among the components of a successful dual-purpose system is an effective fertility program that accounts for optimizing both animal performance and grain yield.

**Note:** 1 lb = 0.454 kg; 1 A = 0.404 ha.

M. Stewart/IPNI Photo

## References


1. Taylor, K.W., F.M. Epplin, B.W. Brorsen, B.G. Fieser, and G.W. Horn. 2010. J. Ag. Appl. Econ. 42:87-103.



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