ON-FARM SOYBEAN TEST

Virginia On-Farm Soybean Test Plots 2006

A Summary of Research and Demonstration Plots Conducted by Virginia Cooperative Extension in Cooperation with Local Producers and Agribusiness

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Introduction

The demonstration and research plot results discussed are a cooperative effort of Virginia Cooperative Extension Agents and Specialists, area producers, and agribusiness. The purpose of this publication is to provide research-based information to aid in the decision-making process for grain producers in Virginia. It provides an unbiased evaluation of certain varieties, management practices, and new technology through on-farm replicated research using producer equipment and time. The plot work and analyzed results enable those producers to make management decisions based on research and provides them a greater opportunity to improve yields and profits, which can improve the quality of life for them and their families. The success of these on-farm plots is very dependent on the cooperative effort of the producer and the assisting agribusinesses. We are grateful for their cooperation. We hope that the information will be beneficial to you and your individual agribusiness operations.

This publication will be presented each year at the Virginia Grain and Soybean Conference and will be available at least 6 regional production meetings throughout Virginia. The information found inside can potentially reach over 400 Virginia soybean and grain producers and agribusinesses impacting over 250,000 acres of soybeans valued at nearly $50 million.

The field work and printing of this publication is supported by the Virginia Soybean Check-Off Funds. The cooperators graciously wish to acknowledge this support. Any producer or agribusiness professional wishing to receive a copy of this publication should contact their local Extension Agent who can request a copy from David Moore in Middlesex County at 804-758-4120 or **damoore3@vt.edu.**

This is the tenth year of this multi-county cooperative effort and further work is planned for 2007.

The authors wish to thank the many producers who participated in this project. Appreciation is extended to seed, chemical, and fertilizer representatives who donated products and/or assisted with the field work. Special thanks Paige Hogge, for her valuable technical assistance in compiling the book.

General Summary:

A. **VARIETY SELECTION:** Soybean variety selection remains one of the most important components of successful a soybean production system. Soybean yield varies with variety, location, and environment. One should not compare varieties of different maturity groups because weather conditions during pod and seed development is most responsible for whether a variety yields well or poor. Some years, timing of rainfall favors Group 4s and other years, it favors Group 5s. Let the information contained here help you select varieties that do well in your management system. It is always good to spread your risks. When viewing the variety information, look for plots that are similar to your location and soil type. When looking at overall variety performance, remember that the more locations a variety is in, the more reliable the yield information. Use this information along with Virginia Soybean Variety Evaluation Tests 2006 , Virginia Cooperative Extension publication 424-107 to help make variety selections for your operation.

B. **FOLIAR FUNGICIDES:** Soybean fungicide trials have been of interest now for several years. With the onset of soybean rust, producers are trying to stay ahead of the game by experimenting with soybean fungicides. Producers also expect that late season leaf diseases could be affecting yield. Trials most every year have shown that fungicides help keep the crop looking healthy, but an increase in yield does not always occur. Weather conditions will also make a difference in outcome. In most of the plots this year, addition of fungicides did not improve yields.

C. **MATURITY GROUP COMPARISONS:** These tests evaluate Group III varieties and compares Group III vs. Group IV vs. Group V. This was not the year for Group III soybeans in those locations. Weather conditions proved to be detrimental to yields and quality of Group III and early IVs.

D. **OTHER TESTS:** Seed treatments, pelletized poultry litter, various tillage systems, the possibilities of organic soybean production, and effect of sprayer traffic on reproductive-stage soybeans were evaluated. These data are valuable as producers search for new ways to increase yields, lower costs, do their part to decrease dependence on synthetic fertilizers and pesticides and improve water quality.

Soybean Variety Plots

2006 Overall Soybean Variety Comparison								
Maturity Group IV								*Avg. Rel. Yield*
Variety	*Cul-peper*	*New Kent/ Ch. City*	*King & Queen*	*West-moreland*	*Lancaster/ North.*	*Prince George*	*Avg.*	
Hubner H484NRR*	24.4	38	38	22.7	47	42.5	35.4	111
D&PL DP4919R/S*	24.6	38	45.4	13.3	44	45.7	35.2	106
Asgrow AG4703*	20.1	35	34.8	22.7	47	41.8	33.6	105
S. States RT4981*	30.5	30	40.3	12.7	41	45.8	33.4	102
TA Seeds TS4599R*	22.7	32	30	18.9	55	39.4	33.0	101
Vigoro V49N6RR*	32.1	20	37.5	20	47	40.9	32.9	102
Delta King DK4866RR*	26.8	25	42.3	15.5	47	39.7	32.7	99
NK S40-R9*	27.8	27	35.5	19.2	49	36	32.4	100
Vigoro V44N6RR*	33.5	26	26.2	19.7	52	36	32.2	101
TA Seeds TS4389R*	20	30	34.1	14.2	49	43.1	31.7	95
NK S43-B1*	27.2	21	32.1	20.9	48	40.1	31.6	98
Asgrow AG4404	21.8	25	31.4	20	48	38.7	30.8	95
Pioneer 94M80	23.6	20	33.8	14.7	46	38.1	29.4	88
USG 7495nRS	27.5	40		21.9	50	38.5		114
D&PL DP4724RR	27.1		43.9	19.8	48			110
Hubner H431NRR			45	18.8	44			107
S. States RT4451N	26.4		28.9	19.5	52	45.4		103
Campbell 444			32	20.7	47			100
USG 7423nRS	19.2	26		22.6	48	37.9		97
Campbell 476			35.3	15	52			97
Chemgro 4444		28	30.3	17.1	48	36		94
Hubner H454NRR	22.4	28				31.3		88
Pioneer 94B73		21	32.2	13.7	45	41		87
Average	25.4	28.3	35.5	18.3	47.9	39.9		100
LSD (0.10)							4.4**	16**

Maturity Group V							*Avg. Rel. Yield*
Variety	*Charles City*	*King & Queen*	*Southampton*	*Chesa-peake*	*Prince George*	*Average*	
Pioneer 95M82*	45	31	35.3	53.8	47	42.8	117
Asgrow AG5905*	38	30	33.1	51.7	52.2	41.4	112
Asgrow AG5605*	38	30	35.7	52.1	48.3	41.2	113
USG 7553nRS*	37	29	26.3	45.2	59.3	39.1	106
Delta King DK5066RR*	32	29	28.8	54.8	47.7	38.8	104
D&PL DP5115RR	37	31	15.5	49.4	54.9	37.4	99
Pioneer 95M50	34	22	27.7	51.8	42	35.8	95
S.States RT5450N	33	27	24.7	47.5	48.1	35.8	97
Chemgro 5339	33	24	18.7	44.6	45.9	33.0	88
Vigoro V51N6RR	34	23	24.6	44.6	36.6	32.6	89
S.States RT5130N	34	23	16.7	48.7	36.5	31.8	84
USG 7515nRR	38	31			52.9		110
Hubner H546NRR	35	32					107
Hubner H571NRR			30.2	49.7	46.9		106
USG 7582nRR			27.1	49.1			103
Vigoro 53N5RS	35	28	25.4		40.8		96
Hubner H502NRR	34	25	11.9		46.5		83
Average	35.8	27.7	25.4	49.5	47.0		100
LSD (0.10)						4.5**	14**

*Not significantly different from top-yielding variety

**LSD of yield and average relative yield is only for varieties tested in all locations.

Discussion:

The more locations a variety is in the more reliable the yield information is. Group 5 soybeans, this year, performed well for the most part because of the timely rains in early September that saved a lot of soybean crops. Group 5 out-yielded Group 4 soybeans in most locations. It is always a good idea to spread your risks with soybeans. We have been spoiled for several years with good summer weather and Group 4s have yielded well.

The top yielding maturity group 4 varieties that were tested in all 6 locations were: Hubner H484NRR, Deltapine DP4919RR/S, Asgrow AG4703, Southern States RT4981, TA Seeds TS4599R, Vigoro V49N6RR, Delta King DK4866RR, NK S40-R9, Vigoro V44N6RR, and TA Seeds TS4389, and NK S43-B1. There was no significant difference between the yields of these varieties.

The top yielding maturity group 5 varieties that were tested in all 5 locations were: Pioneer 95M82, Asgrow 5905, Asgrow 5605, USG 7553nRS, and Delta King 5066. There was no significant difference between the yields of these varieties.

Relative Yield:

Past analysis of data has shown that more test locations result in more reliable information. It is better to choose a variety by averaging yields over all test locations than by choosing a variety that yielded well only in a test close to where you farm. But, average yields should not be used unless all varieties are tested in all locations because data will be skewed to those varieties that are tested in the highest yielding locations. If varieties were not tested in all locations, relative yield is a better method of comparing varieties. Relative yield is calculated by dividing the yield of a variety by the average yield of all varieties at that location. A variety with a relative yield of 105 was 5% above the average of all varieties at that location. Relative yield is not an actual yield, but a value that is relative to all other yield values at that location.

Thanks to all the cooperators and supporters. Use these data, official soybean variety tests, and other Virginia Tech variety information when making planting decisions for 2007.

2006 KING AND QUEEN GROUP 4 SOYBEAN VARIETY COMPARISONS

Cooperators: Producer: Latane Trice
Extension: Keith Balderson, Essex; David Moore, Middlesex
Agribusiness: Participating Seed Companies
Soil Type: Loamy sand
Tillage: Conventional
Planting Date: May 3, 2006 in 7-inch rows
Seeding Rate: 55 pounds per acre
Herbicides: glyphosate – postemergence
Harvest Date: October 24, 2006

Variety	Moisture (%)	Harvest Pop (plants/A)	Yield (bu/A)
Vigoro V44N6RR	14.3	81,510	22.5
Vigoro V44N6RR	14.8	139,425	27.8
Vigoro V44N6RR	14.3	150,150	26.2
Vigoro V44N6RR	14.5	263,835	25.1
Vigoro V49N6RR	14.9	130,845	37.5
T.A. Seeds TS4599	14.6	115,830	30.0
T.A. Seeds TS4389	14.8	111,540	34.1
Asgrow AG4404	14.5	169,455	31.4
Asgrow AG4703	14.9	165,165	34.8
S.States RT4451	14.8	122,265	28.9
S.States RT4981	15.4	158,730	40.3
Pioneer 94M80	14.7	105,105	33.8
Pioneer 94B73	14.5	109,395	32.2
Chemgro 4404	14.6	156,585	30.3
NK S43-B1	14.3	143,715	32.1
NK S40-R9	14.7	115,830	35.5
Hubner H484	14.7	122,265	38.0
Campbell 444	13.9	171,600	32.0
Campbell 476	14.9	124,410	35.3
Delta King DK4866RR	14.7	139,425	42.4
D&PL 4724RR	14.9	135,135	43.9
D&PL 4919RR	14.4	109,395	45.4
Hubner H431	14.6	150,150	45.0

Discussion: Yields varied greatly due to soil type differences in the field. This is one of the reasons that we replicate varieties across locations. This plot suffered significant moisture stress during the season, and varieties on the sandier parts of the field suffered significant yield loss. Leafhopper injury was significant on the varieties with less pubescence. Notice the population study at beginning of plot with Vigoro 44N6. Be sure to use replicated yield data when selecting varieties for 2007.

2006 LANCASTER GROUP 4 SOYBEAN VARIETY COMPARISON

Cooperators: Producer: Lowell Starr, Holyoke Farm
Extension: Matt Lewis, Northumberland/Lancaster; Philip Henley, Summer Intern
Agribusiness: Participating Seed Companies
Soil Type: Sassafras fine sandy loam
Planted: June 21, 2006 @ 210,000 seed/A
Equipment: JD 1520 No-Till Drill w/ SI Distributing seedbelts 7.5 inch Rows
Crop Protection: Glyphosate- burndown & postemergence, Warrior postemergence
Harvested: October 31, 2006

Variety	Moisture	Yield
	(%)	(bu/A)
TA Seeds TS4389	12.3	49
TA Seeds TS4599	12.1	55
Delta King DK4866RR	11.6	47
Chemgro 4444	11.4	48
Vigoro V44N6RR	11.5	52
Vigoro V49N6RR	12.0	47
Asgrow AG4703	11.6	47
Asgrow AG4404	11.2	48
Hubner H484	11.2	47
Hubner H431	11.1	44
Pioneer 94B73	11.2	45
Pioneer 94M80	10.8	46
S. States RT4451	11.1	52
S. States RT4981	11.3	41
USG 7423nRS	11.5	48
USG 7495nRS	11.5	50
D&PL 4919RR	11.6	44
D&PL 4724RR	10.8	48
Campbell 444	10.7	47
Campbell 476	10.7	52
NK S40-R9	10.9	49
NK S43-R1	11.0	48
NK S49-Q9	11.1	48

Discussion: Another year of excellent yields, especially considering that these were wheat beans! Outstanding performers in this plot were TA 4599 and SS 4451 – the only two high-yielding varieties that exhibited no lodging. Use this and other Virginia Cooperative Extension plot data when choosing new varieties on your farm.

2006 NEW KENT/CHARLES CITY GROUP 4 SOYBEAN VARIETY COMPARISON

Cooperators: Producer: Archer & Tim Ruffin, Evelynton Farms
Extension: Paul Davis, New Kent, Phillip Henley-Intern
Agribusiness: Participating Seed Companies
Plant Date: May 22, 2006
Population: 120,000 seed/A
Harvest Date: October 12, 2006

Variety	Moisture (%)	Yield (bu/A)
Pioneer 94B73	15.8	21.0
Pioneer 94M80	15.7	20.0
Vigoro V49N6RR	15.6	20.0
Vigoro V44N6RR	15.5	26.0
Delta King DK4868RR	14.8	25.0
TA Seeds TS4599	14.8	32.0
TA Seeds TS4389	15.0	30.0
Asgrow AG4703	14.9	35.0
Asgrow AG4404	14.8	25.0
D&PL DP4919RR	14.8	38.0
Hubner H454	14.8	28.0
Hubner H484	14.8	38.0
NK S40-R9	14.6	27.0
Chemgro 4444	14.4	28.0
S. States RT4981	15.0	30.0
USG 7495nRR	14.4	40.0
USG 7423nRR	14.4	26.0
NK S43-B1	14.6	21.0

Discussion: These full season Group 4 soybeans were under water and heat stress from July 24th through August 27th. The late August rains did not help the early Group 4 varieties but the late 4's (Examples USG 7495 @ 40 bu., Hubner 484 @ 38 bu., Deltapine 4919 @ 38 bu., and Asgrow 4703 @ 35 bu. were able to recover with the 10 inches of rain that fell from August 28th to September 1st. Use this and other Virginia Tech and On-farm variety information when making planting decisions for 2007

2006 WESTMORELAND GROUP 4 SOYBEAN VARIETY COMPARISON

Cooperators: Producer: F. F. Chandler, Jr.
Extension: Sam Johnson, Westmoreland, Andy Beahm, Summer Intern
Industry: Rusty Green & Curtis Packett, Crop Production Services;
Participating Seed Companies
Planted: July 7, 2006-15 inch rows
Planting Info: No-till behind wheat, 180,000 population, IH Cyclo Air Planter
Soil type: Kempsville
Fertilizer: 30-50-60 on wheat last fall
Crop Protection: glyphosate-postemergence
Harvest Date: November 20, 2006

Variety	Test Wt. (lb/bu)	Moisture (%)	Yield (bu/A)
Hubner H484	56.0	14.6	22.7
Campbell 444	57.1	14.0	20.7
D&PL DP4724RR	56.6	13.8	19.8
Pioneer 94M80	55.7	14.0	14.7
T.A. Seeds TS4599	56.8	14.0	18.9
Hubner H431	56.4	13.9	18.8
NK S40-R9	56.1	13.7	19.2
T.A. Seeds TS4389	56.0	14.0	14.2
Campbell 476	56.8	14.1	15.0
Chemgro 4444	56.4	13.9	17.1
Vigoro V44N6RR	56.3	14.0	19.7
S. States RT4451	56.1	14.1	19.5
Asgrow AG4404	56.3	14.1	20.0
Pioneer 98B73	55.6	14.6	13.7
D&PL DP4919RR	56.9	14.7	13.3
NK S43-B1	55.8	14.1	20.9
USG 7423nRR	55.7	14.0	22.6
DeltaKing DK4866RR	56.1	14.1	15.5
Vigoro V49N6RR	56.6	14.2	20.0
S. States RT4981	57.3	14.3	12.7
Asgrow AG4703	56.9	14.0	22.7
USG 7495nRR	56.8	14.1	21.9
Hubner H431(check)	57.0	13.7	20.4

Discussion: The test average was 18.4 bu/acre. The range was 12.7 bu./acre to 22.7 bu. / acre. Two plantings of Hubner 431 as a check ranged from 18.8 to 20.4 bu./acre and averaged 19.6. This is a strip test and not replicated. Please review the regional summary of variety tests for more complete information. This planting was stressed from day one by dry weather and heat and did not recover even after good rains came later in August. There was also insect pressure from bean leaf beetle and corn earworm but did not reach threshold levels. Harvest was late due to harvest time rains and there was considerable drop in quality and test weight. Overall this was a good stress test for these Group IV varieties.

2006 CULPEPER (AG EXPO) GROUP 4 SOYBEAN VARIETY COMPARISON

Cooperators: Producer: James Bowen, Beauregard Farms
Extension: Carl Stafford, Culpeper, David Holshouser, TAREC
Agribusiness: Participating Seed Companies
Soil Type: Bucks clay loam
Planted: May 18, 2006 @ 140,000 seed/A
Equipment: JD No-Till Drill 15 inch Rows
Crop Protection: glyphosate postemergence
Harvested: October 30, 2006

Brand	***Variety***	***% Moisture***	***Yield***	**Adjusted Yield[1]**
Pioneer	94M80 (Check)	11	26.4	23.6
Pioneer	94M30	11	31.1	29.3
Vigoro	49N6RR	10.9	32.3	32.1
Vigoro	44N6RR	11.3	31.8	33.5
S.States	RT4981	12	27.3	30.5
S.States	RT4451N	11.4	22.1	26.4
NK	S43-B1	10.8	21.3	27.2
NK	S40-R9	11.2	20.2	27.8
Pioneer	94M80 (Check)	11.7	15.8	23.6
TA Seed	TS4599R	11.4	16.5	22.7
TA Seed	TS4389R	11.5	15.7	20.0
Hubner	H484NRR	11	20.6	24.4
Hubner	H454NRR	11.2	20.3	22.4
Asgrow	AG4404	11	21	21.8
Asgrow	AG4703	11.2	20.5	20.1
Pioneer	94M80 (Check)	11.3	25.5	23.6
USG	7423NRS	11.2	20.9	19.2
USG	7495NRS	11.6	30.2	27.5
D&PL	DP4919RR/S	11.4	27.2	24.6
D&PL	DP4724RR	11.2	30.2	27.1
Delta King	DK4866RR	12	30.1	26.8
Pioneer	94M80 (Check)	11.5	26.7	23.6

[1]Yield was adjusted by linear interpolation using the checks on either side of the plot.

Discussion:

Yields were very low due to very dry conditions during pod development and seed fill (no rainfall from mid-July through August). However, this comparison should provide good information on those varieties that yield well under stress.

2006 DINWIDDIE/PRINCE GEORGE/SUSSEX SOYBEAN VARIETY COMPARISON

Cooperators: Producer: Paul Cerny
Extension: Glenn F. Chappell, II, Prince George; Mike Parrish, Dinwiddie; Kelvin Wells. Sussex
Agribusiness: Participating Seed Companies
Planting Date: 6/22-23/2006
Plot: Variety
Seeding Rate: 180,000 seed/A
Soil: Montross silt loam/Rains loam
Herbicides: glyphosate postemergence
Tillage: no-till/straw removed
Fertility: according to soil test
Harvested: Nov. 11, 2006

Group IV Varieties

Company	Variety	Yield (Bu/A)	% of Check[a]
DP&L	DP4919RR	39.6	Check
Delta King	4866RR	39.7	93
Asgrow	AG4404	38.7	91
Asgrow	AG4703	41.8	98
Pioneer	94B73	41.0	96
Pioneer	94M80	38.1	89
Vigoro	V44N6RR	36.0	84
Vigoro	V49N6RR	40.9	96
TA Seeds	TS4389	43.1	101
TA Seeds	TS4599	39.4	92
Hubner	H454	31.3	73
Hubner	H484	42.5	100
Southern States	4451	45.4	106
Southern States	RT4981	45.8	107
DP&L	RT4919	45.7	107
NK	S43-B1	40.1	94
NK	S40-R9	36.0	84
Chemgro	4444	36.0	84
USG	7423nRR	37.9	89
USG	7495nRR	38.5	90
DP&L	DP4919RR	45.8	Check
	Group IV average	**40.2**	

Group V Varieties			
DP&L	4919	45.8	Check
Delta King	5066 RR/STS	47.7	112
Asgrow	AG 5605	48.3	113
Asgrow	AG 5905	52.2	122
Pioneer	95M50	42.0	98
Pioneer	95M82	47.0	110
Vigoro	V51N6RR	36.6	86
Vigoro	V53N5RS	40.8	95
Hubner	H502NRR	46.5	109
Hubner	H571NRR	46.9	110
Southern States	RT5130N	36.5	85
Southern States	RT5450N	48.1	112
DP&L	DP5115RR	54.9	128
Chemgro	5339	45.9	107
USG	7515nRR	52.9	124
USG	7553nRS	59.3	139
DP&L	DP4919RR	39.8	Check
	Group V Average	**47.0**[b]	

[a]% of Check = Individual variety yield divided by the average of the checks on either side of that variety.

[b]Group V Average does not include the check varieties.

Discussion: The plot was very dry until late in the season which favored the Group V beans.

2006 CHESAPEAKE GROUP 5 SOYBEAN VARIETY COMPARISON

Cooperator: Producer: Arnold and Jason Dawley
Extension: Watson Lawrence, Chesapeake
Agribusiness: Participating Seed Companies
Date Planted: May 27, 2006
Previous Crop: Wheat/Soybeans
Equipment: Disk plus disk & cultipacker; 16 inch rows seeded with drill
Soil Type: Chesapeake fine sandy loam
Fertilization: 200 lbs. 6-18-36
Crop Protection: 1 qt. Roundup plus 0.3 oz. First Rate/acre
Date Harvested: November 4, 2006

VARIETY	MOISTURE (%)	Test Wt. (lb/bu)	YIELD (bu/A)
Delta King DK5066RR	13.7	58	54.8
Pioneer 95M82	13.4	57	53.8
Asgrow AG5605	13.6	57	52.1
Pioneer 95M50	13.9	58	51.8
Asgrow AG5905	14.0	55	51.7
Hubner H571NRR	13.8	58	49.7
D&PL DP5115RR	13.7	59	49.4
USG 7582nRR	13.5	57	49.1
S. States RT5130N	14.1	59	48.7
S. States RT5450N	14.0	58	47.5
Vigoro V51N6RR	13.9	57	44.6
Chemgro 5339	13.9	58	44.6
USG 7553nRS	13.3	56	45.2

Discussion: Insect/weed competition and lodging were minimal this year. All varieties performed well and should be considered with other Virginia Tech soybean tests results when selecting varieties for 2007.

NEW KENT/CHARLES CITY GROUP 5 SOYBEAN VARIETY COMPARISON

Cooperators: Producer: Archer & Tim Ruffin, Evelynton Farms
Extension: Paul Davis, VCE-New Kent; Phillip Henley, Intern
Agribusiness: Participating Seed Companies
Plant Date: May 22, 2006
Seeding Rate: 120,000 seed/A
Harvest Date: November 7, 2006

Variety	Moisture (%)	Yield (bu/A)
Delta King DK5066RR	15.0	32.0
Pioneer 95M50	14.7	34.0
Pioneer 95M82	14.0	45.0
Vigoro V53N5RS	13.7	35.0
Vigoro V51N6RR	13.3	34.0
Hubner H546NRR	13.8	35.0
Hubner H502NRR	13.7	34.0
D&PL DP5115RR	13.7	37.0
Asgrow AG5905	13.7	38.0
Asgrow AG5605	13.5	38.0
USG 7515nRR	13.3	38.0
USG 7553nRS	13.3	37.0
Chemgro 5339	13.3	33.0
S. State RT5130N	13.4	34.0
S. State RT5450N	13.4	33.0

Discussion:
These full season Group 5 soybeans were under water and heat stress from July 24th through August 27th. The Group 5 soybeans were able to recover and take advantage of the 10 inches of rain that fell from August 28th to September 1st unlike the early Group 4 varieties. The Group 4 beans averages 28 bu/A while the Group 5's average 36 bu./A/ There are many good yielding varieties in the plot with Pioneer 95M82 topping the plot with a yield of 45 bu./A. Use this and other Virginia Tech and On-farm soybean variety information when making planting decisions for 2007.

2006 SOUTHAMPTON GROUP 5 SOYBEAN VARIETY COMPARISON

Cooperators: Producer: Peter Copeland
Extension: Wes Alexander, Southampton; Cyndi Estienne, Greensville; David Holshouser, TAREC
Agribusiness: Participating Seed Companies
Planting Date: May 11, 2006
Row Spacing: 36-inch Rows
Tillage: Conventional
Harvest Date: November 19, 2006

Variety	Moisture	Yield	Adjusted Yield[1]
Check (DP5634RR)	14.2	29.6	
USG 7553nRS	14.7	24.9	26.3
USG 7582nRR	14.9	25.6	27.1
Chemgro 5339	14.7	17.7	18.7
D&PL DP5115RR	14.7	14.7	15.5
S. States RT5450N	15.3	23.4	24.7
Check (DP5634RR)	14.1	32.0	
S. States RT5130N	15.3	17.0	16.7
Hubner H571RR	15.2	30.7	30.2
Hubner H502RR	14.7	12.1	11.9
Vigoro V53N5RS	15.4	25.8	25.4
Vigoro V51N6RR	15.4	25.0	24.6
Check (DP5634RR)	14.6	34.1	
Pioneer 95M82	15.0	37.2	35.3
Pioneer 95M50	15.4	29.2	27.7
Asgrow AG5605	14.9	37.6	35.7
Asgrow AG5905	15.6	34.9	33.1
Delta King DK5066RR	15.0	30.3	28.8
Check (DP5634RR)	14.4	34.5	

[1]Yield was adjusted by dividing the plot yield by the nearest 2 check average:average check ratio

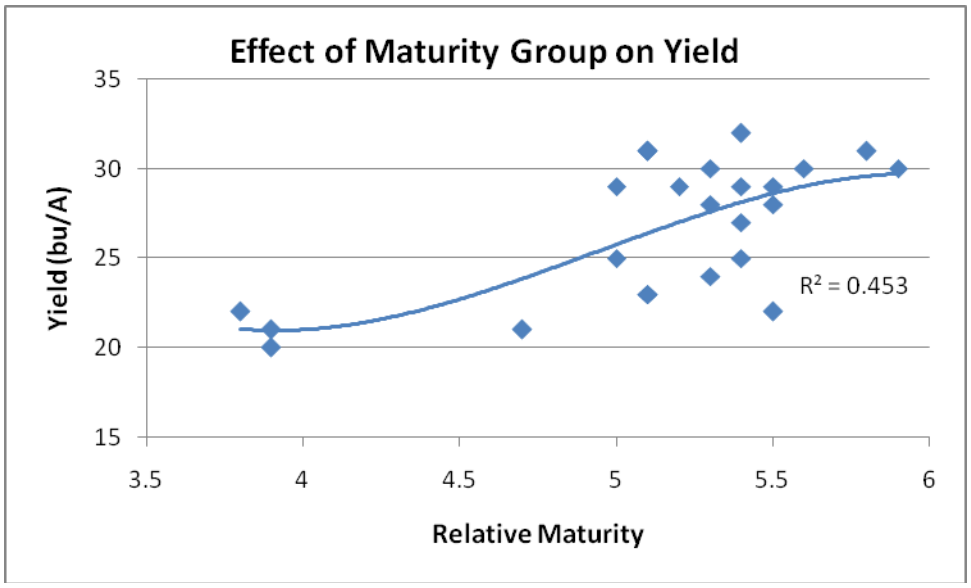
Discussion:
Use this and other Virginia Tech soybean variety information when making planting decisions for 2007

2006 MIDDLESEX GROUP 5 SOYBEAN VARIETY COMPARISON

Cooperators: Producer: William Davis Carlton, David Carlton, Bill Carlton
Extension: David Moore, Middlesex; Keith Balderson, Essex
Agribusiness: Participating Seed Companies
Previous Crop: Wheat
Soil Type: Emporia loam
Planting Date: June 21, 2006
Crop Protection: glyphosate postemergence
Check Variety: Pioneer 94B73
Harvest Date: November 19, 2006

Variety	Moisture	Yield	Bushels Above Check
	(%)	(bu/A)	
USG 7553	14.4	29.0	8
Check	13.6	21.0	
Asgrow 5905	14.0	30.0	10
Check	14.5	20.0	
Asgrow 5605	14.6	30.0	10
Check	14.0	20.0	
Deltapine 5115	14.0	31.0	11
Check	14.1	20.0	
SS 5540	14.4	28.0	9
Check	14.3	19.0	
SS 5401	14.2	25.0	9
Check	14.3	16.0	
SS 5450	14.4	27.0	8
Check	14.4	19.0	
SS 5130	14.4	23.0	5
Check	14.4	18.0	
Vigoro 51N6	14.1	23.0	4
Check	13.6	19.0	
Vigoro 53N5	13.7	28.0	8
Check	13.7	20.0	
Pioneer 95M50	13.8	22.0	2
Check	13.6	20.0	
Pioneer 95M82	13.7	31.0	10
Check	13.6	21.0	
Hubner 502	13.7	25.0	1
Check	13.6	24.0	
Hubner 546	14.1	32.0	7
Check	13.7	25.0	
USG 7515	13.7	31.0	6
Check	13.6	25.0	
Delta King 5066	13.5	29.0	4
Check	13.3	25.0	

Chemgro 5339	13.4	24.0	-1
Check	13.7	25.0	
NK 53-A1	13.6	30.0	6
Check	13.5	24.0	
NK 52-U3	13.7	29.0	8
Check	13.8	21.0	
Garst 5412	13.7	29.0	7
Check	13.7	22.0	
Pioneer 93M90	13.7	20.0	0
Check	13.5	20.0	
Vigoro 39N4	13.6	21.0	-1
Check	13.7	22.0	
USG 7384	13.7	22.0	0



Discussion: A fairly consistent plot! Like a lot of soybean fields this year, these suffered from the lack of moisture and heat in July and August. This plot has a MG4 as a check and shows that Group 4s suffered more than Group 5s. It is always a good idea to spread the risks. Take notice of the Group 3s at the end of the plot (P93M90, Vigoro 39N4, and USG 7384) and how they yielded also. We planted these just to observe them in a DC situation.

Thanks to William Davis, David, and Bill Carlton for their assistance with this plot. These varieties were also planted in several other locations across Eastern Virginia. Use this and other Virginia Tech soybean variety information when making planting decisions for 2007.

GROUP III SOYBEAN EVALUATION

Cooperators: Producer: Ronnie Russell, Corbin Hall Farm
Extension: David Moore, Middlesex
Agribusiness: Ginny Barnes, Pioneer; Blox Daugherty-NK Seeds; Daryl Clay-Renwood Farms; Bill Petka-Vigoro Seeds
Previous Crop: Corn
Soil Type: Slagle Silt Loam
Plant Date: May 11, 2006 (30" rows Conventional)
Fertilization: Biosolids prior to Corn Crop (2005)
Crop Protection: glyphosate postemergence
Harvest Date: September 28, 2006

Variety	Moisture	Yield (bu/A)
Pioneer 93M90	13.8	39.0
Garst 3712	13.8	39.5
Vigoro 36N5	13.8	36.5
NK 35-F9	14.0	32.9
Dyna-Gro 33A37	13.9	33.5
USG 7384	14.3	30.2
NK R336	14.8	29.3
NK S33-A8	14.7	33.0

Discussion:
Not a great year for Group IIIs and early IVs due to dry conditions at flowering and pod set. Quality was poor in most varieties. Observations at harvest seemed to show some seed quality advantage to Pioneer 93M90. Seed quality problems included purple seed stain, mottling, shriveled seed and mold. Yields in the upper 30's were better than expected, but full season beans need to do better. Use this and other Virginia Tech soybean variety information when making planting decisions for 2007.

2006 CHESAPEAKE SOYBEAN MATURITY GROUP STUDY

Cooperator: Producers: Knowles Brothers Farm: Buck, Buddy & Johnny Knowles
Extension: Watson Lawrence, Chesapeake
Varieties: Group III – Pioneer 93M90
Group IV – Pioneer 94M80
Group V – Pioneer 95M81
Date Planted: May 25, 2006 (15-inch rows with 3 plants/row ft.)
Previous Crop: Soybeans
Tillage: Field Cultivator followed by Dyna-Drive
Soil Type: Deloss and Hyde Mucky Fine Sandy Loam
Fertilization: 200 lbs. 7-18-36
Crop Protection: 20 oz Touchdown & .3 oz First Rate-Post-Emergence
Harvest Date: Group III & IV – October 11, 2006
Group V – November 10, 2006

Varieties	Rep	Moisture	Test Wt	Yield
		(%)	(lb/bu)	(bu/A)
Pioneer 93M90	1	20.3	56	36.68
Pioneer 94M80	1	18.3	57	48.33
Pioneer 95M81	1	16.3	56	45.34
Pioneer 93M90	2	19.1	56	36.14
Pioneer 94M80	2	17.5	57	46.64
Pioneer 95M81	2	15.8	56	48.39
Pioneer 93M90	3	18.9	55	38.51
Pioneer 94M80	3	17.3	56	41.68
Pioneer 95M81	3	16.4	57	48.11
Averages:				
Pioneer 93M90		19.4	55.6	37.11
Pioneer 94M80		17.7	56.6	45.55
Pioneer 95M81		16.1	56.3	47.28
LSD (0.10)		*0.7*	*1.2*	*4.9*

Discussion: Three maturity groups of Pioneer soybeans were planted side by side under identical production systems to compare yields. All groups were planted at the same time. Group IIIs & IVs were harvested the same day with the Group Vs harvested 30 days later to allow for leaf drop and fields to dry from heavy rain. Group V soybeans averaged 10 bushels higher than Group III, while Group IV averaged 8 bushels higher than Group III. There was no significant difference in yield between the Group IV and V varieties. These results are consistent with other examples showing Group IV and V soybeans usually out-yielding other maturity groups in this area.

2006 KING & QUEEN SOYBEAN EVALUATION STUDY

Cooperators: Producer: William Davis, David Carlton, Bill Carlton
Extension: David Moore, Middlesex
Agribusiness: Participating Seed Dealers
Previous Crop: Wheat
Soil Type: Emporia/Slagle Loam
Plant Date: June 21, 2006
Crop Protection: glyphosate –postemergence
Check Variety: Pioneer 94B73
Harvest Date: November 19, 2006

Variety	Moisture (%)	Yield (bu/A)
Check	14.8	24.0
NK XR4560 (Cruiser Maxx Pack)	14.2	28.0
Check	14.8	26.0
NK S49-Q9 (Cruiser Maxx Pack)	14.4	30.0
Check	14.3	25.0
NK XR4467 (Cruiser Maxx Pack)	14.0	27.0
Check	13.9	26.0
NK XR4669 (Cruiser Maxx Pack)	13.9	26.0
Check	14.0	24.0
USG 7495 (Moly-Maxx/Apron)	13.8	30.0
Check	14.2	25.0
USG 7423 (Cruiser/Apron/ Moly-Maxx)	14.1	27.0
Deltapine 4331	14.4	28.0
Check	15.5	26.0
Deltapine Exp	15.0	28.0
Check	14.5	26.0
Asgrow 4403	14.4	28.0
Check	14.2	28.0
Deltapine 4546	14.2	28.0
Check	14.4	26.0
Asgrow 4503	14.4	28.0
Check	14.2	25.0
Deltapine 4724	14.3	27.0
Check	14.3	28.0
Deltapine 4690	15.1	32.0
Check	14.3	27.0
Deltapine 4919 RR/STS	14.2	32.0
Check	14.4	26.0
Asgrow 4903	14.2	35.0
Check	14.2	27.0
Deltapine 5115RR/STS	14.8	35.0

2006 CHESAPEAKE SOYBEAN FUNGICIDE TEST

Cooperator: Producer: Don and Ryan Horsley
Extension: Watson Lawrence, Chesapeake
Custom Applicator: Glen Miller
Variety: Southern States 4098 RR
Date Planted: May 1, 2006
Previous Crop: Soybeans
Tillage: No-till with 15-inch Rows
Soil Type: Chapanoke Silt Loam and Tetotum Loam
Fertilization: 115 lbs. 0-0-60
Herbicide: 22 oz./acre Original Max Roundup post-emergence
Fungicide: July 28, 2006, R3 development stage
Headline 6 oz./acre + Kinetic (surfactant)
Quadris 6.2 oz./acre + Kinetic (surfactant)
Date Harvested: October 4, 2006

TREATMENT	REP	Moisture (%)	Yield (bu/A)
Control	1	13.2	45
Headline	1	12.0	54
Quadris	1	14.8	52
Control	2	12.2	50
Headline	2	12.9	50
Quadris	2	13.2	58
Control	3	11.1	48
Headline	3	11.4	60
Quadris	3	12.6	64
AVERAGES:			
Control		12.2	47.7
Headline		12.1	54.7
Quadris		13.5	58.0
LSD (0.05)		1.5	8.7

Discussion: In the past, foliar applied fungicides have not been shown to consistently and significantly increase soybean yields. However, seed quality generally is improved which may be of interest for seed production. Recent concerns about soybean rust has prompted some farmers to consider whether a preemptive spray might boost yields plus give some preventive rust protection, even when the threat of rust is very low. This 3X replicated test did a comparison of fungicides Headline and Quadris plus a control when the Group IV variety was in R3 stage of development (beginning pod development). Both of these fungicides are in a class called Strobilurins, and can be effective in preventing rust if applied before rust spore germination. This field was scouted

weekly by Virginia Cooperative Extension and a professional crop consultant for soybean rust. It also contained a small acreage of an early-maturing variety for early detection. There was no Extension recommendation to spray for rust or any diseases this season.
Yield results showed a 7 bushel benefit from the Headline application and a 10.3 bushel benefit from the Quadris application over the Control. In this test, the increased yield more than paid for the added cost of a fungicide application at approximately $16.56/acre (including application cost).

2006 NEW KENT/CHARLES CITY FUNGICIDE STUDY

Cooperators: Producers: Archer & Tim Ruffin
Extension: Paul Davis, New Kent & Charles City
Plant Date: May 22, 2006
Tillage: No-Till
Row Spacing: 7-inch rows
Plant Population: 120,000 plants/A
Soil Type: Fine Sandy Loam
Previous Crop: Corn
Crop Protection: Roundup Ultra @ 22 oz. May 15 & July 1, 2006;
Karate Z @ 1 oz. July 25, 2006
Treatment Date: Fungicides: July 25, 2006 @ R-3
Harvest Date: December 8, 2006

Treatments	Rep	Moisture	Yield
		(%)	(bu/A)
Headline (7oz.)	1	12.1	53.0
Tilt (4 oz.)	1	11.1	48.0
Quadris (10 oz.)	1	11.1	51.0
Untreated	1	11.3	46.0
Headline	2	11.4	50.0
Tilt	2	11.1	46.0
Quadris	2	11.2	47.0
Untreated	2	11.4	39.0
Headline	3	11.5	53.0
Tilt	3	11.3	43.0
Quadris	3	11.0	40.0
Untreated	3	11.5	47.0
Headline	4	11.7	50.0
Tilt	4	11.4	49.0
Quadris	4	11.1	42.0
Untreated	4	11.7	45.0
Averages:			
Headline		11.7	51.5
Tilt		11.4	46.5
Quadris		11.1	45.0
Untreated		11.5	44.2
LSD (0.10)		0.3	4.4

Discussion: Previous plots have shown a 1.5 to 3 bushel/A increase in yield with a foliar fungicide over untreated soybeans. The Tilt and Quadris plots averaged only .8 and 1.3 bushels/A more than the untreated (not significantly different than untreated), but Headline yielded 7.3 bushels higher in this experiment. Seed quality was not visibly different across the treatments. The cost to apply late season fungicides ranges between $15 - $20 per acre equating to roughly a 3 bushel/A increase to make it pay. Use this and other Virginia Tech soybean fungicide study information when making management decisions for 2007.

2006 MIDDLESEX SOYBEAN FUNGICIDE STUDY

Cooperators: Producer: Jason Benton
Extension: David Moore, Middlesex
Previous Crop: Wheat
Plant Date: June 23, 2006
Soil Type: Suffolk Fine Sandy Loam
Crop Protection: glyphosate burndown
Fungicides: Headline @ 6 oz. per acre @ R3
Quadris @ 6.25 oz. per acre @ R3
Application Info: Turbo TeeJet TT11005, 40 psi, 20 GPA, 6 mph
Harvest Date: December 11, 2006

Treatment	Rep	Test Wt.	Moisture	Yield
Headline	1	56	11.9	21.7
Quadris	1	56	11.5	22.0
Check	1	54	11.0	22.4
Headline	2	55	12.0	25.0
Quadris	2	56	11.5	28.1
Check	2	55	10.8	24.9
Headline	3	55	11.7	25.6
Quadris	3	56	11.1	27.1
Check	3	55	10.9	24.1
Averages:				
Headline		55.3	11.9	24.1
Quadris		56.0	11.4	25.7
Check		54.6	10.9	23.8
LSD (0.10)		1.0	0.2	1.9

Discussion:
Lots of interests in soybean fungicides! Yes, the beans look healthy and cleaner, but in this case, the increase in yield associated with fungicide use (Quadris yielded significantly higher than the check) will not pay for the application. Producers raising soybeans for seed may see the advantage in seed quality, etc. Many producers are experimenting by adding the fungicide to the insecticide when treating for CEW. Fungicides are costly and there should be a reason for making the application. Please see other fungicide studies in this publication. Use this and other Virginia Tech soybean fungicide application information when making production decisions for 2007.

2006 SOUTHAMPTON SOYBEAN FUNGICIDE STUDY

Cooperators: Producer: M.L. Everett, Lewis Everett
Extension: Wes Alexander, Southampton; Cyndi Estienne, Greensville; David Holshouser, TAREC
Planting Date: May 19, 2006
Treatments: Quadris (6.2 oz/A) + Induce (1 qt/100 gal)
Headline (6 oz./A) + Induce (1 qt./100 gal)
Untreated
Plot Size: 60 x 550 feet
Application Date: July 27, 2006
Application Info: 11003 Turbo TeeJet nozzles, 60 psi, 20 GPA, 6 mph
Harvest Date: November 27, 2006 with a John Deere 9500 with a 22 feet cutting swath.

Treatment	Moisture	Yield
	(%)	(bu/A)
Quadris + Induce	15.8	48.3
Headline + Induce	15.7	45.4
Untreated	15.9	50.0
Headline + Induce	15.9	50.7
Quadris + Induce	15.8	44.4
Untreated	15.8	39.5
Quadris + Induce	15.5	42.3
Headline + Induce	15.5	48.7
Untreated	15.7	46.7
Headline + Induce	15.7	54.8
Quadris + Induce	15.8	57.6
Untreated	16.0	47.9
Averages:		
Quadris + Induce	15.7	48.2
Headline + Induce	15.7	49.9
Untreated	15.9	46.0
LSD (0.10)	0.1	6.0

Discussion: In the past, foliar applied fungicides have not been shown to consistently and significantly increase soybean yields. This 4X replicated trial compared an R3-stage (beginning pod development) application of the fungicides, Headline and Quadris, to a control. Both of these fungicides are in a class called strobilurins, which are generally better than the triazole class of fungicides for controlling diseases common to Virginia. They can also be used as a preventative spray for soybean rust. There were no Extension recommendations to spray for rust or any diseases this season. Yield results showed no significant benefit from the Headline or Quadris application over the Control.

2006 WESTMORELAND SOYBEAN FUNGICIDE STUDY

Cooperators: Producer: George W. Sanford, Jr.
Extension: Sam Johnson, Westmoreland; Andy Beahm, Summer Intern
Industry: Joey Dodson, Southern States; Dr. Sam Alexander, BASF
Variety: Southern States SS439 (non RR)
Plant Date: June 26, 2006
Seeding rate: 5.5 seeds per foot in 18 inch rows (160,000 seed/A)
Soil type: Emporia loam, Suffolk sandy loam
Fertilizer: 12-30-70 in fall 2005 to wheat
Crop Protection: 40 oz. glyphosate + ½ pt of 2,4-D ester burndown; 4.5 oz. Pursuit post
Harvest Date: November 6, 2006
Application Date: Aug. 22, 2006 to R2-R3 soybean
Application Info: 22 GPA

Treatment	Moisture	Test Wt.	Yield
	(%)	(lb/bu)	(bu/A)
Warrior	11.3	56.0	34.1
Warrior + Headline	11.0	56.9	32.2
Warrior + Quadris	10.9	56.6	33.5
Warrior	10.9	55.8	33.4
Warrior + Headline	11.0	56.3	31.6
Warrior + Quadris	11.0	55.7	31.7
Warrior	10.8	56.7	32.0
Warrior + Headline	10.9	56.4	33.2
Warrior + Quadris	10.7	56.5	33.5
Warrior	10.7	56.4	35.5
Warrior + Headline	10.6	56.5	37.4
Warrior + Quadris	10.7	56.3	40.1
Averages:			
Warrior	56.3		33.8
Warrior + Headline	56.5		33.6
Warrior + Quadris	56.3		34.7
LSD (0.10)	0.4		2.0

Discussion:
These soybeans were stressed by dry weather up through R2 and into R3 which substantially reduced yield. It started to rain at this point and the field made fair to good yields. Corn earworm counts prior to treatment were 3 – 6 worms per 15 sweeps. Disease pressure was low probably due to the dry weather and resulting yields among the treatments showed very little difference.

2006 ESSEX SOYBEAN SEED TREATMENT STUDY

Cooperators: Producer: Keith and C.O. Balderson
Extension: Sam Johnson, Westmoreland; Keith Balderson, Essex
Variety: NK S49-Q9
Soil Type: Kempsville sandy loam
Planting Date: June 21, 2006 in 18 inch rows following wheat
Fertilization: 130-90-90-12 to wheat crop
Crop Protection: 1 qt. per acre glyphosate-post emergence
Harvest Date: October 30, 2006

Treatment	Replication	Moisture	Yield
		(%)	(bu/A)
Check	1	12.7	49.0
Cruiser Maxx	1	12.6	50.4
Check	2	12.8	50.3
Cruiser Maxx	2	12.6	51.7
Check	3	12.8	50.3
Cruiser Maxx	3	13.1	50.1
Averages:			
Check		12.8	49.9
Cruiser Maxx Pak		12.8	50.7
LSD (0.10)		0.4	1.6

Discussion:
Cruiser Maxx is a seed treatment containing Cruiser insecticide and Apron Maxx fungicide. In this plot, conditions at and just following planting were ideal for germination and emergence – warm with good soil moisture. Thrips were not a problem. Yields were excellent as early planting and good growing conditions until August allowed the soybeans to get excellent growth. Rains from Ernesto came in time to help the plants fill the pods. The seed treatment did not increase yields.

2006 CHARLES CITY FUNGICIDE SEED TREATMENT STUDY

Cooperators: Producer: Evelynton Farm, Charles City, VA
Extension: Paul Davis, New Kent & Charles City; Phillip Henley, Summer Intern
Agribusiness: NK Seed Representative
Variety: NK S49-Q9
Plant Date: May 23, 2006 No-Till
Treatment: Cruiser Maxx Pak (thiamethoxam insecticide, mefenoxam (*metalaxyl-M*) fungicide; fludioxonil fungicide)
Harvest Date: November 7, 2006

Treatment	Rep	M%	Yield
		(%)	(bu/A)
Cruiser Maxx Pak	1	13.6	34.0
Untreated	1	13.6	32.0
Cruiser Maxx Pak	2	13.7	33.0
Untreated	2	13.7	32.0
Cruiser Maxx Pak	3	13.7	36.0
Untreated	3	13.8	32.0
Averages:			
Cruiser Maxx Pak		13.7	34.3
Untreated		13.7	32.0
LSD (0.10)			2.6

Discussion:
Although Cruiser Maxx Pak treatment yielded 2.3 bushels higher, the difference was not statistically significant. Soil temperature and soil moisture conditions were ideal for soybean seed germination and sprouting so there was no delay in emergence. There were no stand counts because there was no visual difference in the plant population. Compare this seed study with others to see if the 2 bu./A advantage is evident in other locations. Use this and other Virginia Tech and On-farm researched soybean production information when making planting decisions for 2007.

2006 N-HIBIT SOYBEAN SEED TREATMENT STUDY

Cooperators: Producer: Cloverfield Enterprises
Extension: Keith Balderson, Essex
Agribusiness: Paul Bystrak, Eden BioScience
Soil Type: Molena loamy sand
Planting Date: June 18, 2006
Variety: Vigoro V41N6RR
Tillage: No-till in 15 inch rows following barley
Crop Protection: **g**lyphosate-postemergence; Karate for corn earworm
Harvest Date: November 2, 2006

Treatment	Rep.	% Moisture	Yield
		(%)	(bu/A)
N-Hibit	1	12.4	50.7
Check	1	12.6	44.0
N-Hibit	2	12.3	44.2
Check	2	12.6	51.5
N-Hibit	3	12.6	53.7
Check	3	12.3	51.1
Averages:			
N-Hibit		12.4	49.5
Check		12.5	48.9
LSD (0.10)		0.5	12.1

Discussion: N-Hibit is a seed treatment that has been demonstrated to reduce soybean cyst nematodes by roughly 40% in greenhouse studies. In this field study, cyst nematode numbers were extremely high in parts of the test area. Yields were variable due to the variability of the cyst population. Early in the season, it did appear that the N-Hibit was increasing the root mass in those plots. Statistically, there was no difference in yield between the treated seed and untreated seed.

2006 CHARLES CITY SOYBEAN POPULATION STUDY

Cooperators: Producer: Archer & Tim Ruffin, Evelynton Farm
Extension: Paul Davis, New Kent & Charles City; Phillip Henley, Summer Intern
Variety: S. States RT4451N
Plant Date: May 22, 2006 into bean stubble
Harvest Date: October 12, 2006

		6/29/06		
Seeding Rate		**Plant Pop.**	**Moisture**	**Yield**
(seed/A)	(lb/A)	(plants/A)	(%)	(bu/A)
30,000	8	10,400	17.2	8.0
60,000	16	22,800	17.2	20.0
90,000	24	50,000	17.2	17.0
120,000	32	70,000	17.2	19.0
150,000	40	82,000	17.2	18.0
180,000	48	107,000	17.2	18.0

Discussion: North Carolina and Virginia research has shown that full season soybean plant populations can be significantly reduced and still maintain soybean yields. This study started with several challenges, i.e., trying to plant only 8 pounds of soybean seed per acre which was equivalent to 30,000 seeds/A. The no-till drill being used could not drop that few seed, even at 3760 seed/lb., which is very small. The hot and dry conditions from July 24th to August 27th reduced the plant height and overall plant development. As you see from this un-replicated comparison, low populations can yield equal to higher populations, but we are not recommending less than 100,000 seed/A at this time. More tests are planned for 2007.

2006 CULPEPER SOYBEAN SEEDING RATE STUDY

Cooperators: Producer: James Bowen, Beauregard Farms
Extension: Carl Stafford, Culpeper; David Holshouser, TAREC
Variety: Pioneer 94B73
Plant Date: June 30, 2006 into wheat stubble
Harvest Date: November 14, 2006

Seeding Rate	Yield
115,000	24
140,000	23
190,000	29

Discussion:
North Carolina and Virginia research has shown that full season soybean seeding rates can be significantly reduced and still maintain soybean yields. However, reducing seeding rates in double-crop soybean have not shown the same results. Although not a replicated experiment, this research seems to be validated by these on-farm strip plots. Due to late planting and very dry conditions during July, growth was poor. Under better growing conditions, results may have been different.

2006 PELLETIZED POULTRY LITTER ON SOYBEANS STUDY

Cooperators: Producer: James and Calvin Haile
Extension: Keith Balderson, Essex County
Agribusiness: Rob Waring and Donald Ray Bareford, Southern States Coop., Tappahannock
Soil Type: Pamunkey and Tetotum loam
Planting Date: July 1, 2006
Tillage: No-till following wheat
Fertilization: 40-20-30 per acre applied as litter on the litter plots prior to wheat planting; 42-20-30 per acre applied as commercial fertilizer on the commercial fertilizer plots on January 15th; 40-60-80 applied to all plots on January 15th
Crop Protection: glyphosate post emergence Warrior T in late August for corn earworm
Harvest Date: November 1, 2006

Treatment	Rep	%Moisture	Yield
		(%)	(bu/A)
Commercial Fertilizer	1	11.0	44.8
Poultry Litter	1	10.8	46.9
Commercial Fertilizer	2	10.8	51.8
Poultry Litter	2	10.8	53.3
Averages:			
Commercial Fertilizer		10.9	48.3
Poultry Litter		10.8	50.1
LSD (0.10)		0.6	1.9

Discussion:
The litter plots tended to yield higher than the commercial fertilizer plots, but differences were not significant.

EVALUATION OF THREE TILLAGE SYSTEMS IN SOYBEANS

Cooperators:	Producer: Bruce Whitley, Larry Whitley Extension: Wes Alexander, Southampton; Cyndi Estienne, Greensville; Wade Thomason, CSES Agribusiness: Clifton Dixon, Owner/Developer of PATS
Variety:	MFS591
Soil Type:	Slagle fine, sandy, loam
Cropping system	cotton, 2005; wheat, 2005-6; double crop soybeans, 2006
Planting Date:	June 19, 2006 into wheat stubble-7 inch rows
Seeding Rate:	180,000 seed per acre
Equipment::	PATS subsoiler; John Deere 30 ft 1990 drill; John Deere 9600 20 ft. combine
Fertilization:	Nov 8 2005: 25-25lb P 80lb K; March 2006: 60 lb N; April 2006, 60 lb N
Seed Treatment:	Apron
Crop Protection:	Touchdown burndown; Flexstar + Fusilade, postemergence; Karate Z
Harvest Date:	December 8, 2006
Replications:	Four

Treatment	Yield	Moisture
	(bu/A)	(%)
1) Mow cotton stalks, disk, drill wheat, no-till soybeans	44.0	11.5
2) Mow cotton stalks, no-till wheat, no-till soybeans	42.8	11.6
3) Mow cotton stalks, rip 36 inch centered between old cotton rows, no-till wheat, no-till soybeans	44.5	11.6
LSD (0.05)	**1.5**	**NS**

Discussion: Treatment 3, which included deep tillage, yielded significantly more than treatment 2, which is the same treatment with the exception of the deep tillage. No difference in grain moisture was found between the three treatments. The objective of this trial was to compare traditional disking, no-till and deep tillage effects on wheat and soybean yields following cotton. Slagle soil series are prone to developing hardpans. Rainfall during this growing season was above average, and therefore the difference in soybean yields between deep ripping and disking may have been minimized. These data also show that there is no significant soybean yield advantage to disking cotton stubble before planting wheat.

ORGANIC SOYBEAN DEMONSTRATION

Cooperators: Producer: Todd Henley
Extension: Keith Balderson, Essex
NRCS: Chris Lawrence, State Agronomist
Three Rivers SWCD: Michelle Carter, District Manager

Planting Date: May 25, 2006 for Vigoro 435
May 31, 2006 for USG 440

Tillage: Vigoro 435: 2 cultivations
USG 440: primary tillage (3 passes), plus 4-5 cultivations

Variety	%Moisture	Yield
	(%)	(bu/A)
Vigoro 435 (rolled down rye)	12.9	35.0
Vigoro 435 (rolled down rye)	13.6	44.5
USG 440 (high tillage)	13.1	45.0
USG 440 (high tillage)	13.0	50.5

Discussion:

Organic Grain Production: Weed Control Challenge

Todd Henley has been producing certified organic feed grains for as long as 15 years on some fields in King & Queen County. He is now growing about 400 acres of organic corn and soybeans annually. Todd will tell you that organic commodity crops command price premiums and can open up significant marketing opportunities. He'll also tell you that they bring with them lots of production headaches. Todd often says that organic crops take up one-third of his acreage, but three-quarters of his time.

In eastern Virginia, one of the biggest challenges in organic grain production is weed control. Since all chemical herbicides are prohibited, tillage becomes the obvious choice for killing cover crops and weeds. Multiple tillage passes every year eats up lots of time and money. It's also hard on the land, causing erosion in steeper areas and destroying soil structure and organic matter on all fields regardless of slope.

Experimenting with "No-Herbicide No-Till" Soybeans

To save time, money, and soil, Todd has started experimenting with "no-herbicide no-till" seeding of soybeans. The practice involves growing a thick cereal rye cover crop and rolling it down flat in late spring to form a mat of residue. Soybeans are then no-tilled into the residue mat. In theory, this practice has two weed control advantages. First, when properly timed and executed, the process of rolling can kill the cover crop without tillage or herbicides. Second, the mat of residue can slow emergence of weeds, especially annuals, until the cash crop canopies. This can reduce or eliminate the need for post-emergence cultivation.

This year Todd used the cover crop roller available from Three Rivers Soil & Water Conservation District in Tappahannock to roll his rye ahead of no-tilling. When used on a heavy stand of tall rye at the grain-fill stage, this specially-designed "crimper" roller should achieve close to 100% kill without herbicides. This year, Todd waited until the rye reached full

physiological maturity before rolling it. Therefore, we can't make any observations at how well the roller did with respect to killing the cover crop.

Todd no-tilled about 30 acres of organic soybeans into rolled rye. Todd planted in 30-inch rows, which allowed him to row cultivate the organic beans twice with a high-residue cultivator. Plenty of weeds broke through the residue mat and the row cultivation was very much needed. Overall, Todd still saved himself between four and six tillage passes compared to his normal practice. His normal practice is to make two or three full-width tillage passes to prepare the seedbed before planting, plus four or five passes with a rotary hoe or row cultivator after planting.

Yields were checked in two places in the organic no-till soybean field. Yields were also checked in two places in a nearby field where Todd grew organic soybeans using his normal, high-tillage approach. Varieties, planting dates, and soil types were different in the two fields. So these yields have very little research value, but they are still interesting.

Conclusions:

1. The yield checks show that good organic soybean yields are possible in eastern Virginia using both clean-till and no-till establishment methods. Note that this was a relatively dry summer at Todd's with soybeans definitely experiencing periods of moisture stress. Also note that both checked fields have been in continuous certified organic corn and soybean production (with cover crops every winter) for at least eight years.
2. Rolling down a thick stand of tall rye can cause planting challenges. Todd did not plant in the same direction in which he rolled his rye, so his coulters and furrow-opening disks had to cut through large quantities straw. There was a lot of residue hairpinning, but he still got an acceptable stand overall.
3. In fields with no major pre-existing weed infestations, an acceptable level of weed control can be achieved with organic soybeans no-tilled into rolled rye. But even a thick residue mat will not suppress all weeds, so planting in rows to allow for post-plant row cultivation is probably a good option.
4. In fields with major pre-existing weed infestations, organic no-till won't achieve acceptable weed control. One edge of Todd's no-till field has a heavy cocklebur infestation that has been slowly spreading for a number of years. The residue mat, even where it was thickest, had no impact on slowing the seedlings of this aggressive weed. Note that heavy pre-plant tillage might not have done much better on the cocklebur. The reality is that when herbicides are not an option in continuous corn and soybean production, weed control can be a huge challenge, regardless of tillage methods.
5. The jury is still out on whether rolling down cover crops has a place in conventional, non-organic grain production in eastern Virginia. But in organic, herbicide-free grain production systems, it is clear that rolling down cover crops has major potential. Even if Todd experienced a yield drag on the no-till field, he saved the time and cost associated with four to six tillage passes. He plans on continuing to experiment with this practice.

Organic soybeans planted into rolled down rye cover crop. This picture taken looking down rows shortly after planting (May 31, 2006).

Organic soybeans planted into rolled down rye cover crop. This area had low weed pressure. Picture taken prior to any row cultivation (July 03, 2006).

Organic soybeans planted into thick mat of rolled down rye cover crop. This area had low weed pressure. Picture taken prior to any row cultivation
(July 03, 2006).

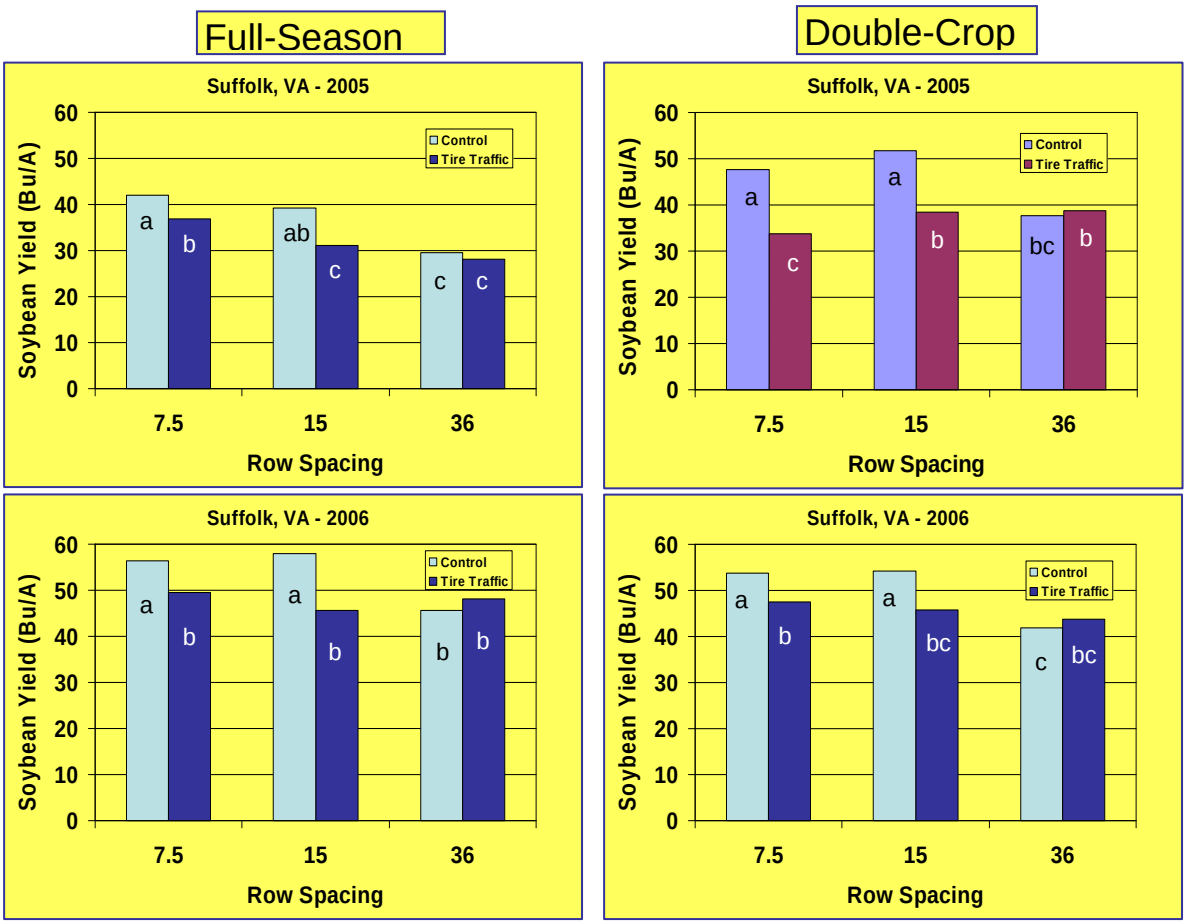
Cocklebur-infested area in no-till organic soybean field. Rows of beans on 30-inch spacing are barely visible among the cocklebur seedlings. Picture taken prior to any row cultivation (July 03, 2006). This level of cocklebur infestation in organic row crops is a no-win situation, whether the crop is established with or without tillage.

SPRAYER TRAFFIC EFFECTS ON REPRODUCTIVE-STAGE SOYBEAN PLANTED AT THREE ROW SPACINGS

Cooperators:	Extension: David Holshouser, Soybean Specialist
	VAES: Mike Ellis, Research Specialist
	Agribusiness: Ralph Hall, Syngenta Crop Protection; Jim Oliver, Monsanto
Soil Type:	Dragston fine sandy loam
Planting Dates:	Full-Season: May 26, 2005 & May 22, 2006
	Double-Crop: June 28, 2005 & June 29, 2006
Variety:	Asgrow AG5603 (2005 FS only) and Vigoro V55N5RR
Tillage:	No-till in 7.5, 15, and 36 inch rows
Treatment Dates:	Full-Season: Aug. 22, 2005 & Aug. 17, 2006
	Double-Crop: Sept. 12, 2005 & Sept. 12, 2006
Soybean Stage at time of treatments:	R4 (late pod development)
Fungicide:	Quadris at 6.2 oz/A + NIS 0.25% applied to half of plots
Crop Protection:	Roundup Ultra Max post-emergence
	Warrior for corn earworm (2006)
Harvest Dates:	Full-Season: Nov. 19, 2005 & Nov. 18, 2006
	Double-Crop: Dec. 8, 2005 & Nov. 18, 2006

Background: Control of Asian soybean rust will require a fungicide application during the reproductive stages. Most soybeans in the Mid-Atlantic region are planted in narrow row spacing. Therefore, unless tram lines are established, one or two soybean rows will be damaged by the sprayer tires. The impact of sprayer traffic on reproductive-stage soybean yield has not been fully investigated. Furthermore, planting date, row spacing, and environment may influence the extent of yield loss. The objective of this research was to determine the yield loss caused by sprayer traffic to R4- (late pod) to R5- (early seed) stage soybean planted in three row widths and two planting dates.

The experimental design was a split-strip-plot with three row spacings as the main plot, with or without traffic as the vertical treatment, and with or without fungicide as the horizontal treatment. At Suffolk, individual plots were 24 feet long and consisted of nineteen 7.5-inch rows, ten 15-inch rows, or four 36-inch rows. Wheel traffic damaged 4, 2, and 0 rows in the 7.5-, 15-, and 36-inch plots, respectively (25% of the rows). This left a 30-inch gap between undamaged 15-inch rows and 22.5-inch gap between 7.5-inch rows.



Cropping System	Year	Row Spacing	Plot*	Sprayer Boom Width			
				45	60	90	120
		(inches)		(% Yield Loss)			
Full Season	2005	7.5	12.6	2.8	2.1	1.4	1.1
		15	20.9	5.6	4.6	2.8	2.3
		36	---	---	---	---	---
	2006	7.5	12.1	2.6	2.0	1.3	1.0
		15	21.2	4.8	3.5	2.4	1.8
		36	---	---	---	---	---
Double Crop	2005	7.5	29.0	6.4	4.8	3.2	2.4
		15	25.5	5.6	4.3	2.8	2.1
		36	---	---	---	---	---
	2006	7.5	11.5	2.6	1.9	1.3	1.0
		15	15.5	3.4	2.6	1.7	1.3
		36	---	---	---	---	---

*Wide rows suffered no significant yield loss with wheel traffic. Row spacing of 7.5- and 15-inches is significantly different at all locations, except the 2005 Suffolk double-crop experiment.

Discussion: Wheel traffic reduced soybean yields when planted in 7.5- or 15-inch rows regardless of location, cropping system, or fungicide. Fungicide did not affect soybean response to wheel traffic nor did it interact with other factors, so yield was averaged over fungicide treatment. Fungicide only increased yield by 3.3 bushel per acre at the 2006 Suffolk full-season site, but not in the other locations. Wheel traffic did not reduce yields in 30- or 36-inch row spacing, but soybean planted in wide rows yielded less than narrow row spacing without traffic in all Suffolk experiments. Moreover, wide-row soybean yielded equal to or less than trafficked soybean planted in narrow row spacing at those sites.

Yield loss from wheel traffic applied to R4-stage soybean planted in 7.5 or 15 inch rows ranged from 12 to 29%. This translates into a 1 to 6% loss in yield depending on sprayer boom width. The greatest yield loss was at the 2005 double-crop site. At that site, an 18-day period of high temperatures and no rainfall preceded the wheel traffic treatment and rainfall was not received until 4 days after the wheel traffic treatment. This 3-week period of hot and dry conditions was likely responsible for the greater yield reduction and lack of compensation from neighboring rows.

Even if the non-compensating experiment is ignored, percent yield reduction was still quite variable (12 to 21%). This indicates that the ability of neighboring rows to compensate for damaged ones may be dependent on several factors. Yield loss in the 7.5-inch row spacing was less at 3 of 4 sites. At those three sites, traffic reduced yield by an average of 12.1 and 19.2% in the 7.5- and 15-inch row spacing, respectively. At the 2005 Suffolk double-crop experiment, row spacing did not affect the amount of yield loss occurring at the site that experienced hot and dry conditions. These indicate that drilled soybean will tolerate wheel traffic better than soybean planted in 15-inch rows, unless drought stress prevents compensation from neighboring rows.

Summary: Widening row spacing to avoid yield loss does not appear to be a solution to reproductive-stage pesticide applications since doing so resulted in yields as low as or lower than narrow row spacing with traffic treatments. Recent experiments in Indiana showed similar results. When taking into account typical spray boom widths, widening rows to avoid wheel traffic damage cannot usually be justified. Drilled soybean tended to compensate better than 15-inch soybean, but the effect of cropping system was not consistent. Theoretically, 7.5-inch rows should compensate since the resulting gap between rows would be less than 15-inch rows. But, our research shows that this may only be the case when environmental conditions are conducive for compensation. Water stress appeared to be the over-riding factor associated with the crops ability to compensate for damaged rows.

In summary, yield loss from running over narrow-row R4-stage soybean with a sprayer needs to be accounted for when determining the cost of managing reproductive-stage pests. Otherwise, the cost and benefit of such pest management practices cannot be fully determined. Alternatives to driving over rows with a ground sprayer include aerial application or the installation of tram lines at planting. Another option may be to run the sprayer perpendicular or at an angle to the rows. With this strategy, damage would be limited to the width of the tire (versus the 22.5- or 30-inch gaps between rows in our study), and may allow more compensation from neighboring plants. These data provide information that can be used to further refine pest management decisions.

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