

Virginia On-Farm Soybean Research

*A summary of replicated research conducted by
Virginia Cooperative Extension in cooperation with local producers and agribusiness*

2019



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Introduction

These results are a collaborative effort of Virginia Cooperative Extension (VCE) 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 soybean producers in Virginia. It provides an unbiased evaluation of varieties, management practices, and new technologies through on-farm replicated research using producer equipment and time. These experiments enable producers to make better management decisions based on research and provide greater opportunities to improve yields and profits, which improves quality of life for them and their families.

The success of these on-farm experiments is very dependent on the cooperative effort of the producer and the assisting agribusinesses. We are grateful for that cooperation. We hope the information will be beneficial to you and your individual agribusiness operations. This publication is made available each year at the Virginia Grain and Soybean Conference, at regional production meetings throughout Virginia, and on the VCE website (<http://pubs.ext.vt.edu>). This information reaches hundreds of Virginia soybean and grain producers plus agribusinesses, impacting over 550,000 acres of soybeans valued at approximately \$200 million.

The field work and printing of this publication is supported by Virginia Soybean Board 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 Stephanie Romelczyk in Westmoreland County at 804-493-8924 or sromelcz@vt.edu.

This is the 23rd year of this multi-county cooperative effort and further work is planned for 2020. The authors wish to thank the many producers who participated in this project. Appreciation is extended to seed, crop protection, and fertilizer representatives who donated products and/or assisted with the field work.



DISCLAIMER: Trade and brand names are used only for educational purposes, and Virginia Cooperative Extension does not guarantee or warrant the standards of the product, nor does Virginia Cooperative Extension imply approval of the product to the exclusion of others which may also be suitable.

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PHOTOS: Courtesy of Lindy Fimon, Laura Siegle, Scott Reiter, Trent Jones, Robbie Longest, and Stephanie Romelczyk

GENERAL SUMMARY

These replicated studies provide information that can be used by Virginia soybean producers to make better management decisions. Refer to individual tests for a discussion of results.

First, we would like to thank everyone that participated in on-farm plot work: seed and input suppliers for providing materials for the trials, our farmer-cooperators for supplying equipment, land, and patience to get these tests from planting to harvest, the Virginia Soybean Board for funding to assist with expenses, Extension Agents for securing locations, hauling seed, and sending in data, and you, the soybean grower, for showing interest in our work and taking time to review this publication.

As expected the weather in 2019 continued to throw curve balls. Planting conditions were nearly ideal with some concerns about dry soils. Then June brought various levels of rain and even flooded or ruined some plots across the State. Then dry conditions set in across the Southside in late July and spread across most of Virginia by late August. Yields range from the teens up to 70 bushels in some plots. Weather is still a risk difficult to manage.

As in the past, Agents have compared Maturity Group (MG) 4 & 5 varieties across multiple locations. This work is performed in concert with the Official Variety Tests conducted by Dr. David Holshouser and offers producers even stronger yield comparison information that they can use when making planting decisions. In addition, a special MG 2.5-3.9 trial was conducted at the Virginia Ag Expo site in Caroline County.

Roundup Ready 2 Xtend soybeans dominated the trial offerings. Eighteen of 19 varieties carried the RR2X trait in the MG 4 tests; 16 of 17 in the MG 5 tests. The LL trials offered a limited look at Liberty Link GT27 and Enlist E3 varieties. For 2020, there will be at least 6 different options for herbicide tolerance traits in soybean. Weed control system, nematode resistance, and disease package should be considered when selecting varieties for 2020.

The widespread use of cover crops and a focus on soil health continue to look at yield advantage and return on investment. Two studies, one on the Northern Neck and one on the Middle Peninsula, evaluated wheat, barley, oats, and rye cover crop effect on plant stands and soybean yields. Yield responses have been variable over the past two years with no conclusive yield gains from cover crops.

Seed treatment trials were conducted at three locations. ILEVO was compared to a standard seed treatment in a field with a SDS history. NemaStrike was used at two locations with a history of nematode issues. See those pages for details.

Mr. Trent Jones and Dr. David Holshouser evaluated two seeding rate trials in full-season and double-crop plantings. As with past results, high seeding rates for full-season soybean are rarely beneficial.

We hope you find this information useful. If you have ideas for 2020 on-farm research or would like to be a cooperator in 2020, please contact your local Virginia Cooperative Extension Agriculture Agent.

Trait Data for 2019 VCE On-farm Soybean Varieties

<u>Company</u>	<u>Brand</u>	<u>Relative Maturity</u>	<u>Herbicide Traits</u>	<u>Soybean Cyst Nematode</u>	<u>Root Knot Nematode</u>	<u>Frogeye leafspot</u>	<u>Sudden death syndrome</u>	<u>Brown stem rot</u>	<u>Cercospora blight</u>
Asgrow	AG46X6	4.6	RR2X	R 3	S	G	F		
Asgrow	AG48X9	4.8	RR2X/SR	R 3	S	G	F		
Pioneer	P42A96X	4.2	RR2X	R 3,14	S	VG	VG	MS	
Pioneer	P48A60X	4.8	RR2X	R 3,14	S	F	VG	MS	
USG	7447XTS	4.4	RR2X/STS	R 3, MR 14	S	MR	MR		
USG	7496XTS	4.9	RR2X/STS	R 3, MR 14	MR	MS	MR		
Hubner	H46-29R2X	4.6	RR2X/SR	R 3	S	F	G		
Hubner	H49-27R2X	4.9	RR2X/SR	MR/MS1, R3	S	G	G		
Dyna-Gro	S43XS27	4.3	RR2X/STS	R 3, MR 14	S	VG	VG		
Dyna-Gro	S49XS76	4.9	RR2X/STS	R 3, MR 14	S	VG	VG		G
Progeny	P 4816RX	4.8	RR2X	R 3	S	MR	MR		
Progeny	P 4255RX	4.2	RR2X	R 3, MR 14	S	MR/MS	MR/MS		
Local Seed Company	LS4798X	4.7	RR2X	R 3, MR 14	S	VG	G		
Local Seed Company	LS4889XS	4.8	RR2X/STS	R 3, MR 14	S	G	G		
NK Seed	S42-B9XS	4.2	RR2X/STS	R 3	S	G	VG	VG	
NK Seed	S45-Z5XS	4.5	RR2X/STS	R 3	S	VG	G	G	
VCIA	MO4901D GT	4.9	GT	MR 1,2,3,5,14	MR	R	MR		
LG Seed	C4845RX	4.8	RR2X	R 3, MR 14	MR	VG	VG		
LG Seed	C4615RX	4.6	RR2X/STS	R 3, MR 14	VG	VG	VG		
Asgrow	AG56X8	5.6	RR2X	R 1,3	R	VG	G		
Asgrow	AG55X7	5.5	RR2X	S	R	G	G		
Pioneer	P51A61X	5.1	RR2X	R 3,14	S	F	VG	HT	F
Pioneer	P55A49X	5.5	RR2X	R 3,14	R	G	G	MS	
USG	7547XT	5.4	RR2X	R 3, MR 14	R	MR	MR		MS
USG	7529XTS	5.2	RR2X/STS	S	S		MS		
Hubner	H50-10R2X	5.0	RR2X/SR	R 3	S		VG		
Hubner	H56-20R2X	5.6	RR2X	S	R	G	G		
Dyna-Gro	S52RS86	5.2	RR2X/STS	R 3, MR 14	G	F	VG		F
Dyna-Gro	S52XS39	5.2	RR2X/STS	S	S	VG	VG		
Progeny	P 5016RXS	5.0	RR2X/STS	R 3, MR 14	MR	MR	MR		
Progeny	P 5554RX	5.5	RR2X	R 1,3	R	R	MR		MR
Local Seed Company	LS5386X	5.3	RR2X	R 3, MR 14	MR/MS	G	G		
Local Seed Company	LS5588X	5.5	RR2X	R 3, MR 14	MR/MS	VG	G		
NK Seed	S53-F7X	5.3	RR2X	R 3, MR 14	MS	VG	VG		
NK Seed	S57-A7X	5.7	RR2X	R 3, MR 14	MR	VG	VG		
VCIA	Corbin	5.3	RR						

R = Resistant
 S = Susceptible
 MR = Moderately resistant
 M = Moderate
 MS = Moderately susceptible
 RR = Roundup Ready
 RR2 = Roundup Ready 2 Yield
 GT = glyphosate tolerant
 STS or SR = Tolerant to sulfonylurea herbicides; such as Synchrony STS or Classic
 X or XT = Xtend - dicamba tolerant

No entry for a particular trait means that no information was provided or trait has not been rated by the company.

All ratings were taken from company literature available in current catalogs or websites.

Trait Data for 2019 VCE On-farm Soybean LL Varieties

<u>Company</u>	<u>Brand</u>	<u>Relative Maturity</u>	<u>Herbicide Traits</u>	<u>Soybean Cyst Nematode</u>	<u>Root Knot Nematode</u>	<u>Frogeye leafspot</u>	<u>Sudden death syndrome</u>	<u>Brown stem rot</u>	<u>Cercospora blight</u>
Credenz	CZ 4539 GTLL	4.5	LL-GT-27	VG	P	VG	G	VG	
Credenz	CZ 4649 LL	4.6	LL	G	P	VG			
Credenz	CZ 5150 LL	5.1	LL	VG	P	E	F	E	
Credenz	CZ 5859 LL	5.8	LL	F	F	VG			
Progeny	P 4930 LL	4.9	LL	MR3	MS	R	MR		
Progeny	P 5909 LLS	5.9	LL-ST5	S	MR	R	MS		
Dyna-Gro	S42EN89	4.2	LL-GT-EN	R3, MR14	P	VG	VG		
Dyna-Gro	S52LL66	5.2	LL	MR3	G	VG	G		
Dyna-Gro	S55LS75	5.5	LL-ST5	S	G	VG	G		
USG	75G95LS	5.9							

R = Resistant
 S = Susceptible
 MR = Moderately resistant
 M = Moderate
 MS = Moderately susceptible

No entry for a particular trait means that no information was provided or trait has not been rated by the company.

LL = Liberty Link; glufosinate tolerant
 GT = glyphosate tolerant
 STS or SR = Tolerant to sulfonylurea herbicides; such as Synchrony STS or Classic 27 = Tolerant to pre-emerge application of HPPD (Group 27) herbicide Alite 27.
 EN= Enlist E3 system, tolerant to glyphosate, glufosinate, and 2,4-D choline.

All ratings were taken from company literature available in current catalogs or current websites.

Seed Treatments on Submitted Varieties

Company	Brand	Treatment Brand Name (Contents)	Insecticide	Fungicide	Nematicide	Inoculant	Biological
			None				
Asgrow	AG46X6	Acceleron Seed Applied Solutions (Elite + NemaStrike, Acceleron B-200SAT)	X	X	X		X
Asgrow	AG48X9	Acceleron Seed Applied Solutions (Elite + NemaStrike, Acceleron B-200SAT)	X	X	X		X
Pioneer	P42A96X	Pioneer Premium FST/IST (Evergol Energy SB, Lumisena, B. subtilis & pumilis)	X	X			X
Pioneer	P48A60X	Lumigen FST/IST (Evergol Energy SB, Lumisena, B. subtilis & pumilis)	X	X			X
USG	7447XTS	RenPro Plus Riznate	X	X			X
USG	7496XTS	RenPro Plus Votivo Riznate (BioST)	X	X	X		X
Hubner	H46-29R2X	Acceleron Seed Applied Solutions (Elite with NemaStrike, Acceleron B-200SAT)	X	X	X		X
Hubner	H49-27R2X	Acceleron Seed Applied Solutions (Elite with NemaStrike, Acceleron B-200SAT)	X	X	X		X
Dyna-Gro	43XS27		X				
Dyna-Gro	49XS76		X				
Progeny	P 4816RX	Poncho Votivo Trilex 2000 Ileo	X	X	X		
Progeny	P 4255RX	Poncho Votivo Trilex 2000 Ileo	X	X	X		
Local Seed Company	LS4798X	RSP+1	X	X			
Local Seed Company	LS4889XS	RSP+1	X	X			
NK Seed	S42-B9XS	Clariva Complete Beans + Mertect	X	X	X		
NK Seed	S45-Z5XS	Clariva Complete Beans + Mertect	X	X	X		
Vicia	MO4901D GT		X				
LG Seed	C4845RX	<i>Seed treated but not specified on bag</i>					
LG Seed	C4615RX	<i>Seed treated but not specified on bag</i>					
Asgrow	AG56X8	Acceleron Seed Applied Solutions (Elite + NemaStrike, Acceleron B-200SAT)	X	X	X		X
Asgrow	AG55X7	Acceleron Seed Applied Solutions (Elite + NemaStrike, Acceleron B-200SAT)	X	X	X		X
Pioneer	P51A61X	Pioneer Premium FST/IST (Evergol Energy SB, Lumisena, B. subtilis & pumilis)	X	X			X
Pioneer	P55A49X	Lumigen FST/IST (Evergol Energy SB, Lumisena, B. subtilis & pumilis)	X	X			X
USG	7547XT	RenPro Plus Votivo Riznate (BioST)	X	X	X		X
USG	7529XTS	RenPro Plus Votivo Riznate	X	X	X		X
Hubner	H50-10R2X	Acceleron Seed Applied Solutions (Elite + NemaStrike, Acceleron B-200SAT)	X	X	X		X
Hubner	H56-20R2X	Acceleron Seed Applied Solutions (Elite + NemaStrike, Acceleron B-200SAT)	X	X	X		X
Dyna-Gro	DG52RS86	ApronMaxx + Dynastart PBC (fungicide, inoculant, liquid extender, concensus)		X		X	X
Dyna-Gro	DG52XS39	ApronMaxx + Dynastart PBC (fungicide, inoculant, liquid extender, concensus)		X		X	X
Progeny	P 5016RX	Poncho/Votivo, Ileo, Trilex 2000	X	X	X		
Progeny	P 5554RX	Poncho/Votivo, Ileo, Trilex 2000	X	X	X		
Local Seed Company	LS5386X	RSP+1	X	X			
Local Seed Company	LS5588X	RSP+1	X	X			
NK Seed	S53-F7X	Clariva Complete Beans + Mertect	X	X	X		
NK Seed	S57-A7X	Clariva Complete Beans + Mertect	X	X	X		
Vicia	Corbin		X				



**MATURITY GROUP 4
VARIETY COMPARISONS**

2019 Virginia Cooperative Extension On-farm Soybean Variety Trials - MG 4

Company	Brand	AG EXPO	Appomattox	Brunswick	Caroline*	Chesapeake-Virginia Beach	Culpeper	Mecklenburg	Middlesex	Prince George	Westmoreland	Overall Average	Relative Yield
NK Seed	S45-Z5XS	57.1	50.1	41.1	43.9	60.7	69.8	28.7	31.8	35.4	64.8	48.8	105
Pioneer	P48A60X	55.1	48.3	47.9	38.3	56.8	69.1	36.3	22.0	37.3	69.1	49.1	105
Progeny	P4816RX	55.9	43.5	50.7	39.1	48.1	70.2	36.9	26.4	39.9	63.8	48.4	105
Pioneer	P42A96X	60.3	48.1	38.8	38.0	47.2	64.2	33.0	32.7	36.7	67.7	47.6	104
Progeny	4255RX	58.3	48.5	42.5	37.9	55.6	58.6	31.8	31.9	34.7	60.8	47.0	103
Local Seed Co	LS4889XS	53.8	40.6	49.1	37.0	54.5	69.2	30.4	29.7	36.5	61.7	47.3	102
USG	7447XTS	54.0	46.4	47.5	33.8	54.7	60.7	33.3	26.4	36.2	63.9	47.0	102
LG Seed	C4845RX	53.6	44.6	44.3	36.8	54.5	67.9	31.6	27.3	35.4	63.6	47.0	101
USG	7496XTS	50.7		44.4	36.1	57.1	71.2	31.2	22.9	36.2	66.0	47.5	101
Hubner	H46-29R2X	55.2		42.9	39.5	53.1	68.7	29.8	24.5	37.6	63.2	46.9	100
LG Seed	C4615RX	52.9	47.3	41.2	38.1	47.8	72.3	31.9	25.5	36.9	63.1	46.5	100
NK Seed	S42-B9XS	60.1	46.5	41.0	42.8	38.4	63.1	32.4	29.9	33.5	66.0	45.7	99
Asgrow	AG46X6	53.7	44.6	44.3	36.9	50.8	72.1	29.6	24.8	33.8	61.0	46.1	98
Local Seed Co	LS4798X	47.8	45.2	43.7	34.7		62.8	28.7	27.2	36.1	61.4	44.1	97
Hubner	H49-27R2X	50.5	47.5	39.7	38.2	52.5	70.4	27.2	24.4	37.3	58.2	45.3	97
Asgrow	AG48X9	53.1	43.0	45.3	36.4	46.0	66.3	27.9	26.4	34.3	57.4	44.4	96
Dyna-Gro	43XS27	50.6		48.1	36.7	44.8	69.0	27.9	23.4	32.7	63.7	45.0	96
Dyna-Gro	49XS76	51.9	43.4	41.4	37.4	56.7		26.3	20.9	35.1	59.2	41.9	94
VCIA	MO4901D GT	48.6	37.6		44.6	57.8		25.2	25.4	26.2	57.8	39.8	90
Average		53.9	45.3	44.1	38.2	52.1	67.4	30.5	26.5	35.4	62.8		

Notes:

* VCIA MO4901GT was killed or injured by dicamba at 2 locations.

* Dyna-Gro 49XS76 not received by Culpeper planting date.

* Caroline location - not included in overall average because some varieties planted in a different field.

* Average Relative Yield ranks varieties based on their performance compared to the location average.

It is a percentage above or below the location average.

Asgrow	AG53X9	12.9	43.0
Asgrow	AG53X0	12.6	42.2
Asgrow	AG54X9	12.8	37.2
CHECK	DG48XT56	12.9	39.5
	AVERAGE	12.6	43.7

Discussion: Keep track of your herbicide technologies; VCIA MO4901D GT was killed with dicamba application

2019 CAROLINE COUNTY AG EXPO MATURITY GROUP 4 SOYBEAN COMPARISONS

Cooperators: **Producer:** Charity Hill Farm/Steve Smith
Extension: M. Broaddus, R. Longest
Industry: Participating seed companies
Previous Crop: Wheat and pea haylage cut for ensilage
Soil Type: Kempsville
Tillage: No-till
Planting Date: May 16, 2019
Seeding Rate/Row Spacing: 120,000/30" rows
Fertilization: 11-52-100
Crop Protection: **Burndown**-1 qt. Roundup, 22 oz Xtendimax, 1.25 pt. Dual, 1/2 gal Black Label Zinc
Post - 1 qt. Roundup, 2 oz. Radiate, 1 qt. Taskforce 2
R5 - 6.8 oz. Quadris Top STX, 2 qt. Locomotive, 2 qt. Maxima N-Tact
Harvest Date: October 3, 2019
Harvest Equipment: New Holland CR9040 w/730C Super Flex header

Brand	Variety	Moisture%	Yield (bu/A)
Pioneer	P48A60X	10.4	55.1
Progeny	P 4816RX	10.6	55.9
Local Seed Company	LS4798X	11.0	47.8
Dyna-Gro	S43XS27	10.5	50.6
Local Seed Company	LS4889XS	11.2	53.8
Hubner	H49-27R2X	11.1	50.5
USG	7447XT	10.6	54.0
Hubner	H46-29R2X	10.7	55.2
VCIA	MO4901D GT	11.2	48.6
Dyna-Gro	S49XS76	11.2	51.9
Pioneer	P42A96X	10.6	60.3
Asgrow	AG46X6	10.7	53.7
Channel CHECK	3919R2X	10.4	59.0
Asgrow	AG48X9	10.6	53.1
Channel	4519RR2X/SR	10.9	53.8
Progeny	P 4255RX	11.0	58.3
USG	7496XTS	11.1	50.7
NK Seed	S45-Z5XS	11.0	57.1
NK Seed	S42-B9XS	10.9	60.1
LG Seed	C4845RX	10.8	53.6
LG Seed	C4615RX	10.6	52.9
Channel	4919RR2X/SR	10.8	54.1

	AVERAGE	10.8	54.1

Discussion: Channel 3919 R2X was planted as the check variety. The Ag Expo maturity group 4 varieties were planted next to the maturity group 2.5 - 3.9 varieties.

2019 CAROLINE COUNTY MATURITY GROUP 4 SOYBEAN COMPARISONS

Cooperators: **Producer:** Airy Hill Farm
Extension: Mike Broaddus, VCE Caroline/King George
 Robbie Longest, VCE-Essex
Industry: Participating seed companies
Previous Crop: Summer 2018: Full-Season Soybeans
 Fall/Winter 2018/19: Triple Species Winter Cover Crop
Soil Type: Suffolk fine sandy loam, 2-6% slopes
Tillage: No-tilled into rolled winter cover crop
Planting Date: June 8, 2019
Seeding Rate/Row Spacing: 120,000 seeds per ac./30-inch rows
Fertilization: 0-0-60 (3/14); 100-225-0 via biosolids (early Feb– Field B)
Crop Protection: Burndown: 1 qt./ac. Glyphosate with 4 oz. Matrix/100 gal.
 Post-emergence: 40 oz./ac. Makaze (Glyphosate)
Harvest Date: November 13, 2019
Harvest Equipment: Case/IH 1660 Rotary w/25' 1020 flex head

Field A

Brand	Variety	Moisture %	Yield (bu./ac.@13.0%)
Check (Pioneer)	P48A60X	12.9	37.1
USG	7496XTS	13.0	36.1
USG	7447XTS	13.0	33.8
LG Seed	C4845RX	12.7	36.8
LG Seed	C4615RX	12.0	38.1
Local Seed Company	LS4889XS	12.7	37.0
Local Seed Company	LS4798X	13.2	34.7
Asgrow	AG48X9	12.8	36.4
Asgrow	AG46X6	13.3	36.9
Hubner	H46-29R2X	13.3	39.5
Hubner	H49-27R2X	12.1	38.2
Progeny	P 4816RX	12.7	39.1
Progeny	P 4255RX	13.7	37.9
Dyna-Gro	S43XS27	12.9	36.7
Dyna-Gro	S49XS76	12.5	37.4
Pioneer	P42A96X	13.3	38.0
Pioneer	P48A60X	12.4	38.3
Check (Pioneer)	P48A60X	13.2	35.6
	AVERAGE	12.9	37.1

***The varieties below had to be planted across the road in a different field due to space limitations. Please see the discussion for more info.**

Field B

Brand	Variety	Moisture %	Yield (bu./ac.@13.0%)
Check (Pioneer)	P48A60X	13.1	46.2
NK Seed	S42-B9XS	14.0	42.8
NK Seed	S45-Z5XS	13.9	43.9
VCIA	MO4901D GT	13.3	44.6
Check (Pioneer)	P48A60X	13.1	45.1
	AVERAGE	13.5	44.5

Discussion: This soybean plot was planned for one single field (Field A) that was thought to be big enough to hold all 19 varieties, but when it did not hold all 19 varieties, the plot had to be continued in the neighboring field (Field B) across the state road. The two fields were identical in most aspects, from soil type, potash fertilization, pH, crop protection, and weather. They were fertilized, limed, protected, and cropped identically the same over the past lifetime of the farmer. The only difference in the two fields was that Field B had biosolids applied in early February, and Field A did not. It is possible that the increased average yields observed in Field B is due to the application of biosolids, as this makes sense. More experimentation would be needed to scientifically conclude these yield results from biosolids, to see if the yield of the varieties in Field B would have been similar or different if they could have been planted in Field A with the other varieties in this test.

It was also felt that these soybean varieties yielded very well due to the rolled rye ground cover from the previous cover crop in both Field A and B, which aided in conserving moisture, which helped these soybeans yield well from a growing season where only 0.3” of rain was received in July 2019.

2019 CHESAPEAKE/VA BEACH MATURITY GROUP 4 SOYBEAN COMPARISONS

Cooperators: **Producer:** Frank Brickhouse
 Extension: Watson Lawrence Chesapeake-VCE
 Roy Flanagan VA Beach-VCE
Previous Crop: Corn grain
Soil Type: Acredale silt loam
Tillage: Conventional
Planting Date: May 28, 2019
Seeding Rate/Row Spacing: 180,000 seeds/A; 30 inch rows
Fertilization: 500 lbs. 15-15-15
Crop Protection: Post emergence herbicide: 12 oz. Select + 16 oz. Reflex
 Insecticide: 9 oz. Besiege
Harvest Date: November 26, 2019
Harvest Equipment: JD 9860 w/935 grain platform

Brand	Variety	Moisture%	Yield (bu/A)
USG	7496XTS	15.2	57.1
USG	7447XTS	14.6	54.7
Hubner	H46-29R2X	14.9	53.1
Hubner	H49-27R2X	14.8	52.5
Local Seed Company	LS4889XS	14.9	54.5
VCIA	MO4901D GT	14.8	57.8
NK Seed	S42-B9XS	14.7	38.4
NK Seed	S45-Z5XS	15.1	60.7
Progeny	P 4255RX	14.8	55.6
Progeny	P 4816RX	15.1	48.1
LG Seed	C4615RX	15.1	47.8
LG Seed	C4845RX	15.1	54.5
Asgrow	AG46X6	14.8	50.8
Asgrow	AG48X9	14.5	46.0
Pioneer	P42A96X	14.8	47.2
Pioneer	P48A60X	14.9	56.8
Dyna-Gro	S43XS27	14.7	44.8
Dyna-Gro	S49XS76	15.0	56.7
	AVERAGE	14.9	52.1

Discussion: Use these data, as well as other test plot results, when making variety selections.

Check 13	P48T53R-SU26	15.1	34.8	
NK Seed	S45-Z5XS	15.2	31.8	99.5
Check 14	P48T53R-SU26	15.3	29.1	
VCIA	MO4901D GT	15.4	25.4	87.9
Check 15	P48T53R-SU26	15.4	28.7	
LG Seed	C4845RX	15.3	27.3	92.5
Check 16	P48T53R-SU26	15.2	30.3	
LG Seed	C4615RX	15.1	25.5	84.0
Check 17	P48T53R-SU26	15.4	30.4	
Local Seed Company	LS4798X	15.6	27.2	86.3
Check 18	P48T53R-SU26	15.8	32.6	
Local Seed Company	LS4889XS	16.2	29.7	91.1
	AVERAGE	14.8	28.2	88.3
	CHECK AVERAGE	14.8	29.9	

*% of Check = variety divided by yield of 1 or 2 closest check(s).

Discussion: Rain was none to limited within the first month of planting. Rainfall increased late August through mid-October. Check is Pioneer P48T53R-SU26.

Discussion: This double-crop planting yielded well considering the hot and dry conditions in late summer. Approximately 1 inch of rain was received from August 15 - October 15. In preharvest evaluation, MO4901 GT was noted to have substantial pod/seed shattering compared to other varieties. Most varieties yielded tightly around the test average showing solid yields by brands. Consider the statewide summary and variety traits when making seed decisions for 2020.

2019 WESTMORELAND COUNTY MATURITY GROUP 4 SOYBEAN COMPARISONS

Cooperators:	Producer:	F.F. Chandler, Jr. and Louis Chandler
	Extension:	Stephanie Romelczyk, ANR - Westmoreland Trent Jones, ANR - Northumberland/Lancaster Robbie Longest, ANR-Essex
Previous Crop:		Corn
Soil Type:		Savannah loam and Kempsville loam
Tillage:		No-till
Planting Date:		May 17, 2019
Seeding Rate/Row Spacing:		130,000/30" rows
Fertilization:		0-50-75-5S
Crop Protection:	Burndown:	Makaze 1/2 gal/A + Weather Gard 1 qt/100 gal + Sharpen 2 oz/A
	Preplant:	Broadaxe 24 oz/A
	Postemergence:	1. Makaze 1.5 qts/A + Weather Gard 1 qt/100 gal + Task Force 1 qt/A + Radiate 2 oz/A 2. Miravis Top 13.7 oz/A + Franchise 3 oz/A + Maximum N-pact K 1 gal/A + Pro Trio 1 qt/A + Sniper 6 oz/A
Harvest Date:		October 15, 2019
Harvest Equipment:		Gleaner M3

Brand	Variety	Moisture%	Yield (bu/A)
Asgrow	AG48X9	12.9	57.4
Asgrow	AG46X6	13.0	61.0
Dyna-Gro	S49XS76	12.6	59.2
Dyna-Gro	S43XS27	12.6	63.7
Local Seed Company	LS4798X	12.7	61.4
Local Seed Company	LS4889XS	13.0	61.7
Pioneer	P48A60X	11.8	69.1
Pioneer	P42A96X	12.9	67.7
NK Seed	S42-B9XS	12.8	66.0
NK Seed	S45-Z5XS	12.7	64.8
Hubner	H49-27R2X	12.2	58.2
Hubner	H46-29R2X	12.2	63.2
Progeny	P 4255RX	12.8	60.8
Progeny	P 4816RX	12.5	63.8
VCIA	MO4901D GT	12.1	57.8
USG	7496XTS	12.4	66.0
USG	7447XTS	12.1	63.9
LG Seed	C4615RX	11.5	63.1

LG Seed	C4845RX	12.3	63.6
Asgrow	AG48X9	12.0	60.8
	AVERAGE	12.5	62.8

Discussion: Use these data, as well as other test plot results, when making variety selections.



MATURITY GROUP 5 VARIETY COMPARISONS

2019 Virginia Cooperative Extension On-farm Soybean Variety Trials - MG 5

Company	Brand	Brunswick	Gibbs	Brunswick Griffin	Chesapeake- Virginia Beach	Dinwiddie	Mecklenburg*	Prince George	Southampton	Overall Average	Average Relative Yield
Pioneer	P55A49X	30.6	44.1	52.1	58.7	15.1	32.9	56.5	45.8	113	
Asgrow	AG55X7	25.6	39.9	45.8	66.6	15.7	31.6	66.9	46.1	110	
Local Seed Co	LS5386X	19.4	44.8	55.8	58.0	11.2	30.8	63.8	45.4	106	
Asgrow	AG56X8	24.6	37.9	48.6	57.5	9.6	29.9	60.5	43.2	103	
NK Seed	S53-F7X	20.2	38.5	55.4	55.4	14.8	27.7	67.3	44.1	103	
Local Seed Co	LS5588X	24.4	37.2	50.5	52.0	12.5	28.9	64.6	42.9	102	
Dyna-Gro	DG52RS86	22.2	32.0	57.0	56.4	16.2	30.5	58.2	42.7	101	
NK Seed	S57-A7X	27.8	37.9	51.1	49.9	8.2	25.0	59.2	41.8	101	
Progeny	5016RX	17.6	38.0	51.7	55.3	12.1	32.2	62.9	43.0	100	
Dyna-Gro	DG52XS39	20.2	40.9	42.8	51.1	13.8	30.1	62.2	41.2	98	
Pioneer	P51A61X	12.1	52.3	48.8	51.2	16.4	30.8	54.9	41.7	97	
Progeny	5554RX	24.6	32.5	49.7	49.7	11.8	27.9	54.3	39.8	96	
USG	7529XTS	20.2	36.0	36.5	51.4	19.4	34.7	57.9	39.4	95	
USG	7547XT	21.0	41.9	36.7	51.9	17.7	32.5	49.8	39.0	95	
VCIA	Corbin	19.4	40.1	49.6	47.4	15.7	28.3	53.0	39.6	94	
Hubner	H50-10R2X	13.6	40.4	48.3	52.5	17.9	30.4	58.5	40.6	94	
Hubner	H56-20R2X	26.1	35.1	42.6	43.8	12.3	25.9	51.8	37.6	92	
Average		21.7	39.4	48.4	53.5	14.1	30.0	59.0			

Notes:

* Mecklenburg location not included in overall averages due to low yields.

* Average Relative Yield ranks varieties based on their performance compared to the location average. It is a percentage above or below the location average.

2019 BRUNSWICK COUNTY MATURITY GROUP 5 SOYBEAN COMPARISONS

Cooperators: **Producer:** J.N. Gibbs
Extension: Lindy Fimon and Taylor Clarke
Previous Crop: Soybeans
Soil Type: Appling-Mattaponi complex
Tillage: No-till
Planting Date: May 24, 2019
Seeding Rate/Row Spacing: 15" rows
Fertilization: P₂O₅ and K₂O applied variable based on soil test grid
Crop Protection: Burndown: Roundup and Envide, Post: Roundup
Harvest Date: November 7, 2019
Harvest Equipment: JD 9670 with 25' head

Brand	Variety	Moisture%	Yield (bu/A)
CHECK	DG39RY57	14.3	24.0
Local Seed Company	LS5588X	14.8	24.4
Asgrow	AG56X8	14.5	24.6
NK Seed	S57-A7X	14.0	27.8
Asgrow	AG55X7	14.0	25.6
Pioneer	P55A49X	14.7	30.6
Hubner	H56-20R2X	15.3	26.1
CHECK	DG39RY57	15.0	25.0
Progeny	P 5554RX	14.7	24.6
USG	7547XT	14.5	21.0
Dyna-Gro	S56X99	14.5	20.3
Dyna-Gro	S58RY78	14.7	23.2
CHECK	DG39RY57	15.0	21.9
Asgrow	AG59X7	14.7	22.7
Dyna-Gro	S52RS86	14.7	22.2
Dyna-Gro	S52XS39	14.2	20.2
Local Seed Company	LS5386X	14.0	19.4
Hubner	H50-10R2X	14.8	13.6
Pioneer	P51A61X	15.0	12.1
VCIA	Corbin	15.2	19.4
NK Seed	S53-F7X	14.8	20.2
USG	7529XTS	14.7	20.2
Progeny	P 5016RXS	14.6	17.6
CHECK	DG39RY57	14.9	20.0
Asgrow	AG59X7	14.0	18.5
	AVERAGE	14.6	21.8

Discussion: Use these data, as well as other test plot results, when making variety selections.

Asgrow	AG54X9	14.2	32.9
CHECK	AG55X7	14.0	37.2
	AVERAGE	14.5	40.0

Discussion: Plots flooded in early June when beans were about 12" tall. There was not a tremendous amount of stand loss however this early stress reduced the growth of some varieties more than others. For the most part, this response was reflected in the yields. Yields were also lower than normal for this field due to severe drought stress during pod fill.

2019 CHESAPEAKE/VA BEACH MATURITY GROUP 5 SOYBEAN COMPARISONS

Cooperators: **Producer:** Frank Brickhouse
Extension: Watson Lawrence, VCE-Chesapeake
Roy Flanagan, VCE-VA Beach
Previous Crop: Corn grain
Soil Type: Acredale silt loam
Tillage: Conventional
Planting Date: May 28, 2019
Seeding Rate/Row Spacing: 180,000 seeds/A; 30 inch rows
Fertilization: 500 lbs. 15-15-15
Crop Protection: Post Emerg. Herbicide: 12 oz. Select + 16.0 oz. Reflex
Insecticide: 9 oz. Besiege
Harvest Date: November 26, 2019
Harvest Equipment: JD 9860 w/935 grain platform

Brand	Variety	Moisture%	Yield (bu/A)
USG	7547XT	16.6	36.7
USG	7529XTS	17.0	36.5
Hubner	H50-10R2X	16.6	48.3
Hubner	H56-20R2X	16.3	42.6
Pioneer	P55A49X	16.1	52.1
Pioneer	P51A61X	15.7	48.8
VCIA	Corbin	15.0	49.6
Dyna-Gro	S52RS86	15.9	57.0
Dyna-Gro	S52XS39	15.9	42.8
Local Seed Company	LS5386X	16.1	55.8
Local Seed Company	LS5588X	15.3	50.5
Asgrow	AG56X8	14.9	48.6
Asgrow	AG55X7	15.0	45.8
Check-Hubner	5718R2X	15.0	66.4
Progeny	P 5554RX	14.8	49.7
Progeny	P 5016RXS	15.5	51.7
NK Seed	S53-F7X	15.1	55.4
NK Seed	S57-A7X	14.8	51.1
	AVERAGE	15.6	49.4

Discussion: Use these data, as well as other test plot results, when making variety selections.

2019 DINWIDDIE COUNTY MATURITY GROUP 5 SOYBEAN COMPARISONS

Cooperators: **Producer:** Billy Bain
 Extension: Mike Parrish
Previous Crop: Double Crop Soybeans - cover crop was Guardian Rye
Soil Type: Mattaponi sandy loam
Tillage: No-till
Planting Date: May 28, 2019
Seeding Rate/Row Spacing: 170,000 per acre/15 inch rows
Fertilization: 4-03-19 - 300lbs 5-10-30
Crop Protection: 8-20-19 - Domark Fungicide 5oz/ac
 8-20-19 - Besiege Insecticide 10oz/ac
 4-16-19 - 1qt 24D, 1qt Roundup, 1 1/2pt Dual w/ 1qt
 8020/100gals
Harvest Date: November 6, 2019
Harvest Equipment: 2588 Case International

Brand	Variety	Moisture%	Yield (bu/A)
Asgrow	AG55X7	14.4	66.6
Asgrow	AG56X8	14.0	57.5
Pioneer	P51A61X	14.6	51.2
Pioneer	P55A49X	14.2	58.7
CHECK	NK S51-R3XS	14.2	52.6
USG	7547XT	13.4	51.9
USG	7529XTS	13.5	51.4
Hubner	H50-10R2X	13.5	52.5
Hubner	H56-20R2X	14.1	43.8
CHECK	NK S51-R3XS	13.9	68.7
Dyna-Gro	S52XS39	13.3	51.1
Dyna-Gro	S52RS86	13.7	56.4
Progeny	P 5016RXS	13.5	55.3
Progeny	P 5554RX	13.5	49.7
CHECK	NK S51-R3XS	13.3	58.1
NK Seed	S53-F7X	12.7	55.4
NK Seed	S57-A7X	13.1	49.9
VCIA	Corbin	13.1	47.4
Local Seed Company	LS5386X	13.3	58.0
Local Seed Company	LS5588X	13.9	52.0
CHECK	NK S51-R3XS	14.6	75.3
	AVERAGE	13.7	55.4

Discussion: Experienced significant drought in late July, August and part of September.

2019 MECKLENBURG COUNTY MATURITY GROUP 5 SOYBEAN COMPARISONS

Cooperators: **Producer:** John Manning
 Extension: Taylor Clarke and Lindy Fimon
Previous Crop: Soybeans
Soil Type: Appling
Tillage: No-till
Planting Date: June 28, 2019
Seeding Rate/Row Spacing: 200,000 on 18 inch rows
Fertilization: 0-40-60
Crop Protection: Burndown: Envive, 2-4D, Roundup
 Post: Roundup, Flexstar
Harvest Date: Nov 21, 2019
Harvest Equipment: JD 4420 with 215 flex head

Brand	Variety	Moisture%	Yield (bu/A)
CHECK	DG39RY57	15.9	14.8
Local Seed Company	LS5588X	15.4	12.5
Pioneer	P55A49X	16.0	15.1
Local Seed Company	LS5386X	16.1	11.2
NK Seed	S53-F7X	15.8	14.8
Hubner	H56-20R2X	15.5	12.3
VCIA	Corbin	16.5	15.7
Progeny	P 5554RX	15.0	11.8
NK Seed	S57-A7X	15.1	8.2
USG	7547XT	14.9	17.7
CHECK	DG39RY57	15.0	14.7
USG	7529XTS	14.1	19.4
NK Seed	S58-Z4	14.8	12.0
Dyna-Gro	S56XT99	14.2	11.2
Dyna-Gro	S58RY78	14.7	15.9
Dyna-Gro	S52XS39	14.0	13.8
Dyna-Gro	S52RS86	15.2	16.2
Pioneer	P51A61X	15.4	16.4
Progeny	P 5016RXS	15.6	12.1
CHECK	DG39RY57	15.5	12.6
Hubner	H50-10R2X	15.6	17.9
Asgrow	AG55X7	15.1	15.7
Asgrow	AG56X8	14.3	9.6
Asgrow	AG52X9	15.1	10.9
Asgrow	AG53X0	15.0	19.4

Asgrow	AG53X9	15.3	12.9
CHECK	DG39RY57	15.0	9.2
	AVERAGE	15.2	13.9

Discussion: Use these data, as well as other test plot results, when making variety selections.

Discussion: This double-crop planting yielded well considering the hot and dry conditions in late summer. Approximately 1 inch of rain was received from August 15 - October 15. Most varieties yielded tightly around the test average showing solid yields by brands. Consider the statewide summary and variety traits when making seed decisions for 2020.



**OTHER
SOYBEAN WEED CONTROL SYSTEM TESTS**

2019 Virginia Cooperative Extension On-farm Soybean Variety Trials - Liberty Link

Company	Brand	Brunswick Wright	Chesapeake- Virginia Beach	Overall Average	Average Relative Yield
Progeny	P4930LL	54.5	56.9	55.7	113
Credenz	CZ 4539 GTLL	49.9	48.6	49.3	100
Dyna-Gro	42EN89	47.7	49.5	48.6	98
Credenz	CZ 4649 LL	43.5	44.3	43.9	89
	Average	48.9	49.8		
Credenz	CZ 5859 LL	49.4	52.0	50.7	107
Credenz	CZ 5150 LL	53.4	46.5	50.0	105
USG	75G95LS	48.1	48.5	48.3	101
Progeny	5909LLS	45.0	51.2	48.1	101
Dyna-Gro	55LS75	44.5	46.5	45.5	96
Dyna-Gro	52LL66	47.1	39.1	43.1	90
	Average	47.9	47.3		

Notes:

* Average Relative Yield ranks varieties based on their performance compared to the location average. It is a percentage above or below the location average.

2019 BRUNSWICK COUNTY LIBERTY LINK SOYBEAN COMPARISONS

Cooperators:	Producer:	Edward, William and Howard Wright & Mallory Blackwell
	Extension:	Taylor Clarke and Lindy Fimon
Previous Crop:		Soybeans followed by small grain cover crop
Soil Type:		Appling-Mattaponi complex
Tillage:		No-till
Planting Date:		May 16, 2019
Seeding Rate/Row Spacing:		18" rows
Fertilization:		4-0-48-5S
Crop Protection:		Burndown: Roundup, 2-4D, Surveil Post: Liberty and Intensity
Harvest Date:		November 20, 2019
Harvest Equipment:		Gleaner R52 with 15 foot head

Brand	Variety	Moisture%	Yield (bu/A)
CHECK	SH5515	16.9	56.5
Credenz	CZ 4649 LL	17.7	43.5
Progeny	P 4930LL	17.4	54.5
Credenz	CZ 5150 LL	17.4	53.6
Dyna-Gro	S59LS45	16.7	44.7
Dyna-Gro	S42EN89	17.5	47.7
Credenz	CZ 4539 GTLL	17.8	49.9
Credenz	CZ 5859 LL	16.3	49.8
Dyna-Gro	S55LS75	15.8	49.9
CHECK	SH5515	15.9	53.1
USG	75G95LS	15.8	50.3
Progeny	P 5909LLS	15.7	45.9
Dyna-Gro	S52LL66	15.8	45.2
Credenz	CZ 5859 LL	15.6	48.9
Credenz	CZ 5150 LL	16.4	53.2
Dyna-Gro	S52LL66	16.2	49.0
Progeny	P5909LLS	15.7	44.2
USG	75G95LS	15.6	45.9
Dyna-Gro	S55LS75	15.5	39.1
Dyna-Gro	S59LS45	15.5	46.4
Southern Harvest	SH5915	15.8	30.8
CHECK	SH5515	16.2	47.8
	AVERAGE	16.3	47.7

Discussion: Liberty-Link varieties continue to provide an alternative to weed control without repeated use of glyphosate.



Other Research

2019 CAROLINE COUNTY AG EXPO MATURITY GROUP 2.5 - 3.9 SOYBEAN COMPARISONS

Cooperators: **Producer:** Charity Hill Farm/Steve Smith
Extension: M. Broaddus, R. Longest
Industry: Participating seed companies
Previous Crop: Wheat and pea haylage cut for ensilage
Soil Type: Kempsville
Tillage: No-till
Planting Date: May 16, 2019
Seeding Rate/Row Spacing: 120,000/30" rows
Fertilization: 11-52-100
Crop Protection: **Burndown**-1 qt. Roundup, 22 oz Xtendimax, 1.25 pt. Dual, 1/2 gal Black Label Zinc
Post - 1 qt. Roundup, 2 oz. Radiate, 1 qt. Taskforce 2
R5 - 6.8 oz. Quadris Top STX, 2 qt. Locomotive, 2 qt. Maxima N-Tact
Harvest Date: October 3, 2019
Harvest Equipment: New Holland CR9040 w/730C Super Flex header

Brand	Variety	Moisture%	Yield (bu/A)
LG Seed	C2888RX	10.0	57.0
Channel	2820R2X	10.4	58.9
USG	7399GTL	10.9	62.1
Hubner	H35-27R2X	10.5	66.1
Pioneer	P37A69X	9.5	63.5
Pioneer	P39A58X	10.7	62.3
LG Seed	LGS3777RX	10.6	61.8
Channel CHECK	3919R2X	10.2	58.8
Dyna-Gro	S39XT68	10.5	57.6
Dyna-Gro	S37XS89	10.7	55.6
Hubner	H39-28R2X	10.6	59.0
Credenz	CZ3929 GTLL	10.9	51.5
	AVERAGE	10.5	59.5

Discussion: Channel 3919 R2X was planted as the check variety. The Ag Expo maturity group 2.5-3.9 varieties were planted next to the maturity group 4 varieties.

2019 KING WILLIAM COUNTY NEMASTRIKE SEED TREATMENT STUDY

Cooperators: **Producer:** Old Place Farm; David Johnson
Extension: Robbie Longest, VCE-Essex County and Brittany Semco,
VCE – King William Co. Summer Intern
Other: Danny Withers, TRSWCD
Previous Crop: Corn followed by rye cover crop
Soil Type: Wickham, Seabrook, and Conetoe loamy fine sand
Tillage: No-till
Planting Date: June 4, 2019
Variety: Asgrow AG42X9
Seeding Rate/Row Spacing: 147,368 seeds per acre/ 7-inch rows
Plot Size: 30 feet wide (25 feet harvested)
Fertilization: 6-30-80 (N-P-K lb/ac)
Crop Protection: **Burndown:** 1.3 qt glyphosate + 0.75 pt 2,4-D LV6 (April)
1.3 qt/ac glyphosate (May)
Post-emergence: 1.3 qt/ac glyphosate (June)
Harvest Date: October 11, 2019
Harvest Equipment: John Deere Titan II 8820

Treatment	Rep.	% Moisture	Yield (bu./ac.@13.0%)
Standard*	1	12.1	53.2
NemaStrike	1	11.7	53.9
Standard*	2	12.1	53.7
NemaStrike*	2	12.1	54.2
Standard	3	11.3	53.8
NemaStrike*	3	11.7	51.7
Standard*	4	11.4	49.4
NemaStrike	4	11.3	48.1
Standard*	5	11.7	46.8
NemaStrike*	5	11.3	47.2
Average Standard		11.7	51.4
Average NemaStrike		11.6	51.0
LSD (0.10)		NS	NS

*Denotes the presence of tram lines through the length of the plot (2 x 14 inches). Treatment differences not significant (NS) at the 90% confidence level.

Table 1: Nematode assay results by species per 500 cc soil samples taken at-planting, in-season, and at harvest for Standard and NemaStrike™ seed treatment plots. (Representative samples consisted of random soil samples taken to a depth of 6 inches throughout the replicated treatment plots)

Sampling Interval	Treatment	Nematode Species Counts (# nematodes/500cc soil)									
		Dagger	Lance	Root-knot	Lesion	Ring	Spiral	Stubby root	Sting	Cyst	Stunt
At-Planting	Standard	0	1050	0	0	0	200	50	0	0	250
	NemaStrike	0	400	0	0	0	150	0	0	0	100
In-Season	Standard	50	100	0	0	0	100	0	0	0	0
	NemaStrike	0	50	0	0	0	100	50	0	0	0
Harvest	Standard	50	550	50	0	0	550	0	0	0	150
	NemaStrike	0	750	0	0	0	350	0	0	0	300

KEY:

	No thresholds are established for this crop (the nematode is not economically important)
LOW	Production of this crop the following growing season should not be affected by nematodes.
MODERATE	Nematodes may cause damage to this crop if growing conditions are unfavorable. A nematicide may be profitable.
HIGH	Nematodes will most likely cause damage to this crop and control strategies are needed. A nematicide is likely to be profitable.

Discussion: The purpose of this plot was to evaluate *NemaStrike*™ seed treatment compared to the standard seed treatment (Accelaron Seed Applied Solutions) in the soybean variety Asgrow AG42X9. The standard and *NemaStrike*™ treatments were planted in alternating strips across a field that has been known to have some nematode pressure in previous years. The test was planted on June 4, 2019, and nematode assay soil samples were taken at-planting, in-season (7/29/19), and at harvest (10/11/19). The complete results of the nematode counts measured in the lab can be seen in Table 1. The most prevalent species detected throughout the season was lance, at levels high enough to cause crop injury during both the at-planting and harvest sampling intervals for both treatments. It is interesting to note that nematode numbers were higher at planting, decreased during the in-season sampling, and increased again at harvest. It would be expected that nematode populations would be highest toward the end of the growing season nearing harvest. There were minimal differences in plant growth and vigor observed between treatments during the growing season. In poorer areas of the field where nematodes were believed to be and sandier soil types were, decreased plant growth appeared similar across treatments.

There were minimal differences in average yields between the two seed treatments, with the standard treatment resulting in a 0.4-bushel average advantage over the *NemaStrike*™ treatment. This difference is not statistically different from the standard treatment. Overall, this test yielded very well. It should

also be noted that several plots contained a set of tram lines (2 x 14 inches) as denoted in the table above that ran the length of the plot.

More extensive research should be conducted to determine if this seed treatment helps alleviate nematode pressure and damage on soybeans in the field setting. Further work in fields that have known nematode issues should be explored.

2019 LANCASTER COUNTY NEMASTRIKE SEED TREATMENT STUDY

Cooperators: **Producer:** Craig Giese
 Extension: Trent Jones, VCE Northumberland & Lancaster

Previous Crop: Corn
Soil Type: 13.1% Lakeland loamy fine sand
 35.7% Sassafras loamy fine sand
 51.2% Woodstown fine sandy loam

Tillage: Minimum Tillage
Planting Date: June 3, 2019
Seeding Rate/Row Spacing: 156,000 Seed/A/15” rows
Fertilization: Variable Rate Potash + MAP
Crop Protection: **Post Emergence (First Application)** - Roundup, Black Label Zn
 Post Emergence (Second Application) – Quadris Top QSB, Brigade 2EC, Maximum N-Pact K
Harvest Date: November 4, 2019

Treatment	Replication	% Moisture	Yield (bu/A)
NemaStrike Seed Treatment	1	13.0	49.2
Untreated	1	12.8	44.9
NemaStrike Seed Treatment	2	12.7	35.1
Untreated	2	12.5	38.0
NemaStrike Seed Treatment	3	12.7	37.3
Untreated	3	12.5	40.0
NemaStrike Seed Treatment	4	12.7	44.0
Untreated	4	12.3	43.6
Nemastrike Average		12.78 b	41.4
Untreated Average		12.53 a	41.6
	LSD (0.10)	0.12	NS

Averages with different letters are statistically different with 90% confidence.

NS = not statistically different

103	106	Stunt 203	206	Stunt 303	306	403	Stunt 406
102	Stunt 105	Female Cyst 202	205	302	Stunt 305	Stunt & Spiral 402	Stunt 405
101	Female Cyst 104	201	204	Stunt 301	Stunt 304	Stunt 401	404
REP I		REP II		REP III		REP IV	
Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated

Figure 1. Nematode assay results at planting

103	106	Stunt 203	206	Stunt 303	306	Stunt 403	Stunt 406
102	105	202	205	302	305	402	405
101	104	Female Cyst 201	Female Cyst 204	301	304	Dagger 401	Dagger 404
REP I		REP II		REP III		REP IV	
Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated

Figure 2. Nematode assay results mid-season

103	106	203	Stunt 206	Stunt 303	Female Cyst 306	Stunt 403	Spiral & Dagger 406
102	Stunt & Spiral 105	Female Cyst 202	Stunt 205	Juvenile Cyst & Stunt 302	Juvenile & Female Cyst, Stubby root, & Stunt 305	402	Stunt, Dagger, & Spiral 405
Lesion & Stunt 101	Juvenile Cyst & Juvenile Root-Knot 104	Female Cyst 201	204	Stunt, Lesion, & Female Cyst 301	Female Cyst & Stunt 304	Juvenile Root-Knot, Juvenile & Female Cyst, Stunt, & Stubby Root 401	Stunt 404
REP I		REP II		REP III		REP IV	
Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated

Figure 3. Nematode assay results at harvest

Discussion: This plot is intended to investigate the efficacy of NemaStrike seed treatment on soybeans. Four replications of treated and untreated beans were established. Each treatment was broken into three ~300 ft. zones, and nematode assays were performed at planting, mid-season, and at harvest in each zone to determine nematode presence. Results from nematode assays throughout the season are shown in **Figures 1-3**. Zones highlighted in yellow represent nematode populations that may cause damage to soybean if growing conditions are unfavorable. Zones highlighted in red represent nematode populations that will most likely cause damage to soybean. In **Figures 1-3**, zones that have been highlighted also include the nematode species identified within the zone. Nematode presence and abundance were variable across the field and throughout the season. Seed-treated and untreated treatments yielded inconsistently across replications with no apparent trend.

2019 ESSEX COUNTY SOYBEAN FOLLOWING SMALL GRAIN COVER CROP STUDY

Cooperators:
Producer: Brandon Farms
Extension: Robbie Longest, VCE-Essex County
Others: Danny Withers, Three Rivers SWCD; Keith Balderson and Dwight Forrester, NRCS
Previous Crop: Corn followed by cover crops or fallow
Soil Type: Pamunkey loam
Tillage: No-till
Planting Date: 10-26-18 for cover crops; soybeans planted 5-17-19
Variety: USG 74D95RS
Seeding Rate/Row Spacing: 140,000 seeds per acre / 15-inch rows
Fertilization: 0-37-78 (N-P-K lb/ac)
Crop Protection: Burndown: Roundup (1 qt/ac) plus 2,4-D (10 oz/ac)
 Post-emergence: Roundup (1 qt/ac) plus Ravage (3 oz/ac)
Harvest Date: October 29, 2019
Harvest Equipment: John Deere S670 w/625F Header

Treatment	Rep.	% Moisture	Stand Counts* (plants/ac.)	Yield (bu./ac.@13.0%)
Rye	1	13.8	114,500	50.6
Oats	1	13.8	117,500	50.2
Wheat	1	14.2	117,500	51.9
Barley	1	13.7	115,500	50.9
Annual Ryegrass	1	13.6	117,000	45.2
Fallow (Check)	1	13.6	117,500	42.8
Rye	2	13.7	114,500	44.2
Oats	2	13.8	126,000	46.8
Wheat	2	13.5	117,500	43.3
Barley	2	13.7	122,500	45.6
Annual Ryegrass	2	13.5	117,500	33.8
Fallow (Check)	2	13.5	122,000	36.6
Average Rye		13.8 a	114,500 a	47.4 a
Average Oats		13.8 a	121,750 a	48.5 a
Average Wheat		13.9 a	117,250 a	47.6 a
Average Barley		13.7 a	118,750 a	48.3 a
Average Annual Ryegrass		13.6 a	117,000 a	39.5 b
Average Fallow (Check)		13.6 a	119,750 a	39.7 b
LSD (0.10)		NS	NS	3.96

*Stand counts are the average of two measurements per treatment taken June 4th.

Discussion: The purpose of this study was to evaluate the performance of full-season soybeans following small grain cover crops, fallow land (corn residue), and a grower choice of annual ryegrass.

The cover crops were planted on October 26, 2018 using a no-till drill. Biomass samples of the cover crops were taken by randomly placing a 1 square foot quadrant down, and cutting all the plant material within that square foot. Two samples were taken for each species on April 22, 2019. Samples were air dried, and then weighed to determine biomass on a dry matter basis per acre (Table 1). Rye and barley were observed to have the greatest biomass of 2,113 and 2,017 lbs. per acre respectively. Annual ryegrass and wheat were both observed to have the lowest biomass of 1,248 lbs. per acre. The soybean plot received a season rainfall total of 27.6 inches, and accumulated 3,903 GDU according to the producers *Climate Fieldview* report.

It can be noticed from the data that the observed measured plant stand counts were lower than the seeded rate. This is commonly observed when planting into high biomass cover crops, as seeding depth and placement can be affected, resulting in reduced stands. However, there were no differences between cover crop treatments on soybean stands.

Soybean yields following these cover crop species and fallow ground were variable. Looking at the yield table above, it can be observed that the yields have a decreasing trend as you move across the plot. This can also be seen in the attached yield map (Figure 1). Numerically, soybeans following oats and barley were observed to have the highest average yields of 48.5 and 48.3 bu/ac respectively. Annual ryegrass and fallow treatment averages were about 8-9 bushels per acre less than the cereal cover crops. At harvest, a nematode assay sample was taken and submitted to the lab. Results showed that the plot had areas which contained high levels of root-knot (500 in 500cc soil) and soybean cyst (150 in 500cc soil) nematodes. This was believed to have impacted yields.

Please remember that these results are for this location and year, and these results may not be observed in every location in every year. Cover crop dynamics are complex, and results from previous studies such as this one conducted in recent years have had mixed results. We plan to continue this work and further assess relationships between cover crop species, nematodes, crop yield, and other production factors.

Table 1: Biomass sampling estimates for each cover crop taken April 22, 2019

Cover Crop Species	Weight (lbs. per acre)
Rye	2,113
Oats	1,729
Wheat	1,248
Barley	2,017
Annual Ryegrass	1,248

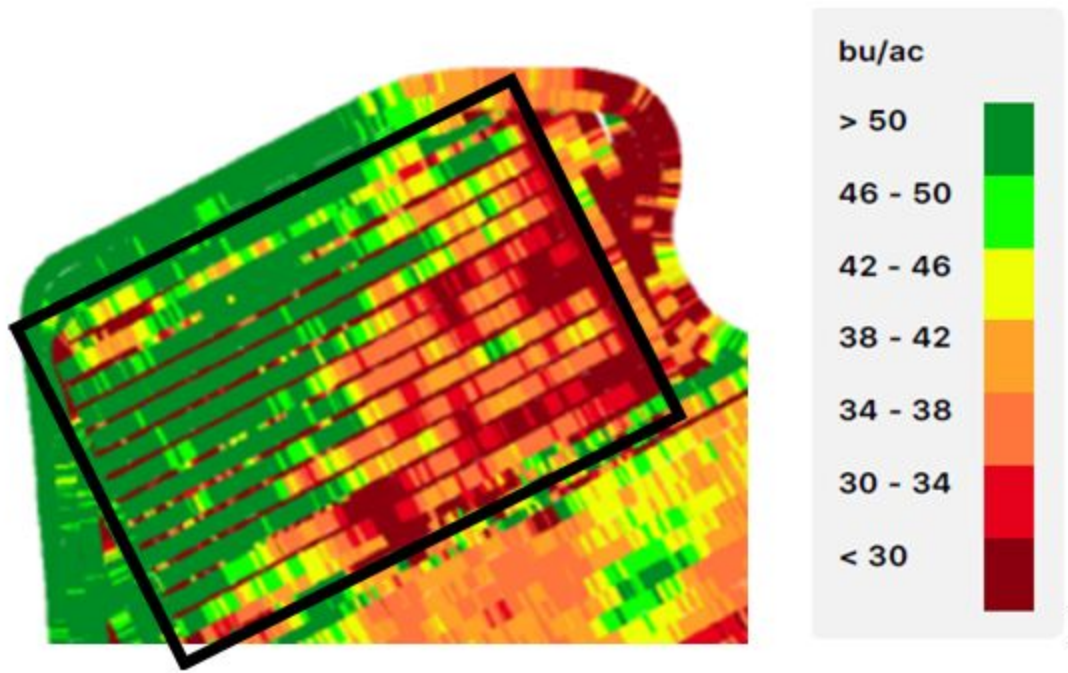


Figure 1: Yield map of the cover crop plot. Areas within strips that are dark red (<30 bu/ac) were believed to be affected by nematode pressure, and confirmed by assay results.

2019 WESTMORELAND COUNTY SOYBEAN FOLLOWING COVER CROP STUDY

Cooperators:
Producer: Keith Balderson
Extension: Robbie Longest, ANR - Essex County
 Stephanie Romelczyk, ANR - Westmoreland
Industry: Danny Withers, Three Rivers SWCD
Previous Crop: Corn followed by cover crops or left fallow
Soil Type: Suffolk sandy loam, Rumsford and Tetotum soils
Tillage: Continuous no-till
Planting Date: October 17, 2018-cover crops; May 3, 2019-soybeans
Variety: Dyna-Gro S43XS27
Seeding Rate/Row Spacing: approx. 125,000 seeds/A
Fertilization: 14-65-60 per acre
Crop Protection: Burndown: Roundup + 2,4-D
 Pre-emergence: Envive
 Post-emergence: Makaze and Synchrony
Harvest Date: October 2, 2019
Harvest Equipment: John Deere 7720 w/18 foot header

Treatment	Replication	Moisture%	Yield (bu/A)
Fallow (Check)	1	10.4	56.3
Wheat	1	10.1	56.7
Rye	1	9.9	55.5
Barley	1	10.0	57.1
Oats	1	9.9	54.5
Fallow (Check)	2	9.8	53.0
Wheat	2	9.7	54.8
Rye	2	9.9	53.6
Barley	2	9.7	49.4
Oats	2	9.8	49.6
Fallow (Check)	3	9.8	46.7
Wheat	3	9.8	47.8
Rye	3	9.8	46.4
Barley	3	9.6	44.1
Oats	3	9.5	42.9
Fallow (Check) Average		10.0	52.0 ab
Wheat Average		9.9	53.1 a
Rye Average		9.9	51.8 ab
Barley Average		9.8	50.2 bc
Oats Average		9.7	49.0 c
Overall Plot Average		9.8	51.2
	LSD (0.10)	NS	1.93

Averages followed by different letters indicate a statistical difference with a 90% confidence level.

Discussion: The purpose of this plot was to evaluate the performance of full-season soybean following small grain cover crops and fallow land (corn residue). Barley, oats, rye, and wheat cover crops were established on October 17, 2018 following corn harvest using a no-till drill. A very good stand of all four species was achieved. Biomass samples were taken by cutting all plant material from two 1 square foot samples in each species on April 17th. Samples were air-dried for several days until the samples were crispy and bio-mass was calculated on a dry matter per acre basis. The results are reported below.

Biomass (April 17, 2019)

Species	Weight (Lbs. per acre)
Barley	1,825
Oats	1,537
Rye	3,745
Wheat	1,633

Cover crops were terminated using herbicides and full-season soybeans were planted with a no-till drill on May 3rd. A successful stand of soybeans was achieved in all plots. Plant stands were taken and are reported below.

**Soybean Plant Stand Counts (plants per acre)
(2 counts per treatment made on May 31st)**

Treatment	Rep 1	Rep 2	Rep 3	Average
Fallow	106,333	91,667	95,333	97,778
Wheat	95,333	88,000	88,000	90,444
Rye	110,000	99,000	99,000	102,667
Barley	110,000	84,333	95,333	96,555
Oats	110,000	102,667	88,000	100,222

*No statistical differences observed in stand counts across treatments.

The plot experienced some drought stress during the growing season. Soybean yields were good in all treatments. Wheat, fallow, and rye are statistically different from the oats, the lowest yielding plots. Many of the benefits of cover crops take several years to achieve and are very difficult to quantify, and producers are encouraged to experiment with cover crops on their farms to determine how they best fit into their cropping systems.



Figure 1. View of cover crop plots on April 18th prior to burndown and planting of full-season soybeans.

2019 LANCASTER COUNTY DOUBLE-CROP SOYBEAN SEEDING RATE STUDY

Cooperators:	Producer:	Keith Harris
	Extension:	Trent Jones, David Holshouser, and Lindsey Bowers
Previous Crop:		Corn
Soil Type:		Kempsville fine sandy loam
Tillage:		No-till
Planting Date:		June 25, 2019
Variety:		Asgrow AG49X9
Row Spacing:		15-inch row spacing
Fertilization:		0-80-80 in fall
Crop Protection:		Roundup 1.5 qt/A postemergence Lambda Cy 3 oz/A + Approach Prima 6.8 oz/A at R3
Harvest Date:		November 11, 2019
Harvest Equipment:		John Deere 780 w/ 35-foot Draper header

Treatment	Replication	Plant Stand (x1,000)	Moisture (%)	Yield (bu/A)
205,000 seed/acre	1	155	12.3	52.2
175,000 seed/acre	1	142	12.3	50.8
205,000 seed/acre	2	161	12.3	49.0
175,000 seed/acre	2	145	12.3	49.4
205,000 seed/acre	3	169	12.3	50.3
175,000 seed/acre	3	131	12.3	48.0
Average 205,000 seed/acre		161	12.3	50.5
Average 175,000 seed/acre		139	12.3	49.4
Overall Average		150	12.3	49.9
LSD (P=0.10)		23	<0.1	2.3

Discussion: Seed represent a major cost of soybean production. Reducing seeding rate by 30,000 seed/acre could save \$10 to \$13 per acre. In this test, we reduced the seeding rate from 205,000 seed/acre (farmer's rate) to 175,000 seed. Final stand at harvest averaged 161,000 and 139,000 plants/acre, which was not significantly different from each other. Although the higher seeding rate yielded slightly more than the lower seeding rate, this was not statistically different. These results do not reflect past double-crop seeding rate research indicating that 180,00 to 220,000 seed/acre is needed for double-crop production. However, the lack of difference in the yield could be due to the relatively small difference in final plant stand (22,000 plants/acre).

2019 LANCASTER COUNTY FULL-SEASON SOYBEAN SEEDING RATE STUDY

Cooperators:	Producer:	Craig Giese
	Extension:	Trent Jones, David Holshouser, and Lindsey Bowers
Previous Crop:		Corn
Soil Type:		Suffolk fine sandy loam
Tillage:		No-till
Planting Date:		June 15, 2019
Variety:		Asgrow AG45X6
Row Spacing:		15-inch row spacing
Fertilization:		0-80 lbs/A MAP and 80-170 lb/A K ₂ O variable rate on grid sample
Crop Protection:	Preplant Burndown:	Roundup Power Max 24 oz/A, Liberty 280 SL 32 oz/A, Antares 5 oz/A, Medal II EC 16 oz/A, Grounded 16 oz/A, Quest 6.4 oz/A, Vision 0.6 oz/A
	Postemergence:	<ol style="list-style-type: none"> 1. Black Label Zn 32 oz/A, Roundup Glyfox X-tra 24 oz/A, Lampcap II 2 oz/A, Weather Gard Complete 4.8 oz/A 2. Maximum N-Pact K 32 oz/A, Quadris Top SBX 7 oz/A, Brigade 2 EC 6 oz/A, Franchise 2 oz/A
Harvest Date:		November 5, 2019
Harvest Equipment:		Gleaner R65

Treatment	Replication	Plant Stand (x1,000)	Moisture (%)	Yield (bu/A)
158,000 seed/acre	1	127	12.6	48.4
125,000 seed/acre	1	95	12.6	50.5
158,000 seed/acre	2	127	12.5	47.3
125,000 seed/acre	2	97	12.5	49.0
158,000 seed/acre	3	136	12.6	53.0
125,000 seed/acre	3	97	12.6	52.7
158,000 seed/acre	4	118	12.6	50.3
125,000 seed/acre	4	97	12.6	55.1
Average 158,000 seed/acre		127	12.6	49.7
Average 125,000 seed/acre		96.5	12.6	51.8
Overall Average		111.75	12.6	50.8
LSD (P=0.10)		8.7	<0.1	2.5

Discussion: Seed represent a major cost of soybean production. Reducing seeding rate by 30,000 seed/acre could save \$10 to \$13 per acre. In this test, we reduced the seeding rate from 158,000 seed/acre (farmer's rate) to 125,000 seed. Final stand at harvest averaged 127,000 and 97,000

plants/acre. Although the lower seeding rate yielded slightly more than the higher seeding rate, this was not statistically different. These results reflect past seeding rate research that indicated that 90 to 120,000 seed/acre is sufficient for full-season production.

2019 BRUNSWICK COUNTY ILEVO SOYBEAN TREATMENT EVALUATION

Cooperators: **Producer:** TTP Farm Operations
 Extension: Taylor Clarke, Mecklenburg
 Lindy Fimon, Lunenburg
 Industry: Tyler Ashworth, Nutrien
Previous Crop: Soybeans
Soil Type: Appling-Mattaponi complex
Tillage: No-till
Planting Date: May 27, 2019
Variety: See treatments
Seeding Rate/Row Spacing: 130,000 on 15 inch rows
Fertilization: Avg 40 P2O5, 60 K2O - applied variable rate on 1
 acre grid
Crop Protection: Burndown: 1 qt Roundup PowerMax, 10 oz Barrage,
 3.5 oz Envive
 Post: 1 qt Roundup PowerMax, 12.8 oz Engenia, 40 oz
 Warrant Ultra
Harvest Date: October 18, 2019
Harvest Equipment: JD 9500, Weigh Wagon

Treatment	Replication	Moisture%	Yield (bu/A)
DG 48XT56 ILEVO	1	13.5	40.2
Asgrow 52X9 ILEVO	1	13.2	37.2
Asgrow 52X9	1	13.0	36.8
Asgrow 52X9	2	13.1	38.8
Asgrow 52X9 ILEVO	2	13.0	42.7
DG 48XT56 ILEVO	2	13.0	43.8
Asgrow 52X9	3	13.0	40.5
Asgrow 52X9 ILEVO	3	13.1	37.7
Asgrow 52X9	4	13.0	37.7
Asgrow 52X9 ILEVO	4	13.1	39.3
DG 48XT56 ILEVO	3	13.1	43.9
DG 48XT56 ILEVO	AVG	13.2 a	42.7 b
Asgrow 52X9 ILEVO	AVG	13.1 a	39.2 a
Asgrow 52X9	AVG	13.0 a	38.4 a
Means followed by the same letters are not significantly different at the P=0.10 level.			

Discussion: The objective of this test was to evaluate ILEVO seed treatment in a continuous soybean system for Sudden Death Syndrome (SDS) control. DG 48XT56 was the original planned variety to use but untreated seed was not available by the planting date. The ILEVO treated version was included because it was on-hand. DG 48XT56 has a high disease tolerance rating for SDS and AG 52X9 has a moderate rating. The AG 52X9 check did have insecticide, fungicide, and NemaStrike seed treatment. The AG 52X9 ILEVO treated seed yielded just 0.8 bushels more than the AG 52X9 with no ILEVO. This is not significantly different at the 90% confidence level. SDS was present in all plots. The use of a nematicide seed treatment on all seed may have reduced nematode injury and reduced SDS pressure.