

ANNUAL REPORT
WHEAT RESEARCH AND PROMOTION BOARD
 November 2001

TITLE. Wheat Fertility Demonstrations

PRINCIPAL INVESTIGATORS

W.F. Johnson, Jr., Extension Agronomist
 W.J. Ross, Area Extension Agronomist
 R.A. Klerk, Area Extension Agronomist
 D. Beaty, Area Extension Agronomist

The Sabbe by seeding rate by nitrogen test was established at the Cotton Branch Station (CBS), Pine Tree Station (PTS) and Rice Research and Extension Center (RREC) in mid October. Seed were planted at the rate of 15, 30 and 45 seed per foot square. Nitrogen rates were 0, 90 and 180 pounds per acre. Fertilization with P and K followed soil test recommendation. Weed control was implemented as needed. The data is located in Table 1, 2 and 3 for the CBS, PTS and RREC, respectively.

Table 1. Seeding density and nitrogen rate effect on Sabbe wheat yields at CBS.

<u>Seed Density</u> seed/ft ²	<u>N Rate</u> lb/a	<u>Yield</u> bu/a
15	0	28e †
	90	44c
	180	53ab
30	0	35d
	90	51b
	180	56a
45	0	34d
	90	49b
	180	55a

† Means followed by the same letter within a column are not significantly different (P<0.10).

Table 2. Seeding density and nitrogen rate effect on Sabbe wheat yields at PTS.

<u>Seed Density</u> seed/ft ²	<u>N Rate</u> lb/a	<u>Yield</u> bu/a
15	0	15d †
	90	42b
	180	56a
30	0	22c
	90	48b
	180	58a
45	0	19cd
	90	46b
	180	55a

† Means followed by the same letter within a column are not significantly different (P<0.10).

Table 3. Seeding density and nitrogen rate effect on Sabbe wheat yields at RREC.

<u>Seed Density</u> seed/ft ²	<u>N Rate</u> lb/a	<u>Yield</u> bu/a
15	0	67b†
	90	73ab
	180	69ab
30	0	67b
	90	75a
	180	70ab
45	0	67b
	90	73ab
	180	70ab

† Means followed by the same letter within a column are not significantly different (P<0.10).

The highest yields were reported at the CBS and PTS at N applications of 180 pounds per acre (Table 1 and 2). Seeding rates were not significantly different across N rates. Sabbe appears to have the ability to increase tiller number and/or head size to offset lower plant population. At RREC, the previous crop was summer fallow and N mineralization over the summer resulted in higher soil nitrates levels, thus less yield response as N fertilization increased (Table 3). The test at CBS and PTS was planted following soybean resulting in increased yield as N rate was increased. From the data, N rates for Sabbe should range from 150 to 180 pounds of N per acre. N response curves will better pinpoint the optimum N rate

Nitrogen rate studies were conducted at Cotton Branch Station (CBS), Pine Tree Station (PTS) and Rice Research and Extension Center (RREC). Plots were established in mid October. Seed were planted at the rate of 30 seed per foot square. Wheat cultivars were AgriPro Shelby, NK Coker 9663, Pioneer 26R24, Roane, Sabbe and Terral TV 8555. Nitrogen rates were 0, 45, 90, 135, 180 and 225 pounds per acre applied in equal splits in February and March. The first application was timed at GS 5. Fertilization with P and K followed soil test recommendation. Weed control was implemented as needed. The data is located in Table 4, 5 and 6 for the CBS, PTS and RREC, respectively.

The wheat planted following soybean at CBS and PTS yield peaked in most cases at N applications rates of 135 pounds per acre (Table 4 and 5) with the exception of Sabbe. Sabbe yield trended higher with N application of 180 pounds per acre. Significant yield differences were noted across all cultivars. At RREC, the highest yields occurred with either 45 or 90 pounds of N (Table 6). The previous crop at RREC was summer fallow and elevated nitrate-N accumulation contributed to yields peaking at the lower N rates as compared to CBS and PTS.

Table 4. Wheat yields response of several well-adapted cultivars with increasing N rates at CBS.

<u>Cultivar</u>	<u>N Rate</u> lb/a	<u>Yield</u> bu/a
AgriPro Shelby	0	34
	45	44
	90	53
	135	58
	180	60
	225	66
NK Coker 9663	0	40
	45	54
	90	57
	135	60
	180	64
	225	63
Pioneer 26R24	0	41
	45	49
	90	56
	135	61
	180	64
	225	65
Roane	0	32
	45	43
	90	46
	135	52
	180	53
	225	52
Sabbe	0	38
	45	48
	90	50
	135	53
	180	57
	225	53
Terral TV 8555	0	44
	45	49
	90	56
	135	62
	180	63
	225	67
<u>LSD (P<0.10)</u>		<u>6</u>

Table 5. Wheat yields response of several well-adapted cultivars with increasing N rates at PTS.

<u>Cultivar</u>	<u>N Rate</u> lb/a	<u>Yield</u> bu/a
AgriPro Shelby	0	26
	45	39
	90	53
	135	61
	180	62
	225	63
	NK Coker 9663	0
45		34
90		34
135		39
180		37
225		37
Pioneer 26R24		0
	45	42
	90	51
	135	55
	180	58
	225	57
	Roane	0
45		43
90		54
135		56
180		54
225		52
Sabbe		0
	45	48
	90	56
	135	58
	180	63
	225	58
	Terral TV 8555	0
45		46
90		58
135		63
180		64
225		63
LSD (P<0.10)		

Table 6. Wheat yields response of several well-adapted cultivars with increasing N rates at RREC.

<u>Cultivar</u>	<u>N Rate</u> lb/a	<u>Yield</u> bu/a
AgriPro Shelby	0	65
	45	71
	90	76
	135	76
	180	75
	225	76
NK Coker 9663	0	53
	45	56
	90	58
	135	56
	180	61
	225	61
Pioneer 26R24	0	66
	45	72
	90	76
	135	76
	180	76
	225	70
Roane	0	59
	45	64
	90	59
	135	57
	180	58
	225	59
Sabbe	0	66
	45	70
	90	69
	135	69
	180	66
	225	66
Terral TV 8555	0	65
	45	72
	90	70
	135	69
	180	65
	225	64
LSD (P<0.10)		6

Phosphorus rate studies were conducted at Pine Tree Station (PTS) and Rice Research and Extension Center (RREC) in mid October. Seed were planted at the rate of 30 seed per foot square. Wheat cultivars were AgriPro Shelby, NK Coker 9663, Pioneer 26R24, Roane, Sabbe and Terral TV 8555. Phosphorus rates were 0, 45, 90 and 135 pounds P₂O₅ per acre surface applied after planting. Fertilization with K followed soil test recommendation. A standard N rate was 120 pounds per acre applied in equal splits beginning at GS 5. Weed control was implemented as needed. The data is located in Table 7 and 8 for the PTS and RREC, respectively.

Table 7. Wheat yields response of several well-adapted cultivars with increasing P rates at PTS.

<u>Cultivar</u>	<u>N Rate</u> lb/a	<u>Yield</u> bu/a
AgriPro Shelby	0	55
	45	60
	90	63
	135	61
NK Coker 9663	0	46
	45	47
	90	51
	135	50
Pioneer 26R24	0	62
	45	64
	90	67
	135	64
Roane	0	52
	45	56
	90	57
	135	55
Sabbe	0	54
	45	55
	90	57
	135	56
Terral TV 8555	0	58
	45	59
	90	61
	135	60
<u>LSD (P<0.10)</u>		5

Table 8. Wheat yields response of several well-adapted cultivars with increasing P rates at RREC.

<u>Cultivar</u>	<u>N Rate</u> lb/a	<u>Yield</u> bu/a
AgriPro Shelby	0	75
	45	79
	90	78
	135	80
NK Coker 9663	0	69
	45	70
	90	70
	135	68
Pioneer 26R24	0	79
	45	81
	90	81
	135	80
Roane	0	60
	45	64
	90	64
	135	67
Sabbe	0	71
	45	70
	90	75
	135	72
Terral TV 8555	0	68
	45	72
	90	71
	135	71
<u>LSD (P<0.10)</u>		4

Wheat yields trended higher with increasing rates of P (Table 7 and 8). On the average, yields were the highest with P applications of 90 pounds of P₂O₅ per acre at the PTS (Table 7). The P rate of 45 of pounds of P₂O₅ per acre typically yielded the highest at the RREC (Table 8). Yields were significantly different across cultivars.