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HYBRID SUDANGRASS PERFORMANCE TRIALS IN OKLAHOMA, 1991

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Each year, performance trials for hybrid sudangrasses are conducted in Oklahoma to provide producers with useful information in selecting hybrids for the next growing season. These trials are conducted in various locations throughout the state to indicate which hybrids are adaptable to general areas and growing conditions. These trials are conducted in fulfillment of Oklahoma State Department of Agriculture seed regulations, section 8-112.

To stay updated on current hybrids and new releases, producers should consult yield trials conducted by OSU, seed companies and other sources. Producers are encouraged to plant small areas of the hybrids they presume will perform well in their location to evaluate their performance under producer conditions.

Hybrid sudangrasses and pearl millets are listed in Table 1. This table includes the company, hybrid name, and type of hybrid cross.

Twenty nine sudangrass hybrids and five pearl millets were tested at four locations (Tables 2 to 6). The locations are; Eastern Research Station, Muskogee County; Perkins Research Station, Payne County; South Central Research Station, Grady County; Southwest Agronomy Research Station, Tillman County. A randomized complete block design was used at each location. At time of planting both soil and moisture conditions were good at all locations for germination and emergence.

Muskogee County experienced a dry period during the last part of the initial crop and the recurrent growth of the second crop lowering yields somewhat. Adequate rainfall was received for good 3rd harvest yields. Payne County had adequate rainfall for the initial crop but not for recurrent growth of the second crop.

Only second cutting yields are reported for Grady County due to an error that compromised the accuracy of the first cutting yields. Good rainfall distribution at this location resulted in good second harvest yields. A higher C.V. is indicated for this location due to the fact that only the second cutting was analyzed and the regrowth variation that is encountered among hybrids during secondary growth. Tillman County had good rainfall distribution and optimum conditions for good yields. All locations were fertilized in acoordance with OSU soil test recommendations. Each location was cut prior to seed head exertion and top dressed to provide adequate nitrogen for secondary growth.

A tractor-powered cone planter was used to plant all tests. A seeding rate of approximately 413,000 seeds per acre (25 lbs/A) was used. Recommendations on seeding rates will vary with company and hybrid. To calculate the pure live seed rate desired, use the following equation: Recommended pure live seed per acre ÷ germination % = lbs of seed to plant. Plots were harvested with a Carter Forage harvester and the reported yields are based on 16% moisture to resemble normal hay production.

Small differences should not be overemphasized since these can be due to variations in soils, climate and uncontrollable experimental error (Table 2 to 5). Least significant differences (L.S.D.) are shown at the bottom of each table. Unless two entries differ by at least the L.S.D. shown, little confidence can be placed in one entry being superior to another. If differences between two entries exceed the L.S.D. (0.05) value given for that data, the chances are that approximately 95% of the time the apparent difference is real. The coefficient of variability is an estimate of the precision of the data, with the higher C.V. indicating greater variability. The C.V. and L.S.D. are directly related in that a higher C.V. will also generate a higher L.S.D.

Two year means have been provided in each table for the hybrids that have appeared in the test for two consecutive years. Producers interested in comparing consistency of hybrid yields over a 2 year period should review these mean yields. The yield levels may differ between years, but the relative rankings remain similar for most hybrids. Producers looking for hybrids with above average yield potential should consider the top 5 or 6 hybrids in a group.

All proteins contain nitrogen. One ton of forage testing 12.5% crude protein contains 40 lbs of nitrogen. Some nitrogen will be available from the soil but without the addition of nitrogen fertilizer, production will be limited to about 1.5 tons per acre for the year.

Fifty pounds of actual nitrogen per acre applied at planting time plus 50 lbs. of nitrogen topdressed after each cutting will allow near optimum forage production and reduce the risk of nitrate accumulations.

Sudan and sudan hybrids can vary a great deal in quality (protein and digestibility). Production and harvesting practices can control much of this variability.

Optimum yield and digestibility can be obtained by harvesting at the "boot" state of growth (just before the head appears). Digestibility drops rapidly as a forage plant starts to produce seed and only a small increase in tonnage occurs during that time.

Additional information can be found in OSU Extension Facts No. 2568, **Protein-Nitrogen Relationship in Forages** and at your local OSU County Extension Center.

Sudan and hybrid sudan grasses may contain potentially harmful levels of nitrate and prussic acid, while pearl millets may contain harmful levels of nitrate. Proper management of grazing, haying, and ensiling can reduce potential risks. Additional information on nitrate and prussic acid can be found in OSU Current Report No. 3272, **Nitrate and Prussic Acid Poisoning in Cattle** and at your local OSU County Extension Center. When a problem is suspected all three types of hay should be sampled and tested for nitrate. For information on where this analysis may be performed, contact your County Extension office.

Contributors

The following people have contributed to this report by gathering data or assisting in its final preparation: Rocky Thacker, Mike Goodson, Toby Kelly, Larry Bull, Jimmy Gaither, Alton Young, Lynn Halford, Rick Matheson, Burt Coffman, Jerry Walker, Tommy Pickard, Dwayne Miller, Don Hooper, Lawrence Hurt, William Rayburn, Randall Boldt, Jimmie Wheeler and Barbara Herring.

Table 1. Hybrid Sudangrass and Pearl Millet Performance Entries, 1991.

Company	Entry Designation	Type of Cross
Agripro Seeds	HY-PRO (PM)	PM
BWI Texarkana	JACKPOT	A
BWI Texarkana	TOPCUT	B
Cargill Hybrid Seeds	SS111C	A
Cargill Hybrid Seeds	SWEET SIOUX V	B
Cargill Hybrid Seeds	HS35	C
Coffey Seed Co.	SUGAR QUEEN II	B
Coffey Seed Co.	SUGAR GRAZE III	A
Dekalb Pfizer Genetics	DEKALB SUDAX SX-132	A
Garrison Seed Company	SUGAR DAN	A
Garrison Seed Company	S.G. GAINER	B
Garrison Seed Company	TRI-SWEET +	A
Garst Seed Co.	757 G	A
Garst Seed Co.	PEARL MILLET (PM)	PM
Garst Seed Co.	SUPERMILL (PM)	PM
Gayland Ward Seed	SUPER SUGAR	B
George Warner Seed Co. Inc.	W-8493	B
Hobart Seed Co.	EXPERIMENTAL 850	A
Hyperformer Seed Company	TASTEMAKER III	A
Hyperformer Seed Company	HSC M2D (PM)	PM
Hyperformer Seed Co.	HB91-M22 (PM)	PM
James Reneau Seed Co.	SUPERGRAZE II	A
Justin Seed Co.	ROYAL SWEET	A
Justin Seed Co.	ROYAL REDTOP	A
MBS Seed Inc.	HAYMAN I	A
MBS Seed Inc.	GOTCHA II	B
NC+ Hybrids	NC+ SWEETLEAF II	B
Richardson Seed Co.	XSSP II	B
Scott Seed Co.	PREFERRED STOCK	A
Sharp Brothers Seed Co.	GRAZEX	A
Sharp Brothers Seed Co.	GRAZEX II	A
Sunburst Seed Co.	SUNBURST SWEET	A
Taylor Evans Seed Co.	HAYGRAZER-S	A
Cal/West Seeds	MONARCH V (CHECK)	C

Hybrid Types: A) Sorghum-Sudangrass B) Sorgo-Sudangrass
C) Sudan-Sudan PM) Pearl Millet

Table 2. Muskogee County, Hybrid Sudangrass and Pearl Millet Forage Yields, Eastern Research Station, Haskell, Ok.

Entry Designation	Hybrid Type	Annual Total Yield 1990	Yield reported @ 16% moisture 1991	1st Cut 1991	2nd Cut 1991	3rd Cut 1991
		(*)	(Tons/A)			
GRAZEX II	Sorghum-	-	8.48	2.86	2.27	3.35
GRAZEX	Sudangrass	-	8.44	3.14	2.13	3.17
SS111C	Hybrids	5.79(6)	7.49	2.31	1.77	3.42
JACKPOT		-	7.07	2.64	1.53	2.90
SUGAR DAN		6.45(1)	7.07	2.27	1.81	2.99
757 G		-	7.05	2.68	1.49	2.88
SUGAR GRAZE III		-	6.96	2.68	1.62	2.66
EXPERIMENTAL 850		-	6.94	2.61	1.56	2.77
TASTEMAKER III		-	6.86	2.74	1.56	2.57
HAYGRAZER-S		-	6.85	2.46	1.74	2.65
PREFERRED STOCK		-	6.64	2.40	1.55	2.69
DEKALB SUDAX SX-132		-	6.41	2.23	1.17	3.01
TRI-SWEET +		-	6.29	2.57	1.29	2.43
HAYMAN I		-	6.27	2.15	1.43	2.70
ROYAL SWEET		-	5.92	2.31	1.25	2.36
SUPERGRAZE II		-	5.75	2.13	1.34	2.28
SUNBURST SWEET		-	5.69	1.95	1.06	2.68
ROYAL REDTOP		-	5.54	2.36	0.90	2.28
SWEET SIOUX V	Sorgo-	7.04(2)	7.68	2.83	1.69	3.17
S.G. GAINER	Sudangrass	4.68(9)	7.08	2.84	1.46	2.78
NC+ SWEETLEAF II	Hybrids	-	6.76	2.42	1.74	2.60
TOPCUT		-	6.62	2.49	1.53	2.61
W-8493		6.04(4)	6.24	2.15	1.36	2.73
SUPER SUGAR		-	6.19	2.75	1.51	1.93
XSSP II		-	6.09	2.26	1.11	2.72
GOTCHA II		-	5.25	1.83	0.96	2.46
SUGAR QUEEN II		-	5.23	1.94	0.96	2.33
HS35	Sudan-Sudan	-	4.84	2.02	1.24	1.58
MONARCH V (CHECK)	Hybrids	-	4.52	1.74	1.13	1.64
SUPERMILL (PM)	Pearl	-	5.79	3.21	1.02	1.56
HY-PRO (PM)	Millets	-	5.22	2.94	0.94	1.35
HB91-M22 (PM)		-	4.84	2.96	1.04	0.83
PEARL MILLET (PM)		-	4.34	3.17	0.65	0.52
HSC M20 (PM)		-	4.32	2.83	1.11	0.38
Overall Mean			6.3	2.5	1.4	2.4
L.S.D.(.05)			1.7	0.7	0.7	0.9
C.V.			19.5			

Soil Name: Taloka Silt Loam Row Width: 12 in.

Monthly Rainfall (in)

Jan.	Feb.	March	April	May	June	July	Aug	Sept.	Oct.
2.11	.54	1.26	2.10	2.48	5.72	.26	1.76	5.39	6.28

Fertilize: Preplant N: 50 lbs/A P: 80 lbs/A K: 80 lbs/A
Postharvest N: 50 lbs/A

Planted: 5-14-91 Harvest: 6-26, 8-9, 10-8-91

* Number in parenthesis indicates the rank position of the hybrid for that year and hybrid type.

Table 3. Payne County, Hybrid Sudangrass and Pearl Millet Forage Yields, Perkins Research Station, Perkins Ok.

Entry Designation	Hybrid Type	Yield reported as 16% moisture Annual Total Yield 1990	1991	1st Cut 1991	2nd Cut 1991
		(*)	(Tons/A)		
SUGAR DAN	Sorghum-		6.81	5.82	0.98
GRAZEX II	Sudangrass		6.59	5.38	1.22
ROYAL SWEET	Hybrids		6.18	5.22	0.96
SS111C			6.17	4.97	1.20
GRAZEX			6.16	5.19	0.98
EXPERIMENTAL 850			6.08	5.00	1.08
HAYMAN I			6.00	4.98	1.02
SUGAR GRAZE III			5.70	4.81	0.89
HAYGRAZER-S			5.56	4.73	0.84
DEKALB SUDAX SX-132			5.50	4.60	0.90
SUNBURST SWEET			5.45	4.70	0.74
JACKPOT			5.24	4.46	0.77
PREFERRED STOCK			5.20	4.31	0.89
TRI-SWEET +			5.13	4.27	0.86
TASTEMAKER III			5.10	4.20	0.90
757 G			4.85	3.83	1.02
ROYAL REDTOP			4.68	4.20	0.48
SUPERGRAZE II			4.64	3.81	0.83
NC+ SWEETLEAF II	Sorgo-		6.53	5.33	1.20
SWEET SIOUX V	Sudangrass		6.02	4.67	1.35
S.G. GAINER	Hybrids		5.96	4.93	1.03
SUGAR QUEEN II			5.83	4.66	1.17
SUPER SUGAR			5.74	4.87	0.88
TOPCUT			5.52	4.26	1.26
W-8493			5.47	4.53	0.94
XSSP II			4.75	3.79	0.96
GOTCHA II			4.60	3.62	0.97
HS35	Sudan-Sudan		5.13	4.30	0.84
MONARCH V (CHECK)	Hybrids		4.74	3.79	0.94
HB91-M22 (PM)	Pearl		5.06	4.48	0.58
HY-PRO (PM).	Millets		4.90	4.75	0.15
SUPERMILL (PM)			4.74	4.32	0.43
PEARL MILLET (PM)			4.64	4.49	0.14
HSC M20 (PM)			4.44	4.26	0.17
Overall Mean			5.4	4.6	0.9
L.S.D.(.05)			1.0	0.8	0.5
C.V.			12.6		

Soil Name: Teller Loam Row Width: 12 in.

Monthly Rainfall (in.)

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.
.81	.06	1.10	2.36	6.56	3.51	.97	.51	5.15	4.59

Fertilize: Preplant N: 50 lbs/A P: None K: None
Postharvest N: 50 lbs/A

Planted: 5-17-91 Harvest: 7-8, 10-1-91

* No sudangrass trial was planted at this location in 1990.

Table 4. Grady County, Hybrid Sudangrass and Pearl Millet Forage Yields, South Central Research Station, Chickasha, Ok.

Entry Designation	Hybrid Type	Yield reported @ 16% moisture Total Annual Yield 1990	1991
		(*)	(Tons/A)
DEKALB SUDAX SX-132	Sorghum-	-	5.17
EXPERIMENTAL 850	Sudangrass	-	5.17
ROYAL REDTOP	Hybrids	-	4.61
TASTEMAKER III		-	4.60
JACKPOT		-	4.58
SUGAR GRAZE III		-	4.55
GRAZEX II		-	4.30
SUNBURST SWEET		-	4.21
HAYMAN I		-	4.18
GRAZEX		-	4.06
SUPERGRAZE II		-	3.82
SS111C		12.13(3)	3.78
PREFERRED STOCK		-	3.77
ROYAL SWEET		-	3.60
SUGAR DAN		12.53(2)	3.47
HAYGRAZER-S		-	3.24
TRI-SWEET +		-	3.03
757 G		-	2.99
SWEET SIOUX V	Sorgo-	12.62(3)	4.88
W-8493	Sudangrass	11.64(2)	4.08
NC+ SWEETLEAF II	Hybrids	-	3.88
S.G. GAINER		9.83(9)	3.63
GOTCHA II		-	3.57
SUPER SUGAR		-	3.57
TOPCUT		-	3.20
XSSP II		-	3.04
SUGAR QUEEN II		-	2.65
MONARCH V (CHECK)	Sudan-Sudan	-	3.16
HS35	Hybrids	-	2.71
HB91-M22 (PM)	Pearl	-	1.62
SUPERMILL (PM)	Millets	-	1.05
HY-PRO (PM)		-	1.01
HSC M20 (PM)		-	0.88
PEARL MILLET (PM)		-	0.82
Overall Mean			3.4
L.S.D.(.05)			1.7
C.V.			35.5

Soil Type: Reinach Silt Loam Row Width: 12 (in.)

Monthly Rainfall(in.)

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.
1.49	.05	1.51	3.28	6.72	3.80	3.41	3.75	9.88	3.47

Fertilize: Preplant N: 50 lbs/A P: None K: None
Postharvest: 50 lbs/A

Planted: 5-28-91 Harvest: 10-4-91

* Numbers in parenthesis indicates the rank position of the hybrid for that year and hybrid type.

Table 5. Tillman County, Hybrid Sudangrass and Pearl Millet Forage Yields, Southwest Agronomy Research Station, Tipton Ok.

Entry Designation	Hybrid Type	Total Annual Yield 1990	Yield reported @ 16% moisture 1991	1st Cut 1991	2nd Cut 1991
		(*)	(Tons/A)		
GRAZEX	Sorghum-	-	12.00	7.24	4.76
ROYAL SWEET	Sudan	-	11.72	7.61	4.11
JACKPOT	Hybrids	-	10.97	6.07	4.90
SUGAR GRAZE III		-	10.87	6.35	4.52
PREFERRED STOCK		-	10.80	6.56	4.25
TRI-SWEET +		-	10.75	6.65	4.10
EXPERIMENTAL 850		-	10.66	6.29	4.37
HAYGRAZER-S		-	10.39	5.61	4.78
DEKALB SUDAX SX-132		-	10.17	5.71	4.47
TASTEMAKER III		-	9.99	5.02	4.97
SUGAR DAN		8.61(5)	9.97	6.02	3.96
757 G		-	9.95	5.52	4.43
HAYMAN I		-	9.75	5.28	4.47
ROYAL REDTOP		-	9.08	5.55	3.53
GRAZEX II		-	8.94	4.48	4.46
SUPERGRAZE II		-	8.73	4.99	3.74
SUNBURST SWEET		-	8.54	5.18	3.36
SS111C		6.52(9)	8.50	4.61	3.89
SWEET SIOUX V	Sorgo-	9.37(3)	10.95	6.93	4.02
W-8493	Sudangrass	9.70(1)	10.60	6.15	4.45
GOTCHA II	Hybrids	-	9.90	6.06	3.84
NC+ SWEETLEAF II		-	9.78	5.26	4.52
XSSP II		-	9.78	5.47	4.31
TOPCUT		-	9.61	5.23	4.38
S.G. GAINER		10.34(1)	9.43	5.52	3.91
SUPER SUGAR		-	9.39	6.41	2.98
SUGAR QUEEN II		-	7.67	4.65	3.02
MONARCH V (CHECK)	Sudan-Sudan	-	7.97	3.97	4.00
HS35	Hybrids	-	7.87	3.69	4.17
PEARL MILLET (PM)	Pearl	-	8.78	4.80	3.98
HB91-M22 (PM)	Millets	-	6.29	4.75	1.54
SUPERMILL (PM)		-	5.61	4.94	0.68
HSC M20 (PM)		-	5.15	4.47	0.68
HY-PRO (PM)		-	5.05	4.24	0.80
Overall Mean			9.3	5.5	3.8
L.S.D.(.05)			2.7	2.1	2.1
C.V.			20.9		

Soil Name: Tipton Silt Loam Row Width: 12-inches

Fertilize: Preplant N: 50 lbs/A P: None K: None
Postharvest N: 50 lbs/A

Planted: 5-29-91 Harvest: 8-1, 9-11-91

* Number in parenthesis indicates the rank position of the hybrid for that year and hybrid type. (S.G. GAINER was entered as a TYPE A CROSS in 1990)