



Virginia Cooperative Extension

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2018

Virginia On-Farm Corn

Test Plots



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

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The research and demonstration plots discussed in this publication are a cooperative effort by Virginia Cooperative Extension employees, the Northern Neck & Three Rivers Soil and Water Conservation Districts, the Natural Resources Conservation Service, numerous producers, and many members of the agribusiness community. The fieldwork and printing of this publication are mainly supported by the Virginia Corn Check-Off Fund through the Virginia Corn Board. This is the twenty-seventh year of this multi-county cooperative project. Further work is planned for 2019. Anyone who would like a copy of this publication should contact his or her local extension agent, who can request a copy from the VCE Northumberland County Office.



Producers interested in becoming involved with on-farm research and those with research topics that they would like to have investigated in future on-farm publications should contact their local extension office for further information.

The authors wish to thank the many producers and agribusinesses that participated in these research and demonstration plots.

Disclaimer: Commercial products are named in this publication for informational purposes only. Virginia Cooperative Extension does not endorse these products and does not intend discrimination against other products, which also may be suitable.

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General Summary

These demonstration and replicated studies provide information that can be used by Virginia corn growers to make better management decisions on their farm. Refer to individual results for additional details.

Hybrid Comparisons

Corn hybrid selection continues to be challenging. With more seed companies and more GMO options and seed treatment packages than ever before, hybrid selection can be a difficult decision. We evaluated early maturity hybrids (107 day RM or less) at three locations, medium maturity hybrids (108-112 day RM) at eight locations, and full season hybrids (113 day RM or more) at seven locations. Additionally, the Virginia Ag Expo location in Essex County planted hybrids in all three maturity groups. Farmers should use the results compiled from these studies to assist with future hybrid selection; however, they should continue to plant hybrids of multiple maturities to help spread production risk.

Emergence Evaluation

In follow-up work from previous years, we compiled data from uniform stand emergence plots planted 2016 - 2018. In these plots, emergence was checked and flagged for three straight days or more at the same time each day as soon as the corn began spiking the ground. Ears from the forty foot section were hand harvested and weighed at the end of the season and yields were calculated. Uniform emergence is critical for obtaining maximum yields. Farmers should pay close attention to planter speed, strive for uniform planting depth, make sure the planting slot is closed, replace worn planter parts and be sure to plant hybrids with good stress emergence, especially when planting early into cold and wet soils.

Cover Crop Evaluation

We continued to evaluate legume and mixed species cover crop options in corn production. Our work continues to show that these options can provide significant nitrogen to the subsequent corn crop. Hairy vetch, in particular, shows great promise in helping to increase corn yields.

Planting Population Comparisons

In 2018, many producers took advantage of variable rate seeding technologies. In order to assist producers in making population decisions, we planted a flex ear hybrid at 20,000, 25,000, 30,000 and 35,000 seeds per acre in order to determine the effect that population has on yield. Plots were harvested and graphed to represent the positive linear relationship between planting population and crop yield. Further work is planned for the 2019 season to assess yield return at higher populations.

Early Maturity Hybrid Entries
107 Day RM or Less

Brand	Hybrid Entry	Genetic Traits	Relative Maturity	Seed Treatment
Augusta	4657	GT3110	107	C250
Syngenta	NK0968-3110	Viptera, ECB	109	Avicta Complete 500 + Vibrance
Hubner	H04G287		104	
DynaGro	DG44vc36	Double Pro	104	A250
Seed Consultants	SCS 10HR43	XX/RL/LL	104	Poncho 1250
Dekalb	DKC57-99RIB	GENDGVT2PRIB	107	A250
Channel	203-01VT2P	VT2P	103	P250
Pioneer	P0339AM	AcreMax	103	P1250 Votivo
Doebler's	4417AMXT	RW/HXX/YGCB/LL/RR2	104	C250+Raxil
Pinnacle Ag (Mission Seed)	A0357	VT2PRIB	103	ACC250

Early Maturity Hybrid Comparisons 107 Day RM or Less

Company	Hybrid	Maturity	Essex (Ag Expo)	Lancaster	Culpeper	Average
Augusta	4657	107.0	238.6	106.6	139.0	161.4
Syngenta*	NK0968*	109*	235.3	100.4	181.1	172.3
Hubner	H04G287	104.0	229.3	98.5	138.4	155.4
DynaGro	DG44vc36	104.0	223.8	110.6	125.2	153.2
Seed	SCS	104.0	212.5	103.5	155.0	157.0
Dekalb	DKC57-	107.0	216.3	100.9	130.6	149.3
Pioneer	P0339AM	103.0	226.8	100.2		163.5
Doebler's	4417AMXT	104.0	243.1	114.6	106.2	154.6
Pinnacle Ag	A0357	103.0	191.2			
Channel	203-01VT2P	103.0	197.1			
		Average	221.4	104.4	139.4	

*Hybrid does not meet the RM requirement for this maturity set

Lancaster County Early Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** Jock Chilton, R.J. Reynolds, Cliff Grieve
 Extension: Trent Jones, Caroline Campbell

Previous Crop: Soybeans
Soil Type: 74% Woodstown Fine Sandy Loam, 25% Dragston Fine Sandy Loam
Tillage: No-Till
Planting Date: May 2, 2018
Planting Equipment: Kinze 3200
Seeding Rate: 28,500 Seeds / Acre
Row Spacing: 30"

Fertilizer: **Preplant:** 15 Gal. 28-0-0-5S
 Planting: 20 Gal. 15-15-2.5S-0.1B-0.25Zn
 Sidedress: 35 Gal. 24-0-0-35, + N-Fixx XLR Nitrogen Stabilizer

Crop Protection: **Burndown:** 3 pints/acre Gramoxone SL 2.0, 2.5 quarts/acre Resicore
 1.5 quarts/acre Atrazine, 1 quart/acre Simazine
 1 pint/acre Grounded, 2 oz/acre Silencer

Harvest Date: September 27, 2018
Harvest Equipment: John Deere S660

Hybrid	Maturity (Days)	% Moisture	Yield (bu./A) at 15.5%
Check (Hubner 4222)	101	17.9	120.3
Doebler's 4417AMXT	104	16.2	114.6
DynaGro DG44vc36	104	16.6	110.6
Check (Hubner 4222)	101	17.7	111.1
Syngenta NK0968-3110	109	17.6	100.4
Pioneer P0339AM	103	16.8	100.2
Hubner H04G287	104	16.6	98.5
Check (Hubner 4222)	101	17.6	110.4
Augusta 4657	107	16.6	106.6
Seed Consultants SCS 10HR43™	104	16.8	103.5
Dekalb DKC57-99RIB	107	17.1	100.9
Check (Hubner 4222)	101	17.3	114.4

Discussion: This season proved to be difficult for many farmers. This plot was planted during a period of heavy precipitation followed by a three-week drought at pollination and finished the season with steady rains. Yields were severely impacted by consistent untimely weather events; however, this plot provides valuable information on how hybrids will respond to difficult seasons.

Culpeper County Early Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** Battle Park Farms, Don Meek, Thomas Mountjoy, & the George Washington Carver Agriculture Research Center
Extension: Carl Stafford
Industry: Orange Madison Coop - Jimmy Dyer, Nutrien Ag Solutions - Haydon Eicher
Previous Crop: Corn Silage, Barley Cover Crop
Soil Type: Rapidan Silty Clay Loam
Tillage: Conventional
Planting Date: May 14, 2018
Planting Equipment: John Deere 12 Row, 30" Spacing
Seeding Rate: 32,000 Plants / Acre
Row Spacing: 30"
Fertilizer: **Preplant:** Nov 2017 – N 41 – P 59 – K 60 – Dairy Manure, March 2018 P 60-K mag 150, April 2018 3 tons Lime, May 9, 2018 UAN 100 units
Crop Protection: **Burndown:** May w/UAN, 1qt Maddog, 2 lb Atrazine, 1 lb Princep, 3oz Ez mix, 7oz Salvo, 2oz Lamba, 20oz nutrisphere, 32 oz Bio start, 1 oz silspread
Post-Emergence: June 9, 2018 with water, 1qt. maddog, 5 oz rifle, 7 oz choice, 1oz silspread
Harvest Date: October 19, 2018
Harvest Equipment: International Harvester 6 Row

Hybrid	Maturity (Days)	% Moisture	Yield @ 15.5 % (bu/A)
Pioneer P0339AM	103	NA	NA
Doebler's 4417AMXT	104	14.7	106.19
DynaGro DG44vc36	104	14.6	125.18
Hubner HO4G287	104	14.3	138.44
Seed Consultants SCS 10HR43TM™	104	16.2	155.02
Augusta 4657	107	15.7	138.95
Dekalb DKC57-99RIB	107	14.7	130.59
Syngenta NK0968-3110	109*	15.7	181.14

Discussion: Too wet, several areas of the field stunted, late season moisture, cloudy, hot temps, impacted yield, P0339AM - too much grass, too much water, drowned out plot, no yield taken.

Ag Expo Early Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** Cloverfield Farms
Extension: Mike Broaddus, VCE-Caroline & King George
 Robbie Longest, VCE-Essex
 Trent Jones, VCE-Lancaster & Northumberland
 Wade Thomason, VCE
 Keith Balderson - NRCS

Previous Crop: Soybeans
Soil Type: Tetotum Loam
Tillage: No-Till
Planting Date: April 23, 2018
Planting Equipment: Case 1245 Planter
Seeding Rate: 44,000 plants/ac.
Row Spacing: 30”
Fertilizer: **Preplant:** 93 lbs. K Plant Food Broadcast - (April 6)
 15-0-0-7 (20 gal/ac) - (April 13)
 Planting: 30% (15 gal/ac) and Boron (1qt/ac) in 2X2 - (April 23)
 11-37-0 (3 gal/ac), 9% Zinc (1 qt/ac) in furrow –
 (April 23)
 Sidedress: 24-0-0-3 (66 gal/ac) – (May 26)

Crop Protection: **Post-Emergence:** Halex GT (3.6 pt/ac), Atrazine 90 WDG (1 lb/ac) -
 (May 26)

Harvest Date: September 11, 2018
Harvest Equipment: Case 9240

Hybrid	Maturity (Days)	% Moisture	Yield (bu./A @ 15.5%)
Check (Hubner 4663)		19.3	258.8
Pioneer P0339 AM	Early	18.4	226.8
Augusta 4657 GT3110	Early	18.9	238.6
Pinnacle AO 357VT	Early	17.4	191.2
Seed Consultants 10HR43™	Early	17.7	212.5
Hubner H04G287	Early	17.6	229.3
Check		18.3	255.8
Syngenta NK 0968 3000GT	Early	18.6	235.3
Channel 203-01 VT2RIB	Early	18.2	197.1
Dekalb DKC 55-99RIB	Early	17.4	216.3
Doebblers 4417 AMXT	Early	17.0	243.1
DynaGro D44VC36RIB	Early	17.0	223.8

Ag Expo Early Maturity Corn Hybrid Demonstration Plot

Discussion: Many thanks to all those who cooperated in these On-Farm Corn Hybrid plots, and Cloverfield Enterprises and the Hundley Family for hosting the 2018 Virginia Ag Expo! This plot had early, mid, and full season corn hybrids. Yields were very good for this plot, with many plot yields exceeding 250 bu/ac! Excessive rainfall occurred throughout much of the growing season at this site. These plots were irrigated with a center pivot 3" in mid-July due to a period of higher temperatures and a brief period of decreased soil moisture. Use these results and results from other replicated yield data when considering hybrid choice for 2019.

Mid Maturity Hybrid Entries
108-112 Day RM

Brand	Hybrid Entry	Genetic Traits	Relative Maturity	Seed Treatment
Augusta	5062	GT3110	112	C1250
Syngenta	NK1066-3120	Broadlep, ECB	111	Activa Complete 500 + Vibrance
Hubner	H08G394		108	
DynaGro	DG52vc91	Double Pro	112	A250
Seed Consultants	SCS 1087YHR	YGCB/HX1/RR	108	Poncho 1250
Dekalb	DKC62-53RIB	GENVT2PRIB	112	A250
Channel	209-15VT2P	VT2P	109	P250
Pioneer	P1197AM	AcreMax	111	P1250 Votivo
Doebler's	5018AM	HX1/YGCB/LL/RR2	110	Votivo+C1250
Pinnacle Ag (Mission Seed)	A1257	VT2P	112	ACC250

Mid Maturity Hybrid Comparisons 108 - 112 Day RM

Company	Hybrid	Maturity	(Ag Expo) Essex	Middlesex	Westmoreland	King William	Culpeper	Caroline	Loudoun	Lunenburg	Average Yield
Augusta	5062	112.0	224.8	178.0	181.0	203.2	188.7	183.2	46.1		172.1
Syngenta	NK1066-3120	111.0	246.4	181.5	174.0	203.7	133.2	232.9	119.7		184.5
Hubner	H08G394	108.0	220.9	184.9	190.0	207.9	179.4	177.5	125.0		183.7
DynaGro	DG52vc91	112.0	254.3	192.3	182.0	210.4	185.1		96.4		186.8
Seed Consultants	SCS 1087YHR™	108.0	275.7	199.9	179.0	214.9	170.0	224.2	63.9		189.7
Dekalb	DKC62-53RIB	112.0	263.6	197.4	193.0	221.0	188.3	214.1	127.3	216.6	202.7
Pioneer	P1197AM	111.0	256.2	192.3	181.0	218.2	186.1	211.8	78.2	199.6	190.4
Doebler's	5018AM	110.0	263.7	192.7	184.0	215.2	157.7	218.2	73.7	210.6	189.5
Pinnacle Ag	A1257	112.0	271.8								
Channel	209-15VT2P	109.0	252.9								
		Average	253.0	189.9	183.0	211.8	173.6	208.8	91.3	208.9	

Westmoreland County Mid Maturity Corn Hybrid Demonstration Plot

Cooperators:	Producer: F.F. Chandler, Jr. and Louis Chandler
	Extension: Stephanie Romelczyk, ANR – Westmoreland Trent Jones, ANR – Northumberland/Lancaster Makenzie Hall, VCE Intern
Previous Crop:	Soybeans
Soil Type:	Savannah loam and Kempsville loam
Tillage:	No-till
Planting Date:	May 2, 2018
Planting Equipment:	Case IH 950 Cyclo Planter
Seeding Rate:	29,300
Row Spacing:	30”
Fertilizer:	Preplant: 40 lbs N/A + 30 lbs P/A + 70 lbs K/A + 5 lbs S/A
	Planting: 30 lbs N/A + 30 lbs P/A + 0.25 lb B/A + 0.5 lb Zn/A
	Sidedress: 100 lbs N/A + 12 lbs S/A
Crop Protection:	Burndown: Acuron 1.5 qt/A Princep 1.5 pt/A
	Post-Emergence: Halex 3.6 pt/A Atrazine 1 qt/A Radiate 2 oz/A
Harvest Date:	October 10, 2018
Harvest Equipment:	John Deere 9400

Hybrid	Maturity (Days)	Population	% Moisture	Yield (bu/A @15.5%)
Augusta 5062	112	26333	16.1	181
DeKalb DKC62-53RIB	112	22333	15.5	193
Hubner H08G394	108	29000	15.4	190
DynaGro D52VC91	112	23666	15.4	182
Pioneer 1197AM	111	26333	16.1	181
Doebler's 5018AM	110	25333	14.8	184
Seed Consultants SCS 1087YHR™	108	29000	14.8	179
Syngenta NK1066-3120	111	25333	15.8	174
Average				183

Discussion: Despite a challenging growing season, all tested corn varieties yielded well. Total rainfall between planting date and harvest date was 32.2 inches (May: 13.18 in, June: 5.47 in, July: 4.71 in, August: 3.42, and September: 5.42 in).

Culpeper County Early Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** Battle Park Farms, Don Meek, Thomas Mountjoy, & the George Washington Carver Agriculture Research Center
 Extension: Carl Stafford
 Industry: Orange Madison Coop - Jimmy Dyer, Nutrien Ag Solutions - Haydon Eicher
Previous Crop: Corn Silage, Barley Cover Crop
Soil Type: Rapidan Silty Clay Loam
Tillage: Conventional
Planting Date: May 14, 2018
Planting Equipment: John Deere 12 Row, 30" Spacing
Seeding Rate: 32,000 Plants / Acre
Row Spacing: 30"
Fertilizer: **Preplant:** Nov 2017 – N 41 – P 59 – K 60 – Dairy Manure, March 2018 P 60-K mag 150, April 2018 3 tons Lime, May 9, 2018 UAN 100 units
Crop Protection: **Burndown:** May w/UAN, 1qt Maddog, 2 lb Atrazine, 1 lb Princep, 3oz Ez mix, 7oz Salvo, 2oz Lamba, 20oz nutrisphere, 32 oz Bio start, 1 oz silspread
 Post-Emergence: June 9, 2018 with water, 1qt. maddog, 5 oz rifle, 7 oz choice, 1oz silspread
Harvest Date: October 19, 2018
Harvest Equipment: International Harvester 6 Row

Hybrid	Maturity (Days)	% Moisture	Yield @ 15.5 % (bu/A)
Hubner H08G394	108	15.9	179.41
Seed Consultants SCS 1087YHR™	108	15.5	169.99
Doebler's 5018AM	110	15.8	157.73
Pioneer P1197AM	111	15.8	186.07
Syngenta NK1066-3120	111	15.6	133.2
Augusta 5062	112	15.7	188.67
Dekalb DKC62-53RIB	112	15.8	188.32
DynaGro DG52vc91	112	15.6	185.13

Discussion: Too wet, several areas of the field stunted, late season moisture, cloudy, hot temps, impacted yield.

Ag Expo Mid Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** Cloverfield Farms
 Extension: Mike Broaddus, VCE-Caroline & King George
 Robbie Longest, VCE-Essex
 Trent Jones, VCE-Lancaster & Northumberland
 Wade Thomason, VCE
 Keith Balderson - NRCS
 Industry: Participating Companies

Previous Crop: Soybeans
Soil Type: Tetotum Loam
Tillage: No-Till
Planting Date: April 23, 2018
Planting Equipment: Case 1245 Planter
Seeding Rate: 44,000 plants/ac.
Row Spacing: 30”
Fertilizer: **Preplant:** 93 lbs. K Plant Food Broadcast - (April 6)
 15-0-0-7 (20 gal/ac) - (April 13)
 Planting: 30% (15 gal/ac) and Boron (1qt/ac) in 2X2 - (April 23)
 11-37-0 (3 gal/ac), 9% Zinc (1 qt/ac) in furrow –
 (April 23)
 Sidedress: 24-0-0-3 (66 gal/ac) - (May 26)

Crop Protection: **Post-Emergence:** Halex GT (3.6 pt/ac), Atrazine 90 WDG (1 lb/ac) -
 (May 26)

Harvest Date: September 11, 2018
Harvest Equipment: Case 9240

Hybrid	Maturity (Days)	% Moisture	Yield (bu./A @15.5%)
Check (Hubner 4663)		17.4	256.3
Syngenta NK 1066-3102EZ1	111	20.1	246.4
Pioneer P1197AM	111	20.2	256.2
Pinnacle A1257VT2P	112	19.5	271.8
Augusta 5062 GT3110	112	19.9	224.8
Hubner H06G394	108	20.1	220.9
Check		19.5	245.7
Seed Consultants 1087YHR™	108	19.4	275.7
DynaGro 52VC91	112	19.5	254.3
Doebler's 5018AM	110	19.3	263.7
Dekalb 62-53	112	18.6	263.6
Channel 209-15VT2PRIB	109	19.4	252.9

Ag Expo Mid Maturity Corn Hybrid Demonstration Plot

Discussion: Many thanks to all those who cooperated in these On-Farm Corn Hybrid plots, and Cloverfield Enterprises and the Hundley Family for hosting the 2018 Virginia Ag Expo! This plot had early, mid, and full season corn hybrids. Yields were very good for this plot, with many plot yields exceeding 250 bu/ac! Excessive rainfall occurred throughout much of the growing season at this site. These plots were irrigated with a center pivot 3” in mid-July due to a period of higher temperatures and a brief period of decreased soil moisture. Use these results and results from other replicated yield data when considering hybrid choice for 2019.

Loudoun County Mid Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** John Moore: Temple Hall Regional Farm Park
Extension: Jim Hilleary, VCE - Loudoun
Industry: Loudoun County Parks and Recreation

Previous Crop: Soybeans
Soil Type: 73B Penn Silt Loam 90%
 14B Manassas Silt Loam 10%

Tillage: No-Till
Planting Date: May 7, 2018
Planting Equipment: JD MaxEmerge 6 Row
Seeding Rate: 32,000 Plants Per Acre
Row Spacing: 30"

Fertilizer: **Preplant:** Per acre: 150 Nitrogen, 40 Phosphorous, 60 Potassium,
 3.75 eco-N Stabilizer

Harvest Date: October 23, 2018
Harvest Equipment: JD 9500 w/ 643

Hybrid	Maturity (Days)	% Moisture	Yield (bu./A @15.5%)
Dynagrow D52VC91RIB	112	14	96.4
Seed Consultants 1087YHR™	108	13.8	63.9
Augusta 5062GT3110	112	13.5	46.1
Pioneer P1197AM	111	13.8	78.2
Doebler's 5018AM	110	13.7	73.7
DeKalb DKC62-53RIB	112	13.9	127.3
Syngenta NK 1066-3120	111	14.6	119.7
Huebner H08G394	108	14.4	125.0

Discussion: A very wet growing season.

Lunenburg County Mid Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** David Moore
Extension: Taylor Clarke, VCE Mecklenburg
Lindy Fimon, VCE Lunenburg

Previous Crop: Soybeans
Tillage: No-Till
Planting Date: May 2, 2018
Planting Equipment: 1780 JD, vacuum planter 6 row
Seeding Rate: 29,000
Row Spacing: 30”
Fertilizer: **Preplant:** Nitrogen 35 lb
Sidedress: Nitrogen 180 lb
Crop Protection: **Burndown:** RoundUp + Bicep w/Nitrogen
Planting:
Post-Emergence: Nitrogen w/ Atrazine and Roundup
Harvest Date: November 1, 2018
Harvest Equipment: Gleaner R-52

Hybrid	Maturity (Days)	% Moisture	Yield (bu./A @15.5%)
DeKalb C62-53 RIB	112	15.8	216.6
Pioneer 1197 AM	111	16.1	199.6
Doebblers 5018 AM	110	16.5	210.6

Discussion: Unable to harvest the entire plot due to mechanical difficulties.

Caroline County Mid Maturity Corn Hybrid Demonstration Plot

Cooperators:
Producer: Terrell Farms
Extension: Mike Broaddus

Previous Crop: Soybeans
Soil Type: 24B Suffolk Fine Sandy Loam
Tillage: No-till
Planting Date: April 19, 2018
Seeding Rate: 30K Seed / A
Row Spacing: 30”
Fertilizer:
Preplant: 1.5 Ton Biosolid / Acre
275 lb. DAP / Acre
Planting: 50 lb / Acre Starter
Sidedress: 40 lb. / Acre N
Crop Protection:
Burndown: 2 Qt. Glyphosate w/ water + 1.5 qt. Lumax EZ
Post-Emergence: 1 oz Zidua, 12.5 oz. Status, 10 oz. Headline fungicide.
Harvest Date: September 6, 2018
Harvest Equipment: John Deere S780

Brand	Maturity (Days)	% Moisture	Yield @ 15.5 % (bu/A)
Dekalb DKC62-53 RIB	112	22.2	214.1
Hubner H08G394	108	18.1	177.5
Augusta 5062GT3110	112	21.4	183.2
Seed Consultants SCS 1087YHR TM	108	19.9	224.2
Pioneer P1197AM	111	21.6	211.8
Syngenta NK1066-3120-EZ1	110	22.1	232.9
Doeblers 5018AM	110	22.2	218.2

Discussion: All in all, this was a good plot with good yields considering the dry and hot July along with the extreme rain during the spring and fall. The results of this plot can be proof that good fertilization using different forms of nitrogen along with different herbicides with different modes of actions succeeded in keeping the crop clean in a year when others had weed problems.

King William County Mid Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** Cohoke Farm
Extension: Trent Jones – Northumberland & Lancaster County ANR
 Robby Longest - Essex County ANR
 Caroline Campbell - Northumberland County Intern
 Tracy Porter - Former ANR Agent

Previous Crop: Soybeans
Soil Type: Kempsville
Tillage: No-Till
Planting Date: April 18, 2018
Seeding Rate: 29,500 Seeds/ Acre
Row Spacing: 30”
Fertilizer: **Preplant:** Broadcast 30-40-100 + 20S
 Planting: 35-0-0-6 Starter
 Sidedress: 120-0-0
Crop Protection: **Burndown:** Burn Down - Roundup + 2,4-D
 Planting: Harness Max
Harvest Date: August 18, 2018
Harvest Equipment: Case 9230

Brand	Maturity (Days)	% Moisture	Yield @ 15.5 % (bu/A)
Syngenta NK1066-3120	111.0	20.4	203.70
Check		21.5	219.03
DynaGro DG52vc91	112.0	20.0	210.44
Doebler's 5018AM	110.0	21.3	215.19
Check		21.3	227.85
Dekalb DKC62-53RIB	112.0	21.0	220.98
Augusta 5062	112.0	21.3	203.24
Check		22.4	234.65
Seed Consultants SCS 1087YHR™	108.0	21.3	214.87
Pioneer P1197AM	111.0	20.5	218.15
Check		22.0	230.33
Hubner	108.0	19.6	207.89

Middlesex County Mid Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** RT Bland, INC. / Robert Bland
 Extension: M. Rachael Miller-Middlesex VCE

Previous Crop: Soybeans
Soil Type: Emperia Sandy Loam
Tillage: No-Till
Planting Date: May 1, 2018
Planting Equipment: John Deer 1750, MAX-Emerge Plus
Seeding Rate: 30,000 Plants / Acre
Row Spacing: 30”
Fertilizer: **Preplant:** 70-30-60-12S
 Sidedress: 90lbs/N2/AC
Crop Protection: **Burndown:** 2Pt. Atrazine 1Qt. Round Up, 3.5oz Balance Flex
 Post-Emergence: 1Qt. Round Up, 2Pt. Atrazine, 3Oz. Caprino
Harvest Date: October 2, 2018
Harvest Equipment: Gleaner R52

Hybrid	Maturity (Days)	% Moisture	Yield @ 15.5% (bu/A)
Augusta GT3110	112	17.20	178.00
CHECK		16.80	181.31
Syngenta NK1066-3120	111	16.70	181.53
CHECK		16.30	179.94
Hubner H08G394	108	16.30	184.87
CHECK		16.20	177.68
Dyna Grow DG52vc91	112	16.30	192.26
CHECK		16.30	179.94
Seed Consultants SCS1087YHR™	108	16.20	199.90
CHECK		16.10	175.43
Dekalb DKC62-53RIB	112	16.20	197.43
CHECK		16.10	170.48
Pioneer P1197AM	111	16.30	192.26
CHECK		16.20	170.28
Doebler's 5018AM	110	16.10	192.72

Full Maturity Hybrid Entries
108-112 Day RM

Brand	Hybrid Entry	Genetic Traits	Relative Maturity	Seed Treatment
Augusta	1165	VT2Pro	115	C250
Syngenta	NK1573-3110	Viptera, ECB	115	Activa Complete 500 + Vibrance
Hubner	H4890RC2P		117	
DynaGro	DG55vc45	Double Pro	115	A250
Seed Consultants	SCS 1158YHR	YGCB/HX1/RR	115	Poncho 1250
Dekalb	DKC67-44RIB	GENVT2PRIB	117	A250
Channel	218-44VT2P	VT2P	118	P250
Pioneer	P1870AM	AcreMax	118	P1250 Votivo
Doebler's	5518AM	HX1/YGCB/LL/RR2	115	Votivo+C1250
Pinnacle Ag (Mission Seed)	RL8430	AM	113	P500V

Full Maturity Hybrid Comparisons 113 Day RM or More

Company	Hybrid	Maturity	(Ag Expo) Essex	Prince George	Culpeper	King and Queen	Dinwiddie	Lunenburg	Madison	Average Yield
Augusta	1165	115.0	263.5	224.0	192.4	209.0	160.4	196.4	182.5	204.0
Syngenta	NK1573-3110	115.0	216.3	224.4	195.9	206.0	177.2	177.2	125.4	188.9
Hubner	H4890RC2P	117.0	295.7	238.4	162.5	221.0	185.7	214.5	178.0	213.7
DynaGro	DG55vc45	115.0	272.4	192.5	158.4	215.0	152.9	192.3	203.1	198.1
Seed	SCS	115.0	247.7	222.7	169.8	201.0	175.3	189.8	162.4	195.5
Dekalb	DKC67-44RIB	117.0	276.3	240.6	188.4	216.0	201.7	227.9	199.8	221.5
Pioneer	P1870AM	118.0	255.5	225.5	177.5	212.0	198.3	182.4	180.8	204.6
Doebler's	5518AM	115.0	268.5	209.3	156.7	206.0	180.3	181.5	166.1	195.5
Pinnacle Ag	RL8430	113.0	201.9							
Channel	218-44VT2P	118.0	265.5							
		Average	256.3	222.2	175.2	210.8	179.0	195.3	174.8	

Prince George County Full Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** Brandon Plantation, Todd Price
Extension: Scott Reiter, VCE-Prince George

Previous Crop: Soybeans
Soil Type: Pamunkey loam
Tillage: No-till DMI subsoiler
Planting Date: May 4, 2018
Planting Equipment: No-till Kinze 3500
Seeding Rate: 30,000 seed/acre
Row Spacing: 30”

Fertilizer: **Preplant:** 40-60-80
Planting: 20 gal 15-15-0-3S-0.5Zn-0.13B + Accomplish M + Radiate; 3 gal 3-18-18 + 1 pt CarboMax in-furrow
Sidedress: 120-0-0-15S

Crop Protection: **Burndown:** 1 qt Roundup UltraMax + 1 pt 2,4-D + 1.5 oz Leadoff
Post-Emergence: 26 oz Roundup UltraMax + 1.25 qt Resicore
 10 oz Headline with post herbicides; Quadris + Tombstone at tassel

Harvest Date: October 5, 2018
Harvest Equipment: John Deere S660, Weigh wagon, Dickey-john MiniGAC+ moisture meter

Hybrid	Maturity (Days)	% Moisture	Yield @ 15.5 % (bu/A)
CHECK DeKalb DKC65-20		18.3	209.9
Augusta A1165 VT2Pro	115	18.4	224.0
Syngenta NK1573-3110	115	17.7	224.4
Hubner H4890RC2P	117	18.9	238.4
Dyna-Gro D55VC45	115	19.2	192.5
Seed Consultants SCS 1158YHR™	115	18.0	222.7
DeKalb DKC67-44RIB	117	17.6	240.6
Pioneer P1870AM	118	18.6	225.5
Doebler 5518AM	115	17.1	209.3
CHECK DeKalb DKC65-20		17.7	232.2

Discussion: An outstanding dryland corn crop for Prince George. This is the best soil in the county and was managed for 200+ bu yields. Test weights were 55.5 - 60 lb/bu. Use this location with other test data for your 2019 hybrid selections.

Dinwiddie County Full Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** Nick Moody
 Extension: Mike Parrish, VCE Dinwiddie

Previous Crop: Soybeans
Soil Type: Cecil/appling
Tillage: No-till
Planting Date: May 1, 2018
Planting Equipment:
Seeding Rate: 28,000 Plants / Acre
Row Spacing: 30”
Fertilizer: **Planting:** 24-0-0-3S + 50 units of N, then blend of urea and ammonium sulfate
 Sidedress: 100 units of N and 20 units of S
Crop Protection: **Burndown:** 4-30-18: 1qt. Gramoxone, 1qt Atrazine
 Post-Emergence: 6-1-18 - 1qt. Buccaneer 2.5qt. Resicore
Harvest Date: September 19, 2018
Harvest Equipment: JD 9750sts with a JD 1293 head (only cut 6 rows at a time)

Brand	Maturity (Days)	% Moisture	Yield @ 15.5 % (bu/A)
DynaGro DG55vc45	115	21.4	152.9
Hubner H489ORC2P	117	21.8	185.7
Dekalb DKC67-44RIB	117	21.2	201.7
Doebler's 5518AM	115	21.1	180.3
Augusta 1165VT2Pro	115	21.2	160.4
Pioneer P1870AM	118	21.9	198.3
Syngenta NK1573-3110	115	21.5	177.2
Seed Consultants SCS 1158YHR™	115	21.3	175.3

Ag Expo Full Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** Cloverfield Farms
Extension: Mike Broaddus, VCE-Caroline & King George
 Robbie Longest, VCE-Essex
 Trent Jones, VCE-Lancaster & Northumberland
 Wade Thomason, VCE
 Keith Balderson - NRCS

Previous Crop: Soybeans
Soil Type: Tetotum Loam
Tillage: No-Till
Planting Date: April 23, 2018
Planting Equipment: Case 1245 Planter
Seeding Rate: 44,000 plants/ac.
Row Spacing: 30”
Fertilizer: **Preplant:** 93 lbs. K Plant Food Broadcast - (April 6)
 15-0-0-7 (20 gal/ac) - (April 13)
 Planting: 30% (15 gal/ac) and Boron (1qt/ac) in 2X2 - (April 23)
 11-37-0 (3 gal/ac), 9% Zinc (1 qt/ac) in furrow –
 (April 23)
 Sidedress: 24-0-0-3 (66 gal/ac) - (May 26)

Crop Protection: **Post Emergence:** Halex GT (3.6 pt/ac), Atrazine 90 WDG (1 lb/ac) -
 (May 26)

Harvest Date: September 11, 2018
Harvest Equipment: Case 9240

Hybrid	Maturity (Days)	% Moisture	Yield (bu/A @15.5%)
Check (Hubner 4663)		19.2	247.8
DynaGro D55VC45RIB	115	20.6	272.4
Augusta 1165 VT2P	115	21.0	263.5
Channel 218-44 VT2P	118	20.9	265.5
Pinnacle RL8430AM	113	20.5	201.9
Dekalb DKC 64-44RIB	117	19.8	276.3
Check		19.0	244.7
Hubner 4890 RC2P	117	20.7	295.7
Pioneer P1870 AM	118	20.4	255.5
Doebler's 5518 AM	115	19.4	268.5
Seed Consultants 1158 YHR™	115	19.8	247.7
Syngenta NK 1573-3110	115	18.7	216.3
Check		19.3	248.7

Ag Expo Full Maturity Corn Hybrid Demonstration Plot

Discussion: Many thanks to all those who cooperated in these On-Farm Corn Hybrid plots, and Cloverfield Enterprises and the Hundley Family for hosting the 2018 Virginia Ag Expo! This plot had early, mid, and full season corn hybrids. Yields were very good for this plot, with many plot yields exceeding 250 bu/ac! Excessive rainfall occurred throughout much of the growing season at this site. These plots were irrigated with a center pivot 3” in mid-July due to a period of higher temperatures and a brief period of decreased soil moisture. Use these results and results from other replicated yield data when considering hybrid choice for 2019.

Culpeper County Full Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** Battle Park Farms, Don Meek, Thomas Mountjoy, & the George Washington Carver Agriculture Research Center
Extension: Carl Stafford
Industry: Orange Madison Coop - Jimmy Dyer, Nutrien Ag Solutions - Haydon Eicher
Previous Crop: Corn Silage, Barley Cover Crop
Soil Type: Rapidan Silty Clay Loam
Tillage: Conventional
Planting Date: May 14, 2018
Planting Equipment: John Deere 12 Row, 30" Spacing
Seeding Rate: 32,000 Plants / Acre
Row Spacing: 30"
Fertilizer: **Preplant:** Nov 2017 – N 41 – P 59 – K 60 – Dairy Manure, March 2018 P 60-K mag 150, April 2018 3 tons Lime, May 9, 2018 UAN 100 units
Crop Protection: **Burndown:** May w/UAN, 1qt Maddog, 2 lb Atrazine, 1 lb Princep, 3oz Ez mix, 7oz Salvo, 2oz Lamba, 20oz nutrisphere, 32 oz Bio start, 1 oz silspread
Post-Emergence: June 9, 2018 with water, 1qt. maddog, 5 oz rifle, 7 oz choice, 1oz silspread
Harvest Date: October 19, 2018
Harvest Equipment: International Harvester 6 Row

Brand	Maturity (Days)	% Moisture	Yield (bu/A @ 15.5 %)
Augusta 1165	115	15.7	192.43
Doebler's 5518AM	115	16.7	156.74
DynaGro DG55vc45	115	16	158.43
Seed Consultants SCS 1158YHR™	115	16	169.8
Syngenta NK1573-3110	115	16.2	195.9
Dekalb DKC67-44RIB	117	15.7	188.37
Hubner H4890RC2P	117	15.7	162.5
Pioneer P1870AM	118	16.7	177.47

Discussion: Too wet, several areas of the field stunted, late season moisture, cloudy, hot temps, impacted yield.

Madison County Full Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** Shepherd & Sons Farm
 Extension: Brad Jarvis

Previous Crop: Soybeans
Soil Type: Eubanks/Lloyd Loam
Tillage: No-Till
Planting Date: 4/25/2018
Seeding Rate: 32,000 Seeds / Acre
Row Spacing: 30”
Fertilizer: **Planting:** 151-0-75
 Sidedress: 70-0-0
Crop Protection: **Burndown:** Corvus, Siminine, Atrazine, Salvo
 Post-Emergence: Roundup Power Max
Harvest Date: 11/29/2018
Harvest Equipment: JD 9770STS

Hybrid	Maturity (Days)	% Moisture	Yield (bu/A @15.5%)
DynaGro DG55VC45	115	16.3	203.09
Dekalb DKC67-44	117	16.4	199.79
Augusta 1165	115	15.9	182.54
Pioneer P1870AM	118	16.4	180.82
Hubner H4890RC2P	117	16.4	177.95
Doebler's 5518AM	115	16.3	166.13
Seed Consultants SCS1158YHR™	115	16.3	162.37
Syngenta NK1573-3110	115	16.3	125.43

King and Queen County Full Maturity Corn Hybrid Demonstration Plot

Cooperators:	Producer: T.O. Longest Farms
	Extension: Robbie Longest, VCE-Essex Trent Jones, VCE-Northumberland & Lancaster Tracy Porter, VSU-Small Farm Outreach
Previous Crop:	Soybeans
Soil Type:	Craven Fine Sandy Loam & Munden Loamy Sand
Tillage:	No-Till
Planting Date:	April 20, 2018
Planting Equipment:	John Deere 1770NT
Seeding Rate:	30,000 plants/ac.
Fertilizer:	Preplant: 7-17-29 with Boron (310 lb/ac) & 32%N (12 gal/ac)
	Planting: Invictis Captivate D 10-20-5 (3 gal/ac)
	Sidedress: 28-0-0-5 (40 gal/ac) with Nitrogen stabilizer (2qt/ton)
Crop Protection:	Burndown: Dupont Leadoff (1.5 oz/ac), 4 lb 2,4-D (20 oz/ac) Glyphosate (40 oz/ac), Coastal Ag Spectrum (5 oz/ac)
	Planting: Capture LFR (4 oz/ac) in furrow
	Post-Emergence: 4lb Atrazine (48 oz/ac), Dupont Realm Q (4 oz/ac) Glyphosate (32 oz/ac), Coastal Ag. Spectrum (5 oz/ac)
Harvest Date:	October 9, 2018
Harvest Equipment:	John Deere S680 w/ 612C Header

Discussion: Many thanks to all those who cooperated in this On-Farm Corn Hybrid plot! This plot had hybrids ranging from 110-118 days. Yields for this full season hybrid plot were very good considering the season with a plot average yield of 201.5 bu./A. Rainfall was not limiting during most of the growing season, except for a period of stress in late June and early July when temperatures were higher and soil moisture was reduced. Higher than average rainfall amounts may have contributed to some nutrient loss. Use these results and results from other replicated yield data when considering hybrid choice for 2019

King and Queen County Full Maturity Corn Hybrid Demonstration Plot

Hybrid	Maturity (Days)	% Moisture	Yield (bu./A @15.5%)
Seed Consultants SCS 1158YHR™	115	16.6	188
Check (Doebler 5015AM)	110	15.7	173
Dekalb DKC67-44RIB	117	15.9	216
Check	110	15.3	184
Seed Consultants SCS 1158YHR	115	15.7	215
DynaGro DG55VC45	115	15.8	206
Check	110	16.4	179
Pioneer P1870AM	118	16.3	212
Check	110	16.9	184
DynaGro DG55VC45	115	16.0	224
Doebler 5518AM	115	15.7	206
Check	110	15.2	200
Hubner H4890RC20	117	16.2	221
Check	110	15.3	205
Doebler 5518AM	115	15.5	205
Syngenta NK1573-3310	115	16.7	208
Check	110	16.4	198
Augusta 1165	115	16.5	209
Check	110	16.2	194
Syngenta NK1573-3310	115	16.6	203

Lunenburg County Full Maturity Corn Hybrid Demonstration Plot

Cooperators: **Producer:** David Moore
Extension: Taylor Clarke, VCE Mecklenburg
Lindy Fimon, VCE Lunenburg

Previous Crop: Soybeans
Tillage: No-Till
Planting Date: May 2, 2018
Planting Equipment: 1780 JD, vacuum planter 6 row
Seeding Rate: 29,000
Row Spacing: 30"
Fertilizer: **Preplant:** Nitrogen 35 lb
Planting:
Sidedress: Nitrogen 180 lb
Crop Protection: **Burndown:** RoundUp + Bicep w/Nitrogen
Planting:
Post-Emergence: Nitrogen w/ Atrazine and Roundup
Harvest Date: November 1, 2018
Harvest Equipment: Gleaner R-52

Hybrid	Maturity (Days)	% Moisture	Yield (bu./A @15.5%)
Augusta 1165	115	16.3	196.4
Syngenta NK1573-3110	115	16	177.2
DynaGro 55VC45	115	15.7	192.3
Dekalb C67-44 RIB	117	15.5	227.9
Hubner 4890RC2P	117	15.8	214.5
Pioneer 1870 AM	118	16	182.4
Doeblers 5518 AM	115	15.8	181.5
Seed Consultants SCS1158 YHR™	115	15.8	189.8

Corn Emergence Evaluation 2016-2018
Watson Lawrence, Senior Extension Agent, ANR, Chesapeake
Roy Flanagan, Extension Agent, ANR, Virginia Beach

This evaluation analyzed how corn emergence in conventional planted corn field affected yield. Seedling vigor and days to maturity start when seeds are placed in soil capable of inducing germination. From there it is a foot race for plants to utilize available nutrients, sunlight, and moisture in a field that will be harvested collectively. This evaluation asked the question: Will seeds that germinate sooner yield more?

Three years of tests from 2016 to 2018 were conducted in Chesapeake with support from check-off funds provided by the Virginia Corn Board. Seven test plots were set up at separate farms. At each site, a forty foot section of row was flagged off immediately after planting. Those forty foot sections were checked each day between 11 a.m. and 1 p.m. for the next twelve days. Beginning on the first day of emergence (defined as coleoptile visible above the soil line) and each day thereafter, a colored flag was placed beside each seedling. A red flag for 1st day, a blue flag for 2nd day, and a yellow flag for seedlings on or after the 3rd day.

When corn reached maturity, ears were hand-harvested, segregated by color and shelled with an old-time crank style single ear sheller. Corn from all red flags, blue flags and yellow flags were counted and weighed. Average weights per ear were calculated for each grouping.

Day/Date of Emergence	# of Plants	% of Plants	Lbs. Shelled Corn Total	Average Wt. lbs. /Harvestable Ear
Day 1	209	45.0%	86.76	.4151
Day 2	126	27.2%	50.76	.4029
Day 3 and after	78	16.8%	30.62	.3926
Barren Plants (no ears produced)	2	4.1%	0	
TOTALS	464	100%	168.14	

At these separate farms using different production practices, varieties, equipment, soils and dates of planting, results showed corn seedlings emerging on day 1 had more weight per ear than corn emerging on day 2. Corn emerging on day 2 had more weight per ear than corn emerging after day 3. Visual observance also showed more ear uniformity and ear size for day 1 seedlings vs. subsequent seedlings.

Corn Emergence Evaluation 2016-2018

Day/Date of Emergence	Average Wt. lbs. /Harvestable Ear	Plant population Ears/acre	Lbs./acre	Bu/acre	Yield Advantage
Day 1	.4151	38,000	15,773.8	281.7	8.3 vs. Day 2
Day 2	.4029	38,000	15,310.2	273.4	7.0 vs. Day 3
Day 3	.3926	38,000	14,918.8	266.4	

Calculating yield advantage based on final plant population of 38,000 PPA showed **8.28 more bu/acre** for corn emerging on day 1 vs. day 2. A yield advantage of **15.27 bu/acre** for corn emerging on day 1 vs. day 3 and after. This was calculated by multiplying 38,000 ears times average wt/harvestable ear for each of the emergence dates.

Figure 1: Visual appearance in 2016 shows larger ears for day 1 corn (Red Flag) vs. day 2 (Blue Flag) vs. day 3 (Yellow Flag)



Figure 2: → Individual ears were counted, shelled, and weighed according to day of emergence.



Corn Emergence Evaluation 2016-2018



← **Figure 3:** In 2018 at Heath Cutrell site, soil temperatures were cool and wet. Germination was slow and spread out over a week. Result was 18 plants emerged on day 1 (red flags) and 30 plants emerged on day 2 (blue flags). After day 3, 31 plants emerged and were marked with yellow flags.



Figure 4: By contrast, in 2016 at Heath Cutrell → site, soil temperatures were warm and moist, prompting quick 100% germination by day 2. Note only red and blue flags. Day 1 shelled corn still weighed more than day 2 shelled corn.

Cooperating Farms

2016	Row Spacing	Plant Population	Variety
Frank Williams Farm Chesapeake, VA	20 Inches	30,000 plants/acre	Pioneer P1197
Heath Cutrell Farm Chesapeake, VA	30 Inches	38,000 plants/acre	Dekalb 62-08
2017			
Frank Williams Farm	20 Inches	30,000 plants/acre	Pioneer P0604
Heath Cutrell Farm	30 Inches	38,000 plants/acre	Dekalb 62-08
2018			
Frank Williams Farm	20 Inches	35,000 plants/acre	Pioneer P1197
Heath Cutrell Farm	30 Inches	38,000 plants/acre	Dekalb 62-08
Marc McPherson Farm Chesapeake, VA	15 Inches	38,500 plants/acre	Dekalb 62-08

2018 Corn Following Legume Cover Crop

Cooperators: **Producer:** Keith Balderson
Extension: Robbie Longest, VCE-Essex County and Stephanie Romelczyk, VCE-Westmoreland County
Other: Danny Withers, NN SWCD & 3 Rivers SWCD
Soil Type: Suffolk sandy loam
Hybrid: Augusta 5658
Tillage: Continuous no-till
Previous Crop: Hairy Vetch or Crimson Clover cover crop
Planting Date: April 23, 2018
Fertilizer: 25-60-45-12(S) lbs. per acre applied to the cover crops in late March
 Broadcast 90-0-0-20(S) on April 23, 2018
Crop Protection: Burndown: 1.5 quarts per acre Gramoxone
 Pre-emergence: 2.75 quarts per acre of Accuron, 1 quart per acre Simazine, 1 quart per acre Atrazine, 2 ounces per acre Tombstone
Harvest Date: September 20, 2018
Harvest Equipment: John Deere 7720

Treatment	Rep.	% Moisture	Yield (bu./ac. @15.5%)	NUE lbs. N/ bu.
Hairy Vetch Cover Crop	1	19.8	149	1.268
Crimson Clover Cover Crop	1	20.7	146	1.178
Hairy Vetch Cover Crop	2	20.3	156	1.212
Crimson Clover Cover Crop	2	20.1	151	1.139
Hairy Vetch Cover Crop	3	20.4	172	1.099
Crimson Clover Cover Crop	3	20.6	140	1.229
Ave. Hairy Vetch Cover Crop		20.2	159	1.189
Ave. Crimson Clover Cover Crop		20.5	145.7	1.181

Discussion:

The purpose of this plot was to evaluate the performance of corn following crimson clover and hairy vetch cover crops. Cover crops were planted on October 6, 2017 and terminated on April 23, 2018. Biomass samples were taken on April 22. Results and estimated nitrogen release estimates are reported in Table 1.

2018 Corn Following Legume Cover Crop

Table 1: Biomass sampling results for each cover crop and their estimated nitrogen release.

Date Sampled/Planting Date	Crop	Biomass (lbs. per acre)	Nitrogen Release (lbs./ac.)*
April 22, 2018/October 6, 2017	Hairy Vetch	5663	99
April 22, 2018/October 6, 2017	Crimson Clover	4704	82

*Nitrogen Release estimates were calculated by using 3.5% N content of biomass accumulation and a 50% nitrogen release rate.

Rainfall was excessive for most of the season except for a 4 week dry period in late June to mid-July. Yields were good, but sandier parts of the field showed some drought stress and nitrogen deficiency. Research indicates that nitrogen from legume cover crops converts to the nitrate form fairly quickly, and leaching losses were probably fairly high given the heavy rains, especially on the sandier parts of the field. Sidedressing some nitrogen when utilizing legume cover crops is a good nutrient management practice. In addition, this plot was planted green into the standing cover crops (Figure 1). Stands were acceptable, but averaged about 22,000 plants per acre after being planted at 26,000 plants per acre. Corn following the hairy vetch cover crop yielded higher than the corn following the crimson clover cover crop. This is consistent with some of our past findings.



Figure 1. Planting corn into green hairy vetch cover crop on April 23, 2018

2018 Nitrogen Fertilization of Corn Following Hairy Vetch Cover Crop Demonstration Plot

Cooperators: **Producer:** B and H Farms
Extension: Robbie Longest, VCE-Essex County
Other: Danny Withers, NN SWCD & 3 Rivers SWCD, Keith Balderson, NRCS

Soil Type: State fine sandy loam
Hybrid: Pioneer 1442
Tillage: No-till
Previous Crop: Hairy Vetch Cover Crop
Planting Date: May 1, 2018
Fertilizer: Broadcast: 20-50-80-5(S) per acre
 Burndown: 60 lbs. N per acre
 Sidedress: See discussion

Harvest Date: October 10, 2018
Harvest Equipment: John Deere 3300 w/ 3 row header

Treatment	% Moisture	Yield (bu./ac. @ 15.5%)
No Sidedress N	16.4	171
50 lbs. per acre N & 6 lbs. per acre S Sidedress	16.1	171
100 lbs. per acre N & 12 lbs. per acre S Sidedress	16.2	173
Fallow (No hairy vetch cover crop and 100 lbs. per acre N and 12 lbs. per acre S sidedress with Pioneer 1197)	16.4	171

Discussion:

The purpose of this demonstration plot was to evaluate sidedress nitrogen rates on corn following a hairy vetch cover crop. An excellent stand of hairy vetch was obtained. Prior to termination, bio-mass samples were taken and the plant available nitrogen (PAN) was estimated to be just over 100 pounds per acre. At sidedress time, 2 strips were sidedressed: one with 100 pounds of nitrogen per acre and 12 pounds of sulfur per acre, and the other strip with 50 pounds of nitrogen per acre and 6 pounds of sulfur per acre. Corn was stressed in late June and early July by heat and a lack of rainfall. There was no difference in the yield of the treatments. Hairy vetch cover crops can provide significant plant available nitrogen (PAN) for subsequent crops.

2018 Corn Following Legume Cover Crop Nitrogen Plot

Cooperators: **Producer:** Keith Balderson
Extension: Robbie Longest, VCE-Essex County and Stephanie Romelczyk, VCE-Westmoreland County
Soil Type: Kempsville loam, Montross silt loam
Hybrid: Axis 60K23
Tillage: Continuous no-till
Previous Crop: Hairy Vetch cover crop
Planting Date: May 1, 2018
Fertilizer: 25-60-45-12(S) lbs. per acre applied to the cover crop in late March
 Broadcast 90-0-0-20(S) on April 23, 2018.
 In test strips - 30 lbs. of N per acre applied early June
Crop Protection: Burndown: 1.5 quarts per acre Gramoxone,
 Pre-emergence: 2.75 quarts per acre of Accuron, 1 quart per acre Simazine, 1 quart per acre Atrazine, 2 ounces per acre Tombstone
Harvest Date: October 2, 2018
Harvest Equipment: John Deere 7720

Treatment	Rep.	% Moisture	Yield (bu./ac. @15.5%)	NUE, lbs. N/ bu.
Check	1	19.6	174	.920
30 lbs. nitrogen/acre	1	18.9	178	1.067
Check	2	18.6	165	.970
30 lbs. nitrogen/acre	2	19.5	171	1.111
Check	3	18.6	153	1.046
30 lbs. nitrogen/acre	3	17.5	153	1.242
Ave. Check		18.9	164	.976
Ave. 30 lbs. nitrogen/acre		18.6	167	1.138

Discussion:

The purpose of this plot was to evaluate an additional nitrogen fertilizer application to corn following a hairy vetch cover crop. Hairy vetch cover crop was planted on October 15, 2017 and terminated on April 23, 2018. From a visual observation, it was estimated that about 70 lbs. of nitrogen would be available to the corn crop from the hairy vetch cover crop. An additional 90 lbs. of nitrogen per acre was applied to the entire plot on April 23. 30 lbs. of nitrogen in the form of urea was applied to 3 strips in early June, just prior to a rainfall. Rainfall was excessive for most of the season except for a dry period from late June to mid-July. The additional nitrogen tended to increase corn yield, but the increase would not be enough to cover the additional nitrogen fertilizer and application expense.

2018 Legume Cover Crop Biomass and Plant Available Nitrogen (PAN) Estimates

During 2018, as employees of the Northern Neck Soil and Water Conservation District, Danny Withers and Keith Balderson worked with several growers experimenting with legume cover crops on their farms. Some locations were plots with both hairy vetch and crimson clover, while other locations were hairy vetch only. As part of this work, bio-mass samples were taken by cutting all plant material from three 1 square foot samples in each location. Samples were air-dried for several days until the samples were crispy and bio-mass was calculated on a per acre dry matter basis. Plant available nitrogen (PAN), defined as nitrogen available to the spring planted crop, was calculated by using 3.5% nitrogen content of biomass and assuming 50% of the nitrogen is available to the spring planted crop. Bio-mass and plant available nitrogen results are reported in the following table.

Location	Planting Date	Sampling Date	Crop	Biomass (lbs. per acre)	Plant Available N (lbs./A)*
1	10/6/2017	4/22/2018	Hairy Vetch	5563	99
1	10/6/2017	4/22/2018	Crimson Clover	4704	82
2	Early Oct. 2017	4/26/2018	Hairy Vetch	6534	114
3	Early Oct. 2017	4/26/2018	Hairy Vetch	7279	127
4	Early Oct. 2017	4/26/2018	Hairy Vetch	6795	119
5	10/17/2017	5/2/2018	Hairy Vetch	2688	47
5	10/17/2017	5/2/2018	Crimson Clover	2783	49
6	10/19/2017	3/27/2018	Hairy Vetch	480	9
6	10/19/2017	5/2/2018	Hairy Vetch	6186	108
7	10/27/2017	4/26/2018	Hairy Vetch	817	14
7	10/27/2017	4/26/2018	Crimson Clover	432	8

Legume cover crops have the potential to produce high levels of bio-mass and as a result significant plant available nitrogen for the crop following the cover crop. In the coastal plain of Virginia, producers should strive to get crimson clover planted by September 30 and hairy vetch planted by October 15 and be willing to delay termination of both species until late April or early May to maximize bio-mass and PAN. Location 6 was sampled twice and the results illustrate the importance of delaying termination until late April or early May. Bio-mass accumulation increased from 480 pounds per acre on March 27 to 6,186 pounds on May 2, while PAN increased from 9 pounds per acre to 108 pounds per acre.

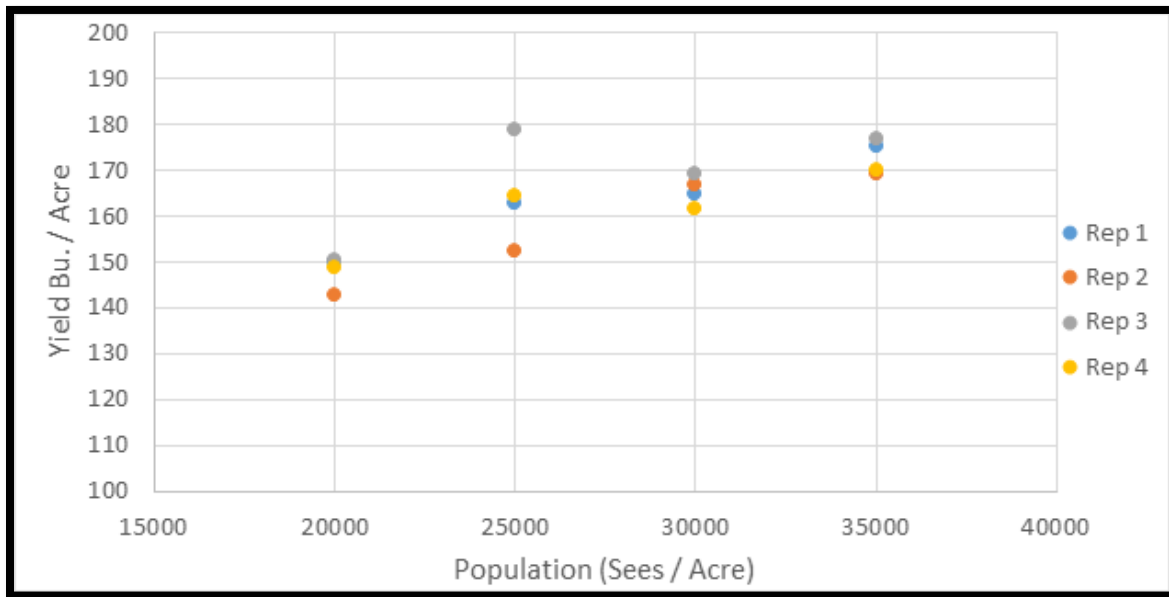
Corn Plant Population Demonstration Plot

Cooperators: **Producer:** Harris Farms

Extension: Trent Jones – VCE Northumberland County
Caroline Campbell – VCE Intern

In this demonstration plot, a flex ear corn hybrid was planted at varying populations in order to determine the effect that planting population has on crop yield. Replications were planted on May 3 at 20,000, 25,000, 30,000 and 35,000 plants per acre with each population replicated four times. At harvest on October 1, each replication was picked individually and weighed in order to determine crop yield. Additionally, photos were taken the day of harvest in order to display the difference in ear size at the varying planting populations.

Population (Seed / Acre)	Yield (Rep 1)	Yield (Rep 2)	Yield (Rep 3)	Yield (Rep 4)	Average Yield (Bu. / A)
20000	149.85	142.62	150.35	148.81	148
25000	162.86	152.36	178.94	164.52	165
30000	165.02	167.04	169.37	161.61	166
35000	175.48	169.13	177.07	169.94	173



Corn Plant Population Demonstration Plot



Discussion: Seen above, as plant population increased ear length shortened due to intercompetition between plants for available resources. It is apparent that there is a positive linear relationship between planting population and the yield returned. At 20,000 plants per acre, the average yield harvested was 148 bu/a and at 35,000 seeds per acre the average yield returned was 173 bu/a, allowing a 25 bushel difference between the highest and lowest planting densities. When making plant population decisions, producers should use this data as a tool. Producers should also take into account seed costs, expected market return, and additional input costs at higher populations in order to arrive at their individual primary seeding rate. Additionally, the corn hybrid itself should be considered, as flex ear corn hybrids perform differently than fixed ear hybrids.

