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Influence of Variety on Wheat Yield Performance and Maturity

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Introduction

Wheat, a cool-season crop, is often used in double-cropping systems. Soybean is the most common crop to follow wheat; however, interest has increased recently in wheat/cotton and wheat/grain sorghum cropping systems. In north Louisiana, wheat is planted in mid-October to mid-November and normally harvested in late May and early June. Optimal planting dates are: Group IV soybean, early May (Boquet, 1998); cotton, early May (Aquillard et al., 1980); and grain sorghum, mid to late April (Boquet and Walker, 1982). To ensure maximum yield performance and profitability, earlier wheat harvest is necessary for more timely planting of follow-up crops.

Certain cultural practices such as the use of early-maturing wheat varieties may permit earlier wheat harvests. Some early-maturing varieties are competitive in yield with later-maturing varieties (Gardner et al., 1993; Shah et al., 1994). High yield potential, along with early maturity, make these varieties good candidates for a wheat double-cropping system.

Extensive wheat production research has been conducted, but little information is available about optimum harvest dates. More information is needed on determining maturity (based on harvest moisture) for different wheat varieties. The objective of this research was to evaluate yield performance and dates of maturity for wheat varieties with a wide range of maturity.

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Materials and Methods

Field experiments were conducted from 1998 to 2000 on Sharkey clay at the Northeast Research Station near St. Joseph to evaluate the influence of variety on yield potential and maturity. Varieties evaluated were 'FFR502W' (early maturity), 'Pioneer /2691' (early maturity), 'NK/Coker 9663' (medium-early maturity), 'Terral TV8825' (medium maturity) and 'Terral TV8557' (late maturity). Varieties were planted at a seeding rate of 90 pounds of seed per acre on November 3, 1998; October 30, 1999; and October 29, 2000.

Measurements included grain yield, date of mid-head and date of 15% grain moisture. Mid-heading was when 50% of the plants within a plot had emerged heads. Grain samples were taken at about three-day intervals for determination of 15% grain moisture. Date of 15% grain moisture was determined using linear regression.

Two adjacent 5-ft. X 20-ft. plots were planted for each treatment. One was used for grain yield determination. The companion plot was used for measuring the different parameters. The experimental design was a randomized complete block with four replications. All data were statistically analyzed with the GLM procedure using the SAS package (SAS Inst., 1985).

Results and Discussion

Average yields were 69.5 bushels per acre in 1998, 61.0 bushels per acre in 1999 and 54.9 bushels per acre in 2000 (Table 1). Yields ranged from 62.9 to 76.2 bushels per acre in 1998, with no significant yield differences among varieties. In 1999 and 2000, however, the early-maturing varieties, Pioneer/2691 and FFR502W, had higher yields than the later-maturing varieties. Yields ranged from 49.6 to 71.0 bushels per acre in 1999 and 36.7 to 72.1 bushels per acre in 2000. In a Louisiana study, Shah et al. (1994) reported that an early-maturing variety yielded significantly more than a later-maturing variety in three of six environments and yielded less in only one.

Experiments were planted in late October and early November, the optimal planting period for north Louisiana. Yield differences attributed to maturity are related, to a large extent, on climatic conditions throughout the growing season. If planted too early, early-maturing varieties tend to have excessive fall and winter vegetative growth, increasing risks of plant damage and potential yield loss from early spring freezes. No early spring freezes occurred during this investigation. The later the planting the less risk from spring freezes.

Influence of varieties on maturity is shown in Table 2. In each year, there was a much wider range among varieties for mid-head date than for date to 15% grain moisture. In 1999, dates of mid-head ranged from March 16 for the early-maturing Pioneer/2691 to April 5 for the late-maturing Terral TV8557, a difference of 20 days. In contrast, dates of 15% grain moisture ranged from May 1 for Pioneer/2691 to May 8 for Terral TV8557, a difference of only seven days. For the same two varieties, the differences in mid-head dates and 15% grain moisture dates were 15 and six days in 1998, respectively, and 20 and six days in 2000, respectively.

Table 1. Influence of variety on wheat yield performance at St. Joseph for three years.

Variety	1998	1999	2000
	bushels per acre		
Pioneer/2691	67.1	68.2	72.1
FFR502W	62.9	71.0	65.1
NK/Coker 9663	73.9	61.9	55.1
Terral TV8825	76.2	54.2	36.7
Terral TV8557	67.3	49.6	45.3
LSD (0.05)	NS	9.3	8.4

In summary, early-maturing wheat varieties were equal to or higher in yield performance with the later-maturing varieties. Although there was a relatively large difference among varieties to date of mid-head, these differences narrowed significantly by maturity (15% harvest moisture). In two of the three years, the earlier-maturing varieties reached harvest moisture before May 10. High-yielding wheat varieties can be harvested early, permitting timely planting of a double-crop such as cotton and increasing profit opportunities with high yield of both crops.

Table 2. Influence of variety on dates of mid-head (50% heading) and 15% grain moisture (GrMo) at St. Joseph for three years.

	1998		1999		2000	
Variety	Mid-head	15% GrMo	Mid-head	15% GrMo	Mid- head	15% GrMo
Pioneer/2691	Mar 24	May 13	Mar 16	May 1	Mar 9	May 7
FFR502W	Mar 27	May 11	Mar 23	May 6	Mar 15	May 9
NK/Coker 9663	Mar 30	May 16	Mar 25	May 7	Mar 17	May 9
Terral TV8825	Apr 4	May 18	Mar 31	May 6	Mar 23	May 8
Terral TV8557	Apr 8	May 19	Apr 5	May 8	Mar 29	May 13

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