

Performance of Sorghum Hybrids in the Virginia-Carolina Region

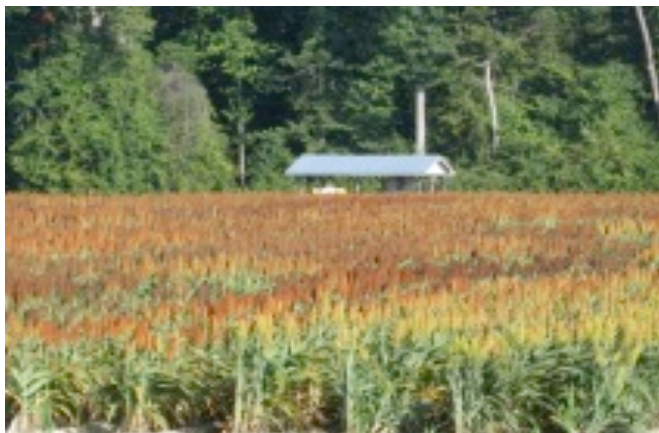


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in the
Virginia-Carolina Region**

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Pam Copeland, left, and Frank Bryant, right.



Mike Ellis (left), Dough Redd (center), and Ed Seymore (right)



Mike Ellis and Doug Redd

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Performance of Sorghum Hybrids in the Virginia-Carolina Region

Cultural Practices and Weather Conditions in 2009

Table 1. Cultural practices used in Sorghum Test, at TAREC (Suffolk), VA, in 2009.

Planting Date	May 20						
Harvest Date	September 30						
Soil Type	Emporia & Nansemond						
Soil Test Results	pH	P	K	Ca	Mg	Zn	Mn
		(lb/A)	(lb/A)	(lb/A)		(ppm)	
	6.82	70	61	328	64	0.7	3.1
Cultivation	6/18						
WEED MANAGEMENT			PEST CONTROL				
Date	Product	Rate/Ac	Date	Product	Rate/A		
					c		
4/17	Starfire	1 qt	5/20	Temik	7 lbs		
5/21	Dual	1.25 pts	7/15	Intrepid	4 oz		
6/4	Attrex	1 qt	7/15	Baythroid	2 oz		
			8/19	Baythroid	3 oz		

Table 2. Temperature of air and soil at 4 inches depth, light (photosynthetic active radiation – PAR), air relative humidity (RH), and precipitation at Tidewater AREC, Suffolk VA, in 2009.

Month	AVG Tair	Max Tair	Min Tair	AVG Tsoil	AVG PAR¹	Max PAR	RH	Rain
	°F				μmol m⁻² s⁻¹		%	inch
May	71	80	64	69	574	2188	78	1.77
June	80	90	73	75	575	2248	78	3.38
July	81	91	73	76	587	2172	77	6.02
August	83	92	75	78	500	2062	85	5.86
September	73	81	66	69	394	1733	86	5.54
October	69	79	62	67	268	1267	74	0.16
Mean	76	86	69	72	483	1945	80	22.73

¹ Light is important for peanut growth and development. On a fully sunny day, maximum PAR approaches 2500 μmol m⁻² s⁻¹ and average PAR (average from sunrise to sunset) is

approximately $600\mu\text{mol m}^{-2} \text{ s}^{-1}$. If these numbers are less, it denotes cloudy days, on which plants grow less.

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Results in 2009

Table 3. Effect of hybrid on grain yield at TAREC (Suffolk), VA in 2009.

<u>Company</u>	<u>Hybrid</u>	<u>Yield (Lb/acre)</u>
TAMU	Tx399 x Tx430	4223.9 a ¹
Monsanto	A 571	4170.2 a
Pioneer	P 84G62	4155.6 a
Monsanto	DKS 53-67	3783.6 ab
Pioneer	P 83G66	3611.2 ab
Pioneer	P 85G46	3591.2 ab
Monsanto	DKS 52	3348.5 ab
Pioneer	P 8925	3229.4 ab
TAMU	Tx642 x Tx439	3071.7 ab
Monsanto	DKS 44-20	2746.6 b
Mean		3593.2

¹ Means followed by the same letter are not statistically different based on Tukey's HSD test (P = 0.05)

Table 4. Effect of hybrid on stand count at TAREC (Suffolk), VA in 2009.

<u>Company</u>	<u>Hybrid</u>	<u>No. plants/ foot row</u>
Monsanto	DKS 53-67	6.3 cd ¹
Monsanto	DKS 44-20	5.5 d
Monsanto	DKS 52	9.8 a-d
Monsanto	A 571	6.5 cd
Pioneer	P 84G62	10.3 a-d
Pioneer	P 8925	7.8 b-d
Pioneer	P 85G46	11.5 ab
Pioneer	P 83G66	10.8 a-c
TAMU	Tx399 x Tx430	14.0 a
TAMU	Tx642 x Tx439	12.5 ab
Mean		9.5

¹ Means followed by the same letter are not statistically different based on Tukey's HSD test (P = 0.05)

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Cultural Practices in 2010

Table 5. Cultural practices used in Sorghum Tests in 2010.

Activity	Product	Suffolk, VA	Southampton, VA	Martin, NC	Painter, VA	Orange, VA
<i>Planting Date</i>		May 20	May 26	June 6	May 25	May 10
<i>Harvest Date</i>		Sep.30	Oct. 6	Oct. 11	Sep. 30	Oct. 8
<i>Soil Type</i>		Emporia & Uchee	Emporia fine sandy loam	Norfolk loamy fine sand	Bojack sandy loam	Star silty clay loam
<i>Irrigation</i>		6/24, 7/8, 7/21 (total 3 inches)	6/28, 7/19 (total 4 inches)	None	None	None
<i>Weed Management</i>	Gramoxone	1 pt/A				
	Roundup (WM)	22 oz/A				
	Attrex 4L	1 qt/A	1 qt/A	1 qt/A		
	Intro	2 qts/A	2 qts/A	2 qts/A		
	Dual				1 pt/A	1 pt/A
	Atrazine 4L				1 qt/A	1.6 qt/A
<i>Pest Control</i>	Baythroid	2 oz/A & 3 oz/A	3 oz/A (7/1 & 8/14)	3 oz/A (7/2 & 7/15)		
	Steward	5 oz/A				
	Lannate SP	0.5 lb/A (8/11 & 8/31)		0.5 lb/A		
<i>Disease Control</i>						
<i>Nutrient Management</i>	Broadcast (10-20-20)			400 lbs/A		
	Urea N (30% UAN)		60 units/A (5/27 & 6/1)	60 units/A (6/2 & 7/2)		
					100 lbs/A	
	N-P-K					100-120-80 lbs/A

Performance of Sorghum Hybrids in the Virginia-Carolina Region

Weather Conditions in 2010

Table 6. Weather information and irrigation in 2010 by location.

Location	Month	Max Tair (°F)	Min Tair (°F)	Rain (inch)	Irrigation (inch)
Suffolk, VA	April	76	47	1.26	
	May	83	59	6.57	
	June	93	70	1.53	2
	July	96	69	1.85	2
	August	92	69	5.60	
	September	88	60	17.14	
	October	76	50	1.91	
	Southampton, VA	April	78	47	0.99
May		83	59	3.32	
June		93	69	0.83	3
July		95	69	3.22	
August		92	69	3.18	
September		90	60	12.00	
October		75	48	1.22	
Martin, NC		April	76	50	2.20
	May	81	60	4.42	
	June	91	71	1.90	
	July	91	70	2.56	
	August	90	70	4.80	
	September	86	62	14.17	
	October	75	52	7.81	
	Orange, VA	April	73	46	1.61
May		77	57	3.07	
June		88	66	2.45	
July		91	68	1.45	
August		87	68	2.59	
September		85	59	0.12	
October		73	50	0	
Painter, VA		April	72	49	0.85
	May	80	59	2.94	
	June	90	71	1.68	
	July	92	72	1.33	
	August	88	70	4.62	
	September	84	64	4.00	

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Results in 2010

Table 7. Effect of hybrid on grain yield at TAREC (Suffolk), VA, in 2010.

Company	Hybrid	Yield (Lb/acre)
Monsanto	DKS 49-45	6286 a ¹
Monsanto	DKS 54-03	6275 a
Monsanto	DKS 54-00	6220 ab
Monsanto	DKS 44-20	6166 ab
Advanta	21222	6066 a-c
Monsanto	DKS 53-67	5859 a-d
Advanta	99547	5789 a-d
Pioneer	84G62	5569 a-e
Advanta	28219	5382 a-e
Nebraska State Univ.	NK 6638/09008	5315 a-e
Monsanto	DKS 52	4682 a-e
Advanta	26056	4318 a-e
TAMU	TX 399/430	4123 a-e
Kansas State Univ.	KS 735/99030	4116 a-e
Pioneer	85G46	3882 b-e
Pioneer	83G66	3782 c-e
Monsanto	DKS 36-06	3558 de
Monsanto	DKS 37-07	3286 e
Mean		5037

¹ Means followed by the same letter are not statistically different based on Tukey's HSD test (P = 0.05)

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Results in 2010

Table 8. Effect of hybrid on grain yield at Southampton County, VA, in 2010.

Company	Hybrid	Yield (Lb/acre)
Nebraska State Univ.	NK 6638/09008	5001 a ¹
Monsanto	DKS 53-67	4411 ab
Monsanto	DKS 44-20	4333 ab
Monsanto	DKS 52	4179 ab
Kansas State Univ.	KS 735/99030	4064 ab
Monsanto	DKS 37-07	4019 ab
Pioneer	85G46	3889 ab
Monsanto	DKS 49-45	3824 ab
Advanta	21222	3454 ab
Pioneer	84G62	3356 ab
Monsanto	DKS 54-03	3341 ab
Advanta	26056	3324 ab
Pioneer	83G66	3172 ab
TAMU	TX 399/430	3088 ab
Monsanto	DKS 36-06	2993 ab
Monsanto	DKS 54-00	2927 b
Advanta	28219	2767 b
Advanta	99547	2553 b
Mean		3594

¹ Means followed by the same letter are not statistically different based on Tukey's HSD test (P = 0.05)

Results in 2010

Table 9. Effect of hybrid on grain yield at Martin County, NC, in 2010.

Company	Hybrid	Yield (Lb/acre)
Monsanto	DKS 54-00	3669 a ¹
Monsanto	DKS 53-67	2951 ab
Advanta	99547	2591 a-c
Monsanto	DKS 49-45	2581 a-c
Monsanto	DKS 54-03	2560 a-c
TAMU	TX 399/430	2161 a-c
Pioneer	85G46	2124 a-c
Nebraska State Univ.	NK 6638/09008	2058 a-c
Monsanto	DKS 52	1972 a-c
Kansas State Univ.	KS 735/99030	1811 a-c
Advanta	21222	1747 a-c
Advanta	28219	1596 bc
Pioneer	83G66	1572 bc
Advanta	26056	1523 bc
Monsanto	DKS 44-20	1486 bc
Monsanto	DKS 37-07	1415 bc
Pioneer	84G62	1314 bc
Monsanto	DKS 36-06	909 c
Mean		2002

¹ Means followed by the same letter are not statistically different based on Tukey's HSD test (P = 0.05)

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Results in 2010

Table 10. Effect of hybrid on grain yield at Painter, VA, in 2010.

Company	Hybrid	Yield (Lb/acre)
Monsanto	DKS 53-67	3143 a ¹
Pioneer	84G62	3011 a
Advanta	21222	2711 a
Monsanto	DKS 54-00	2510 a
TAMU	TX 399/430	2232 a
Monsanto	DKS 49-45	2055 a
Advanta	26056	2049 a
Monsanto	DKS 54-03	2039 a
Monsanto	DKS 44-20	1912 a
Monsanto	DKS 37-07	1905 a
Advanta	99547	1797 a
Nebraska State Univ.	NK 6638/09008	1737 a
Pioneer	83G66	1571 a
Kansas State Univ.	KS 735/99030	1509 a
Monsanto	DKS 36-06	1489 a
Advanta	28219	1135 a
Pioneer	85G46	1038 a
Monsanto	DKS 52	895 a
Mean		1933

¹ Means followed by the same letter are not statistically different based on Tukey's HSD test (P = 0.05)

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Results in 2010

Table 11. Effect of hybrid on grain yield at Orange, VA, in 2010.

<u>Company</u>	<u>Hybrid</u>	<u>Yield (Lb/acre)</u>
Monsanto	DKS 44-20	3770 a
Nebraska State Univ.	NK 6638/09008	3245 ab
Pioneer	85G46	3245 ab
Pioneer	84G62	3210 ab
Monsanto	DKS 54-03	3093 a-c
Pioneer	83G66	3083 a-c
Advanta	21222	3042 a-c
Advanta	26056	3015 a-c
Monsanto	DKS 36-06	2926 a-c
Monsanto	DKS 52	2917 a-c
Monsanto	DKS 37-07	2808 a-c
Monsanto	DKS 49-45	2793 a-c
Advanta	28219	2698 a-c
Monsanto	DKS 53-67	2552 a-c
Kansas State Univ.	KS 735/99030	2462 a-c
TAMU	TX 399/430	2459 a-c
Monsanto	DKS 54-00	2001 bc
Advanta	99547	1553 c
Mean		2843

¹ Means followed by the same letter are not statistically different based on Tukey's HSD test (P = 0.05)

Table 12. Effect of hybrid, location, and location × hybrid interaction on grain yield in 2010.

Source of Variable	Degree of Freedom	Sum of Square	Mean Square	F Value	Pr > F
Location	4	477334465.8	119333616.5	110.34	<.0001
Replication	3	33713319.7	11237773.2	10.39	<.0001
Hybrid	17	55705704.6	3276806.2	3.03	<.0001
Location x Hybrid	68	126306830.3	1857453.4	1.72	0.0014

Grain Sorghum Characteristics¹ Chart

MANAGEMENT			PLANT DESCRIPTION						GROWTH				HARVEST	DISEASES				
Company	Variety	Maturity Group ³	Total Plant Height (in.)	Panicle Type	Seeds per Pound (000)	Grain Color ²	Days to Flower – TX and SE	Days to Harvest – TX and SE	Seedling Vigor	Root Lodging	Pre-Flower Stress Tolerance	Post-Flower Stress Tolerance	Test Weight	Charcoal Rot Resistance	Downy Mildew Resistance	Head Smut Resistance	MDMV “A” Resistance	Greenbug Resistance
DEKALB	DKS36-06 Brand	Medium/Early	42-53	Semi-open	12-14	Bronze	61	104	3	4	2	4	2	5	4	3	4	
DEKALB	DKS37-07	Medium/Early	40-49	Semi-open	14-16	Bronze	62	105	3	3	3	2	2	4	4	3	4	
DEKALB	DKS44-20 Brand	Medium	42-52	Semi-open	14-15	Bronze	70	112	2	2	3	2	2	3	4	2	3	
DEKALB	DKS49-45 Brand	Medium	41-53	Semi-open	13-15	Bronze	71	114	3	2	3	4	2	4	5	2	3	
DEKALB	DKS53-67 Brand	Medium/Full	41-51	Semi-compact	14-16	Bronze	72	114	3	3	4	2	1	2	4	5	3	
DEKALB	DKS54-00	Medium/Full	42-54	Semi-compact	15-16	Bronze	72	116	2	3	3	4	3	5	7	2	3	
DEKALB	DKS54-03 Brand	Medium/Full	42-53	Semi-open	13-15	Bronze	72	116	3	3	4	3	4	4	1	1	2	
DEKALB	DKS52	No longer sold in this area																
ASGROW	A571	No longer sold in this area																
Advanta	28219	Medium/Late	48-52	Semi-compact	13-16	Red	72		2	3	3	3	2	3	4	3	2	C
Advanta	26056	Medium	42-48	Semi-open	12-14	Red	66		3	2	3	3	3	2	5	3	3	C
Advanta	21222	Medium	48-52	Semi-open	14-16	Bronze	68		3	6	2	2	2	2	7	8	4	C&E
Advanta	99547	Full Season	46-50	Semi-open	12-14	Bronze	73		3	4	3	5	3	4	3	4	2	none

Rating Scale: 1-2 = Excellent
 3-4 = Very Good
 5-6 = Good
 7-8 = Fair
 9 = Poor

Greenbug Resistance: C = Biotype “C”; E = Biotype “E”; I = Biotype “I”

MDMV = Maize Dwarf Mosaic Virus

The ratings are approximate and should not be considered as absolute.

Notes:

- ¹ Ratings are based upon a number of years testing in numerous locations by the companies. Adverse environmental conditions and planting dates may alter a hybrids performance, maturity, and resistance to certain diseases and insects.
- ² Plant pigmentation is the color exhibited by plants when damaged diseases, insects or chemicals. There are three primary colors: purple, red and tan. Food-type sorghum must have tan pigmentation.
- ³ Early maturity in central and south Texas.