DIFFERENTIAL SOYBEAN VARIETAL RESPONSE TO NO-TILL PLANTING IN WHEAT STRAW

T.C. Keisling¹, N.W. Buehring², L.O. Ashlock¹, G.A. Jones², J.D. Widick¹, and J.E. Askew²

INTRODUCTION

Double-cropping soybeans and winter wheat grown for grain is a predominate cultural system in the Midsouth. In the last few years, equipment has become available to plant into the wheat stubble and obtain a stand consistently. The conservation compliance requirements of the farm bill has spurred many growers into adapting no-till planting practices for soybeans planted after wheat. Conservation compliance coupled with the recent increase in recommended varieties from about 30 (mostly public) to over 100 (mostly private) has resulted in much greater genetic diversity in commercial varieties. The "niche" to which varieties are best adapted has become smaller.

Genetic diversity among varieties to phytotoxic substances in wheat straw was demonstrated by Herrin et al. (1986). However, their field study was not related to their greenhouse derived indexes (Caviness and Collins, 1985). Boerma (19781has developed cultivars specifically adapted for double cropping. However, no documented grain yield reduction in the field from varieties planted in wheat straw has been reported. The objective of the study reported herein was to evaluate yield response of soybean varieties planted in standing wheat straw and to determine if their relative rank is the same as in a monocropping system.

MATERIALS AND METHODS

Experiments were initiated in 1992 in Mississippi and in 1993 in Arkansas. Specific cultural practices are given in Table 1. Fertilizer, preplant burndown and weed control followed recommended practices for each location and was tailored to the weed species and cultural practices. Weed control was maintained at a very high level.

Soybean varieties planted at Verona, MS were those entered in the conventional monocrop (MC)

soybean variety trial. In Mississippi the MC conventional variety trial and the no-till doublecropped (DC) trial were adjacent to each other and on the same soil type. Trials were planted at the normal planting time and is listed in Table 1. The MC study was planted in a prepared seedbed and DC soybeans were planted no-till into wheat stubble after wheat harvest.

In Arkansas, varieties selected were those whose 3-year means were not measurably different in MC variety trials (ie. recommended varieties, Anon., 1993).

Each Maturity Group (MG) was analyzed separately at each location using analysis of variance procedure. Means were separated by least significant difference (LSD).

RESULTS AND DISCUSSION

In 1992 and 1993, the Mississippi yield range differences between varieties was about 20 bu/acre from low to high in MG V and VI in both years (Tables 2 and 3). In Mississippi, varieties responded differently planted in wheat stubble than planted in a monocrop system in both years. Overall means indicated that yields in doublecropped beans were about 25% or more less than monocrop beans. In addition, varieties which had the highest yield in monocrop were not the highest vield in double-cropped system. These data suggest that soybean varieties should be evaluated in both monocrop and double-cropped systems as one study to more fully evaluate as to whether varieties under both systems have the same yield potential.

In Arkansas, the yield differences ranged about 15 bu/acre and showed a difference in MG's (Table 4 and 5). MG VII was lower than MG's IV, V and VI. The data here are for varieties (excluding MG IV) that would normally be recommended as being equivalent for the location based on conventional variety trials. However, these data suggest that in the recommended varieties for MG V and VI, approximately **50%** are superior for

University of Arkansas.

² Mississippi State University

Location	Mississippi	Arkansas		
Experimental Design	RCB with 4 reps	RCB with 2 reps		
Plot Size	10 ft x 20 ft	7.9 ft x 25 ft		
Soil Type	Leeper Silty Clay	Calloway Silt Loam		
Wheat Land Prep. Wheat	Chisel, Disk, Do-all	Disk, Disk, Do-all		
Variety	Coker 9835	Cardinal		
Seeding Rate, Method (Ib/acre)	80, Drilled	90 , Drilled		
Harvest Dates	6-21-92 6-10-93	6-31-93		
Stubble Height (in.)	12	8		
Soybean Planting Date Double-Crop (DC)	6-23-92	7-9-93		
Monocrop (MC)	6-16-93 5-1-92 6-16-93			
Seeding Rate (seed/row-ft)	9	3 to 5		
Row Spacing (in.) Harvest Date	30	19		
Monocrop	10-26-92 11-8-93 10-4-92 10-21-93	1 1-8-93		

Table 1. Specific cultural practices and site characteristics of double-cropped soybean variety evaluation.

Group V		Group VI			
ariety	D.C.	M.C.	Variety	D.C.	M.C.
	Bu	/acre		Bu/a	acre
olliday	43.4	51.0	Deltapine DPX 3682	39.3	45.4
pehart Stone	41.1	51.6	Pioneer 9641	37.8	43.8
eltapine 415	39.8	52.4	North King S62-66	36.6	55.1
artz H5088	39.7	51.5	Young	35.8	48.0
oneer 9593	39.2	54.9	Sharkey	34.9	55.6
gra Tech AT 575	38.6	48.9	Davis	34.6	43.9
rthrup King C485	38.4	54.8	Buckshot Bu 62	34.6	52.8
grow A5885	37.9	52.3	Riverside Cajun	33.9	57.8
verside RVSL 9094	36.9	52.4	Hartz 6200	33.9	50.3
orrest	36.8	39.8	Buckshot Bu 62	33.0	52.8
utcheson	36.0	57.2	Deltapine 3627	32.5	45.5
nodes	35.6	53.9	Hartz 6686	32.3	52.0
grow ACT 9204	34.6	46.6	Hartz H6500	31.7	52.0
artz H5566	34.5	50.1	Leflore	31.4	47.0
rra-Vig 515	34.2	43.7	TN6-90	29.5	47.7
rtz H5810	34.1	42.9	D87-5870	29.1	55.1
rthrup King C6955	33.8	43.4	Northrup KingS6423	29.1	42.0
neer 9592	33.7	49.9	Riverside RVSL9185	28.9	27.0
apine 105	33.5	46.0	Riverside RVSL9142	28.4	46.3
a Tech AT 2665	32.9	52.6	Tracy-M	28.1	51.0
thrup King \$5960	32.0	35.0	Bryan 66	28.0	44.0
row A5403	31.9	50.0	Buckshot 66	27.7	54.1
ra-Vig 5452	31.8	48.6	Terra-Vig 6653	27.2	46.8
erside 577	31.5	46.8	Northrup Kingx9169	26.9	46.4
tz H5070	31.2	48.1	Riverside 699	25.8	52.4
ra Tech AT 2555	30.7	41.1	Lamar	25.8	54.0
rra-Vig 5693	30.3	39.0	Hornbeck HEK 65	25.1	45.2
lters	29.8	37.3	Northrup Kingx9267	23.6	47.7
grow A5560	29.4	51.3	Buckshot BU 68	23.0	53.5
itwig	29.4 29.4	33.0	Stoneville FFR 646	22.5	44.5
-					
sgrow ACT 9219 verside AVSL 77	29.0 28.6	56.4 58.3	Terra-Vig x6670	18.7	42.9
oneville FFR38108	27.6	43.9	LSD ₁₀	6.3	6.5
ps	27.0	45.0			
ra-Vig x6897	27.0	40.7			
rth King x9256	27.0	47.0			
derwood 509A	26.7	40.9			
oneville FFR 595	25.6	43.4			
rra-Vig x5653	24.7	50.4			
ckshot 55	24.6	54.0			
oneer 9551	24.5	43.3			
ckshot 507	23.5	46.0			

Table 2. Yield characteristics for 1992 for the Mississippi location. Maturity Group V and VI soybean variety yield response planted no-till in wheat stubble, Verona, MS.

Bu/acre Bu/acre Bu/acre hrup King \$5960 39.7 50.6 Sharkey 42.3 41.1 a King DK 5850 37.7 49.8 Davis 41.3 39.3 beer 9584 36.9 43.9 Pioneer 9692 40.7 48.9 yow ACT 14 36.6 47.6 Agra Tech ATX 2665 39.6 40.8 sshot 55 36.6 53.9 Asgrow XP 6711 38.8 50.0 jets 36.1 47.3 Riverside 678 37.0 38.0 apine 115 35.4 61.2 Lamar 36.4 42.7 schot EK 58 33.7 43.5 Deltapine DP 3606 34.4 47.4 paine DPX 3553 33.1 47.2 Hartz 16630 34.0 40.7 apine DPX 3555 32.6 46.4 Lyon 32.7 52.9 hrup King X9357 32.6 46.4 Lyon 32.7 52.9 hrup King C6955 32.1 37.8 Northrup King X9365 32.4	Group V			Group VI		
hrup King S5960 39.7 50.6 Sharkey 42.3 41.1 a King DK 5850 37.7 49.8 Davis 41.3 39.3 beer 9584 36.9 43.9 Pioneer 9692 40.7 48.9 ow ACT 14 36.6 47.6 Agra Tech ATX 2665 39.6 40.8 sishot 55 36.6 53.9 Asgrow XP 6711 38.8 50.0 japine 415 35.4 45.8 Young 36.6 37.2 apine DP 3589 35.4 61.2 Lamar 36.4 42.7 skot K 58 33.7 43.5 Deltapine DP 3606 34.4 47.4 hrup King C485 33.5 50.8 Hartz 6200 34.1 39.9 ae King DK 551 32.6 46.4 Lyon 32.9 39.5 hrup King C4855 32.1 37.8 Northrup King x9365 32.4 42.5 avig 5555 31.8 45.6 Riverside Cajun 32.4 42.5 avig 5452 30.5 48.7 Northrup King x9366 31.1 45.1 avig 5455 <th>Variety</th> <th>D.C.</th> <th>M.C.</th> <th>Variety</th> <th>D.C.</th> <th>M.C.</th>	Variety	D.C.	M.C.	Variety	D.C.	M.C.
a King DK 5850 37.7 49.8 Davis 41.3 39.3 eer 9584 36.9 43.9 Pioneer 9692 40.7 48.9 ow ACT 14 36.6 47.6 Agra Tech ATX 2665 39.6 40.8 sshot 55 36.6 53.9 Asgrow XP 6711 38.8 50.0 tes 36.1 47.6 Riverside 678 37.0 38.0 apine D73589 35.4 45.8 Young 36.6 37.2 apine D73589 35.4 45.2 Lamar 36.4 42.7 shot EK 58 33.7 43.5 Deltapine DP 3606 34.4 47.4 hrup King C485 33.5 49.7 Hartz 6200 34.1 39.9 a King DK 551 32.6 46.4 Lyon 32.9 39.5 hrup King x9357 32.6 42.3 SC84.931 32.7 52.9 avig 5555 31.8 45.6 Riverside Cajun 32.4 42.5 avig 5452 30.3 48.7 TN6-90 29.8 41.3 304 50.7 Bogar		Bu/a	cre		Bu/a	acre
eer 9584 36.9 43.9 Pioneer 9692 40.7 48.9 sshot 55 36.6 53.9 Agra Tech ATX 2665 39.6 40.8 sshot 55 36.6 53.9 Asgrow XP 6711 38.8 50.0 apine 215 35.4 45.8 Young 36.6 37.2 apine DP 3589 35.4 61.2 Lamar 36.4 42.7 skot 55 36.4 61.2 Lamar 36.4 42.7 skot 51 35.4 49.7 Hartz 6200 34.4 47.4 hrup King C485 33.5 49.7 Hartz 6686 33.7 38.9 a King DK 551 32.6 46.4 Lyon 32.9 39.5 hrup King x9357 32.6 42.3 SC84-931 32.7 52.9 hrup King x9355 31.8 45.6 Riverside Cajun 32.4 38.5 schot 507 30.9 40.4 Northrup King x9366 30.4 42.5 a-Vig 5452 30.5 43.2 Northrup King x9366 30.4 42.5 a-Vig 5551 25.4 </td <td>Northrup King \$5960</td> <td>39.7</td> <td>50.6</td> <td>Sharkey</td> <td>42.3</td> <td>41.1</td>	Northrup King \$5960	39.7	50.6	Sharkey	42.3	41.1
ow ACT 14 36.6 47.6 Agra Tech ATX 2665 39.6 40.8 sshot 55 36.6 53.9 Asgrow XP 6711 38.8 50.0 apine 415 36.4 47.3 Riverside 678 37.0 38.0 apine DP 3589 35.4 61.2 Lamar 36.4 42.7 sshot EK 58 33.7 43.5 Deltapine DP 3606 34.4 47.4 hrup King C485 33.5 49.7 Hartz 6200 34.1 39.9 aking DK 551 32.6 46.4 Lyon 32.9 39.5 hrup King C6955 32.1 37.8 Northrup Kingx9365 32.4 42.5 avig 555 31.8 45.6 Riverside Cajun 32.4 38.5 avig 555 30.5 43.2 Northrup Kingx9365 32.4 42.5 avig 555 30.3 48.7 TN6-90 29.8 41.3 ow A5885 29.5 48.6 Pioneer 9641 28.9 39.6 sthart Stone 29.4	Delta King DK 5850	37.7		Davis	41.3	39.3
Asymptotic variable is a start of the set of the	Pioneer 9584	36.9	43.9	Pioneer 9692	40.7	48.9
les 36.1 47.3 Riverside 678 37.0 38.0 apine DP 3589 35.4 45.8 Young 36.6 37.2 shot EK 58 33.7 43.5 Deltapine DP 3606 34.4 42.7 hrup King C485 33.5 49.7 Hartz 6200 34.1 39.9 action PX 3553 33.1 47.2 Hartz 6686 33.7 38.9 a King DK 551 32.6 46.4 Lyon 32.9 39.5 hrup King x9357 32.6 46.4 Lyon 32.9 39.5 hrup King x9357 32.6 46.4 Lyon 32.9 39.5 hrup King x9357 32.6 42.3 SC84-931 32.7 52.9 hrup King x9365 32.1 37.8 Northrup King x9365 32.4 42.5 a-Vig 5555 31.8 45.6 Riverside Cajun 32.4 42.5 a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 300 V 40.4 Northrup King x9366 30.4 42.5 a-Vig 5452 30.3 48.7	Asgrow ACT 14	36.6	47.6	Agra Tech ATX 2665	39.6	40.8
les 36.1 47.3 Riverside 678 37.0 38.0 apine D 35.4 45.8 Young 36.6 37.2 apine D 35.4 61.2 Larnar 36.4 42.7 shot EK 58 33.5 49.7 Hartz 6200 34.1 39.9 eer 9592 33.5 50.8 Hartz 16500 34.0 40.7 a King DK 551 32.6 46.4 Lyon 32.9 39.5 hrup King x9357 32.6 42.3 SC84-931 32.7 52.9 hrup King x9365 32.1 37.8 Northrup King x9365 32.4 42.5 a-Vig 5555 31.8 45.6 Riverside Cajun 32.4 43.5 schot 507 30.9 40.4 Northrup King x9365 30.4 42.5 a-Vig 5452 30.3	Buckshot 55	36.6	53.9	Asgrow XP 6711	38.8	50.0
apine 415 35.4 45.8 Young 36.6 37.2 apine DP 3589 35.4 61.2 Lamar 36.4 42.7 skhot EK 58 33.7 43.5 Deltapine DP 3606 34.4 47.4 hrup King C485 33.5 49.7 Hartz 6200 34.0 40.7 apine DPX 3553 33.1 47.2 Hartz H6500 34.0 40.7 apine DPX 3553 33.1 47.2 Hartz 6686 33.7 38.9 a King DK 551 32.6 46.4 Lyon 32.9 39.5 hrup King C6955 32.1 37.8 Northrup Kingx9365 32.4 42.5 a-Vig 5555 31.8 45.6 Riverside Cajun 32.4 38.5 schot 507 30.9 40.4 Northrup Kingx9366 30.4 42.5 a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 sow XP 5843 30.1 50.7 Bogart Carl 29.1 32.2 row A5885 29.5 48.6 Pioneer 9641 28.9 39.6 shart Stone	Rhodes	36.1	47.3		37.0	38.0
apine DP 3589 35.4 61.2 Lamar 36.4 42.7 kshot EK 58 33.7 43.5 Deltapine DP 3606 34.4 47.4 hrup King C485 33.5 49.7 Hartz 6200 34.1 39.9 a King DK 3553 33.1 47.2 Hartz 6686 33.7 38.9 a King DK 551 32.6 46.4 Lyon 32.9 39.5 hrup King x9357 32.6 42.3 SC84-931 32.7 52.9 hrup King C6955 32.1 37.8 Northrup Kingx9365 32.4 42.5 a-Vig 5555 31.8 45.6 Riverside Cajun 32.4 38.5 schot 507 30.9 40.4 Northrup Kingx9366 30.4 42.5 a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 sow XP 5843 30.1 50.7 Bogart Carl 29.1 32.2 row A5885 29.5 48.6 Pioneer 9641 28.9 39.6 shart Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RVSL 7	Deltapine 415	35.4	45.8	Young	36.6	
hrup King C485 33.5 49.7 Hartz 6200 34.1 39.9 beer 9592 33.5 50.8 Hartz H6500 34.0 40.7 apine DPX 3553 33.1 47.2 Hartz 6686 33.7 38.9 a King DK 551 32.6 42.3 SC84-931 32.7 52.9 hrup King C6955 32.1 37.8 Northrup Kingx9365 32.4 42.5 a-Vig 5555 31.8 45.6 Riverside Cajun 32.4 38.5 scshot 507 30.9 40.4 Northrup Kingx9366 30.4 42.5 a-Vig 5452 30.5 43.2 Northrup Kingx9366 30.4 42.5 a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 ow XP 5843 30.1 50.7 Bogart Carl 29.1 32.2 row A5885 29.5 48.6 Pioneer 9641 28.9 39.6 shart Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RVSL 77 27.3 49.5 Terra-Vig 6792 25.6 38.0 r	Deltapine DP 3589			5		
hrup King C485 33.5 49.7 Hartz 6200 34.1 39.9 beer 9592 33.5 50.8 Hartz H6500 34.0 40.7 apine DPX 3553 33.1 47.2 Hartz 6686 33.7 38.9 a King DK 551 32.6 42.3 SC84-931 32.7 52.9 hrup King C6955 32.1 37.8 Northrup Kingx9365 32.4 42.5 a-Vig 5555 31.8 45.6 Riverside Cajun 32.4 38.5 scshot 507 30.9 40.4 Northrup Kingx9366 30.4 42.5 a-Vig 5452 30.5 43.2 Northrup Kingx9366 30.4 42.5 a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 ow XP 5843 30.1 50.7 Bogart Carl 29.1 32.2 row A5885 29.5 48.6 Pioneer 9641 28.9 39.6 shart Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RVSL 77 27.3 49.5 Terra-Vig 6792 25.6 38.0 r	Buckshot EK 58	33.7	43.5	Deltapine DP 3606	34.4	47.4
eer 9592 33.5 50.8 Hartz H6500 34.0 40.7 apine DPX 3553 33.1 47.2 Hartz 6686 33.7 38.9 a King DK 551 32.6 46.4 Lyon 32.9 39.5 hrup King x9357 32.6 42.3 SC84-931 32.7 52.9 a-Vig 555 31.8 45.6 Riverside Cajun 32.4 42.5 a-Vig 555 31.8 45.6 Riverside Cajun 32.4 38.5 sshot 507 30.9 40.4 Northrup Kingx9366 31.1 45.1 -325 30.5 43.2 Northrup Kingx9366 30.4 42.5 a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 ow XP 5843 30.1 50.7 Bogart Carl 29.1 32.2 row A5885 29.5 48.6 Pioneer 9641 28.9 39.6 sthart Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RSVL 9094 28.2 47.9 Terra-Vig 6792 25.6 38.0 Tech AT 575	Northrup King C485			Hartz 6200		
apine DPX 3553 33.1 47.2 Hartz 6686 33.7 38.9 a King DK 551 32.6 46.4 Lyon 32.9 39.5 hrup King X9357 32.6 42.3 SC84-931 32.7 52.9 hrup King C6955 32.1 37.8 Northrup Kingx9365 32.4 42.5 a-Vig 5555 31.8 45.6 Riverside Cajun 32.4 38.5 sshot 507 30.9 40.4 Northrup Kingx9366 30.4 42.5 a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 abdraft Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RVSL 9094 28.2 47.9 Terra-Vig TVX 6565 28.1 40.6 eer 9551 27.3 36.1 Vernal 27.6 36.6 rside RVSL 77 27.3 49.5 Terra-Vig 6792 25.6 38.0 n Tech AT 555 25.1 41.6 LSD ₁₀ 5.1 6.5 in Tech AT 520<	Pioneer 9592					
hrup King x9357 32.6 42.3 SC84-931 32.7 52.9 hrup King C6955 32.1 37.8 Northrup Kingx9365 32.4 42.5 a-Vig 5555 31.8 45.6 Riverside Cajun 32.4 38.5 sshot 507 30.9 40.4 Northrup Kingx9366 30.4 42.5 a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 a-Wa XP 5843 30.1 50.7 Bogart Carl 29.1 32.2 row A5885 29.5 48.6 Pioneer 9641 28.9 39.6 shart Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RSVL 9094 28.2 47.9 Terra-Vig TVX 6565 28.1 40.6 cer 9551 27.3 36.1 Vernal 27.6 36.6 ricch AT 575 26.6 48.8 Riverside 699 24.1 42.2 aday 26.1 47.2 V86-815 18.0 34.2 row A 5560 <	Deltapine DPX 3553					
hrup King x9357 32.6 42.3 SC84-931 32.7 52.9 hrup King C6955 31.8 45.6 Riverside Cajun 32.4 38.5 a-Vig 5555 31.8 45.6 Riverside Cajun 32.4 38.5 sshot 507 30.9 40.4 Northrup Kingx9366 30.4 42.5 -325 30.5 43.2 Northrup Kingx9366 30.4 42.5 -aVig 5452 30.3 48.7 TN6-90 29.8 41.3 row XP 5843 30.1 50.7 Bogart Carl 29.1 32.2 row A5885 29.5 48.6 Pioneer 9641 28.9 39.6 shart Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RSVL 9094 28.2 47.9 Terra-Vig TVX 6565 28.1 40.6 eer 9551 27.3 36.1 Vernal 27.6 36.6 ricch AT 575 26.6 48.8 Riverside 699 24.1 42.2 ow A 5560 26.0 47.3 Mean 32.4 41.0 ow A 5560	Delta King DK 551	32.6	46.4	Lyon	32.9	39.5
hrup King C6955 32.1 37.8 Northrup King x9365 32.4 42.5 a-Vig 5555 31.8 45.6 Riverside Cajun 32.4 38.5 sshot 507 30.9 40.4 Northrup King x9366 30.4 42.5 -325 30.5 43.2 Northrup King x9366 30.4 42.5 -325 30.3 48.7 TN6-90 29.8 41.3 row XP 5843 30.1 50.7 Bogart Carl 29.1 32.2 row A5885 29.5 48.6 Pioneer 9641 28.9 39.6 shart Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RSVL 9094 28.2 47.9 Terra-Vig TVX 6565 28.1 40.6 eer 9551 27.3 36.1 Vernal 27.6 36.6 rice AT 575 26.6 48.8 Riverside 699 24.1 42.2 row A 5560 26.0 47.3 Mean 32.4 41.0 rech AT 520 24.7 42.9 46.1 LSD ₁₀ 5.1 6.5 side 5	Northrup King x9357	32.6	42.3			52.9
a-Vig 5555 31.8 45.6 Riverside Cajun 32.4 38.5 sshot 507 30.9 40.4 Northrup King\$6266 31.1 45.1 -325 30.5 43.2 Northrup King\$2666 30.4 42.5 a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 row XP 5843 30.1 50.7 Bogart Carl 29.1 32.2 row A5885 29.5 48.6 Pioneer 9641 28.9 39.6 shart Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RSVL 9094 28.2 47.9 Terra-Vig TVX 6565 28.1 40.6 eer 9551 27.3 36.1 Vernal 27.6 36.6 rside RVSL 77 27.3 49.5 Terra-Vig 6792 25.6 38.0 aday 26.1 47.2 V86-815 18.0 34.2 row A 5560 26.0 47.3 Mean 32.4 41.0 rech AT 520 24.7 42.9 42.9 5.1 6.5 sest 24.3 30.9<	Jorthrup King C6955					
-325 30.5 43.2 Northrup Kingx9366 30.4 42.5 a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 row XP 5843 30.1 50.7 Bogart Carl 29.1 32.2 row A5885 29.5 48.6 Pioneer 9641 28.9 39.6 shart Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RSVL 9094 28.2 47.9 Terra-Vig TVX 6565 28.1 40.6 eer 9551 27.3 36.1 Vernal 27.6 36.6 rside RVSL 77 27.3 49.5 Terra-Vig 6792 25.6 38.0 r Tech AT 575 26.6 48.8 Terra-Vig 6253 21.4 46.1 day 26.1 47.2 V86-815 18.0 34.2 row A 5560 26.0 47.3 Mean 32.4 41.0 rest 24.3 30.9 25.0 46.9 1.5 16.5 row A 5560 26.4 43.5 Terra-Vig 6253 21.4 41.0 rest 24.7	erra-Vig 5555					
-325 30.5 43.2 Northrup Kingx9366 30.4 42.5 a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 row XP 5843 30.1 50.7 Bogart Carl 29.1 32.2 row A5885 29.5 48.6 Pioneer 9641 28.9 39.6 shart Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RSVL 9094 28.2 47.9 Terra-Vig TVX 6565 28.1 40.6 eer 9551 27.3 36.1 Vernal 27.6 36.6 rside RVSL 77 27.3 49.5 Terra-Vig 6792 25.6 38.0 averside RVSL 77 26.4 43.5 Terra-Vig 6253 21.4 46.1 day 26.1 47.2 V86-815 18.0 34.2 row A 5560 26.0 47.3 Mean 32.4 41.0 rest 24.3 30.9 25.0 46.9 15.1 6.5 aver 29.9 40.3 35.6 5.1 6.5 5.1 6.5 aver	uckshot 507	30.9	40.4	Northrup KingS6266	31.1	45.1
a-Vig 5452 30.3 48.7 TN6-90 29.8 41.3 row XP 5843 30.1 50.7 Bogart Carl 29.1 32.2 row A5885 29.5 48.6 Pioneer 9641 28.9 39.6 shart Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RSVL 9094 28.2 47.9 Terra-Vig TVX 6565 28.1 40.6 eer 9551 27.3 36.1 Vernal 27.6 36.6 rside RVSL 77 27.3 49.5 Terra-Vig 6792 25.6 38.0 rech AT 575 26.6 48.8 Riverside 699 24.1 42.2 row A 5560 26.0 47.3 Terra-Vig 6253 21.4 46.1 row A 5560 26.0 47.3 Mean 32.4 41.0 rech AT 520 24.7 42.9 42.9 5.1 6.5 est 24.3 30.9 25.1 41.6 1.0 1.0 row A 5579 25.0 46.9 35.6 5.1 6.5 5.1 6.5 sige 57	87-325					
row XP 5843 30.1 50.7 Bogart Carl 29.1 32.2 row A5885 29.5 48.6 Pioneer 9641 28.9 39.6 shart Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RSVL 9094 28.2 47.9 Terra-Vig TVX 6565 28.1 40.6 eer 9551 27.3 36.1 Vernal 27.6 36.6 rside RVSL 77 27.3 49.5 Terra-Vig 6792 25.6 38.0 a Tech AT 575 26.6 48.8 Riverside 699 24.1 42.2 theson 26.1 47.2 V86-815 18.0 34.2 row A 5560 26.0 47.3 Mean 32.4 41.0 a Tech AT 555 25.1 41.6 LSD ₁₀ 5.1 6.5 a Tech AT 520 24.7 42.9 43.3 30.9 22.4 44.9 side 577 20.9 40.3 35.6 5.1 6.5 5.1 6.5 3292 17.1 36.8 Mean 29.1 44.6 44.6 <td>erra-Vig 5452</td> <td></td> <td></td> <td></td> <td></td> <td></td>	erra-Vig 5452					
abart Stone 29.4 43.3 Buckshot 66 28.6 41.1 rside RSVL 9094 28.2 47.9 Terra-Vig TVX 6565 28.1 40.6 eer 9551 27.3 36.1 Vernal 27.6 36.6 rside RVSL 77 27.3 49.5 Terra-Vig 6792 25.6 38.0 r Tech AT 575 26.6 48.8 Riverside 699 24.1 42.2 cheson 26.1 47.2 V86-815 18.0 34.2 row A 5560 26.0 47.3 Mean 32.4 41.0 rech AT 555 25.1 41.6 LSD ₁₀ 5.1 6.5 or Tech AT 550 24.7 42.9 42.9 5.1 6.5 est 24.3 30.9 22.4 44.9 5.1 6.5 seg 9593 22.4 44.9 43.6 5.6 5.1 6.5 5292 17.1 36.8 43.6 5.6 5.1 6.5 6292 17.1 36.8 43.3 43.6 43.6 43.6 eer 9593	grow XP 5843					
rside RSVL 9094 28.2 47.9 Terra-Vig TVX 6565 28.1 40.6 eer 9551 27.3 36.1 Vernal 27.6 36.6 rside RVSL 77 27.3 49.5 Terra-Vig 6792 25.6 38.0 a Tech AT 575 26.6 48.8 Terra-Vig 6792 25.6 38.0 a Tech AT 575 26.4 43.5 Terra-Vig 6253 21.4 46.1 day 26.1 47.2 V86-815 18.0 34.2 row A 5560 26.0 47.3 Mean 32.4 41.0 or Tech AT 555 25.1 41.6 LSD ₁₀ 5.1 6.5 est 24.3 30.9 5.1 6.5 6.5 eer 9593 22.4 44.9 5.1 6.5 5292 17.1 36.8 5.6 5.1 6.5 Mean 29.1 44.6 44.6 44.6 44.6	sgrow A5885	29.5	48.6	Pioneer 9641	28.9	39.6
rside RSVL 9094 28.2 47.9 Terra-Vig TVX 6565 28.1 40.6 eer 9551 27.3 36.1 Vernal 27.6 36.6 rside RVSL 77 27.3 49.5 Terra-Vig 6792 25.6 38.0 a Tech AT 575 26.6 48.8 Riverside 699 24.1 42.2 cheson 26.1 47.2 V86-815 18.0 34.2 row A 5560 26.0 47.3 Mean 32.4 41.0 rech AT 555 25.1 41.6 LSD 10 5.1 6.5 or Tech AT 520 24.7 42.9 Mean 32.4 41.0 eest 24.3 30.9 1.5 5.1 6.5 or Tech AT 520 24.7 42.9 40.3 5.1 6.5 eest 24.3 30.9 22.4 44.9 5.6 5.1 6.5 or 292 17.1 36.8 29.1 44.6 44.6 44.6	apehart Stone	29.4	43.3	Buckshot 66	28.6	41.1
eer 9551 27.3 36.1 Vernal 27.6 36.6 rside RVSL 77 27.3 49.5 Terra-Vig 6792 25.6 38.0 a Tech AT 575 26.6 48.8 Riverside 699 24.1 42.2 a tech AT 575 26.1 47.2 V86-815 18.0 34.2 row A 5560 26.0 47.3 V86-815 18.0 34.2 row A 5560 26.0 47.3 Mean 32.4 41.0 a Tech AT 555 25.1 41.6 42.9 Mean 32.4 41.0 est 24.3 30.9 5.1 6.5 6.5 6.5 or Tech AT 520 24.7 42.9 40.3 100 5.1 6.5 est 24.3 30.9 22.4 44.9 20.9 40.3 40.3 40.3 40.3 swig 19.6 35.6 35.6 46.8 44.6 44.6 46.1 46.5 46.5 46.5 46.5 46.5 46.5 46.5 46.5 46.5 46.5 46.5 46.5 46.5<	verside RSVL 9094	28.2	47.9	Terra-Vig TVX 6565	28.1	40.6
Tech AT 575 26.6 48.8 Riverside 699 24.1 42.2 theson 26.4 43.5 Terra-Vig 6253 21.4 46.1 day 26.1 47.2 V86-815 18.0 34.2 row A 5560 26.0 47.3 Mean 32.4 41.0 a Tech AT 555 25.1 41.6 LSD 10 5.1 6.5 row A 5979 25.0 46.9 LSD 10 5.1 6.5 est 24.3 30.9 22.4 44.9 row a 577 20.9 40.3 40.3 40.3 wig 19.6 35.6 5.6 5.1 6.5 5292 17.1 36.8 Mean 29.1 44.6	oneer 9551					
1 Tech AT 575 26.6 48.8 Riverside 699 24.1 42.2 cheson 26.4 43.5 Terra-Vig 6253 21.4 46.1 day 26.1 47.2 V86-815 18.0 34.2 row A 5560 26.0 47.3 Mean 32.4 41.0 a Tech AT 555 25.1 41.6 Image: state s	iverside RVSL 77	27.3		Terra-Vig 6792	25.6	
cheson 26.4 43.5 Terra-Vig 6253 21.4 46.1 day 26.1 47.2 V86-815 18.0 34.2 row A 5560 26.0 47.3 Mean 32.4 41.0 a Tech AT 555 25.1 41.6	gra Tech AT 575		48.8	Riverside 699	24.1	42.2
day 26.1 47.2 $V86-815$ 18.0 34.2 row A 5560 26.0 47.3 Mean 32.4 41.0 Tech AT 555 25.1 41.6 $$	utcheson	26.4	43.5	Terra-Vig 6253	21.4	46.1
Tech AT 555 25.1 41.6 row A5979 25.0 46.9 Tech AT 520 24.7 42.9 est 24.3 30.9 eer 9593 22.4 44.9 rside 577 20.9 40.3 wig 19.6 35.6 5292 17.1 36.8 Mean 29.1 44.6	olliday	26.1			18.0	
row A5979 25.0 46.9 LSD ₁₀ 5.1 6.5 a Tech AT 520 24.7 42.9 42.9 5.1 6.5 eest 24.3 30.9 22.4 44.9 44.9 rside 577 20.9 40.3 40.3 40.3 40.3 wig 19.6 35.6 35.6 5292 17.1 36.8 Mean 29.1 44.6 44.6 44.6 44.6 44.6	sgrow A 5560			Mean	32.4	41.0
a Tech AT 520 24.7 42.9 est 24.3 30.9 eer 9593 22.4 44.9 rside 577 20.9 40.3 wig 19.6 35.6 5292 17.1 36.8 Mean 29.1 44.6	Agra Tech AT 555					
est 24.3 30.9 eer 9593 22.4 44.9 rside 577 20.9 40.3 wig 19.6 35.6 5292 17.1 36.8 Mean 29.1 44.6	sgrow A5979				5.1	6.5
eer 9593 22.4 44.9 rside 577 20.9 40.3 wig 19.6 35.6 5292 17.1 36.8 Mean 29.1 44.6	gra Tech AT 520	24.7	42.9			
rside 577 20.9 40.3 wig 19.6 35.6 5292 17.1 36.8 Mean 29.1 44.6	orrest					
wig 19.6 35.6 5292 17.1 36.8 Mean 29.1 44.6	ioneer 9593					
5292 17.1 36.8 Mean 29.1 44.6	iverside 577					
Mean 29.1 44.6	artwig	19.6	35.6			
	S 5292	17.1	36.8			
LSD ₁₀ 5.8 6.3	Mean	29.1	44.6			
	LSD ₁₀	5.8	6.3			

Table 3. Yield characteristics for 1993 for the Mississippi location. Maturity Group V and VI soybean variety yield response planted no-till in wheat stubble, Verona, MS.

Group IV		Group V		
Variety	Yield	Variety	Yield	
	Bu/acre		Bu/acre	
Manokin	22.0	Hartz H 5350	24.8	
Pioneer 9442	19.9	Hartz H 5088	24.8	
Crawford	19.6	Riverside 577	22.1	
Northrup King \$4884	18.3	A 5560	22.1	
Hartz H 4464	14.9	Hartz 5164	21.7	
Northrup King RA452	13.7	Hutcheson	21.7	
RSV 499	13.7	A 5403	20. 2	
Williams 82	9.9	Deltapine 415	20.2	
TN 4-86	9.3	Hartz H 5810	20.2	
A 4715	8.0	Northrup King C485	19.6	
		Terra-Vig 5555	18.9	
LSD 06	9.4	Crowley	18.6	
		Deltapine 105	18.6	
		AT 555	18.6	
		AT 5885	18.0	
		Walters	17.7	
		Pioneer 9584	17.4	
		Northrup King C6955	16.4	
		Buckshot 55	16.4	
		Rhodes	15.2	
		Northrup King \$5960	14.3	
		Hartz H 5566	12.7	
		Narow M	10.8	
		Terra-Vig 5452	9.6	
		LSD	9.7	

.

-

Table 4. Yield characteristics for 1993 for the Arkansas location using Maturity Group IV and V.

Group VI		Group VII		
Variety	Yield	Variety	Yield	
	Bu/acre		Bu/acre	
Pioneer 9641	25.9	Hartz H 7190	17.0	
A 6961	23.9	Pioneer 9711	11.2	
Brim	23.3	Stonewall	7.5	
Young	23.0	Riverside 757	4.7	
A 6785	22.4	LSD	10.3	
Hartz 6200	21.7			
Riverside Cajun	19.9			
Sharkey	18.6			
Hartz 6686	18.3			
Terra-Vig 6253	17.4			
LLoyd	14.9			
Buckshot 66	14.0			
A 6297	13.7			
Davis	9.6			
L.SD ₀₅	12.5			

Table 5. Yield characteristics for 1993 for the Arkansas location using Maturity Group VI and VII.

LITERATURE CITED

Anonymous, 1993. Soybean update. Coop. Ext. Ser., Univ. of Arkansas.

Boerrna, H.R. 1978. Breeding soybeans for double-cropping. p. 57-62. In Proc. Eighth Soybean Res. Conf. Arner. Seed Trade Assoc., Washington, D.C. Caviness, C.E. and F.C. Collins. 1985. Double cropping. In Richard Shibles (ed.) World Soybean Research Conference 111: Proceedings. Westview Press, Inc., London.

Herrin. L.L., F.C. Collins. and C.E. Caviness. 1986. Techniques for identifying tolerance of soybean to phytotoxic substances in wheat straw.