2008 Extension Cotton Report

J.C. Banks, Extension Cotton Specialist
Shane Osborne, Associate Extension Specialist
Larry Bull, Foreman
Karen Coggeshall, Extension Secretary

An effective cotton integrated pest management program includes all aspects of production. This report contains summarized data from experiments and demonstrations that address key production issues in the areas of variety selection, weed control, agronomics (plant population, tillage, fertility) and defoliation.

The 2008 season was again a different year compared to 2007. The new year started with below average winter rainfall and record fertilizer prices. Despite the fact that soil moisture profiles were in marginal condition at the beginning of planting time producers remained optimistic. Temperatures were below normal (only 3 days above 85 degrees, with many lows in the 40's) for the first half of May, however the second half of the month was exactly opposite (only 3 days below 90 degrees). Although some cotton was planted in the end of April/first of May time frame, conditions were more conducive after the 15th. Rainfall for May-September totaled 12 inches with the total annual rainfall at 21 inches . Irrigated acres began receiving water in the latter part of June and continued through August. Welcome August rains and a warm September and October helped to finish many fields that were running behind. Relatively mild and dry October through December made for excellent harvest conditions. Due to patchy summer rainfall dryland yields ranged from poor to excellent.

It should be emphasized that the data from only one year should not be used for major production decisions, and at least 2-3 year's results should be utilized before production practices should be modified. This report sometimes includes data generated from "off-label" applications or practices. Although this data is presented, OSU does not recommend the implementation of any "off-label" use of any product.

We are very appreciative of the contributions made by the OSU Integrated Pest Management Program. Without their support, much of this work would not be possible. We also appreciate the support from producers, County Extension Educators, OSU Agricultural Experiment Station and ginners. Cotton Incorporated, through the Oklahoma State Support Committee, has provided assistance through partial funding of several projects. The Oklahoma Cotton Council and the Oklahoma Center for the Advancement of Science and Technology (OCAST) have made tremendous contributions to our educational programs and we are grateful for their continued support. A special thanks goes also to the following organizations, whose contributions make it possible to maintain and expand our research and demonstration programs and distribute results.

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We appreciate the interest, cooperation and support of all those involved in the cotton industry in Oklahoma and encourage your comments and suggestions for the improvement of our programs. This report can be accessed on the web at http://www.osu.altus.ok.us and the NTOK website: www.ntokcotton.org

OSU Southwest Research & Extension Staff

Karen Coggeshall, Extension Secretary
Larry Bull, Foreman
Nathan Helm, WOSC-OCAST Intern
Clay Jack, OSU PASS graduate student
Rocky Thacker, Experiment Station Superintendent
Toby Kelley, Assistant Experiment Station Superintendent
Connie Bookout, Experiment Station Secretary
Lynn Halford, Field Assistant

Area Extension Personnel

J. Terry Pitts, Area Extension IPM Specialist
Jerry Goodson, Extension Assistant

Producers and Cooperators

Western Oklahoma State College
Humphreys Cooperative
Keeff Felty & Natalie Wheeler-Altus
Keith Graumann-Granite
Mike Johnson-Dill City
Lee Ballard-Duke
Joe Kelly-Altus
Brad McKinley-Frederick
Cotton Growers Cooperative
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Murray Williams-Altus
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Roger Fisher-Frederick
Danny Davis-Elk City

Weather Records

Month	Apr.08			May.08			Jun.08		
Date	Air Temp.(F)			Air Temp. (F)			Air Temp. (F)		
	Max.	Min.	Precip.	Max.	Min.	Precip	Max.	Min.	Precip.
1	88	41	0	89	55	0	98	70	0
2	60	41	0	93	43	0	99	71	0
3	56	44	0.03	80	43	0	100	73	0
4	89	43	0	68	38	0	107	75	0
5	64	34	0	78	43	0	103	77	0
6	76	37	0	79	59	0.52	102	63	0.74
7	76	45	0	84	58	0.74	97	68	0
8	83	47	0	73	53	0.26	96	76	0
9	70	39	0	78	57	0	97	65	0
10	51	44	2.14	81	57	0	81	55	0.05
11	70	40	0	89	43	0	95	62	0
12	65	37	0	69	46	0	101	74	0
13	66	40	0	82	53	0	100	74	0
14	64	33	0	86	54	0.01	99	68	0
15	70	37	0	75	51	0.33	100	65	0.17
16	80	42	0	73	52	0	101	73	0
17	83	53	0	79	50	0	101	66	0.38
18	67	34	0	85	52	0	89	65	0
19	76	39	0	92	56	0	94	65	1.56
20	87	45	0	102	66	0	89	66	0
21	83	53	0	87	58	0	91	70	0.05
22	90	56	0	91	65	0	90	66	0
23	79	59	0	94	71	0	97	71	0
24	76	60	0.17	96	67	0	99	69	0
25	95	58	0	97	71	0	96	70	0
26	75	43	0	95	73	0	96	72	0
27	75	46	0.11	97	62	0	100	73	0
28	66	36	0	94	65	0.61	102	68	0.36
29	85	41	0	89	66	0	92	71	0
30	88	47	0	93	68	0	88	62	0
31	0	0	0	96	66	0	0	0	0
Totals	75.1	43.8	2.45	85.9	56.8	2.47	96.6	68.7	3.31

Weather Records Cont.

Month	Jul.08			Aug.08			Sep.08		
Date	Air Temp.(F)			Air Temp. (F)			Air Temp. (F)		
	Max.	Min.	Precip.	Max.	Min.	Precip	Max.	Min.	Precip.
1	92	65	0	96	73	0	93	68	0
2	97	69	0	102	70	0	92	68	0
3	97	69	0	103	73	0	92	64	0
4	95	70	0	104	72	0	72	56	0
5	98	66	0	105	72	0	86	59	0
6	100	72	0	104	70	0	92	63	0
7	97	70	0	94	71	0	94	63	0
8	96	73	0	97	71	0.64	96	64	0
9	96	71	0	93	72	0	79	57	0.17
10	94	67	0.07	101	75	0	68	58	0.01
11	97	70	0	93	74	0.49	73	65	0.18
12	99	74	0	88	69	0	79	71	0.26
13	101	69	0.6	94	67	0	86	71	0.23
14	78	68	0.36	93	68	0	81	60	0
15	91	71	0	98	65	0.62	77	52	0
16	85	71	0.03	86	68	0.06	77	48	0
17	92	72	0	76	65	0	83	51	0
18	98	71	0	79	66	0.74	83	53	0
19	100	68	0	73	65	1.02	81	53	0
20	99	68	0	72	66	0.06	84	54	0
21	101	68	0	78	64	0.01	86	55	0
22	103	69	0	88	67	0	88	57	0
23	103	71	0	97	68	0	89	60	0
24	101	72	0	95	70	0	91	60	0
25	99	72	0	92	70	0	89	57	0
26	99	70	0	89	66	0	86	55	0
27	100	74	0	94	70	0	89	55	0
28	105	73	0	96	70	0	91	56	0
29	109	71	0.66	97	70	0	88	54	0
30	94	71	0	95	67	0	90	55	0
31	95	69	0	92	68	0.02	0	0	0
Totals	97.1	70.1	1.72	92.3	69	3.66	85.1	58.7	0.85

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Variety Performance

Variety selection continues to be an important decision for cotton producers in Oklahoma. Although most newly released varieties have been tested prior to their commercial release, most cotton producers have had little experience with those varieties on their farms. Therefore, fourteen variety projects were established throughout Oklahoma evaluating several newly released varieties. Five of these locations were under dryland production while the remaining nine were irrigated sites. Unfortunately, only 12 locations (7 irrigated and 5 dryland) were harvestable due to either drought or herbicide damage.

Four irrigated locations (3 in Jackson, and 1 in Beckham County) were replicated trials comparing 20 varieties. Three additional irrigated locations were non-replicated demonstrations. All of these varieties contained either the Bollgard II or Widestrike insect resistance genes and the Roundup Ready Flex herbicide tolerance gene. All dryland locations were replicated trials comparing 25 varieties that contained either the Roundup Flex tolerance gene or a combination with either Bollgard II or Widestrike insect resistance genes.

Irrigated Variety Performance

Location:	Jackson-WOSC	**Plant Date:**	5/12/2008
Soil Type:	Clay Loam	**Harvest Date:**	10/31/08

Trt No.	Treatment Name	Gin %	Lint Yield lbs/Acre		Fiber Mic	Fiber Length	Fiber Uniformity	Fiber Strength
1	FM 1740 B2F	0.278	1683.2	a	4.6	1.18	83.1	32.7
2	ST 4498 B2F	0.272	1604	ab	4.3	1.15	84.2	31.8
3	ST 5458 B2F	0.262	1553.6	bc	4.8	1.15	83.6	33.7
4	ST 4554 B2F	0.267	1551.2	bc	4.4	1.12	83.4	31.3
5	DP 164 B2F	0.256	1498.5	cd	4.3	1.15	81.5	31.1
6	PHY 375 WRF	0.268	1488.4	cde	4.3	1.11	81.5	29.8
7	DP 0924 B2F	0.265	1487.7	cde	3.8	1.1	81	31.1
8	NG 3348 B2F	0.286	1473.2	c-f	4.3	1.1	82.9	31
9	DP 0935 B2F	0.261	1469.5	c-f	4.4	1.15	82.2	31.1
10	DP 141 B2F	0.257	1448.3	d-g	4.3	1.17	84.2	33.3
11	FM 9180 B2F	0.246	1438.6	d-h	4.6	1.17	83.4	33.4
12	FM 1880 B2F	0.249	1406	e-i	3.8	1.17	82.1	31.8
13	DP 0912 B2F	0.249	1385.6	f-i	4.2	1.14	81.4	31.4
14	DP 161 B2F	0.239	1379.4	g-j	4.2	1.22	83.6	32.3
15	ST 5327 B2F	0.242	1355.9	h-k	4.2	1.14	83.9	33.2
16	DG 2570 B2F	0.282	1349.7	h-k	4.1	1.14	82.4	30.4
17	FM 9160 B2F	0.239	1335.2	ijk	4	1.16	83.7	30.9
18	FM 9063 B2F	0.234	1332.7	ijk	4.3	1.2	82.9	33.8
19	NG 2549 B2F	0.251	1290.2	jk	4.4	1.07	83.1	30.4
20	PHY 485 WRF	0.232	1283.5	k	4	1.13	84.3	32.5
LSD (P=.05)			89.67					
CV			4.4					

Irrigated Variety Performance (cont.)

Location:	Jackson-Felty		**Plant Date:**	5/15/2008		
Soil Type:	Clay Loam		**Harvest Date:**	10/28/08		

Trt No.	Treatment Name	Gin %	Lint Yield lbs/Acre		Fiber Mic	Fiber Length	Fiber Uniformity	Fiber Strength
1	DP 0924 B2F	0.303	1849.5	a	4.1	1.1	82.8	30
2	FM 1740 B2F	0.259	1675.4	ab	3.4	1.1	81.5	29.8
3	ST 4554 B2F	0.276	1671.1	b	4.2	1.13	82.2	29.6
4	ST 5458 B2F	0.271	1635	bc	4	1.15	83.5	30.1
5	PHY 375 WRF	0.27	1630.4	bc	3.9	1.12	81.7	28.5
6	FM 9160 B2F	0.277	1613.8	bcd	3.3	1.21	81.8	30
7	DP 0935 B2F	0.264	1602.8	b-e	3.8	1.13	81.6	29.3
8	ST 4498 B2F	0.267	1594.8	b-e	3.9	1.13	83.2	30.7
9	FM 9180 B2F	0.258	1574.8	b-f	4.1	1.17	83.5	31.2
10	NG 2549 B2F	0.268	1565.8	b-f	3.9	1.09	82.4	30.8
11	DP 0912 B2F	0.258	1555.1	b-f	4.2	1.09	82.4	29.3
12	DG 2570 B2F	0.254	1537.9	b-f	3.8	1.16	82.2	29.4
13	FM 1880 B2F	0.264	1536.7	b-f	3.7	1.17	82.4	30.1
14	ST 5327 B2F	0.255	1527.3	b-f	3.8	1.11	82.9	30.7
15	PHY 485 WRF	0.25	1481	c-f	4.2	1.15	82.8	30.2
16	DP 141 B2F	0.261	1462.4	c-f	4.2	1.16	81.7	30.4
17	FM 9063 B2F	0.251	1451.4	def	4.2	1.13	82.8	32.8
18	NG 3348 B2F	0.251	1450.1	def	3.8	1.14	83.8	30.6
19	DP 164 B2F	0.232	1430	ef	3.5	1.17	81.9	28
20	DP 161 B2F	0.254	1410.7	f	3.7	1.16	79.6	30.7
LSD (P=.05)			176.26					
CV			7.97					

Irrigated Variety Performance (cont.)

Location:	Jackson-OSU-SWREC	**Plant Date:**	5/13/2008
Soil Type:	Clay Loam	**Harvest Date:**	11/05/08

Trt No.	Treatment Name	Gin %	Lint Yield lbs/Acre		Fiber Mic	Fiber Length	Fiber Uniformity	Fiber Strength
1	DP 0935 B2F	0.269	1455.9	a	4.4	1.13	82.1	30.2
2	ST 5458 B2F	0.273	1369.1	ab	4.7	1.08	80.6	29.9
3	DP 0912 B2F	0.272	1355.2	abc	4.7	1.15	84.4	29.9
4	PHY 375 WRF	0.265	1352	abc	4.6	1.12	79.9	33.6
5	FM 1740 B2F	0.286	1309.7	bcd	5.2	1.13	84.6	31
6	DG 2570 B2F	0.269	1308	bcd	4.6	1.16	81.2	33.2
7	DP 0924 B2F	0.266	1303.5	bcd	4.5	1.07	79.6	30.6
8	DP 161 B2F	0.255	1299.6	b-e	4.7	1.13	83.7	31.7
9	ST 4498 B2F	0.254	1294.5	b-e	4.8	1.13	81.9	32.8
10	ST 4554 B2F	0.25	1279.6	b-e	4.4	1.18	83.6	34.6
11	DP 141 B2F	0.245	1243.3	c-f	4.2	1.13	82.6	32.4
12	PHY 485 WRF	0.247	1236	d-g	4.7	1.14	82.3	31.5
13	FM 9160 B2F	0.248	1232.9	d-g	4.2	1.13	80.5	30.6
14	DP 164 B2F	0.239	1190.7	e-h	4.9	1.11	83.2	31
15	NG 2549 B2F	0.245	1156.6	f-i	4.6	1.05	81.9	31.7
16	NG 3348 B2F	0.267	1151.4	f-i	4.5	1.1	81.7	31.9
17	ST 5327 B2F	0.262	1149.8	f-i	4.2	1.15	81.3	32.3
18	FM 1880 B2F	0.246	1125.2	ghi	4.6	1.09	82.4	31.4
19	FM 9063 B2F	0.235	1092.8	hi	4.1	1.19	83.5	34.2
20	FM 9180 B2F	0.234	1056.3	i	4.6	1.18	81.9	34.8
LSD (P=.05)			112.28					
CV			6.36					

Irrigated Variety Performance (cont.)

Location:	Beckham-Gamble		**Plant Date:**	5/19/2008		
Soil Type:	Sandy Loam		**Harvest Date:**	11/18/08		

Trt No.	Treatment Name	Gin %	Lint Yield lbs/Acre		Fiber Mic	Fiber Length	Fiber Uniformity	Fiber Strength
1	DG 2570 B2F	0.24	1591.7	a	3.3	1.11	80.7	28.4
2	DP 0935 B2F	0.246	1576.5	a	3.1	1.12	81	30
3	FM 9180 B2F	0.231	1547.1	ab	3.6	1.2	81.4	32.5
4	ST 5458 B2F	0.22	1539.9	ab	3.2	1.14	81.1	31.2
5	PHY 485 WRF	0.22	1527.3	abc	3.2	1.1	83.9	31.1
6	PHY 375 WRF	0.237	1512.6	a-d	3.4	1.13	82.8	29.2
7	DP 0912 B2F	0.234	1455.1	a-e	3.7	1.11	82	28.9
8	FM 9063 B2F	0.254	1427.3	a-e	3.7	1.21	83.4	31
9	NG 2549 B2F	0.236	1421.2	a-e	3.7	1.07	83.9	31.1
10	NG 3348 B2F	0.244	1412.3	a-f	3.5	1.13	82.7	31.3
11	DP 0924 B2F	0.23	1343.8	b-g	3.3	1.12	81.8	29.4
12	FM 1880 B2F	0.218	1322.3	b-g	3.1	1.19	82	31.5
13	ST 4498 B2F	0.242	1305.3	c-g	3.6	1.13	83.2	31.4
14	FM 1740 B2F	0.216	1293.7	d-g	3	1.11	81.9	30.7
15	ST 4554 B2F	0.25	1275.4	efg	3.4	1.12	84	30.3
16	FM 9160 B2F	0.246	1246.5	efg	3	1.18	83.6	29.9
17	DP 141 B2F	0.205	1185.4	fgh	2.8	1.17	82.8	32.6
18	ST 5327 B2F	0.225	1171.9	gh	3	1.12	81.1	29.5
19	DP 164 B2F	0.187	988.1	hi	2.9	1.2	82	30.5
20	DP 161 B2F	0.17	865.8	i	2.9	1.15	80.4	29.7
LSD (P=.05)			231.09					
CV			11.97					

Irrigated Variety Demonstration

Location:	Jackson-Kelly	**Plant Date:**	5/14/2008
Soil Type:	Clay Loam	**Harvest Date:**	11/17/08

Variety	HGT (in.)	Final # Nodes	Storm Tol. (9=tight)	Gin Turnout	Lint Yield
DP 161 B2RF	27.3	22.5	7	36.5%	1629
FM 9160B2F	29.6	21.4	8	34.0%	1579
ST 4498B2RF	28.0	20.4	3	37.2%	1578
FM 1740B2F	25.3	20.7	9	38.9%	1567
ST 5458B2RF	21.6	19.4	8	36.9%	1550
ST 4554B2RF	23.9	19.9	6	37.7%	1507
BCSX0721B2F	22.3	19.7	8	39.6%	1478
DP 141 B2RF	27.4	20.9	5	36.9%	1465
FM 1880B2F	29.9	21.4	9	36.4%	1464
ST 4288B2F	24.4	21.0	3	35.7%	1423
BCSX0870B2F	28.2	21.2	5	36.0%	1411
ST 5327B2RF	23.1	18.5	4	37.5%	1406
FM 9058F	27.8	20.0	6	34.6%	1371
FM 9063B2F	28.1	21.6	7	34.9%	1291
FM 9180B2F	23.7	20.3	7	34.0%	1238

Variety	Mic	Length	Staple	Unif	Strength	Loan Value	Value/A
DP 161 B2RF	4.9	1.18	38	83.3	29.9	56.85	$926
FM 9160B2F	4.5	1.19	38	83.2	30.6	57.05	$901
ST 4498B2RF	4.8	1.12	36	83.5	27.9	56.60	$893
FM 1740B2F	5.2	1.11	36	81.7	29.2	54.45	$853
ST 5458B2RF	5.1	1.13	36	82.4	30.7	54.90	$851
ST 4554B2RF	5.0	1.09	35	81.8	28.7	55.70	$840
BCSX0721B2F	5.2	1.11	36	82.3	27.2	54.45	$805
DP 141 B2RF	5.0	1.13	36	82.8	32.1	53.05	$777
FM 1880B2F	4.8	1.15	37	82.4	29.6	56.65	$829
ST 4288B2F	5.3	1.12	36	82.4	28.5	53.05	$755
BCSX0870B2F	4.6	1.18	38	82.5	31.5	57.05	$805
ST 5327B2RF	5.1	1.10	35	83.5	29.4	54.15	$761
FM 9058F	4.5	1.17	37	81.9	28.4	56.40	$773
FM 9063B2F	4.8	1.20	38	84.2	31.3	57.15	$738
FM 9180B2F	4.8	1.17	37	83.6	31.9	57.15	$707

Irrigated Variety Demonstration

Location:	Jackson-OSUREC	**Plant Date:**	5/12/2008
Soil Type:	Clay Loam	**Harvest Date:**	11/10/08

				10/11/2008			
Trt No.	Treatment Name	Gin %	Lint Yield lbs/Acre	Fiber Mic	Fiber Length	Fiber Uniform	Fiber Strength
1	ST 4554 B2F	0.267	991.8	4.9	1.12	81.7	32.6
2	MCS 0702 B2F	0.258	978.6	5	1.11	81.4	29.1
3	DP 161 B2F	0.239	930	4.7	1.2	84.6	33.8
4	DP 0935 B2F	0.245	885.3	4.7	1.14	82.5	33.3
5	FM 1740 B2F	0.295	864.3	4.9	1.12	82.1	32.3
6	DP 143 B2F	0.235	845.3	4.4	1.21	80.7	33.1
7	DP 0924 B2F	0.258	838.6	5.3	1.07	81.6	30.4
8	07W590 DF	0.247	836	4.3	1.16	81.9	32.3
9	07W901 DF	0.231	830.9	4.4	1.13	81.4	31.2
10	07W903 DF	0.229	775.8	4.8	1.14	81.1	32.6
11	MCS 0711B2F	0.214	773.3	4.4	1.19	82.2	27.5
12	07X440 DF	0.264	766.6	4.4	1.11	81.5	26.7
13	FM 9180 B2F	0.233	766.5	4.5	1.17	83	33.7
14	DP 0912 B2F	0.211	727.2	4.5	1.08	79.2	30.4

Irrigated Variety Demonstration

Location:	Jackson-WOSC	**Plant Date:**	5/12/2008
Soil Type:	Clay Loam	**Harvest Date:**	11/5/08

Trt No.	Treatment Name	Gin %	Lint Yield lbs/Acre	Fiber Mic	11/5/2008 Fiber Length	Fiber Uniform	Fiber Strength
1	07X440 DF	0.295	1723.5	4.1	1.12	83.6	26.1
2	FM 1740 B2F	0.271	1713.3	4.4	1.12	83.5	30.9
3	FM 9180 B2F	0.236	1610.3	4.4	1.11	83.1	32.9
4	07W903 DF	0.266	1525.1	4.6	1.11	83.5	29.5
5	DP 143 B2F	0.256	1512.4	3.5	1.16	81.6	31
6	MCS 0702 B2F	0.262	1502.2	4.1	1.13	83.6	29.9
7	DP 161 B2F	0.23	1499.2	3.7	1.18	82.7	32.1
8	DP 0920 B2F	0.267	1449.3	4.3	1.13	83.3	30
9	ST 4554 B2F	0.239	1401.5	4.5	1.09	82.9	31.5
10	MCS 0711B2F	0.251	1368	3.9	1.17	83.2	28.5
11	07W590 DF	0.268	1367.1	4.2	1.16	84.6	31
12	DP 0912 B2F	0.234	1305.9	4.5	1.05	82.2	29.3
13	DP 0924 B2F	0.22	1294.9	4.4	1.09	83.3	28.7
14	DP 0935 B2F	0.241	1287.2	3.9	1.08	80.5	29.4

Dryland Variety Performance

Location:	Jackson-Felty	**Plant Date:**	6/12/2008
Soil Type:	Clay Loam	**Harvest Date:**	11/12/08

Trt No.	Treatment Name	Gin %	Lint Yield lbs/Acre		Fiber Mic	Fiber Length	Fiber Uniform	Fiber Strength
1	DP 0935 B2F	0.223	546.8	a	3.7	1.16	80.4	29.1
2	FM 1740 B2F	0.262	537.8	a	4	1.13	81.8	31.8
3	DP 161 B2F	0.261	534.2	a	4.1	1.07	81.4	28
4	DP 174 F	0.268	522.4	ab	4.2	1.1	81.2	27.4
5	FM 9063 B2F	0.244	511.5	abc	3.6	1.21	81.6	32.7
6	NG 2549 B2F	0.256	504.6	a-d	4.2	1.09	83.4	30.7
7	ST 4554 B2F	0.246	501	a-d	3.9	1.15	80.5	32.1
8	MCS 0702 B2F	0.227	489.5	a-e	3.4	1.13	83.8	30
9	FM 9160 B2F	0.225	457	b-f	3.8	1.2	84.7	31.7
10	DG 2100 B2F	0.213	455.8	b-f	3.3	1.1	82.2	27.2
11	FM 9180 B2F	0.221	453.7	b-f	4.2	1.14	81.7	31.4
12	PHY 375 WRF	0.22	444.4	c-g	3.1	1.13	82.8	29.7
13	ST 5458 B2F	0.228	442	c-g	3.4	1.19	81.3	31.4
14	DG 2520 B2F	0.203	439.9	c-g	3.4	1.12	82.1	29.2
15	ST 4498 B2F	0.228	435.8	d-g	3.8	1.16	84.2	32.5
16	AFD 5065 B2F	0.214	432.3	d-g	3.9	1.15	81.6	30.1
17	DP 141 B2F	0.231	427.7	e-h	3.3	1.18	81.2	30.3
18	NG 3348 B2F	0.239	419	e-h	4	1.15	82.4	30.9
19	ST 5327 B2F	0.219	395.9	fgh	3.2	1.12	81.9	29.9
20	FM 1880 B2F	0.212	393.6	fgh	3.2	1.14	82.2	30
21	FM 9058 F	0.216	391.6	fgh	3.8	1.17	81.5	30.9
22	PHY 485 WRF	0.208	390.7	fgh	3.4	1.16	83.3	32.3
23	DP 147 F	0.197	385.1	fgh	3.4	1.16	82	30.6
24	AFD 5064 F	0.223	378.8	gh	4.3	1.07	80.8	31.8
25	NG 3410 F	0.221	357.4	h	3.6	1.16	82.6	30.2
LSD (P=.05)			72.98					
CV			11.47					

Dryland Variety Performance (cont.)

Location:	Tillman-McKinley		**Plant Date:**	5/19/2008		
Soil Type:	Sandy Loam		**Harvest Date:**	11/04/08		

Trt No.	Treatment Name	Gin %	Lint Yield lbs/Acre		Fiber Mic	Fiber Length	Fiber Uniformity	Fiber Strength
1	DP 141 B2F	0.296	1242.1	a	4.9	1.13	83	30.3
2	ST 4554 B2F	0.303	1218.7	ab	5.2	1.09	82.1	29.3
3	DP 174 F	0.31	1136.6	abc	5	1.06	81.9	28.6
4	ST 5458 B2F	0.296	1134.7	abc	5.2	1.1	81.7	30.4
5	ST 5327 B2F	0.301	1127.6	abc	4.7	1.11	82.8	30.7
6	NG 3348 B2F	0.266	1123.9	abc	4.7	1.08	83.1	29
7	ST 4498 B2F	0.283	1115.6	abc	5	1.13	84.3	32.2
8	NG 2549 B2F	0.281	1097.6	abc	4.8	1.01	81.7	31.2
9	FM 9180 B2F	0.279	1087.7	abc	4.6	1.11	83.1	30.9
10	FM 9160 B2F	0.277	1083.9	a-d	4.8	1.12	83.3	29.4
11	FM 1740 B2F	0.296	1076.6	a-e	4.8	1.1	81	30.9
12	PHY 485 WRF	0.287	1071	a-e	5	1.22	81.8	29.7
13	NG 3410 F	0.272	1068.3	a-e	4.5	1.1	81.9	28.7
14	DP 0935 B2F	0.289	1051.2	a-e	4.8	1.04	81	28
15	MCS 0702 B2F	0.319	1049.1	a-e	5	1.02	83.5	28.4
16	DP 161 B2F	0.271	1042.8	a-e	5	1.15	81.8	31.2
17	FM 9058 F	0.278	1037.4	a-e	4.9	1.17	84.8	32.1
18	FM 1880 B2F	0.273	1032.6	b-e	4.7	1.11	80.9	28.2
19	PHY 375 WRF	0.292	1028.2	b-e	4.9	1.03	81.5	27.9
20	DP 147 F	0.292	1017.6	b-e	4.6	1.09	79.4	27.4
21	DG 2520 B2F	0.277	959.3	cde	4.9	1.1	83.6	27.4
22	FM 9063 B2F	0.257	942.2	cde	4.7	1.13	83.8	34.1
23	AFD 5064 F	0.249	932.8	cde	4.9	1.04	81.9	30.2
24	AFD 5065 B2F	0.246	878.7	de	4.5	1.08	81.9	29
25	DG 2100 B2F	0.267	870.4	e	4.6	1.06	84.4	27.2
LSD (P=.05)			208.88					
CV			11.97					

Dryland Variety Performance (cont.)

Location:	Washita-Davis		**Plant Date:**	6/11/2008		
Soil Type:	Sandy Loam		**Harvest Date:**	11/06/08		

Trt No.	Treatment Name	Gin %	Lint Yield lbs/Acre		Fiber Mic	Fiber Length	Fiber Uniformity	Fiber Strength
1	DP 174 F	0.28	1210.5	a	3.9	1.14	82.2	27.6
2	ST 5458 B2F	0.248	1004.7	b	3.9	1.15	81.2	29.7
3	NG 2549 B2F	0.267	997.3	bc	3.9	1.1	83.5	29.8
4	ST 4498 B2F	0.263	992.4	bc	3.8	1.17	84.1	29.7
5	DP 0935 B2F	0.268	974.8	bcd	4	1.06	81.6	28
6	ST 5327 B2F	0.252	950.9	b-e	3.6	1.15	84	32.8
7	PHY 375 WRF	0.266	931.3	b-f	3.4	1.12	83	28.4
8	DP 147 F	0.249	912.5	b-f	3.6	1.18	82.1	29.6
9	DG 2100 B2F	0.246	906.8	b-f	3.4	1.09	82.4	25.6
10	FM 1880 B2F	0.246	901.5	b-g	3.5	1.2	82.9	30.7
11	FM 1740 B2F	0.248	877.7	c-h	4	1.15	83.4	31.5
12	MCS 0702 B2F	0.233	860.2	d-i	4	1.19	83.4	32.1
13	DP 141 B2F	0.24	853.3	d-i	4	1.18	83.6	31.3
14	NG 3410 F	0.247	841.9	e-i	4	1.2	84.3	32.4
15	FM 9063 B2F	0.242	840.7	e-i	3.9	1.2	84	32.7
16	FM 9160 B2F	0.231	821.3	f-i	3.1	1.21	84	32.6
17	ST 4554 B2F	0.223	818.4	f-i	3.5	1.12	82.5	28.3
18	FM 9180 B2F	0.243	815.1	f-i	3.2	1.22	84.8	32.2
19	FM 9058 F	0.242	811.7	f-i	3.8	1.25	84	31.4
20	NG 3348 B2F	0.252	809.6	f-i	4.4	1.18	84.3	31.2
21	PHY 485 WRF	0.215	778.5	g-j	3.4	1.13	82.7	30.9
22	AFD 5065 B2F	0.217	775.1	hij	3.7	1.16	83.7	28.5
23	AFD 5064 F	0.236	762	hij	4.9	1.11	82.2	31.6
24	DG 2520 B2F	0.213	746.9	ij	3.2	1.14	82	28.4
25	DP 161 B2F	0.222	676.9	j	3.5	1.2	83	30.7
LSD (P=.05)			125.56					
CV			10.15					

Dryland Variety Performance (cont.)

Location:	Washita-Johnson		**Plant Date:**	6/11/2008		
Soil Type:	Sandy Loam		**Harvest Date:**	12/05/08		

Trt No.	Treatment Name	Gin %	Lint Yield lbs/Acre		Fiber Mic	Fiber Length	Fiber Uniformity	Fiber Strength
1	FM 1740 B2F	0.25	1221	a	3.1	1.08	80.3	27.5
2	ST 5327 B2F	0.27	1162.9	ab	3.6	1.11	82.6	29.9
3	FM 9058 F	0.232	1104.4	abc	3.3	1.18	83.2	30.8
4	AFD 5064 F	0.223	1046.7	bcd	4	1.11	83.7	32.2
5	FM 1880 B2F	0.219	1044.6	bcd	3.1	1.19	82.5	28.5
6	PHY 375 WRF	0.228	1025.4	b-e	3.1	1.12	83.3	28.8
7	ST 4554 B2F	0.238	1025.1	b-e	3.3	1.14	83.4	29.3
8	ST 4498 B2F	0.247	1018.1	b-e	3	1.09	82.3	31.1
9	NG 2549 B2F	0.216	1003.2	cde	3.3	1.09	81.6	28.5
10	FM 9180 B2F	0.24	982.6	cde	3.5	1.19	83.8	33.6
11	FM 9063 B2F	0.231	976.4	cde	3.2	1.19	82.3	30.5
12	NG 3410 F	0.226	966	cde	2.9	1.14	81.3	29.6
13	ST 5458 B2F	0.243	963.2	cde	3.2	1.1	79.6	28.1
14	NG 3348 B2F	0.217	960.6	c-f	3	1.15	83	35.5
15	PHY 485 WRF	0.199	943.8	def	3.2	1.1	82.6	29.3
16	FM 9160 B2F	0.216	925.6	d-g	2.9	1.16	82.8	30.6
17	MCS 0702 B2F	0.185	913.4	d-g	2.5	1.09	81.1	27.5
18	AFD 5065 B2F	0.192	906.4	d-g	3.4	1.11	80.8	30.2
19	DG 2100 B2F	0.193	881.7	efg	2.8	1.11	82.1	26.8
20	DP 0935 B2F	0.186	802.1	fgh	3.2	1.16	82.8	28.4
21	DP 174 F	0.197	780.1	ghi	2.8	1.17	82.8	27.2
22	DG 2520 B2F	0.17	698.9	hij	3.1	1.16	80.4	27.5
23	DP 147 F	0.159	690.9	hij	2.5	1.18	80.2	27.8
24	DP 141 B2F	0.161	641.7	ij	2.6	1.2	82.2	30.1
25	DP 161 B2F	0.15	574.2	j	2.7	1.16	80.6	30.1
LSD (P=.05)			159.64					
CV			12.13					

Dryland Variety Performance (cont.)

Location:	Custer-Shepard		**Plant Date:**	5/14/2008		
Soil Type:	Sandy Loam		**Harvest Date:**	11/13/08		

Trt No.	Treatment Name	Gin %	Lint Yield lbs/Acre		Fiber Mic	Fiber Length	Fiber Uniformity	Fiber Strength
1	ST 5458 B2F	0.26	1230.2	a	5.7	1.08	79.1	27
2	ST 4554 B2F	0.27	1201.1	ab	5.3	0.97	80.1	27.5
3	DP 0935 B2F	0.262	1191.2	ab	4.3	1.08	79.9	27.2
4	FM 9160 B2F	0.262	1158.4	abc	4.8	1.12	81.8	30.1
5	ST 4498 B2F	0.26	1155.2	abc	3.9	1.11	81.7	30.9
6	DP 147 F	0.258	1147.7	abc	4.3	1.12	80.3	26.5
7	FM 1740 B2F	0.277	1141.8	a-d	5.2	1.08	80.5	29.2
8	ST 5327 B2F	0.244	1134.6	a-e	4.8	1.11	82.3	30.6
9	AFD 5064 F	0.249	1106.3	a-f	4.5	1.03	79.5	28
10	DP 174 F	0.25	1091.7	a-f	4.7	1.15	80.7	27.6
11	PHY 485 WRF	0.237	1076.2	a-g	5.4	1.09	82.2	28.2
12	DG 2520 B2F	0.236	1048.6	b-h	3.7	1.14	81.6	27.3
13	DP 141 B2F	0.236	1046	b-h	4.6	1.15	80.3	29
14	FM 9063 B2F	0.241	1030.1	b-h	5.1	1.05	79.1	26.2
15	FM 1880 B2F	0.232	1014.4	c-h	4.2	1.12	82	31.7
16	FM 9180 B2F	0.26	999.5	c-h	4.6	1.1	80.9	30.3
17	DP 161 B2F	0.204	971.4	d-i	3.9	1.09	81.1	28.2
18	NG 3348 B2F	0.256	966	e-i	4.8	1.03	80.7	28.9
19	MCS 0702 B2F	0.229	952.6	f-i	4.6	1.08	82.1	28.4
20	FM 9058 F	0.224	917.2	ghi	4.3	1.19	82.2	28.9
21	NG 2549 B2F	0.229	906.5	ghi	5.2	0.99	81.7	26.9
22	DG 2100 B2F	0.199	888.5	hi	4.1	1.07	82.6	25.7
23	PHY 375 WRF	0.237	885.3	hi	4.4	1.13	82.1	27.5
24	NG 3410 F	0.255	881.7	hi	4.7	1.06	79.8	28.6
25	AFD 5065 B2F	0.208	798.5	i	4.7	1.01	79.8	27.1
LSD (P=.05)			173.41					
CV			11.82					

Oklahoma State University

2008 County Replicated Variety Trial Summary-Irrigated

Average Numerical Rankings Across Locations

Irrigated	Jackson WOSC	Jackson Felty	Jackson OSU	Beckham Gamble	Avg. Rank
ST 5458 B2F	3	4	2	4	**3.3**
DP 0935 B2F	9	7	1	2	**4.8**
PHY 375 WRF	6	5	4	6	**5.3**
FM 1740 B2F	1	2	5	14	**5.5**
DP 0924 B2F	7	1	7	11	**6.5**
ST 4498 B2F	2	8	9	13	**8**
ST 4554 B2F	4	3	10	15	**8**
DP 0912 B2F	13	11	3	7	**8.5**
DG 2570 B2F	16	12	6	1	**8.8**
FM 9180 B2F	11	9	20	3	**11**
NG 3348 B2F	8	18	16	10	**13**
FM 9160 B2F	17	6	13	16	**13**
PHY 485 WRF	20	15	12	5	**13**
NG 2549 B2F	19	10	15	9	**13**
DP 141 B2F	10	16	11	17	**14**
FM 1880 B2F	12	13	18	12	**14**
DP 164 B2F	5	19	14	19	**14**
DP 161 B2F	14	20	8	20	**16**
FM 9063 B2F	18	17	19	8	**16**
ST 5327 B2F	15	14	17	18	**16**

Oklahoma State University

2008 County Replicated Variety Trial Summary-Dryland

Average Numerical Rankings Across Locations

Dryland	Jackson Felty	Tillman McKinley	Washita Davis	Washita Johnson	Custer Shepard	Avg. Rank
FM 1740 B2F	2	11	11	1	7	**6.4**
ST 5458 B2F	13	4	2	13	1	**6.6**
ST 4554 B2F	7	2	17	7	2	**7**
DP 174 F	4	3	1	21	10	**7.8**
ST 4498 B2F	15	7	4	8	5	**7.8**
ST 5327 B2F	19	5	6	2	8	**8**
DP 0935 B2F	1	14	5	20	3	**8.6**
NG 2549 B2F	6	8	3	9	21	**9.4**
FM 9160 B2F	9	10	16	16	4	**11**
FM 9180 B2F	11	9	18	10	16	**12.8**
FM 9063 B2F	5	22	15	11	14	**13.4**
PHY 375 WRF	12	19	7	6	23	**13.4**
DP 141 B2F	17	1	13	24	13	**13.6**
FM 1880 B2F	20	18	10	5	15	**13.6**
MCS 0702 B2F	8	15	12	17	19	**14.2**
NG 3348 B2F	18	6	20	14	18	**15.2**
FM 9058 F	21	17	19	3	20	**16**
DP 147 F	23	20	8	23	6	**16**
PHY 485 WRF	22	12	21	15	11	**16.2**
AFD 5064 F	24	23	23	4	9	**16.6**
DG 2100 B2F	10	25	9	19	22	**17**
DP 161 B2F	3	16	25	25	17	**17.2**
NG 3410 F	25	13	14	12	24	**17.6**
DG 2520 B2F	14	21	24	19	22	**20**
AFD 5065 B2F	16	24	22	18	25	**21**

Agronomic Projects

This section of the report presents the results of various agronomic projects. Cotton producers face numerous in-season management decisions concerning fertility, tillage, plant growth regulators, precision agriculture and/or irrigation. The following projects address some of these areas.

Performance of Stance Plant Growth Regulator

Three rate regimes of Stance were compared to multiple low rate applications of Mepiquat Chloride. No plant growth regulator treatment increased yield or affected fiber quality compared to the untreated.

Planted: May 12 **Variety:** PHY 485 WRF **Soil Type:** Clay loam **Location:** OSU

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	8/12/2008 NAWF 5 P Avg.		8/25/2008 HEIGHT 5 P Avg.		8/25/2008 TOTAL NODES 5 P Avg.		11/3/2008 Gin %	
1	UNTREATED					3.33	a	32.2	a	19.5	ab	0.249	a
2	PIX	4	oz/a	MATCH SQ	A	3.15	a	30.4	a	18.9	b	0.248	a
	PIX	4	oz/a	10-14DAT	B								
	PIX	4	oz/a	EARBLM	C								
3	STANCE	2	oz/a	MATCH SQ	A	3.3	a	30.2	a	20.25	a	0.245	a
	STANCE	2	oz/a	10-14DAT	B								
	STANCE	2	oz/a	EARBLM	C								
4	STANCE	3	oz/a	MATCH SQ	A	3.4	a	29.8	a	19.25	ab	0.246	a
	STANCE	3	oz/a	10-14DAT	B								
	STANCE	3	oz/a	EARBLM	C								
5	STANCE	4	oz/a	MATCH SQ	A	2.85	a	30.3	a	19.65	ab	0.253	a
	STANCE	4	oz/a	10-14DAT	B								
	STANCE	4	oz/a	EARBLM	C								
			LSD (P=.05)			0.911		2.56		1.166		0.013604	
			CV			18.45		5.43		3.88		3.56	

Performance of Stance Plant Growth Regulator (cont.)

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	Lint Yield lbs/Acre		11/3/2008 Fiber Mic		Fiber Length		Fiber Uniform		Fiber Strength	
1	UNTREATED					1530.7	ab	4.53	a	1.145	a	84.33	a	31.53	a
2	PIX	4	oz/a	MATCH SQ	A	1604.3	a	4.58	a	1.14	a	84.13	a	31.1	a
	PIX	4	oz/a	10-14DAT	B										
	PIX	4	oz/a	EARBLM	C										
3	STANCE	2	oz/a	MATCH SQ	A	1446.4	b	4.58	a	1.13	a	83.85	a	31.33	a
	STANCE	2	oz/a	10-14DAT	B										
	STANCE	2	oz/a	EARBLM	C										
4	STANCE	3	oz/a	MATCH SQ	A	1479.4	ab	4.83	a	1.125	a	83.45	a	30.73	a
	STANCE	3	oz/a	10-14DAT	B										
	STANCE	3	oz/a	EARBLM	C										
5	STANCE	4	oz/a	MATCH SQ	A	1524.2	ab	4.6	a	1.148	a	83.78	a	30.83	a
	STANCE	4	oz/a	10-14DAT	B										
	STANCE	4	oz/a	EARBLM	C										
LSD (P=.05)						136.24		0.345		0.0229		1.395		0.822	
CV						5.83		4.85		1.31		1.08		1.72	

Means followed by same letter do not significantly differ (P=.05, LSD)

Performance of Stance Plant Growth Regulator (cont.)

	Application Description		
	A	B	C
Application Date:	7/8/2008	7/22/2008	8/5/2008
Time of Day:	9:00 AM	11:30 AM	8:00 AM
Application Method:	Spray	Spray	Spray
Application Timing:	Match SQ	14DAIT	14DALT
Application Placement:	Broadcast	Broadcast	Broadcast
Applied By:	OSU	OSU	OSU
Air Temperature, Unit:	80 F	93 F	77 F
% Relative Humidity:	61	31	67
Wind Velocity, Unit:	7 mph	4 mph	3.5 mph
Wind Direction:	ssw	s	ne
Soil Temperature, Unit:	83 F	86 F	82 F
Soil Moisture:	Good	Good	Good
% Cloud Cover:	70	0	0
Appl. Equipment:	Lee Spider	Lee Spider	Lee Spider
Operating Pressure, Unit:	26 PSI	26 PSI	26 PSI
Nozzle Type:	TurboTee	TurboTee	TurboTee
Nozzle Size:	110015	110015	110015
Nozzle Spacing, Unit:	20 in	20 in	20 in
Nozzles/Row:	2	2	2
Ground Speed, Unit:	4 mph	4 mph	4 mph
Carrier:	water	water	water
Spray Volume, Unit:	10 GPA	10 GPA	10 GPA
Propellant:	Comp. Air	Comp. Air	Comp. Air

Beltwide Regional PGR Study

The mission of the Extension Cotton Specialist Working Group (ECSWG) is to serve as a multi-state team focusing on high priority needs of the cotton industry, and to be a central source of information dealing with current issues across all U.S. cotton producing areas. The ultimate objective of this group is increasing the profitability of the U.S. cotton producer. Conducting research protocols on a uniform basis can assist in the development of broad-based recommendations. This protocol originated from this group with the intent to address producer's options regarding the use of plant growth regulators. Six different treatments were compared to untreated plots. By the end of August all treatments effectively reduced plant height compared to untreated plots. No plant growth regulator treatment increased lint yield compared to untreated plots.

Planted: May 12th **Variety:** PHY 485 WRF **Soil Type:** Clay loam **Location:** OSU

						7/28/2008							
Trt	Treatment		Rate	Growth	Appl	Height		Nodes		Nffb*		Nawf**	
No.	Name	Rate	Unit	Stage	Code	5 P Avg.		5 P Avg.		5 P Avg.		5 P Avg.	
1	Mepex	8	fl oz/a	MHS	A	26.43	b	16.58	c	6.48	a	4.93	ab
	Induce	0.25	% v/v	MHS	A								
	Mepex	10	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
2	Mepex Ginout	8	fl oz/a	MHS	A	27.1	b	16.75	bc	6.75	a	5.1	ab
	Induce	0.25	% v/v	MHS	A								
	Mepex Ginout	10	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
3	Stance	1.5	fl oz/a	MHS	A	27.5	b	17.35	abc	6.5	a	4.8	b
	Induce	0.25	% v/v	MHS	A								
	Stance	2	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
4	Stance	2	fl oz/a	MHS	A	27.1	b	17.7	a	6.75	a	4.95	ab
	Induce	0.25	% v/v	MHS	A								
	Stance	3	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
5	Stance	2	fl oz/a	MHS	A	26.75	b	17.4	abc	6.25	a	5.25	ab
	Induce	0.25	% v/v	MHS	A								
	Stance	3	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
	Stance	3	fl oz/a	NAWF=5	C								
	Induce	0.25	% v/v	NAWF=5	C								
6	Pentia	8	fl oz/a	MHS	A	26.25	b	16.75	bc	6.35	a	5	ab
	Induce	0.25	% v/v	MHS	A								
	Pentia	10	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
7	Induce	0.25	% v/v	MHS	A	30.15	a	17.6	ab	6.85	a	5.5	a
	Induce	0.25	% v/v	2 WAt 1	B								
8						29.95	a	16.9	abc	6.75	a	5.05	ab
LSD (P=.05)						1.9796589		0.9093005		0.658		0.6278	
CV						4.87		3.61		6.8		8.41	

Means followed by same letter do not significantly differ (P=.05, LSD)

*Node of first fruiting branch

**Nodes above white flower

Beltwide Regional PGR Study (cont.)

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	8/12/2008 Nawf 5 P Avg.		8/25/2008 Height 5 P Avg.		8/25/2008 Tot. Nodes 5 P Avg.	
1	Mepex	8	fl oz/a	MHS	A	2.75	b	28.15	b	17.65	b
	Induce	0.25	% v/v	MHS	A						
	Mepex	10	fl oz/a	2 WAT 1	B						
	Induce	0.25	% v/v	2 WAT 1	B						
2	Mepex Ginout	8	fl oz/a	MHS	A	2.65	b	28.8	b	18.55	ab
	Induce	0.25	% v/v	MHS	A						
	Mepex Ginout	10	fl oz/a	2 WAT 1	B						
	Induce	0.25	% v/v	2 WAT 1	B						
3	Stance	1.5	fl oz/a	MHS	A	2.7	b	29.45	b	18.45	ab
	Induce	0.25	% v/v	MHS	A						
	Stance	2	fl oz/a	2 WAT 1	B						
	Induce	0.25	% v/v	2 WAT 1	B						
4	Stance	2	fl oz/a	MHS	A	3.35	a	29.8	b	19.15	ab
	Induce	0.25	% v/v	MHS	A						
	Stance	3	fl oz/a	2 WAT 1	B						
	Induce	0.25	% v/v	2 WAT 1	B						
5	Stance	2	fl oz/a	MHS	A	3.05	ab	29.15	b	17.8	b
	Induce	0.25	% v/v	MHS	A						
	Stance	3	fl oz/a	2 WAT 1	B						
	Induce	0.25	% v/v	2 WAT 1	B						
	Stance	3	fl oz/a	NAWF=5	C						
	Induce	0.25	% v/v	NAWF=5	C						
6	Pentia	8	fl oz/a	MHS	A	2.6	b	29.2	b	18.4	ab
	Induce	0.25	% v/v	MHS	A						
	Pentia	10	fl oz/a	2 WAT 1	B						
	Induce	0.25	% v/v	2 WAT 1	B						
7	Induce	0.25	% v/v	MHS	A	3	ab	31.75	a	19.15	ab
	Induce	0.25	% v/v	2 WAt 1	B						
8						2.7	b	32.4	a	19.8	a
LSD (P=.05)						0.574		1.741		1.668	
CV						13.7		3.97		6.09	

Means followed by same letter do not significantly differ (P=.05, LSD)

Beltwide Regional PGR Study (cont.)

						9/22/2008							
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	% Open Bolls		Tot. Nodes 5 P Avg.		Turnout %		Lint Yield lbs/Acre	
1	Mepex	8	fl oz/a	MHS	A	73.3	a	2.95	a	0.248	a	1502	a
	Induce	0.25	% v/v	MHS	A								
	Mepex	10	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
2	Mepex Ginout	8	fl oz/a	MHS	A	73.5	a	3.25	a	0.244	a	1542	a
	Induce	0.25	% v/v	MHS	A								
	Mepex Ginout	10	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
3	Stance	1.5	fl oz/a	MHS	A	74.3	a	2.7	a	0.248	a	1494	a
	Induce	0.25	% v/v	MHS	A								
	Stance	2	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
4	Stance	2	fl oz/a	MHS	A	72.8	a	2.05	a	0.249	a	1464	a
	Induce	0.25	% v/v	MHS	A								
	Stance	3	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
5	Stance	2	fl oz/a	MHS	A	75.3	a	1.95	a	0.245	a	1409	a
	Induce	0.25	% v/v	MHS	A								
	Stance	3	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
	Stance	3	fl oz/a	NAWF=5	C								
	Induce	0.25	% v/v	NAWF=5	C								
6	Pentia	8	fl oz/a	MHS	A	76.8	a	2.2	a	0.255	a	1515	a
	Induce	0.25	% v/v	MHS	A								
	Pentia	10	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
7	Induce	0.25	% v/v	MHS	A	72.3	a	3	a	0.249	a	1470	a
	Induce	0.25	% v/v	2 WAt 1	B								
8						75	a	2.8	a	0.254	a	1502	a
LSD (P=.05)						6.97		1.925		0.020538		177.85	
CV						6.39		50.1		5.61		8.13	

Means followed by same letter do not significantly differ (P=.05, LSD)

Beltwide Regional PGR Study (cont.)

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	7/28/2008 Fiber Data Mic		Length		Uniform		Strength	
1	Mepex	8	fl oz/a	MHS	A	4.68	ab	1.118	a	83.58	ab	31.2	a
	Induce	0.25	% v/v	MHS	A								
	Mepex	10	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
2	Mepex Ginout	8	fl oz/a	MHS	A	4.63	ab	1.135	a	84.1	a	31.9	a
	Induce	0.25	% v/v	MHS	A								
	Mepex Ginout	10	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
3	Stance	1.5	fl oz/a	MHS	A	4.68	ab	1.115	a	82.6	b	30.5	a
	Induce	0.25	% v/v	MHS	A								
	Stance	2	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
4	Stance	2	fl oz/a	MHS	A	4.78	a	1.133	a	83.18	ab	31.1	a
	Induce	0.25	% v/v	MHS	A								
	Stance	3	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
5	Stance	2	fl oz/a	MHS	A	4.73	ab	1.12	a	83.15	ab	30.7	a
	Induce	0.25	% v/v	MHS	A								
	Stance	3	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
	Stance	3	fl oz/a	NAWF=5	C								
	Induce	0.25	% v/v	NAWF=5	C								
6	Pentia	8	fl oz/a	MHS	A	4.8	a	1.12	a	83.1	ab	31.2	a
	Induce	0.25	% v/v	MHS	A								
	Pentia	10	fl oz/a	2 WAT 1	B								
	Induce	0.25	% v/v	2 WAT 1	B								
7	Induce	0.25	% v/v	MHS	A	4.55	b	1.113	a	83.7	ab	31.4	a
	Induce	0.25	% v/v	2 WAt 1	B								
8						4.75	a	1.118	a	83.83	ab	31.4	a
LSD (P=.05)						0.19		0.0318		1.304		1.908	
CV						2.75		1.93		1.06		4.16	

Means followed by same letter do not significantly differ (P=.05, LSD)

Beltwide Regional PGR Study (cont.)

Application Description			
	A	B	C
Application Date:	7/8/2008	7/22/2008	8/5/2008
Time of Day:	9:30 AM	11:00 AM	2:15 PM
Application Method:	Spray	Spray	Spray
Application Timing:	Matchhead	2 WAT 1	NAWF=5
Application Placement:	Broadcast	Broadcast	Broadcast
Applied By:	OSU	OSU	OSU
Air Temperature, Unit:	78 f	91.4 f	100 F
% Relative Humidity:	65	36	27
Wind Velocity, Unit:	6 mph	8 mph	5.8 mph
Wind Direction:	ssw	s	
Soil Temperature, Unit:	88 f	94 f	109 f
Soil Moisture:	adequate	adequate	adequate
% Cloud Cover:	0	0	0
Appl. Equipment:	Lee Spider	Lee Spider	Lee Spider
Operating Pressure, Unit:	26 PSI	26 PSI	26 PSI
Nozzle Type:	TurboTeej	TurboTeej	TurboTeej
Nozzle Size:	110015	110015	110015
Nozzle Spacing, Unit:	20 in	20 in	20 in
Nozzles/Row:	2	2	2
Ground Speed, Unit:	3 mph	3 mph	3 mph
Carrier:	water	water	water
Spray Volume, Unit:	15 GPA	15 GPA	15 GPA
Mix Size, Unit:	2	2	2

Plant Population Studies-Dryland and Irrigated

Dryland and irrigated plant population studies were conducted in Jackson County, Oklahoma. These studies had five different populations and were replicated four times. Populations were 22,000, 32,000, 42,000, 52,000 and 62,000 seed per acre. On the irrigated location, lint yield per acre was 1240, 1400, 1603, 1534, and 1600 pounds respectively. There was no significant yield difference between the 42,000, 52,000 and 62,000 seed per acre. On the dryland location, lint yield was 459, 491, 510, 497, and 501 pounds per acre respectively. There was no significant yield difference between any of the populations in the dryland study.

Dryland

Planted: June 12th **Variety:** DP 161 B2F **Soil Type:** Clay loam **Location:** OSU **Harvested:** Nov 12

Trt No.		Gin %	Lint Yield lbs/Acre	
1	22k	0.225	459.4	a
2	32k	0.222	490.8	a
3	42k	0.219	510.4	a
4	52k	0.228	496.6	a
5	62k	0.225	501.1	a
LSD (P=.05)		0	103.42	
CV		0	13.65	

Irrigated

Planted: May 15th **Variety:** DP 161 B2F **Soil Type:** Clay loam **Location:** OSU **Harvested:** Oct 28

Trt No.		Gin %	Lint Yield lbs/Acre	
1	22k	0.258	1240	c
2	32k	0.255	1399.6	bc
3	42k	0.274	1603.3	a
4	52k	0.257	1533.7	ab
5	62k	0.259	1600.2	a
LSD (P=.05)		0	166.7	
CV		0	6	

Effects of Headline Applications in Cotton

Planted: May 13th **Variety:** DP 164 B2F **Soil Type:** Clay loam **Location:** OSU

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	Gin %	Lint Yield lbs/Acre	Fiber Mic	Fiber Length	Fiber Uniform	Fiber Strength
1	Untreated Check					0.246 a	891.4 a	4.43 a	1.218 a	81.93 a	31.2 a
2	Headline	6	oz/a	14 DAB	A	0.234 a	820.1 a	4.3 a	1.193 a	81.48 a	31.5 a
LSD (P=.05)						0.03774	194.06	0.762	0.0304	2.511	2.602
CV						7	10.08	7.76	1.12	1.37	3.69

Means followed by same letter do not significantly differ (P=.05, LSD)

Application Description	A
Application Date:	8/6/2008
Time of Day:	9:00 AM
Application Method:	Spray
Application Timing:	14 DAB
Application Placement:	Broadcast
Applied By:	OSU
Air Temperature, Unit:	78 F
% Relative Humidity:	69
Wind Velocity, Unit:	7 mph
Wind Direction:	East
Soil Temperature, Unit:	82 F
Soil Moisture:	Good
% Cloud Cover:	0
Next Rain Occurred On:	8/8/2008
Appl. Equipment:	Lee Spider
Operating Pressure, Unit:	28 PSI
Nozzle Type:	TurboTee
Nozzle Size:	110015
Nozzle Spacing, Unit:	20 in
Nozzles/Row:	2
Boom Length, Unit:	13.3 ft
Ground Speed, Unit:	4 mph
Carrier:	water
Spray Volume, Unit:	10 GPA
Mix Size, Unit:	3 gal
Propellant:	comp. air

Effects of Prowl H20 Over-the-top in Cotton

Planted: May 13th **Variety:** DP 164 B2F **Soil Type:** Clay loam **Location:** OSU

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	Gin %	Lint Yield lbs/Acre	Fiber Mic	Fiber Length	Fiber Uniform	Fiber Strength
1	Roundup Powermax	22	oz/a	6-8lf	A	0.24 a	906 a	4.7 a	1.19 a	82.9 a	32.3 a
2	Roundup Powermax	22	oz/a	6-8lf	A	0.24 a	856 a	4.7 a	1.19 a	82.3 a	32.3 a
	Prowl H2O	1	lb ai/a	6-8lf	A						
3	Roundup Powermax	22	oz/a	6-8lf	A	0.24 a	879 a	4.7 a	1.22 a	83.6 a	32.1 a
	Dual Magnum	1.33	pt/a	6-8lf	A						
LSD (P=.05)						0.015	94.7	0.1	0.0325	2.325	0.764
CV						3.63	6.22	1.23	1.57	1.62	1.37

Means followed by same letter do not significantly differ (P=.05, LSD)

Application Description	A
Application Date:	6/25/2008
Time of Day:	9:30 AM
Application Method:	Spray
Application Timing:	6-8lf
Application Placement:	Broadcast
Applied By:	OSU
Air Temperature, Unit:	77 F
% Relative Humidity:	63
Wind Velocity, Unit:	9 mph
Wind Direction:	SSE
Soil Temperature, Unit:	83 F
Soil Moisture:	Good
% Cloud Cover:	0
Next Rain Occurred On:	6/28/2008
Appl. Equipment:	Lee Spider
Operating Pressure, Unit:	28 PSI
Nozzle Type:	TurboTee
Nozzle Size:	110015
Nozzle Spacing, Unit:	20 in
Nozzles/Row:	2
Ground Speed, Unit:	4 mph
Carrier:	water
Spray Volume, Unit:	10 GPA
Mix Size, Unit:	6 gal
Propellant:	comp.air

Cotton Incorporated State Support Project
No-Till Demonstrations in Jackson and Tillman Counties

Jackson County Location

Prod. System:	Cotton after Cotton
Irrigigated/Dry:	Irrigated@$77/Ac
Planting Date:	5/15/08
Variety:	DP 164 B2F
At Plant Insect:	2 lbs Temik-$6/Ac
Pop. Planted:	47,372/acre-$63/Ac
Final Stand:	40,000/acre or 3 plants per foot (40" spacing)
Fertility:	150-50-0 @ $162/Ac
Equipment:	JD 1710 Maxemerge Plus Vaccum (Conventional attachments with disc closers)
Herb. Exp.:	2-apps. Roundup Omax & Aim+Direx(hoods) -$31.50/Ac
Insect Apps:	8 oz/A Orthene @ Pinhead-$7.00/Ac
PGR Apps:	8 oz/A Pentia @ $7.00/Ac
Harvest Aid:	1.5 pt/A Finish+1 pt/A Def @ $21/Ac
Harvest Cost:	$0.10/lb-$84.66/Ac
Yield:	1397 lbs/Acre
Loan rate:	$0.5885
Gross Revenue:	$822.13/Acre
Total Input Costs:	$459.16/Acre
Partial Net Return:	$362.97/Acre

Summary:

Deltapine 164B2F was planted with a JD 1710 Vacuum planter equipped with conservation furrowers, seed press wheels, and closing disks, on May 15, 2008 in Jackson County, Oklahoma. Plant population was 47,372 seeds per acre, with a final plant stand of 40,000 plants per acre. All management inputs are described in the above table. Gross revenue was $822.13/Acre, input expenses were $459.16 per acre, with a net return over direct input expenses of $362.97.

Roger Fisher-Knttle

Tillman County Location

Prod. System:	Cotton after cotton
Irrigated/Dry:	Dryland
Planting Date:	5/23/08
Variety:	DP164B2F
At Plant Insect:	none
Pop. Planted:	29000 seeds $33
Final Stand:	28500 plants/acre or 2.2 plants/ft (40" spacing)
Equipment:	JD 1710 Maxemerge Plus Vaccum (Notill attachments with disc closers)
Fertility:	40 units N-$30/Ac
Herb. Apps.:	2 - App. Roundup Power Max + Stikezone + Ind-$24/Ac
Insect Apps.:	none
PGR Apps.:	none
Harvest Aid:	none
Harvest Cost:	$0.10/lb-$57/Ac
Yield:	570 lbs/Acre
Loan Rate:	$0.5620
Gross Revenue:	$320.34
Total Input Costs:	$144.00/Acre
Partial Net Return:	$176.34/ Acre

Summary:

DP 164 B2F was planted on the 23rd of May with a JD 1710 Maxemerge Plus Vaccum planter with conventional attachments and disc closers. The crop emerged approximately 8 days later. Two in-season applications of Roundup Original Max were applied in order to control weeds. The demonstration site received adequate rainfall throughout the season. No harvest aids were applied for conditioning the crop before harvest. 570 lbs/Acre was produced with a loan rate of $0.5620 resulting in a gross revenue of $320.34/Acre. Partial net returns totaled $176.34/Acre.

GreenSeeker Fertility Trial

The objective of this study was to apply various rates of Nitrogen preplant or in combination with in-season applications compared to a preplant application followed by in-season nitrogen applied according to the GreenSeeker NDVI readings. In-season GreenSeeker readings never called for an application in-season. Due to an abundance of residual nitrogen in the test area there were no yield differences between any treatments.

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	Gin %		Lint Yield lbs/Acre	
1	Untreated Check					0.254	ab	1078.8	a
2	32-0-0	40	lb ai/a	Preplant	A	0.255	ab	1129	a
3	32-0-0	80	lb ai/a	Preplant	A	0.251	ab	1164.3	a
4	32-0-0	120	lb ai/a	Preplant	A	0.243	b	1134.4	a
5	32-0-0	40	lb ai/a	Preplant	A	0.247	b	1097.5	a
	32-0-0	40	lb ai/a	Post 1	B				
6	32-0-0	40	lb ai/a	Preplant	A	0.253	ab	1179.6	a
	32-0-0	40	lb ai/a	Post 2	C				
7	32-0-0	40	lb ai/a	Preplant	A	0.253	ab	1073.8	a
	32-0-0	40	lb ai/a	Post 3	D				
8	32-0-0	40	lb ai/a	Preplant	A	0.262	a	1128.2	a
	32-0-0 fb Greenseeker	40	lb ai/a	Post 2	C				
LSD (P=.05)						0.01514		150.89	
CV						4.08		9.13	

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	Fiber Mic		Length		Uniform		Strength	
1	Untreated Check					4.4	a	1.173	a	81.23	ab	31.68	a
2	32-0-0	40	lb ai/a	Preplant	A	4.3	ab	1.188	a	81.5	ab	32	a
3	32-0-0	80	lb ai/a	Preplant	A	4.3	ab	1.18	a	81.03	b	31.18	a
4	32-0-0	120	lb ai/a	Preplant	A	4.2	ab	1.208	a	81.83	ab	31.55	a
5	32-0-0	40	lb ai/a	Preplant	A	4.13	b	1.205	a	82.35	ab	32.05	a
	32-0-0	40	lb ai/a	Post 1	B								
6	32-0-0	40	lb ai/a	Preplant	A	4.43	a	1.21	a	82.43	a	32.03	a
	32-0-0	40	lb ai/a	Post 2	C								
7	32-0-0	40	lb ai/a	Preplant	A	4.25	ab	1.198	a	81.85	ab	31.63	a
	32-0-0	40	lb ai/a	Post 3	D								
8	32-0-0	40	lb ai/a	Preplant	A	4.35	ab	1.193	a	82.03	ab	31.55	a
	32-0-0 fb Greenseeker	40	lb ai/a	Post 2	C								
LSD (P=.05)						0.267		0.042		1.386		1.305	
CV						4.23		2.39		1.15		2.8	

Means followed by same letter do not significantly differ (P=.05, LSD)

GreenSeeker Fertility Trial (cont.)

Application Description	A	B	C	D
Application Date:	4/30/2008	6/25/2008	7/24/2008	8/7/2008
Time of Day:	8:30 AM	8:30 AM	9:00 AM	2:30 PM
Application Method:	Spray	Spray	Spray	Spray
Application Timing:	Preplant	Post 1	Post 2	Post 3
Application Placement:	Broadcast	Broadcast	Broadcast	Broadcast
Applied By:	OSU	OSU	OSU	OSU
Air Temperature, Unit:	62 F	76 F	80 F	93 F
% Relative Humidity:	52	63	67	43
Wind Velocity, Unit:	8 mph	9 mph	7 mph	7 mph
Wind Direction:	sse	sse	s	s
Soil Temperature, Unit:	60 F	71 F	83 F	86 F
Soil Moisture:	adequate	good	Good	Good
% Cloud Cover:	0	0	0	0
Appl. Equipment:	Lee Spider	Lee Spider	Lee Spider	Lee Spider
Operating Pressure, Unit:	40 PSI	40 PSI	40 PSI	40 PSI
Nozzle Type:	StreamJet	StreamJet	StreamJet	StreamJet
Nozzle Size:	SJ3	SJ3	SJ3	SJ3
Nozzle Spacing, Unit:	20 in	20 in	20 in	20 in
Nozzles/Row:	2	2	2	2
Ground Speed, Unit:	4 mph	4 mph	4 mph	4 mph
Incorporation Equip.:	Lilliston	irrig.	irrig.	irrig.
Hours to Incorp.:	0.1	48	36	24
Incorp. Depth, Unit:	1.5 in	1.5 in	1.5 in	1.5 in
Carrier:	none	none	none	none
Spray Volume, Unit:	11.6 GPA	11.6 GPA	11.6 GPA	11.6 GPA
Mix Size, Unit:	3 gal	3 gal	3 gal	3 gal
Propellant:	comp. air	comp. air	comp. air	comp. air

USE OF OPTICAL SENSORS TO EVALUATE DICAMBA INJURY TO COTTON

Randy Taylor
Biosystems and Agricultural Engineering/Oklahoma State University
Stillwater, OK
J.C. Banks
Shane Osborne
Plant and Soil Sciences /Oklahoma State University
Altus, OK
Don S. Murray
Plant and Soil Sciences/Oklahoma State University
Stillwater, OK

Abstract

A technique was evaluated to assess dicamba herbicide damage to cotton using normalized difference vegetation index on plots treated with a continuously diluting logarithmic sprayer application of dicamba. Five applications were made from early squaring to late bloom, and geo-referenced NDVI readings were taken. Plots were replicated three times and two study locations in southwest Oklahoma were used. Plots were harvested with a commercial picker equipped with a yield monitor.

Introduction

Drift of hormone herbicides has historically resulted in damage to cotton and with the possible introduction of transgenic Banvel resistant cotton, there is more potential for accidental application or drift of dicamba to cotton without the resistance gene. In response to this, a protocol was developed to evaluate drift rates of dicamba on non-Banvel resistant cotton. In addition, commercially available sensors were used in an attempt to measure crop injury in an effort to predict yield response. Thus the objectives of this project were to determine dicamba injury to cotton from timing and rate and the ability to assess injury using active optical sensors.

Materials and Methods

Cotton variety Deltapine 164 B2RF was planted on May 14, 2008 on a Tillman/Hollister clay loam on the OSU Southwest Research and Extension Center. Plots were randomized strips four rows wide by 440 feet long, replicated three times. Row spacing was 40 inches. Spray applications were made on June 18, July 2, July 23, August 9, and August 27 with a constantly diluting logarithmic sprayer that was calibrated to deliver half rates at 40 foot intervals. The growth stages for applications were first square, first bloom, mid bloom, full bloom, and cutout. The initial rate of dicamba was 0.25 lb active ingredient per acre or 8 ounces of product per acre. At the end of the plot, the dicamba application rate was 0.05% of initial rate or 0.000125 lb ac^{-1}. This procedure allowed evaluation of the complete rate range from full rate of dicamba recommended for vegetation control in other crops to less than 1/1000 of this rate at each application stage of the cotton.

Normalized difference vegetative index (NDVI) was collected with GreenSeeker® sensors five times throughout the season. Sensor data collection was scheduled around spray application and irrigation schedules. Data were recorded five times per second with an average distance of 1.5 feet between points. Geographic location was also recorded for each sensor reading. This data were transformed to local coordinates to determine the location of each sensor reading relative the end of the plot.

Plots were harvested with John Deere 9965 cotton picker equipped with an Ag Leader® yield monitor. Data were recorded once per second and with an average distance of 5.4 feet between points. All plots were harvested in the same direction and seed cotton weights were measured for each plot. The yield monitor data were exported from SMS software in ASCII format for further analysis. Total estimated seed cotton mass was determined from the mass flow data in the yield monitor export file. The actual seed cotton mass for each plot was measured with a boll buggy weigh system. The estimated seed cotton mass measured by the yield monitor was adjusted to match the mass measured by the boll buggy by correcting the seed yield at each point by the appropriate percent for the plot. Local coordinates were calculated from the geographical coordinates in Excel and the dicamba concentration for each point was determined based on distance from the beginning of the plot.

Yield was regressed as a function of dicamba concentration (conc) to fit a sigmoidal function (equation 1) using the PROC NLIN procedure in SAS®. The yield plateau of the sigmoid function is □. Predicted yield from the equation was divided by □ to obtain a relative yield.

$$yield = \delta + \left(\frac{\alpha - \delta}{1 + \left(\frac{conc}{\gamma} \right)^{\beta}} \right) \qquad \text{Eq. 1}$$

yield is seed cotton yield in lbs/ac
□, □, □, and □ are regression coefficients
conc is dicamba concentration in percent relative to the initial mix.

Since NDVI and yield monitor data were collected at different times and scales, the NDVI data within ± 5 feet of a yield point along each transect were averaged to correlate with yield at that point. Since the average spacing of yield monitor data was 5.4 feet, some NDVI values were used for multiple yield monitor points. This correlation was used to assess NDVI as a predictor of yield reduction due to herbicide injury.

Results and Discussion

All treatments impacted cotton yield through crop injury. However, the yield reduction was dependent upon dicamba concentration and growth stage at application. Table 1 shows the relative yield reduction for three concentrations of dicamba applied at the five growth stages. Application at first square caused significant injury, but the plant was able to partially recover and yield was only moderately affected at 100 percent concentration. However, during bloom, small rates caused fairly large yield reductions. Specifically the mid bloom application had the greatest yield loss. Injury occurring during cutout had less affect on yield.

Table 1. Estimated yield reduction at three concentrations of dicamba for the five growth stages at application.

	% Yield Reduction at Conc.		
	100%	10%	1%
1st Square	35	7	0
1st Bloom	87	28	6
Mid Bloom	98	52	9
Full Bloom	44	20	6
Cutout	22	5	1

Regression coefficients for each plot are shown in Table 2 by treatment. Also shown in Table 2 are the yield at a concentration of 100 percent (Y100) and the r^2 value. While each replicated plot may have responded slightly different to the dicamba application there were certainly consistencies. Yield as a function of dicamba concentration applied at first square is shown in figure 1 for the three replicated plots individually. While the yield plateau values at concentrations below 1 percent were different the general trend at concentrations above 10 percent was similar. In general, the sigmoidal equation fit the data with the exception of plot 303 where regression failed to converge. The sigmoidal equation may not have been the best choice for some treatments, but it was used for consistency and the ability to compare coefficients across treatments. Yield as a function of dicamba concentration applied at mid bloom is shown in figure 2 for the three replicated plots individually. Data from the first two reps were nearly identical whereas the third rep had a slightly greater plateau yield. Yield data from the other treatments is not shown, but observations between reps was similar to treatments 1 and 3. The r^2 values for treatment 5, dicamba applied at cutout, were the lowest.

Table 2. Regression coefficients, yield at 100% concentration and r^2 for each plot.

Plot	Treatment	alpha	delta	beta	gamma	Y100	r^2
101	1	3298.9	1.542	0.208	1970.4	2078.5	0.823
202	1	3584.1	2.226	0.244	2373.3	2423.6	0.829
303	1	3767.7	0.669	5766564.776	-53868173	2142.1	0.795
102	2	3605.5	0.783	0.306	-267.3	830.7	0.962
204	2	3747.7	0.609	8.902	-11041.2	660.1	0.953
301	2	3692.4	0.855	0.559	-2088.8	98.0	0.960
103	3	3638.7	0.973	0.117	-388.5	55.9	0.988
201	3	3597.0	1.168	0.093	-94.8	122.4	0.987
304	3	3926.4	0.930	0.123	-469.4	78.3	0.985
104	4	3438.0	0.652	0.640	443.6	1724.4	0.907
203	4	3758.2	0.768	0.232	1794.2	2276.7	0.919
302	4	3824.1	0.931	0.118	2148.9	2350.8	0.873
105	5	3733.3	0.817	2.192	1259.2	2879.9	0.631
205	5	3758.5	0.910	2.247	1180.9	2924.3	0.602
305	5	3665.1	0.612	2.278	1402.5	2812.9	0.536

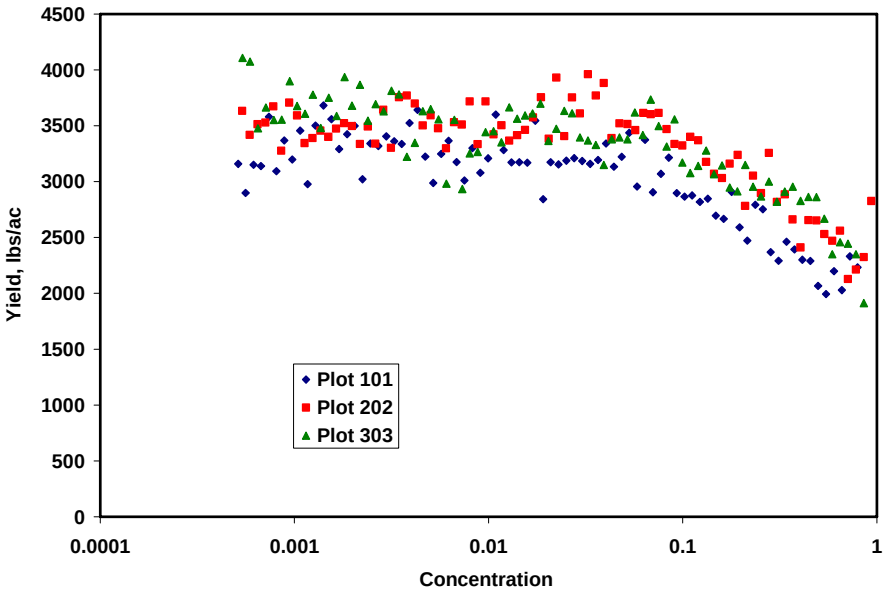


Figure 1. **Seed cotton** yield as a function of dicamba concentration for application at first square.

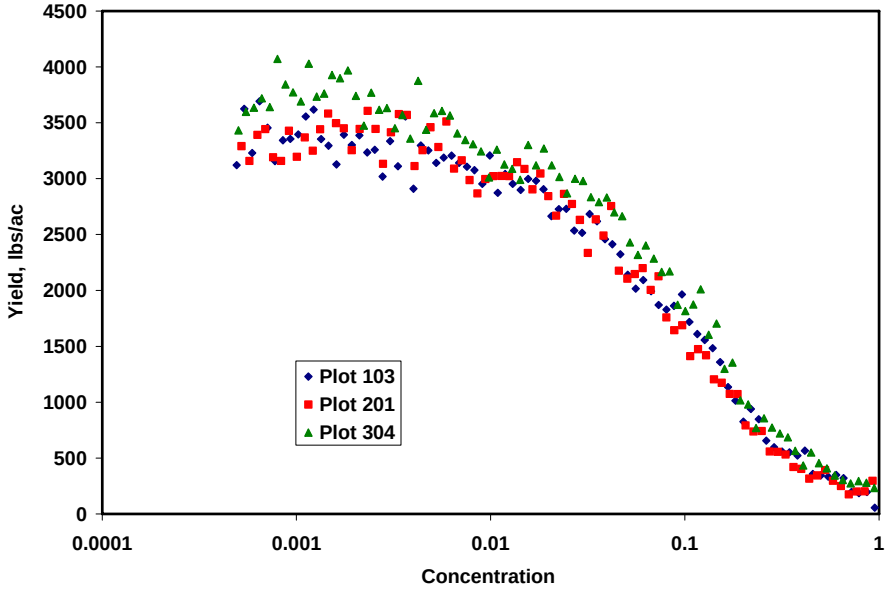


Figure 2. **Seed cotton** yield as a function of dicamba concentration for application at mid bloom.

Active light sensors were used in an attempt to quantify herbicide injury. Figure 3 shows NDVI data measured 21 days after application as a function of dicamba concentration. This data are for two reps of the first treatment where dicamba was applied at first square. Data for one rep for this treatment was incomplete and was not included in any analysis. The NDVI decreases with increasing concentration at concentrations greater than about 5 percent, whereas is appears independent at lower concentrations. The correlation between NDVI and seed cotton yield for these two reps was approximately 0.80.

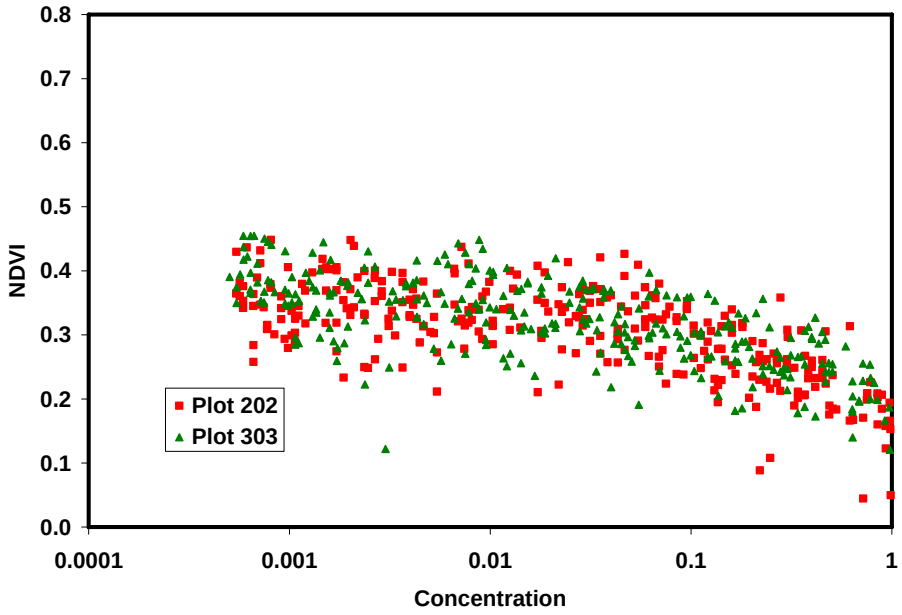


Figure 3. NDVI measured 21 days after application as a function of dicamba concentration for application at first square. Data for the first rep was incomplete and not used in the analysis

Figure 4 shows NDVI data for the first bloom application. Similar to Figure 3 this data were collected 22 days after application. This data shows a higher plateau value than Figure 3 because it is later in the season. However, NDVI is affected at lower concentrations of dicamba than the first square application. The NDVI decreases with increasing concentration at rates above 1 percent. The correlation between NDVI shown in Figure 4 and seed cotton yield exceeded 0.90. Figure 5 shows NDVI as a function of dicamba concentration for the mid bloom application. Consistent with Figures 3 and 4, this data were taken 22 days after application. Even though the data were collected about three weeks after the data in Figure 4, the plateau NDVIs are similar. The NDVI decreases with increasing concentration at levels greater than 10 percent. However the magnitude of the slope is not large. The average correlation between seed cotton yield and NDVI for the three reps shown in figure 5 is less than 0.60. Even though the mid bloom application had the greatest effect on yield, the correlation between NDVI and yield for this treatment was not high.

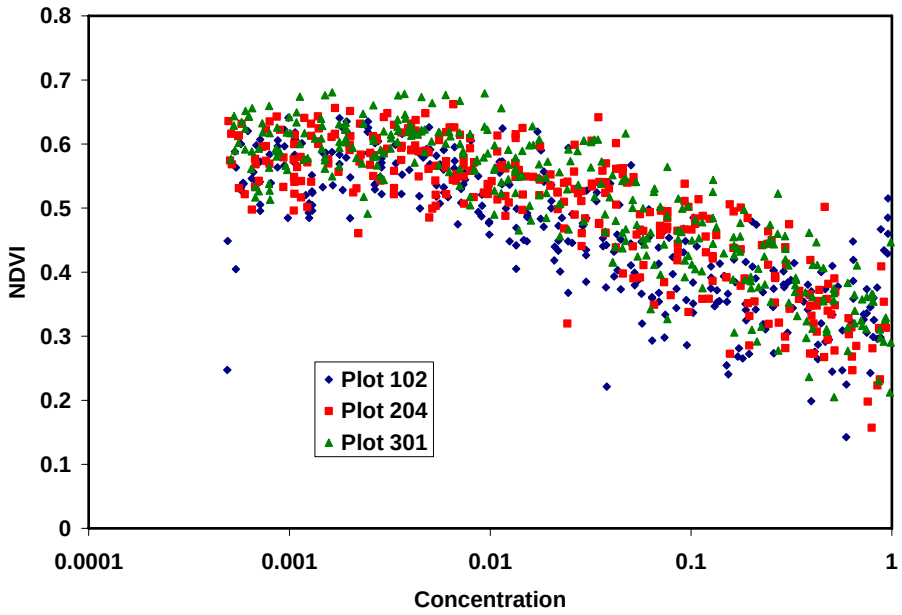


Figure 4. NDVI measured 22 days after application as a function of dicamba concentration for application at first bloom.

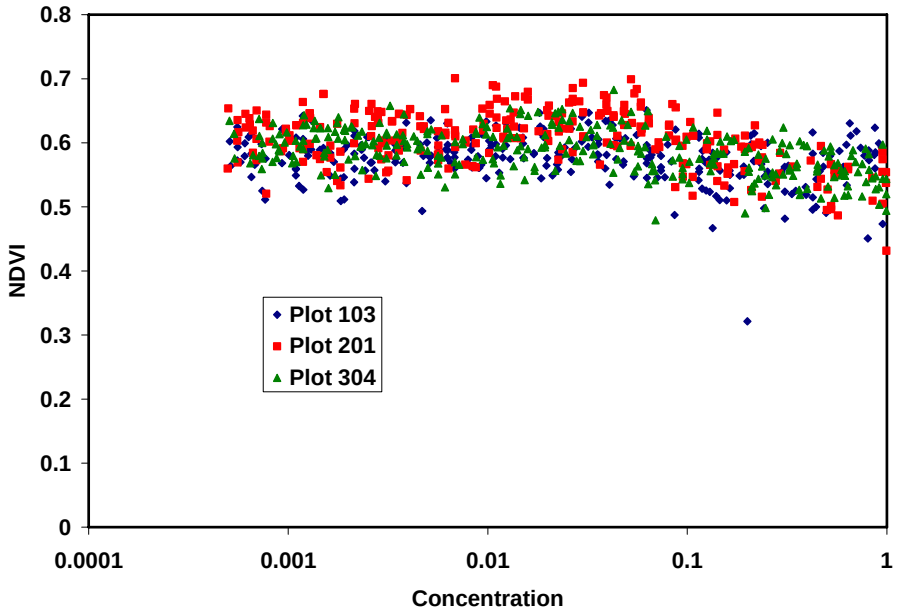


Figure 5. NDVI measured 22 days after application as a function of dicamba concentration for application at mid bloom.

Correlation between NDVI readings and yield was dependent on growth stage when injury occurred and time between injury and sensing. The outlined plot in figure 6 shows crop discoloration at mid bloom resulting from a dicamba application at 1st bloom. This discoloration was also evident in the NDVI readings.

Figure 6. Injury from first bloom application shown at mid bloom. The plot to the left was treated at first square and the right plot is untreated. In general, correlation was better at early growth stages (1st square to 1st bloom) when sensing was completed within 20 to 45 days after injury (Figure 7). As the crop matured to mid bloom and later, there was less time after injury for sensing (Figure 8). Correlation between NDVI and yield continually decreased from the time of crop injury.

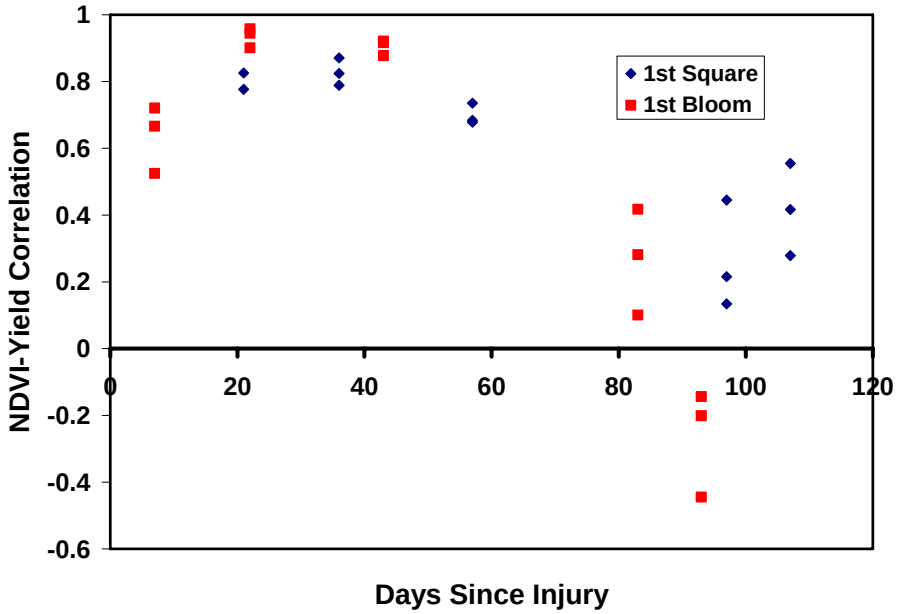


Figure 7. Correlation between NDVI readings and yield as a function of days since injury occurred for two early growth stages when injury occurred.

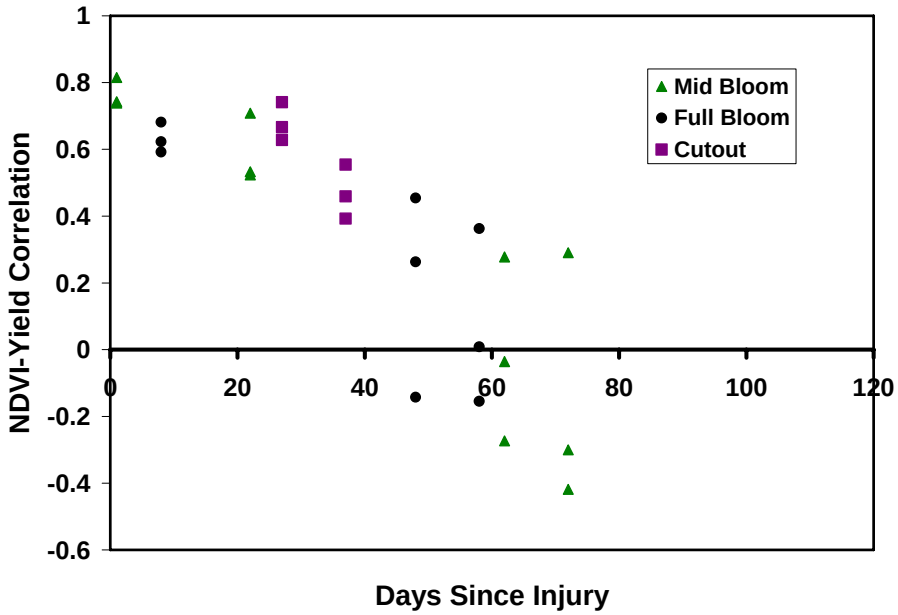


Figure 8. Correlation between NDVI readings and yield as a function of days since injury occurred for three later growth stages when injury occurred.

Though the correlation values shown in Figure 7 show some promise for estimating potential yield reduction due to dicamba application, they may not have the desired predictive capability. Assuming a linear relationship between NDVI and yield, the equation slopes for the first square application are similar for the first two sampling dates (21 and 37 day after injury). However, the equation slopes after this time are not similar. Further the equation slopes for the first bloom application also differ.

Summary

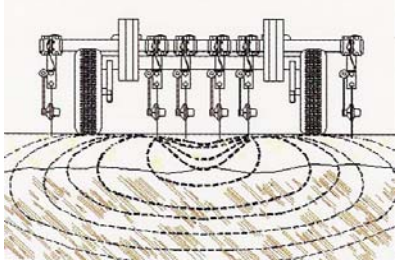
Yield reduction from dicamba injury was dependent on growth stage and rate. Cotton tended to 'grow' out' of early season damage and was less susceptible to late season injury. Mid season application during bloom caused the most severe injury.

Measuring NDVI showed some promise for assessing the degree of injury to dicamba. There was a longer time window for detecting early season injury.

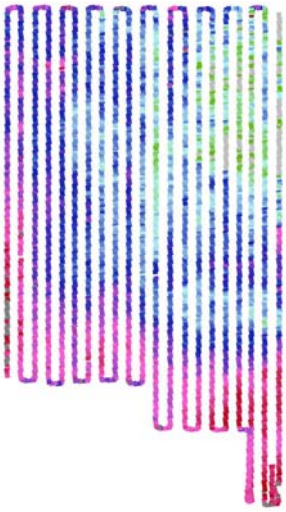
Demonstration of Veris Soil EC Mapping

The adoption of field mapping continues to increase in conjunction with the verification of the economic advantages of precision farming. Variable rate applications are based on definable differences that exist within a field. These differences can be expressed through aerial photography, zone or grid-based soil sampling, optical sensor readings, yield monitor data, or soil electrical conductivity (EC). The soil EC is a measure of how much electicity a soil can conduct. Since smaller soil particles (common with clay) conduct more electricity than larger soil particles (more prevalent in sand) it is an effective means of determining differences in soil texture. One set of coulters emits a known voltage while another set recognizes the drop in that voltage. The resulting field map can be utilized for the precision management of the differences within a field. Soil EC maps are an effective means for detecting soil texture differences which can correlate with crop yields. The map below (figure 1.) resulted from a Veris trip on April 2, 2008. The soil EC was measured on 60 foot intervals across the entire 58 acre field. Lower soil EC values correspond to the reddish or pink areas while higher soil EC relates to the green areas. The corresponding yield map shown in figure 2 was produced from an Ag Leader yield monitor in the fall of 2008. As you can see there does seem to be a significant level of correlation between the two maps. The green areas represent the highest relative yield within the field while the red areas represent the lowest yielding areas of the field.

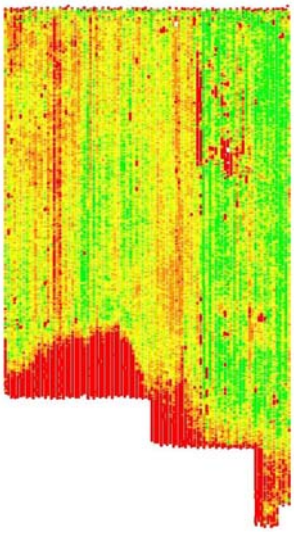
Veris Soil EC Unit



2008 Veris Soil EC Map



2008 Yield Monitor Results



Weed Control Projects

Weed control decisions continue to be an important part of cotton production in Oklahoma. The introduction of new herbicides and new seed technologies are increasing producer's options and maximizing efficiency of their operations. Our purpose is to identify the best options available to Oklahoma producers and help adapt those programs to their operation. The following trials attempt to address current or potential weed control issues important to Oklahoma cotton producers.

Incorporating Residuals into a Roundup Ready Flex Program for Morningglory Control

Planted: May 14th **Variety:** FM 9063 B2F **Soil Type:** Clay loam **Location:** OSU

						9/1/2008				11/12/2008			
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	% Pigweed Control		% MG Control		Gin %		Lint Yield lbs/Acre	
1	untreated check					0	b	0	b	0	g	0	d
2	Treflan	1	qt/a	PPI	A	100	a	83.8	a	0.225	d	1433.4	bc
	Caparol	3.2	pt/a	PRE	B								
	Roundup Powermax	32	oz/a	EP-4lf	D								
	Roundup Powermax	32	oz/a	MP	E								
	Staple LX	1.8	oz/a	MP	E								
3	Treflan	1	qt/a	PPI	A	100	a	84.5	a	0.239	b	1495.3	ab
	Roundup Powermax	22	oz/a	EP 1-2lf	C								
	Staple LX	1.8	oz/a	EP1-2lf	C								
	Roundup Powermax	32	oz/a	MP	E								
	Staple LX	1.8	oz/a	MP	E								
4	Treflan	1	qt/a	PPI	A	100	a	85.3	a	0.221	e	1363.4	c
	Caparol	3.2	pt/a	PRE	B								
	Roundup Powermax	32	oz/a	EP-4lf	D								
	Roundup Powermax	32	oz/a	MP	E								
	Staple LX	3.8	oz/a	MP	E								
5	Treflan	1	qt/a	PPI	A	100	a	84.5	a	0.217	f	1383.6	c
	Caparol	3.2	pt/a	PRE	B								
	Roundup Powermax	32	oz/a	EP-4lf	D								
	Roundup Powermax	32	oz/a	MP	E								
	Dual Magnum	1	pt/a	MP	E								
	Aim	1	oz/a	LP	F								
	Direx	1	qt/a	LP	F								
	Crop Oil Concentrate	1	% v/v	LP	F								
6	Treflan	1	qt/a	PPI	A	100	a	83.3	a	0.248	a	1598.8	a
	Caparol	3.2	pt/a	PRE	B								
	Roundup Powermax	32	oz/a	EP-4lf	D								
	Roundup Powermax	32	oz/a	MP	E								
	Dual Magnum	1	pt/a	MP	E								
	Roundup Powermax	32	oz/a	LP	F								
	Staple LX	3	oz/a	LP	F								
7	Treflan	1	qt/a	PPI	A	100	a	85	a	0.233	c	1517.3	ab
	Roundup Powermax	32	oz/a	Anytime	CDEF								
8	Roundup Powermax	32	oz/a	Anytime	CDEF	100	a	83.3	a	0.221	e	1417.5	bc
LSD (P=.05)						0		4.73		0		109.78	
CV						0		4.37		0		5.85	

Means followed by same letter do not significantly differ (P=.05, LSD)

Incorporating Residuals into a Roundup Ready Flex Program for Morningglory Control (cont.)

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	Fiber Mic	Fiber Length	Fiber Uniform	Fiber Strength
1	untreated check					0	0	0	0
2	Treflan	1	qt/a	PPI	A	3.9	1.22	83.3	35.1
	Caparol	3.2	pt/a	PRE	B				
	Roundup Powermax	22	oz/a	EP-4lf	D				
	Roundup Powermax	32	oz/a	MP	E				
	Staple LX	1.8	oz/a	MP	E				
3	Treflan	1	qt/a	PPI	A	4.4	1.23	83.4	33.2
	Roundup Powermax	22	oz/a	EP 1-2lf	C				
	Staple LX	1.8	oz/a	EP1-2lf	C				
	Roundup Powermax	32	oz/a	MP	E				
	Staple LX	1.8	oz/a	MP	E				
4	Treflan	1	qt/a	PPI	A	3.9	1.21	82.6	34.2
	Caparol	3.2	pt/a	PRE	B				
	Roundup Powermax	22	oz/a	EP-4lf	D				
	Roundup Powermax	32	oz/a	MP	E				
	Staple LX	3.8	oz/a	MP	E				
5	Treflan	1	qt/a	PPI	A	4.2	1.24	84.3	34.9
	Caparol	3.2	pt/a	PRE	B				
	Roundup Powermax	22	oz/a	EP-4lf	D				
	Roundup Powermax	32	oz/a	MP	E				
	Dual Magnum	1	pt/a	MP	E				
	Aim	1	oz/a	LP	F				
	Direx	1	qt/a	LP	F				
	Crop Oil Concentrate	1	% v/v	LP	F				
6	Treflan	1	qt/a	PPI	A	4.1	1.17	81.7	34.7
	Caparol	3.2	pt/a	PRE	B				
	Roundup Powermax	22	oz/a	EP-4lf	D				
	Roundup Powermax	32	oz/a	MP	E				
	Dual Magnum	1	pt/a	MP	E				
	Roundup Powermax	32	oz/a	LP	F				
	Staple LX	3	oz/a	LP	F				
7	Treflan	1	qt/a	PPI	A	4.2	1.25	83.8	33.9
	Roundup Powermax	32	oz/a	Anytime	CDEF				
8	Roundup Powermax	32	oz/a	Anytime	CDEF	4.5	1.21	83.2	32.9
LSD (P=.05)									
CV									

Means followed by same letter do not significantly differ (P=.05, LSD)

Incorporating Residuals into a Roundup Ready Flex Program for Morningglory Control (cont.)

	Application Description					
	A	B	C	D	E	F
Application Date:	5/2/2008	5/14/2008	5/30/2008	6/24/2008	7/10/2008	7/24/2008
Time of Day:	9:00 AM	8:00 AM	8:00 AM	10:00 AM	9:00 AM	11:30 AM
Application Method:	Spray	Spray	Spray	Spray	Spray	Spray
Application Timing:	PPI	Preemerge	EP 1-2lf	EP 4-5lf	MidPost	LatePost
Application Placement:	Broadcast	Broadcast	Broadcast	Broadcast	Broadcast	Directed
Applied By:	OSU	OSU	OSU	OSU	OSU	OSU
Air Temperature, Unit:	58 F	60 F	75 F	77 F	74 F	88 F
% Relative Humidity:	38	71	65	58	88	52
Wind Velocity, Unit:	6.5 mph	7 mph	8 mph	7 mph	7 mph	8 mph
Wind Direction:	West	NE	S	SSE	S	SSW
Soil Temperature, Unit:	64 F	61 F	68 F	73 F	71 F	82 F
Soil Moisture:	Good	Good	Good	Good	Good	Good
% Cloud Cover:	0	75	0	70	20	0
Appl. Equipment:	Lee Spider	Lee Spider	Lee Spider	Lee Spider	Lee Spider	RedballHood
Operating Pressure, Unit:	26 PSI	26 PSI	26 PSI	26 PSI	26 PSI	26 PSI
Nozzle Type:	TurboTee	TurboTee	TurboTee	TurboTee	TurboTee	TurboTee
Nozzle Size:	110015	110015	110015	110015	110015	11002/001
Nozzle Spacing, Unit:	20 in	20 in	20 in	20 in	20 in	20 in
Nozzles/Row:	2	2	2	2	2	2
Ground Speed, Unit:	4 mph	4 mph	4 mph	4 mph	4 mph	4 mph
Incorporation Equip.:	Lilliston	Lilliston	Lilliston	Lilliston	Lilliston	Lilliston
Hours to Incorp.:	0.2					
Incorp. Depth, Unit:	1.5 in					
Carrier:	water	water	water	water	water	water
Spray Volume, Unit:	10 GPA	10 GPA	10 GPA	10 GPA	10 GPA	15 GPA
Propellant:	Comp. Air	Comp. Air	Comp. Air	Comp. Air	Comp. Air	Comp. Air

Controlling Volunteer Glyphosate Tolerant Cotton

Planted: May 14th **Variety:** FM 9063 B2F **Soil Type:** Clay loam **Location:** OSU

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	7/1/2008 Volunteer Control %		8/14/2008 Volunteer Control %	
1	Untreated Check					0	f	0	d
2	Gramoxone Inteon	24	oz/a	6-8lf	A	90.5	b	23.8	c
	Induce	0.5	% v/v	6-8lf	A				
3	Ignite	28	oz/a	6-8lf	A	28.8	e	28.8	c
	Induce	0.5	% v/v	6-8lf	A				
4	Aim	1	oz/a	6-8lf	A	80	c	86.3	a
	Crop Oil Concentrate	1	% v/v	6-8lf	A				
5	Aim	1.5	oz/a	6-8lf	A	81.3	c	93.8	a
	Crop Oil Concentrate	1	% v/v	6-8lf	A				
6	ET	2	oz/a	6-8lf	A	75	d	26.3	c
	Crop Oil Concentrate	1	% v/v	6-8lf	A				
7	Valor	2	oz/a	6-8lf	A	95	a	31.3	c
	Crop Oil Concentrate	1	% v/v	6-8lf	A				
8	Blizzard	1.25	oz/a	6-8lf	A	96.3	a	52.5	b
	Crop Oil Concentrate	1	% v/v	6-8lf	A				
LSD (P=.05)						3.97		8.47	
CV						3.95		13.46	

Means followed by same letter do not significantly differ (P=.05, LSD)

Controlling Volunteer Glyphosate Tolerant Cotton (cont.)

Application Description	A
Application Date:	6/24/2008
Time of Day:	9:30 AM
Application Method:	Spray
Application Timing:	5-7 Leaf
Application Placement:	Broadcast
Applied By:	OSU
Air Temperature, Unit:	75 F
% Relative Humidity:	63
Wind Velocity, Unit:	8 mph
Wind Direction:	SSE
Soil Temperature, Unit:	73 F
Soil Moisture:	Good
% Cloud Cover:	40
Appl. Equipment:	Lee Spider
Operating Pressure, Unit:	26 PSI
Nozzle Type:	TurboTee
Nozzle Size:	11002
Nozzle Spacing, Unit:	20 in
Nozzles/Row:	2
Ground Speed, Unit:	4 mph
Carrier:	water
Spray Volume, Unit:	15 GPA
Propellant:	Comp. Air

Cotton Incorporated State Support Projects
Morningglory Control Comparison
Roundup Ready System vs. Roundup Flex System
And
Horseweed Control Demonstrations in Limited Tillage Cotton

Morningglory Project

Fibermax cotton varieties 960 B2R and 9063 B2F were both planted on the 14th of May, 2008 into 48 row by 800 foot blocks. Separate weed control systems were applied to each block according to their inherent transgenic nature. Each block received six three inch irrigations beginning June 27th and ending August 28th. Thrips and fleahoppers were controlled in-season with Temik and Vydate ,respectively. Plots received Finish plus Def plus Ginstar for harvest preparation approximately two weeks prior to harvest. Plots were harvested on November 11th, 2008. A John Deere 484 brush stripper was used in combination with scales mounted on a boll buggy. Three 4 row by 800 foot strips were harvested from each block in order to obtain an average yield sample. Samples were taken from each of these strips and ginned separately for turnouts. Fiber samples were taken from each yield sample and sent to the Texas Tech University Fiber and Biopolymer Research Institute where HVI analysis was performed. Fiber data was combined with the yield information in order to get a gross return for each system. Herbicide program costs of each system were applied to these gross returns in order to obtain a partial net return herbicide system.

The Roundup Ready system allows broadcast over-the-top applications of glyphosate prior to cotton emergence and up to the 4-leaf growth stage. Once cotton has past this growth stage glyphosate applications must be directed away from crop foliage in order to prevent fruit loss. Therefore this system utilized glyphosate applications up to the 4th true leaf and incorporated Staple herbicide mid-way through the season for both burndown and residual control of annual (mostly pitted and entireleaf) morningglory. No additional applications were required for morningglory control.

The Roundup Flex system allows for broadcast over-the-top applications of glyphosate both prior to cotton emergence and throughout the entire season without any fruiting losses. Therefore this system utilized glyphosate on an as-needed basis to control morningglory through the end of July. An additional late season application was not required.

Morningglory Control with Roundup Ready System

Planting Date: **5/14/08**
Variety: **FM 960 B2R**

In-season Weed Control Program

Date	Product	Herbicide Cost/Acre
5-30	Broadcast at 10 GPA	
	32 oz/A - Roundup Original Max	$8.40
	2 qt/100 – Accuquest	$1.32
6-12	Broadcast at 10 GPA	
	32 oz/A - Roundup Original Max	$8.40
	2 qt/100 – Accuquest	$1.32
7-23	Broadcast at 15 GPA	
	3.8 oz/A - Staple LX	$24.43
	1 gal/100 – Crop Oil	$1.15
	Seed + Technology	$43.00

Total Herbicide System Cost
For Roundup Ready System: $89.34

Yield: 1249 lbs/Acre
Avg. Loan: $0.5455
Gross Return: $ 681.33

Net Return to herbicide program: **$591.99**

Morningglory Control with the Roundup Flex System

Planting Date: **5/14/07**
Variety: **FM 9063 B2F**

In-season Weed Control Program

Date	Product	Herbicide Cost/Acre
5-31	Broadcast at 10 GPA	
	32 oz/A - Roundup Original Max	$8.40
	3 qt/100 – Accuquest	$1.32
6-12	Broadcast at 10 GPA	
	32 oz/A - Roundup Original Max	$8.40
	3 qt/100 – Accuquest	$1.32
7-23	Broadcast at 10 GPA	
	32 oz/A - Roundup Original Max	$8.40
	2 qt/100 – Accuquest	$1.32
	Seed + Technology	$63.00

Total Herbicide System Cost
For Roundup Ready Flex System: $92.21

Yield: 1239 lbs/Acre
Avg Loan: $0.5455
Gross Revenue: $675.87

Net Returns to herbicide program: $583.66

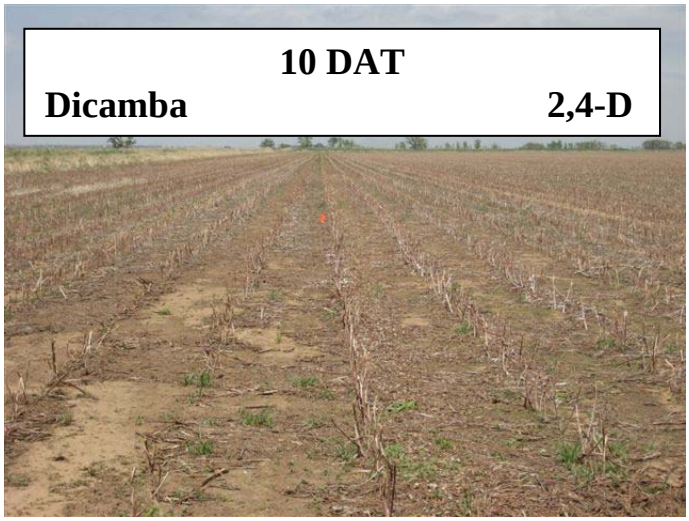
Horseweed Control Demonstrations in Limited Tillage Cotton

Tillman County Location-Roger Fisher

Treatments Applied: 4-8-08 Plot Size: 24 Rows x ¼ mile
App. Info: 15 GPA, 5 mph, 30PSI Nozzles: XR-TJ -11003

Trt #	Product(s) Applied	Herb. $	% Control 14 DAT	30 DAT
1	24 oz/A Glyphos Extra 24 oz/A 2,4-D (LV6) 2 qt/100 Accuquest (Amm.Sulf.) 1 qt/100 Induce (NIS)	$15.46	70	100
2	24 oz/A Glyphos Extra 8 oz/A Banvel 2 qt/100 Accuquest (Amm.Sulf.) 1 qt/100 Induce (NIS)	$17.81	75	95

*Producer followed these treatments with 22 oz/A of Roundup Powermax at planting.

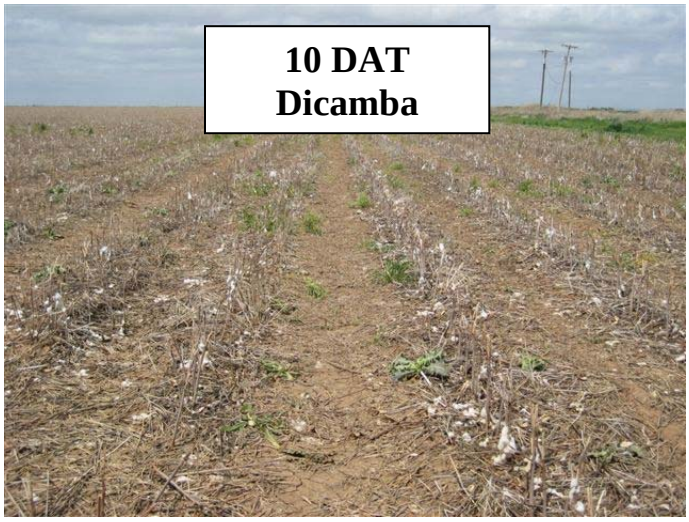


Jackson County Location-Felty Farms-Grider

Treatments Applied: 4-8-08 Plot Size: 24 Rows x ¼ mile
App. Info: 15 GPA, 5 mph, 30PSI Nozzles: XR-TJ -11003

Trt #	Product(s) Applied	Herb. $	% Control 14 DAT	30 DAT
1	24 oz/A Glyphos Extra 24 oz/A 2,4-D (LV6) 2 qt/100 Accuquest (Amm.Sulf.) 1 qt/100 Induce (NIS)	$15.46	80	100
2	24 oz/A Glyphos Extra 8 oz/A Banvel 2 qt/100 Accuquest (Amm.Sulf.) 1 qt/100 Induce (NIS)	$17.81	85	100

*Producer followed these treatments with 22 oz/A of Roundup Powermax at planting.



Timely applications of treatments including either 2,4-D or Dicamba provided excellent control of horseweed at both the Jackson and Tillman county demonstrations. Although dicamba seemed to be slightly more effective on larger horseweed both treatments provided good control 30 days after treatment. Due to increased costs of glyphosate in 2008, the cost of the treatments observed ranged from approximately $16 to $18 per acre. If grasses are not present, it is our recommendation that the glyphosate be left out of the application which would make these treatments substantially more cost-effective.

Defoliation Projects

Conditioning cotton for harvest is a subjective issue. Yield potential and harvest method are some of the factors to be considered when developing an effective harvest aid strategy. The following projects attempt to address questions producers currently have in regards to defoliation.

Defoliation Demonstration in Irrigated Cotton-I (Williams-Tamarack)

						10/2/2008			10/9/2008		
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	Open %	Defol. %	Desicc. %	Open %	Defol. %	Desicc. %
1	Finish 6 Pro	21	oz/a	60%Open	A	96	95	0	100	98	0
	Def	16	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
2	Finish 6 Pro	21	oz/a	60%Open	A	96	95	0	100	100	0
	Ginstar	6	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
3	Finish 6 Pro	21	oz/a	60%Open	A	95	90	0	100	100	0
	Blizzard	0.6	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
4	Finish 6 Pro	21	oz/a	60%Open	A	95	80	5	100	90	0
	ET	2.5	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
5	Prep	32	oz/a	60%Open	A	94	90	0	100	85	0
	Def	16	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
6	Prep	32	oz/a	60%Open	A	86	95	0	100	98	0
	Ginstar	6	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
7	Prep	32	oz/a	60%Open	A	91	75	0	100	85	0
	Blizzard	0.6	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
8	Prep	32	oz/a	60%Open	A	98	85	0	100	90	0
	ET	2.5	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						

Defoliation Demonstration in Irrigated Cotton-I (Williams-Tamarack)

Application Description	A
Application Date:	9/24/2008
Time of Day:	7:00 AM
Application Method:	Spray
Application Timing:	60-70%Op
Application Placement:	Broadcast
Applied By:	OSU
Air Temperature, Unit:	61 F
% Relative Humidity:	94
Wind Velocity, Unit:	5 mph
Wind Direction:	East
% Cloud Cover:	20
Appl. Equipment:	Lee Spider
Operating Pressure, Unit:	70 PSI
Nozzle Type:	TurboTee
Nozzle Size:	110015
Nozzle Spacing, Unit:	20 in
Nozzles/Row:	2
Ground Speed, Unit:	4 mph
Carrier:	water
Spray Volume, Unit:	14 GPA
Propellant:	Comp. Air

Defoliation Demonstration in Irrigated Cotton-II (Nichols)

						10/2/2008			10/9/2008		
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	Open %	Defol. %	Desicc. %	Open %	Defol. %	Desicc. %
1	Finish 6 Pro	21	oz/a	60%Open	A	82	95	0	96	95	0
	Def	16	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
2	Finish 6 Pro	21	oz/a	60%Open	A	81	95	0	94	100	0
	Ginstar	6	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
3	Finish 6 Pro	21	oz/a	60%Open	A	90	85	0	100	95	0
	Blizzard	0.6	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
4	Finish 6 Pro	21	oz/a	60%Open	A	93	90	5	100	100	0
	ET	2.5	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
5	Prep	32	oz/a	60%Open	A	87	95	0	100	95	0
	Def	16	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
6	Prep	32	oz/a	60%Open	A	88	90	0	100	95	0
	Ginstar	6	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
7	Prep	32	oz/a	60%Open	A	92	75	0	100	85	0
	Blizzard	0.6	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
8	Prep	32	oz/a	60%Open	A	92	85	0	100	90	0
	ET	2.5	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						

Defoliation Demonstration in Irrigated Cotton-II (Nichols)

Application Description

	A
Application Date:	9/24/2008
Time of Day:	7:30 AM
Application Method:	Spray
Application Timing:	60-70%Op
Application Placement:	Broadcast
Applied By:	OSU
Air Temperature, Unit:	61 F
% Relative Humidity:	94
Wind Velocity, Unit:	5 mph
Wind Direction:	East
% Cloud Cover:	20
Appl. Equipment:	Lee Spider
Operating Pressure, Unit:	70 PSI
Nozzle Type:	TurboTee
Nozzle Size:	110015
Nozzle Spacing, Unit:	20 in
Nozzles/Row:	2
Ground Speed, Unit:	4 mph
Carrier:	water
Spray Volume, Unit:	14 GPA
Propellant:	Comp. Air

Defoliation Demonstration in Irrigated Cotton-III (Williams-Ag Barn)

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	10/2/2008 Open %	10/2/2008 Defol. %	10/2/2008 Desicc. %	10/9/2008 Open %	10/9/2008 Defol. %	10/9/2008 Desicc. %
1	Finish 6 Pro	21	oz/a	60%Open	A	94	90	5	100	100	0
	Def	16	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
2	Finish 6 Pro	21	oz/a	60%Open	A	93	85	10	100	100	0
	Ginstar	6	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
3	Finish 6 Pro	21	oz/a	60%Open	A	95	85	5	100	90	0
	Blizzard	0.6	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
4	Finish 6 Pro	21	oz/a	60%Open	A	91	85	10	100	90	0
	ET	2.5	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
5	Prep	32	oz/a	60%Open	A	94	80	5	100	85	0
	Def	16	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
6	Prep	32	oz/a	60%Open	A	93	90	5	100	100	0
	Ginstar	6	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
7	Prep	32	oz/a	60%Open	A	94	70	5	100	90	0
	Blizzard	0.6	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
8	Prep	32	oz/a	60%Open	A	95	85	5	100	100	0
	ET	2.5	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						

Defoliation Demonstration in Irrigated Cotton-III (Williams-Ag barn)

Application Description	A
Application Date:	9/24/2008
Time of Day:	8:00 AM
Application Method:	Spray
Application Timing:	60-70%Op
Application Placement:	Broadcast
Applied By:	OSU
Air Temperature, Unit:	61 F
% Relative Humidity:	94
Wind Velocity, Unit:	5 mph
Wind Direction:	East
% Cloud Cover:	20
Appl. Equipment:	Lee Spider
Operating Pressure, Unit:	70 PSI
Nozzle Type:	TurboTee
Nozzle Size:	110015
Nozzle Spacing, Unit:	20 in
Nozzles/Row:	2
Ground Speed, Unit:	4 mph
Carrier:	water
Spray Volume, Unit:	14 GPA
Propellant:	Comp. Air

Blizzard Demonstration in Irrigated Cotton-I (OSUREC)

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	10/2/2008 Open %	10/2/2008 Defol. %	10/2/2008 Desicc. %
1	Untreated Check					68	0	0
2	Blizzard	0.5	oz/a	60% open	A	90	90	5
	Finish	21	oz/a	60% open	A			
	Crop Oil Concentrate	1	% v/v	60% open	A			
	Blizzard	0.5	oz/a	7DAIT	B			
	Crop Oil Concentrate	1	% v/v	7DAIT	B			
3	Blizzard	0.5	oz/a	60% open	A	92	80	5
	Prep	32	oz/a	60% open	A			
	Crop Oil Concentrate	1	% v/v	60% open	A			
	Blizzard	0.5	oz/a	7DAIT	B			
	Crop Oil Concentrate	1	% v/v	7DAIT	B			
4	Blizzard	0.5	oz/a	60% open	A	88	85	5
	FirstPick	56	oz/a	60% open	A			
	Crop Oil Concentrate	1	% v/v	60% open	A			
	Blizzard	0.5	oz/a	7DAIT	B			
	Crop Oil Concentrate	1	% v/v	7DAIT	B			
5	Blizzard	0.5	oz/a	60% open	A	75	85	5
	Def	12	oz/a	60% open	A			
	Crop Oil Concentrate	1	% v/v	60% open	A			
6	Finish	21	oz/a	60% open	A	84	95	0
	Def	16	oz/a	60% open	A			

Blizzard Demonstration in Irrigated Cotton-I (OSUREC) (cont.)

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	10/9/2008 Open %	Defol. %	Desicc. %	10/16/2008 Regrow %
1	Untreated Check					72	0	0	0
2	Blizzard	0.5	oz/a	60% open	A	96	100	0	15
	Finish	21	oz/a	60% open	A				
	Crop Oil Concentrate	1	% v/v	60% open	A				
	Blizzard	0.5	oz/a	7DAIT	B				
	Crop Oil Concentrate	1	% v/v	7DAIT	B				
3	Blizzard	0.5	oz/a	60% open	A	97	100	0	15
	Prep	32	oz/a	60% open	A				
	Crop Oil Concentrate	1	% v/v	60% open	A				
	Blizzard	0.5	oz/a	7DAIT	B				
	Crop Oil Concentrate	1	% v/v	7DAIT	B				
4	Blizzard	0.5	oz/a	60% open	A	100	100	0	10
	FirstPick	56	oz/a	60% open	A				
	Crop Oil Concentrate	1	% v/v	60% open	A				
	Blizzard	0.5	oz/a	7DAIT	B				
	Crop Oil Concentrate	1	% v/v	7DAIT	B				
5	Blizzard	0.5	oz/a	60% open	A	98	100	0	20
	Def	12	oz/a	60% open	A				
	Crop Oil Concentrate	1	% v/v	60% open	A				
6	Finish	21	oz/a	60% open	A	99	100	0	30
	Def	16	oz/a	60% open	A				

Blizzard Demonstration in Irrigated Cotton-I (OSUREC) (cont.)

Application Description	A
Application Date:	9/25/2008
Time of Day:	4:30 PM
Application Method:	Spray
Application Timing:	70%Open
Application Placement:	Broadcast
Applied By:	OSU
Air Temperature, Unit:	86 F
% Relative Humidity:	33
Wind Velocity, Unit:	6.8 mph
Wind Direction:	SW
Soil Temperature, Unit:	90 f
Soil Moisture:	good
% Cloud Cover:	35
Appl. Equipment:	Lee Spider
Operating Pressure, Unit:	68 PSI
Nozzle Type:	TurboTeej
Nozzle Size:	110015
Nozzle Spacing, Unit:	20 in
Nozzles/Row:	2
Ground Speed, Unit:	4 mph
Carrier:	water
Spray Volume, Unit:	14 GPA
Mix Size, Unit:	1

Blizzard Demonstration in Irrigated Cotton-II (WOSC)

						10/2/2008		
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	Open %	Defol %	Desicc %
1	Untreated Check					81	0	0
2	Blizzard	0.5	oz/a	60% open	A	94	65	20
	Finish	21	oz/a	60% open	A			
	Crop Oil Concentrate	1	% v/v	60% open	A			
	Blizzard	0.5	oz/a	7DAIT	B			
	Crop Oil Concentrate	1	% v/v	7DAIT	B			
3	Blizzard	0.5	oz/a	60% open	A	91	50	20
	Prep	32	oz/a	60% open	A			
	Crop Oil Concentrate	1	% v/v	60% open	A			
	Blizzard	0.5	oz/a	7DAIT	B			
	Crop Oil Concentrate	1	% v/v	7DAIT	B			
4	Blizzard	0.5	oz/a	60% open	A	95	50	20
	FirstPick	56	oz/a	60% open	A			
	Crop Oil Concentrate	1	% v/v	60% open	A			
	Blizzard	0.5	oz/a	7DAIT	B			
	Crop Oil Concentrate	1	% v/v	7DAIT	B			
5	Blizzard	0.5	oz/a	60% open	A	95	50	20
	Def	12	oz/a	60% open	A			
	Crop Oil Concentrate	1	% v/v	60% open	A			
6	Finish	21	oz/a	60% open	A	85	85	15
	Def	16	oz/a	60% open	A			

Blizzard Demonstration in Irrigated Cotton-II (WOSC) (cont.)

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	10/9/2008 Open %	10/9/2008 Defol %	10/9/2008 Desicc %	10/16/2008 Regrow %
1	Untreated Check					72	0	0	0
2	Blizzard	0.5	oz/a	60% open	A	95	90	0	15
	Finish	21	oz/a	60% open	A				
	Crop Oil Concentrate	1	% v/v	60% open	A				
	Blizzard	0.5	oz/a	7DAIT	B				
	Crop Oil Concentrate	1	% v/v	7DAIT	B				
3	Blizzard	0.5	oz/a	60% open	A	97	90	0	15
	Prep	32	oz/a	60% open	A				
	Crop Oil Concentrate	1	% v/v	60% open	A				
	Blizzard	0.5	oz/a	7DAIT	B				
	Crop Oil Concentrate	1	% v/v	7DAIT	B				
4	Blizzard	0.5	oz/a	60% open	A	98	85	0	15
	FirstPick	56	oz/a	60% open	A				
	Crop Oil Concentrate	1	% v/v	60% open	A				
	Blizzard	0.5	oz/a	7DAIT	B				
	Crop Oil Concentrate	1	% v/v	7DAIT	B				
5	Blizzard	0.5	oz/a	60% open	A	98	90	0	20
	Def	12	oz/a	60% open	A				
	Crop Oil Concentrate	1	% v/v	60% open	A				
6	Finish	21	oz/a	60% open	A	98	98	0	25
	Def	16	oz/a	60% open	A				

Blizzard Demonstration in Irrigated Cotton-II (WOSC)

Application Description

	A	B
Application Date:	9/25/2008	11/2/2008
Time of Day:	3:30 PM	3:00 PM
Application Method:	Spray	Spray
Application Timing:	70%Open	7 DAIT
Application Placement:	Broadcast	Broadcast
Applied By:	OSU	OSU
Air Temperature, Unit:	82 F	78 F
% Relative Humidity:	37	45
Wind Velocity, Unit:	5.8 mph	4 mph
Wind Direction:	SE	S
Soil Temperature, Unit:	88 f	86 F
Soil Moisture:	good	good
% Cloud Cover:	40	30
Appl. Equipment:	Lee Spider	Lee Spider
Operating Pressure, Unit:	68 PSI	68 PSI
Nozzle Type:	TurboTeej	TurboTeej
Nozzle Size:	110015	110015
Nozzle Spacing, Unit:	20 in	20 in
Nozzles/Row:	2	2
Ground Speed, Unit:	4 mph	4 mph
Carrier:	water	water
Spray Volume, Unit:	14 GPA	14 GPA
Mix Size, Unit:	1	1

Effective Harvest Aid Programs in Irrigated Cotton

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	10/2/2008 OpenBoll %		10/2/2008 Defol. %		10/2/2008 Desicc. %	
1	Untreated Check					72.8	d	0	d	0	a
2	Finish 6 Pro	21	oz/a	60%Open	A	90	a	83.8	a	1.3	a
	Def	16	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
3	Finish 6 Pro	21	oz/a	60%Open	A	88.5	ab	86.3	a	1.3	a
	Ginstar	6	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
4	Finish 6 Pro	21	oz/a	60%Open	A	84.3	bc	72.5	b	0	a
	Blizzard	0.6	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
5	Prep	32	oz/a	60%Open	A	81.3	c	70	b	1.3	a
	ET	2.5	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
6	Prep	32	oz/a	60%Open	A	81	c	65	b	0	a
	Def	16	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
7	Prep	32	oz/a	60%Open	A	88.8	ab	85	a	2.5	a
	Ginstar	6	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
8	Prep	32	oz/a	60%Open	A	85	abc	56.3	c	0	a
	Blizzard	0.6	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
9	Prep	32	oz/a	60%Open	A	89.3	ab	53.8	c	2.5	a
	ET	2.5	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
LSD (P=.05)							5.45		8.61		3.7
CV							4.42		9.28		260.69

Means followed by same letter do not significantly differ (P=.05, LSD)

Effective Harvest Aid Programs in Irrigated Cotton (cont.)

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Code	10/9/2008 OpenBoll %		Defol. %		Desicc. %	
1	Untreated Check					84.3	ab	0	f	0	a
2	Finish 6 Pro	21	oz/a	60%Open	A	100	a	85	bc	0	a
	Def	16	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
3	Finish 6 Pro	21	oz/a	60%Open	A	100	a	90.8	ab	0	a
	Ginstar	6	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
4	Finish 6 Pro	21	oz/a	60%Open	A	74.5	b	80	cd	0	a
	Blizzard	0.6	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
5	Prep	32	oz/a	60%Open	A	95.8	ab	80	cd	0	a
	ET	2.5	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
6	Prep	32	oz/a	60%Open	A	96	ab	76.3	de	0	a
	Def	16	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
7	Prep	32	oz/a	60%Open	A	100	a	91.3	a	0	a
	Ginstar	6	oz/a	60%Open	A						
	Induce	0.25	% v/v	60%Open	A						
8	Prep	32	oz/a	60%Open	A	96.8	ab	72.5	e	0	a
	Blizzard	0.6	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
9	Prep	32	oz/a	60%Open	A	100	a	75	de	0	a
	ET	2.5	oz/a	60%Open	A						
	Crop Oil Concentrate	1	% v/v	60%Open	A						
LSD (P=.05)						22.82		6.17		0	
CV						16.61		5.84		0	

Means followed by same letter do not significantly differ (P=.05, LSD)

Effective Harvest Aid Programs in Irrigated Cotton

Application Description	A
Application Date:	9/24/2008
Time of Day:	9:00 AM
Application Method:	Spray
Application Timing:	60-70%Op
Application Placement:	Broadcast
Applied By:	OSU
Air Temperature, Unit:	68 F
% Relative Humidity:	94
Wind Velocity, Unit:	6 mph
Wind Direction:	East
% Cloud Cover:	20
Appl. Equipment:	Lee Spider
Operating Pressure, Unit:	70 PSI
Nozzle Type:	TurboTee
Nozzle Size:	110015
Nozzle Spacing, Unit:	20 in
Nozzles/Row:	2
Ground Speed, Unit:	4 mph
Carrier:	water
Spray Volume, Unit:	14 GPA
Propellant:	Comp. Air

Variable Rate PGR and Defoliation with Optical Sensors

Randy Taylor, Shane Osborne, J.C. Banks, Geetika Dilawari, Nathan Helm, and Jeffrey Vitale
Oklahoma State University

Variable rate applications are traditionally based on prescriptions developed from prior field mapping activities. This project attempts to utilize real-time, on-the-go NDVI (normalized difference vegetative index) produced from optical sensors. The GreenSeeker RT 200 sensor system was utilized for this project. The project included the following 4 treatments replicated 3 times within the field: Treatment 1 was a uniform application of PGR followed by a uniform application of defoliant; treatment 2 was a uniform PGR application followed by variable rate defoliation; treatment 3 was variable rate PGR followed by uniform defoliation; and treatment 4 was variable rate PGR followed by variable rate defoliation. The variable rate prescriptions were developed from small plot data relating NDVI to various plant parameters and hand held sensor data taken at the time of application. The uniform PGR treatment consisted of 12 oz/A of Pentia at 10 GPA. The uniform defoliation program consisted of 1.5 pt/A of Finish 6 Pro plus 1.1 pt/A Def at 12 GPA. Real-time, on-the-go sensor data was translated by a PDA running the "RT Commander" software available from NTECH industries. The software program receives the NDVI data from the sensors and assigns a specific water volume to be sprayed based on the NDVI value. In other words, an average NDVI value most likely results in a water volume consistent with a uniform application (10 GPA for the PGR or 12 GPA for the defoliant), while an above average NDVI reading most likely resulted in a water volume above the uniform application. Two different rate controller systems were used for the project. The PGR applications were made with a Mid-Tech TASC 6300 controller system while the defoliation program utilized a Raven 440 controller system. Figures 1 and 2 depict some of the harvest aid application information. Figure 1 identifies the relationship between water volume and NDVI, while figure 2 presents the relationship between "percent open bolls" and NDVI.

Figure 1. Application rate and NDVI

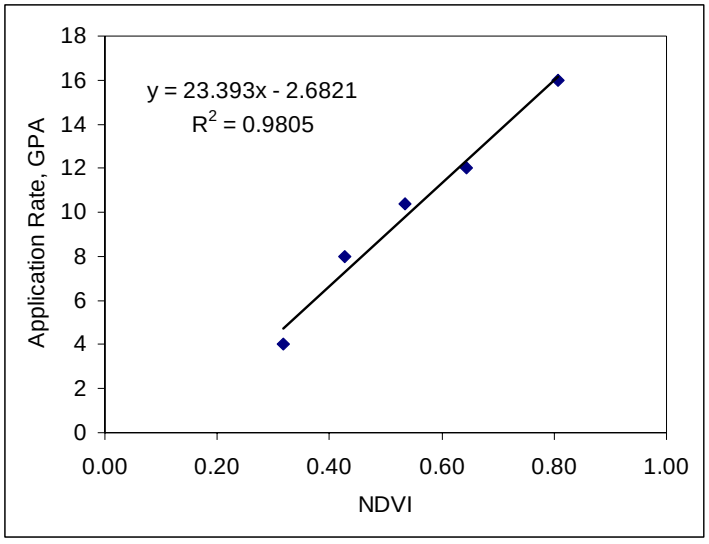


Figure 2. Percent open bolls and NDVI

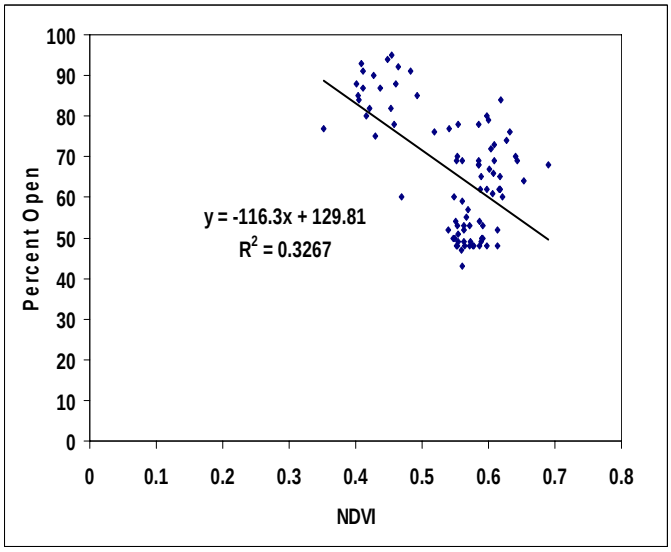


Figure 3 below presents the two variable rate prescriptions used for each application. For the variable rate PGR application, any NDVI readings below 0.6 received 5 GPA (or ½ of the uniform rate), while sensor-based NDVI of 0.8 or above resulted in a 12 GPA rate. Similarly, NDVI readings of approximately 0.3 or below resulted in a defoliation application at 8 GPA (below the uniform rate), while 16 GPA was applied to areas where the sensor-based NDVI was 0.7 or above.

Figure 3. Variable Rate Prescriptions

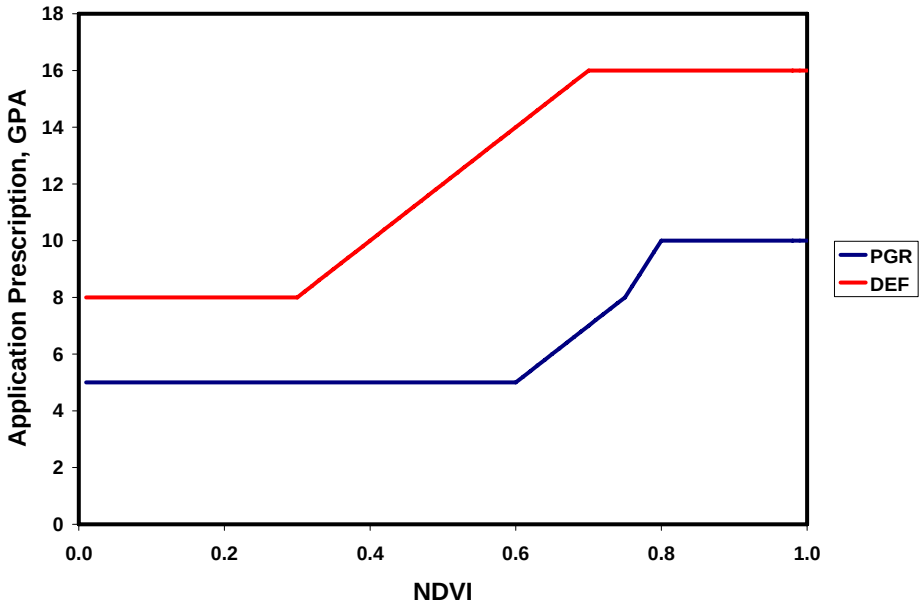


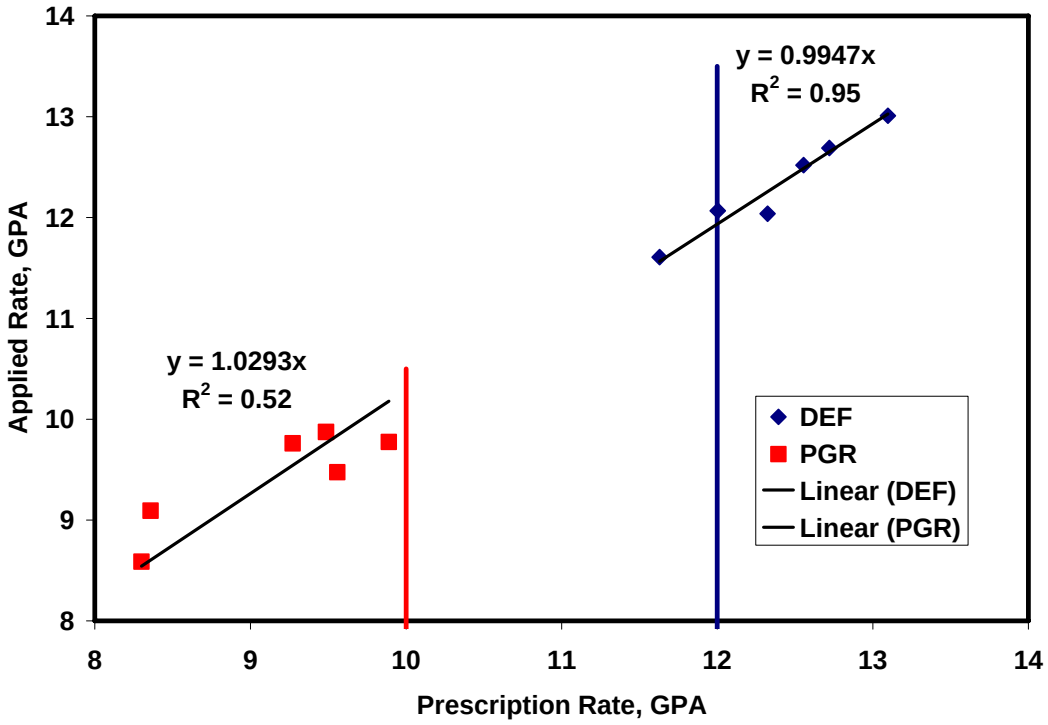
Figure 4 presents the seed-cotton yields produced from each treatment. There were no significant differences between any treatment evaluated.

Figure 4. Seed-cotton yield results by treatment

TRT	PGR	DEF	Yield	PGR Rx	PGR	DEF Rx	DEF
1	U	U	4213	10	10.0	12.0	12.0
2	U	V	4137	10	10.0	12.4	12.4
3	V	U	4340	9.0	9.4	12.0	12.0
4	V	V	4170	9.3	9.4	12.3	12.3

Figure 5 below indicates the level of accuracy achieved with each different rate controller. The PGR application made with the Mid-Tech TASC 6300 system is represented on the left with the red points. The correlation between prescribed and as-applied rates for this system was 0.52. The defoliation application was made with the Raven 440 rate controller and this information is presented on the right (blue points). The correlation between prescribed and as-applied rates for this system was 0.96.

Figure 5. Variable Rate Application Accuracy



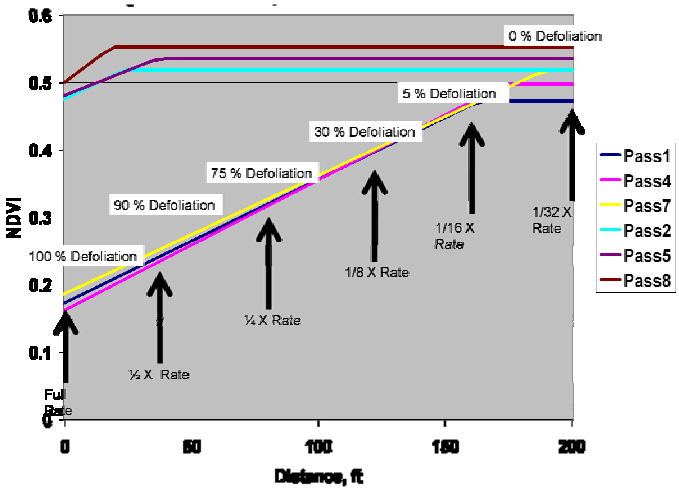
Evaluation of Variable Rate Defoliation with Optical Sensors

Shane Osborne, Dr. J.C. Banks, Dr. Randy Taylor, Nathan Helm and Elizabeth Wallace

Variable rate technology has been available for several years now, however the majority of these systems are based on a "prescription theory" developed prior to application. These prescriptions are typically developed from one the following three observations: soil sampling maps, aerial or satellite imagery, and/or previous year's yield monitor data. Although these methods have proven effective in many instances, all of these variables are typically measured well before application time and may not adequately reflect current crop conditions. The ability to utilize real-time, up-to-date information for these prescriptions could offer an advantage over traditional methods used for developing variable rate prescriptions. Optical sensors may be effective at predicting current, real-time differences in crop health or conditions. Optical sensors have been utilized in many crops and have proven effective at providing real-time information that may characterize differences within a field. Utilizing these sensors (GreenSeeker sensors, figure 1) in order to develop a prescription based on real-time information could offer an advantage over traditional methods. Therefore this project was established in order to explore the potential correlation that may exist between optical sensor readings and a maturing cotton crop. A replicated experiment was established utilizing a logarithmic spray system which applies a continuously variable rate of cotton defoliants in a four row by 200 foot strip. The logarithmic sprayer reduces the application rate by 50% for every 40 feet of travel. Therefore the initial application rate (which was a standard defoliation recommendation) is gradually reduced to 20% of the original rate over the course of each 200 foot strip. These logarithmic applications were made at three different maturity timings (40% open bolls, 70% open bolls, and 100% open bolls). Crop conditions were analyzed with optical sensors at various times post-application. Defoliation levels and will be recorded at five specific locations within each strip each time the optical sensors are utilized. The data produced from the optical sensors will then compared to physical measurements and visual observations within each plot to identify any correlation between defoliation levels and sensor data. This information will be valuable when developing real-time variable rate defoliation prescriptions in the future.

Figure 1. GreenSeeker Sensor System

Figure 2. Relationship between NDVI and Variable Defoliation



Evaluating Field Trial Data

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Field Trials can provide helpful information to producers as they compare products and practices for their operations. But field trials must be evaluated carefully to make sure results are scientifically sound, not misleading and indicate realistic expectations for on-farm performance.

This fact sheet is designed to give you the tools to help you determine whether data from a field trial is science fact or science fiction.

What are the best sources of field trial data?

Field trials are conducted by a broad range of individuals and institutions, including universities, ag input suppliers, chemical and seed companies and growers themselves. All are potentially good sources of information.

What are the common types of field trials?

Most field trials fall into one of two categories: side-by-side trials (often referred to as strip trials) or small-plot replicated trials. Side-by-side trials are the most common form of on-farm tests. As the name suggests, these trials involve testing practices or products against one another in plots arrayed across a field, often in strips the width of the harvesting equipment.

These strips should be replicated across the field or repeated at several locations to increase reliability. Small-plot replicated trials often are conducted by universities and companies at central locations because of the complexity of managing them and the special planting and harvesting equipment often required.

Replicated treatments increase the reliability of an experiment. They compare practices or products against one another multiple times under uniform growing conditions in several randomized small plots in the same field or location.

Small-plot replicated trials also may be conducted on farmers' fields where special conditions exist, for example, a weed infestation that does not occur on an experiment station.

Are side-by-side plots more valuable than small-plot replicated trials, or vice versa?

Both types of plots can provide good information. The key is to evaluate the reliability of the data. It is also important to consider the applicability of the trial to your farming operation.

When is plot data valid, and when isn't it?

There isn't a black-and-white answer to that questions. But there are good rules of thumb that can help guide you. Consider these three field trial scenarios:

Scenario 1:

A single on-farm side-by-side trial comparing 10 varieties. Each variety is planted in one strip the width of the harvesting equipment and is 250 to 300 feet long.

What you can learn:

This trial will allow you to get a general feel for each variety or hybrid in the test, including how it grows and develops during the season.

However, this trial, by itself, probably won't be able to reliably measure differences in yield. This is because variability within the field, even if it appears to be relatively uniform, may be large enough to cause yield variations that mask genetic difference among the varieties. Other varietal characteristics, such as maturity or micronaire in cotton, can also be masked by soil variation.

Scenario 2:

Yield data from side-by-side variety trials conducted on the same varieties on multiple farms in your region.

What you can learn:

When data from multiple side-by-side trials are considered together, reliability increases. In this case, the more trials comparing the same varieties, the better. As you go from three to five to 10 or more locations, the certainty goes up that yield differences represent genetic differences and not field variability. Be aware, however, that small differences between treatments (in this case varieties) may still be within the margin of random variability of the combined trial and may not indicate actual genetic differences. One treatment will almost always be numerically higher. Statistical analysis helps determine if differences are significant (consistent).

Scenario 3:

A university-style small-block replicated trial comparing the same 10 varieties.

What can you learn:

Data from such trials, if they are designed well and carried out precisely, generally are reliable. This is, the results

generally determine the yield potential of crop varieties. However, it is still important to consider whether results are applicable to your farming operation and are consistent with other research.

How do I know whether differences in yield, for example, are real and not caused by field variability or sloppy research?

Scientists use statistical analysis to help determine whether differences are real or are the result of experimental error, such as field variation. The two most commonly used statistics are **Least Significant Difference (LSD)** and the **Coefficient of Variation (CV)**, both of which can provide insight on the validity of trial data. If these values aren't provided with trial results, ask for them.

Least Significant Difference (LSD) is the minimum amount that two varieties must differ to be considered significantly different. Consider a trial where the LSD for yield is four bushels per acre. If one variety yields 45 bushels per acre and another yields 43 bushels per acre, the two are not statistically different in yield. The difference in their yields is due to normal field variation, not to their genetics. In this example, a variety that yields 45 bushels per acre is significantly better than those yielding less than 41 bushels per acre. In many research trials, LSDs are calculated at confidence level of 75 to 95 percent. For example, a confidence level of 95 percent means you can be 95 percent certain that yield differences greater than the LSD amount are due to genetics and not to plot variability.

Coefficient of Variation (CV) measures the relative amount of random experimental variability not accounted for in the design of a test. It is expressed as a percent of the overall average of the test.

For measuring yield differences, CV's of up to five percent are considered excellent; 5.1 to 10 percent are considered good; and 10.1 to 15 percent are fair.

A high CV means there must be larger differences among treatments to conclude that significant differences exist. The bottom line: <u>When considering yield test data, be skeptical when the CV exceeds 15 percent.</u>

Is a one-year test valid, or are several years of results necessary to know whether one product or practice is superior to another?

In an ideal world, having several years of tests to verify use of a practice or product is best. But where changes are rapid, such as with crop varieties, having university data from multiple years isn't always possible.

When multi-year university data aren't available, pay more careful attention to statistical measures like CV and LSD, and the number of locations and testing environments.

Multi-year data on yield and performance can also be requested from the developers of new products prior to university testing. In either case, be cautious about making major production changes and trying large acreages of a given variety based on one year's data.

How should I evaluate trial results that are markedly different from other research in my area?

When research results are at odds with the preponderance of scientific evidence, examine the new research with extra care.

Pay special attention to factors that might have influenced the outcome, such as soil type, planting date, soil moisture and other environmental conditions, and disease, insect and weed pressures. For example, was the growing season unusually wet or unusually dry? When was it dry or wet? What was the crop growth stage when it was wet or dry?

Was there a disease that affected one variety or hybrid more than another one? Were there insect problems? Could this have influenced the trial's outcome and its applicability to your operation? If you determine that unusual circumstances affected the outcome, be cautious about how you use the results.