

WHEAT PRODUCTION NEWSLETTER

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Have you pulled the dipstick?

By Jeff Edwards

Growing up on the Edwards' farm there was one cardinal rule regarding tractor use...NEVER, EVER, crank a tractor without first pulling the dipstick. I'm sure many of you, like me, had this concept drilled into your head by your father and still pull the dipstick prior to cranking any piece of machinery. However, when was the last time you pulled the dipstick on your soil? In other words, when was the last time you pulled a soil test on every field?

An up-to-date soil test is one of the most cost-effective decision aids available to farmers. Without it, most of your fertility decisions will be tradition-based rather than crop-based and you might be spending money you don't have to. In this edition of the Wheat Production Newsletter we will discuss fall fertility decisions and some of the trends we are seeing in the OSU soil testing lab that might affect these decisions.



Time spent pulling a soil sample is some of the most productive time spent on the farm

Take credits for residual N

By Hailin Zhang and Bill Raun

The drought during last winter wheat growing season resulted in poor growth and low yields. It also left more residual nitrogen in the soil. The Soil, Water and Forage Analytical Laboratory at Oklahoma State University compared test results of soil samples marked for wheat between 2005 and 2006. The nitrate-N in the surface samples received from June 10 to July 20 was 43 lbs/acre this year whereas 24 lbs/acre during the same time last year, a 79% increase (Table 1).

The higher residual N in the soil may be due to lower uptake by plants and less leaching and denitrification, both the result of our recent drought. Therefore, it makes a lot of sense to consider this residual N in the soil when planning your fertilizer program for the next crop. Significant amounts of additional residual N generally can be found in the subsoil (6-24" profile) if the residual N in the surface soil is high and that winter wheat can utilize. *cont.. on page 2*



Carryover N can make a large difference in fall wheat forage production

cont.. from page 1

We recommend the following two techniques to fine-tuning your nitrogen fertilization for the next season:

- 1.) Collect a representative soil sample and adjust the total amount of N needed according to the amount of residual N from the soil test. Also, please note that subsoil samples from 6–24” are needed to accurately assess the total amount of plant available N.
- 2.) Apply half of the total N estimated from your yield goal at planting and establish an N-Rich Strip in each field. The amount of N needed by the time you topdress in the winter will be determined by the visual differences between the N Rich Strip and your more conservative preplant N rate applied to the entire field. More information on using N-rich strips can be found at:

http://nue.okstate.edu/Hand_Held/New_N_Strategy.htm.

Table 1. Soil samples coming through the OSU soil testing lab in June and July 2006 are showing much higher soil nitrate-N levels than those processed at a similar time in 2005.

	2005	2006	Changes over 2005
No. of Samples	602	938	56%
pH	6.3	6.1	-3%
NO ₃ -N (lbs/acre)	24	43	79%
Soil Test P Index	58	53	-9%
Soil Test K Index	434	460	6%

Q & A regarding phosphorous application on wheat

By Jeff Edwards and Hailin Zhang

What is Phosphorous (P) and what role does it serve?

Among plant nutrients, phosphorous is known as the “Energizer”. This is because P is an integral constituent of the ATP molecule which is essential in the energy metabolism of cells. Phosphorous is also a major part of other plant parts including cell walls, DNA, and RNA.

What are the deficiency symptoms?

Phosphorous is mobile within the plant, so deficiency symptoms generally appear in older leaves first. Unlike N, a P deficiency will often result in a dark



Phosphorous deficiency can result in poor fall forage production, especially in low pH environments

green plant. However, the dark green color usually coincides with stunted plant growth. Another tell-tale sign is purpling of leaves. Cold injury can cause purpling of leaves as well, so caution must be exercised in making this diagnosis.

What causes P deficiency?

Even though P is a major nutrient for plant growth, it is generally present in very low concentrations in the soil solution. This is because only about one percent of soil phosphorous is actually available for plant uptake. In addition, the available pool of P is strongly influenced by soil pH. Phosphorous is most available from a soil pH of about 5.5 to 7.0. The low native levels of P in Oklahoma soils in conjunction with unavailability due to low or high pH, makes P availability one of the most limiting factors for wheat production in Oklahoma.

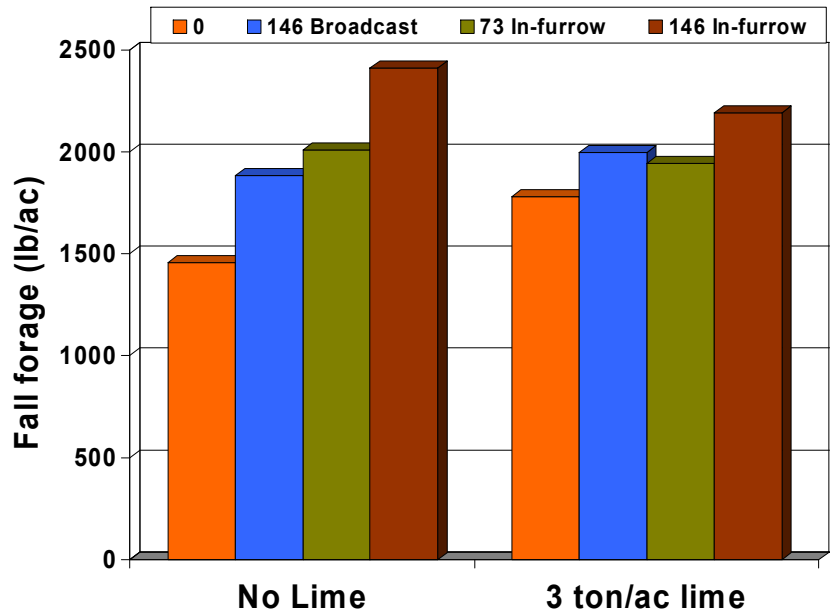
Should I broadcast or band my phosphorous?

Either system can work, but research indicates that lower rates of P fertilizer can be used when banding as opposed to broadcasting. In fact, research at OSU indicates that P rates can be as much as cut in half when banding as opposed to broadcast application (see figures to right). Banding is of particular benefit when the soil pH is below 6.0. This is because when fertilizer is applied in a narrow band, more P is available for root uptake and less is “tied up” by aluminum and calcium.

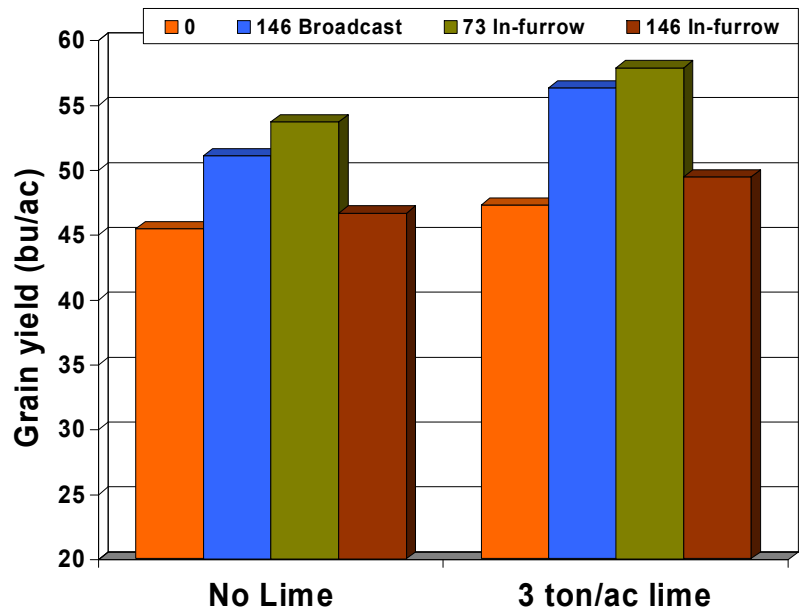
What if I lime, should I still band my phosphorous?

As demonstrated in the figure to the right, in-furrow application of phosphorous can still benefit wheat forage and grain yield after pH issues are corrected.

Wheat forage response to DAP fertilizer (lb/ac)



Wheat grain yield response to DAP fertilizer (bu/ac)



Wheat forage and grain yield benefit from applications of DAP (18-46-0), but forage and grain yield responses were greater and fertilizer requirements were lower when an in-furrow application was used instead of a broadcast application.

Are the P requirements different for grain-only and dual-purpose systems?

Research conducted over the past few years by OSU indicates that P requirements may be much higher in a dual-purpose system. New research is being conducted at the Wheat Pasture Research Unit to better understand the differences in P requirement between dual-purpose and grain-only systems

I am on rented ground. How can I afford to apply phosphorous?

Research conducted at OSU clearly indicates a positive return to P application when soil-test P levels are 65 or below. This response occurs the same year as application, so you should reap most of the rewards from in-furrow P the same year it is applied.

How much P should I apply?

The answer to this question is the easiest of them all. The only way to accurately know how much P to apply is to soil test each year.

How do I compare P sources?

Plant availability is similar among all commercially-available sources of P, so the best way to compare is price per unit P. Of course, the decision of whether to go with dry fertilizer (most likely DAP) or liquid (e.g. 10-34-0) will depend on what type of equipment is available.

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