MISSISSIPPI STATE UNIVERSITY
EXTENSION SERVICE

Grain Crops Update

September 27, 2010 Erick Larson

Wheat Planting Guidelines

Wheat seed supply is very tight this fall, largely a byproduct of inclimate weather last fall, which restricted and delayed seedbed preparation (and all other farming operations), ultimately reducing wheat plantings and seed production, as well as the unpredictability of crop acreage change. Since intentions for wheat plantings far exceed the availability of best varieties, management will play an even more important role in the profitability of this crop. This is important not only because variety selection is critical to optimal productivity, but wheat management deserves considerable improvement, relative to our other row crops. Furthermore, this management cannot wait until the spring, just because wheat is dormant for a period during the winter. In fact, planting date, stand establishment, soil fertility, weed control and pest management during the fall all lay the foundation for high wheat productivity, just as they do with any other crop.

Figure 1. Wheat seed supply, particularly of premier varieties, is very limited this season. Therefore, we really need to improve our management efficiency in order to realize optimal profitability of our wheat acreage.

Variety Selection – The first order of business is to do is make sure your seed is an adapted variety, let alone a top-performer. Since interest in wheat production far exceeds seed supply, many folks have questioned about growing wheat varieties from other regions, particularly varieties from the Soft red winter wheat growing region north of us. Wheat varieties are specifically bred and adapted to perform in a specific environment. The winter wheat climate changes considerably from the Deep South, the Mid-South and the Ohio-River Valley, and correspondingly wheat varieties are largely exclusively adapted for each of those regions. Not only will varieties generally lose substantial productivity when they are grown beyond their adapted region, but they are also prone to severe crop failure. Varieties adapted south of your locale are more likely to experience severe spring freeze damage because they generally head earlier. Varieties adapted north of your locale may not accumulate enough cold temperature (<50°F) during the winter to stimulate reproductive development during the spring - a process called vernalization. If we experience a brief or warm winter, northern varieties may fail to completely vernalize. This means plants simply fail to head and cause a catastrophic loss. Another issue is that wheat varieties commonly have different photoperiod requirement to stimulate heading. Thus, a northern variety may not meet its photoperiod requirement to head until several weeks beyond our normal heading dates. Correspondingly, productivity will suffer significantly because it will try to fill grain when temperatures are much higher than normal in the region it was bred to grow. A good rule of thumb is that if a wheat variety has not been tested in the MSU Variety trials and/or other adjoining states at similar latitude as your farm, it likely will not be well-adapted.

Figure 2. This Mississippi wheat field failed to accumulate enough cold weather to adequately vernalize and produced only an occasional head during 2009.

The Importance of Timely Planting – Planting wheat early is very tempting, but it likely limits wheat grain productivity more than any other factor. In fact, records from the Kentucky Wheat Production Contest (where winners typically produce more than 100 bushels per acre) rarely show growers planting prior to the recommended dates. Planting wheat early needlessly exposes it to developmental, fertility, weed and numerous pest problems which ultimately limit yield potential. Our mild southern winters further intensify this issue, because the onset and degree of dormancy may vary considerably from year to year. Thus, the developmental advantages gained from planting summer crops early, such as corn and soybeans, do not apply to winter wheat. The adverse effects from excessive fall growth include spring freeze injury, development of Barley yellow dwarf virus, Hessian fly and armyworm infestation, more disease infection, more weed competition, poor nutrient use, and increased lodging. In fact, growers in north and south Mississippi experienced severe freeze injury during recent seasons - only the central Delta region has escaped serious damage. Yield loss resulting from spring freeze injury normally increases drastically with early-maturing wheat. Thus, we need to carefully manage variety maturity and planting date, as both these factors affect wheat maturity. Early-maturing varieties should be planted later than normal, to avoid excessive development, which could expose them to substantial freeze damage in the spring. Conversely, late-maturing wheat varieties should be planted before early varieties. We should also plant multiple varieties differing in maturity, to spread risk, since temperatures also influence maturity.

Optimum Wheat Planting Dates – Our suggested wheat planting dates (within 10-14 days of the average first fall freeze date) should provide warm enough temperatures and long enough days for seedling emergence and tillering to begin before dormancy occurs. This can vary depending upon seasonal temperatures, but normally corresponds to:

North & Central Mississippi:	October 15 - November 10
Delta Region:	October 20 - November 15
South Mississippi:	November 1 - November 25
Coastal Region:	November 15 - December 10

Figure 3. Early-planted wheat is prone to disappointment, due to many issues, including freeze injury.

Seeding Rates and Methods – Considering this season's seed shortage issues, I highly recommend planting your crop with a grain drill, compared to more rudimentary broadcast planting methods, in order to optimize stand establishment, vigor and seedling survival. Furthermore, by planting using good practices and sound management, you can reduce your wheat seeding rate considerably without reducing productivity. While it is important to strive for specific planting standards, wheat does have outstanding capability to compensate for wide variation of plant density. Our normal planting recommendation is to strive to establish 1.0 to 1.3 million wheat plants/acre or 23 to 30 plants/ft.^{2}. However, if you plant with a modern drill at the optimal time in a well-prepared seedbed and are committed to actively managing wheat during the fall, you can likely reduce your stand goal to about 650,000 plants/acre without reducing productivity. Wheat seed size can range from 11,000 to 18,000 seeds per pound (should be noted on the tag), so you should base seeding rate on the number of seeds (seeds per pound), rather than on the volume or weight of the seeds (bushels per acre) – particularly since seed supply is short. Using these strategies may reduce your seeding rate by more than 50% and/or allow you to plant better varieties on twice as many acres. Some have asked about broadcast-planting on raised beds (primarily to facilitate irrigation of the subsequent double-crop), and this method can be productive, depending primarily upon adequate soil-water drainage. However, growers broadcasting and incorporating seed should use considerably higher seeding rates (40-45 seeds/ft.^{2}), because emergence success will likely be modest (60-70% of planted seed). Growers broadcasting small grain seed on the soil surface should generally utilize very high seeding rates (50-60 seeds/ft^2), because emergence and seedling survival can be relatively low (around 50% of planted seed). For more information, please refer to Publication 2401 "Planting Methods and Seeding Rates for Small Grain Crops." http://msucares.com/pubs/publications/p2401.pdf.

Figure 4. Wheat may readily compensate for plant density, given proper management. This includes planting at the appropriate time, achieving a uniform, healthy stand, providing sufficient fertility and relieving weed competition during the fall.

Fall Weed Control - A burndown herbicide applied prior to planting and/or before crop emergence is essential to eliminate weed competition during emergence and early tillering stages, if weeds are present in a no-tillage system. Tillage may also serve the same purpose in conventionally prepared seedbeds. In fact, tillage may be the most practical option to control volunteer Roundup Ready corn prior to planting wheat. Maintaining a weed-free environment during planting and stand establishment is essential because weeds are very competitive with young wheat plants, particularly if they emerge before or at a similar time as the wheat crop. Likewise, abundant populations of quick-starting weeds, including henbit and annual bluegrass, may intensely compete with wheat during the fall, despite their small stature. Of course, ryegrass remains a foremost problem. I encourage you to use fall-applied herbicides to control these weeds during the fall, if they are thick, because competition will rob valuable nutrients and reduce wheat tillering. Thus, fewer wheat heads will be produced next spring. Fall weed control is particularly important, if you employ the conservative seeding rate strategy mentioned previously. There are several herbicide options labeled for either pre-plant, preemergence or early postemergence use on wheat which offer residual weed control, so if you would like some assistance with these, we would be happy to help. I believe exclusive reliance on spring-applied postemergence herbicides and late timing is one of the key management areas where we often leave a lot of wheat yield potential on the table. Unimpeded weed competition during southern winters are even more important in the south, compared to further north, because more winter weed growth is likely during our modest winters. 2,4-D should not be applied early postemergence to wheat in the fall, because wheat is intolerant during seedling and early tillering stages.

Figure 5. Delaying control of abundant fall-emerging weeds until spring will reduce wheat tillering and grain yield potential.

To add your address to the Corn and/or Wheat email list, please send a request to: **elarson@pss.msstate.edu**

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