Wheat Yield and Maturity: Influence of Variety

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Wheat is a winter crop that is often part of a double-cropping system, most often followed by soybeans. There is considerable interest in double-cropping cotton and grain sorghum with wheat. In North Louisiana wheat is planted in mid October to mid November and harvested from mid May to early June. The optimal planting date is early May for soybeans and cotton and mid to late April for grain sorghum. Earlier wheat harvest would permit timelier planting of crops following wheat and ensure maximum yield and profitability.

Planting early-heading wheat varieties may permit earlier wheat harvests and planting of the following crop. Some early-maturing varieties are competitive in yield with later-maturing varieties, which make them good candidates for double-cropping systems. The effect of varieties and planting dates on yield potential and harvest maturity (based on grain moisture) is not well-documented. Field experiments were conducted in 1998-1999 and 1999-2000 on Sharkey clay at the Northeast Research Station near St. Joseph to evaluate the influence of planting date and variety on yield and maturity date. Early, optimal and late planting dates were evaluated. Planting dates were: October 12 and 30 and November 27, 1998; and October 15 and 29 and November 18, 1999. The varieties were Pioneer 2691 (early maturity), Terral TV8825 (medium maturity) and Terral TV8557 (late maturity) planted at a seeding rate of 90 pounds per acre. Measurements included grain yield, heading date and date of 15 percent grain moisture. Data are presented as two-year averages.

Higher Yields with Early-maturing Variety

The early-maturing variety had a higher yield than the medium- and late-maturing varieties (Figure 1). The difference in yield between the early- and later-maturing varieties was least at the early planting and most at the late planting. The effect of relative maturity on grain yield is very dependent on climatic conditions throughout the growing season. If planted too early, early-heading wheat varieties produce excess fall and winter vegetation, which increases the risk of plant damage and yield loss from early spring freezes. Planting early-heading varieties later in the recommended planting window decreases the risk of damage from spring freezes. No early spring freezes occurred during the two years of this study.

Figure 1. Influence of planting date and variety on grain yield at St. Joseph, averaged across years.
The greatest differences in maturity among varieties occurred at heading. Differences in heading date between the early and late varieties were 15 days for early planting (March 13 to March 28), 20 days for optimal planting (March 13 to April 2) and 17 days for the latest planting (March 23 to April 9).

**Differences Narrow At Maturity**

During grain fill and dry down, maturity differences among varieties narrowed significantly. Differences between the early and late varieties for date of 15 percent grain moisture were five days for early planting, seven days for optimal planting and 10 days for the late planting (Figure 2).

At both the early and optimal planting dates, all varieties reached 15 percent grain moisture by May 11. Date to 15 percent grain moisture was similar across planting dates for the early-maturing variety. When planted late, the early variety reached 15 percent grain moisture on May 7 compared to May 4 at the earlier dates. The early-heading variety reached harvest moisture at about the same time when planted late as the late-heading variety did when planted early, which supports the recommendation that early-heading varieties should be planted later in the fall and later-heading varieties earlier.

In summary, early-maturing varieties were competitive in yield with later-maturing varieties in years with no late spring freezes. Although there were relatively large differences among varieties for heading date, differences for date of 15 percent grain moisture were considerably smaller. Early planting did not hasten maturity appreciably compared to planting at an optimal date. Date of harvest moisture was not as affected by variety and planting date as was relative heading date. During the normal planting window, early- and medium-maturity varieties reached 15 percent grain moisture before May 10. When planted late, only the early variety reached 15 percent moisture earlier than May 10.

Higher temperatures in late spring appear to force wheat varieties to mature at about the same time regardless of heading date. The result is that late-heading varieties have a shorter grain fill period than early-heading varieties. The implications are that late-heading varieties may have lower yields and test weight when spring temperatures are unusually high, whereas early-heading varieties are more prone to spring damage when late cold spells occur. (Photo by Mark Claesgens)

Late-heading varieties may have lower yields and test weight when spring temperatures are unusually high, whereas early-heading varieties are more prone to spring damage when late cold spells occur. (Photo by Mark Claesgens)

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