SORGHUM PARTNERS®
A BRAND OF S&W SEED COMPANY

Sorghum Partners

SILAGE MANAGMENT

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FORAGE SORGHUM IS AN EXCELLENT SILAGE SOURCE AND IS PERFECTLY SUITED FOR THE SEMI-ARID ENVIRONMENTS OF THE HIGH PLAINS OF KANSAS, NEW MEXICO, OKLAHOMA, AND TEXAS. ITS DROUGHT AND HEAT TOLERANCE OFTEN RESULTS IN HIGH YIELDS WITH ONE-THIRD LESS IRRIGATION WATER THAN IS TYPICALLY REQUIRED FOR CORN.

SORGHUM PARTNERS® 1990

SORGHUM PARTNERS® NK300

SORGHUM PARTNERS HIGH-PERFORMING VERSATILE FORAGE SORGHUM LINE UP OFFERS GROWERS SUPERIOR YIELDS, OUTSTANDING QUALITY, AND SUPERB WATER-USE EFFICIENCY.

SORGHUM PARTNERS® SS405

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SILAGE SORGHUM TYPES

Dual Purpose Hybrids (Sorghum Partners NK300)

Dual purpose forage sorghums grow to between 5 and 7 feet tall depending on growing conditions and will produce a significant amount of grain (Table 1). Some very tall grain hybrids can double as dual- purpose hybrids (NK8416 and KS989). Lab analyses of silage from these hybrids will always result in high starch levels (-20%) because of the grain in the silage (Table 2), However, if not harvested correctly, this may be misleading when the silage is fed. In order for the animal to digest all of this starch, harvest must occur at the soft dough stage. As the grain matures (proceeds from hard dough to maturity), it becomes harder. At this point, the grain must be cracked or ground for the starch to be fully utilized by the animal. Because of this need for precise harvest management, dual purposehybrids fit well with smaller operations that harvest their own silage. It is probably not the best fit for large commercial operations that rely on custom harvesters., unless harvest can occur near soft-dough stage.

Table 1. Yield and forage quality data for three Sorghum Partners forage

Variable	Sorghum Partners NK 300	Sorghum Partners 55405	Sorghum Partners 1990
Harvest Moisture	62.1	65.2	70
Yield(T/a@65%)	22.3	26.2	25.9
Grain (lb/ acre)	7021.8	2633.5	0
Crude Protein (%it	9.76 ±0.54	8.01 ±0.31	9.54 ±1.36
ADF (%)t	24.96 ±0.06	34.63 ±1.52	33.16 ±3.61
NDF ('l.)[1]	39.50 ±1.13	54.43 ±2.5	54.54 ±0.62
TDN (%it	65.24 ±2.78	65.75 ±0.35	61.26 ±4.45
Starch ('l.t)	33.64 ±5.15	19.79 ±9.73	5.93 ±1.92
Crude Fat (%)[1]	2.25 ±0.15	2.08 ±0.52	0.84 ±0.05
Ash ('l.)[1]	6.68 ±0.76	7.1.3±0.41	8.65 ±0.37
NEL 0[1]	75.50 ±2.12	63.50 ±0.71	65.50 ±6.36

Source: Bushland Silage Trials (2002-2005)
t Chromatin internal data collected from different samples.

Table 2. Forage composition and yield parts for three Sorghum Partners

	NK300			55405			1990		
	Stalk	Leaves	Grain	Stalk	Leaves	Grain	Stalk	Leaves	Grain
C. Prot.[1]	6.3	10.63	13.06	4.9	9.64	14.83	8.14	10.25	NIA
ND	60.4	65.73	13.58	69.2	71.33	14.65	52..8	70.18	NIA
Starch[1]	3.85	1.37	65.75	3.6	0.87	59.56	7.93	1.55	NIA
C. Fatt	1.28	1.83	2.94	0.48	1.56	3.65	0.61	1.37	NIA
Ash[1]	12.5	14.42	1.75	8.43	12.75	3.36	8.4	10.88	NIA
NEL *	61	54.5	83.88	48.5	52	85.74	65.5	52.5	NIA

t units = (%); + units = Meal/cwt

Suero-Sorghums
(Sorghum Partners 55304, 55405, 55506)

Suero - Sorghum hybrids are forage sorghums that have high sugar content compared with other forages. These additional sugars make these hybrids great for ensiling because the free sugars convert to organic acids quickly during the ensiling process. These hybrids produce high levels of highly digestible forage and contain low levels of grain. Sorghum Partners offers three different maturities to fit in different environments.

Photoperiod Sensitive Hybrids (Sorghum Partners 1990)

Heading in photoperiod sensitive hybrids is delayed until the plant experiences approximately a 12 hour and 20 minute daylength in the fall. Because of this trait, they do not produce any grain, and are considered headless, and their silage is only comprised of leaves and stems. They are relatively low in starch based on wet chemistry (Table 1).

BMR Hybrids (Sorghum Partners SD1741 BMR)

Brown mid-rib (BMR) forage sorghum hybrids contain a gene that alters the production of lignin and improves digestibility (Table 3).

Table 3. Forage sorghum characteristics by type (2000-2004)

Characteristic		Non-BMR'	BMR	PS	SEM	Pvalue
Yield. tons DM/ac	Mean	0.s•	7.5b	107°	045	<0.001
	s.d	1.8	1.8	29		
CP.'fo□M	Mean	7.3'-	7_g,	6.0'	0.27	<0.001
	s.d.	1.2	1.0	0.9		
NDF,'%□M	Mean	46.6"	45.5°	64.4b	1.36	<0.001
	s.d.	6.1	4.9	4.8		
ADF,'fo□M	Mean	28.0"	27.0"	39.4b	0.94	<0.001
	s.d.	4.1	3.3	4.8		
IVTD,'I.DM	Mean	76.2°	80.:r'	68.5'	0.90	<0.001
	s.d.	4.3	2.3	26		

[1] Non-BMR, n = 154 entries; BMR, n = 99 entries: PS, n = 17 entries,

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PLANTING DATES

In general, the recommendation for planting sorghum is to wait until the soil temperature reaches 60°F. For the High Plains, the optimal window is likely to be the last week of May through the first week of June. Early planting may reduce stands slightly and result in slower growing seedlings during the first couple of weeks, but normal growth will occur when temperatures increase. Delaying planting will reduce yields in these environments as it reduces the number of days for growth.

PLANTING RATES

Higher seeding rates in forage sorghum are often recommended as this reduces stem size, increases digestibility, and reduces lodging. The optimal seeding rate under irrigation appears to be 100,000 seed/acre with very little benefit gained by increasing seeding rates above that level. If planted in dryland or rainfed fields, the recommended seeding rate is between 50- and 75,000seed/acre.

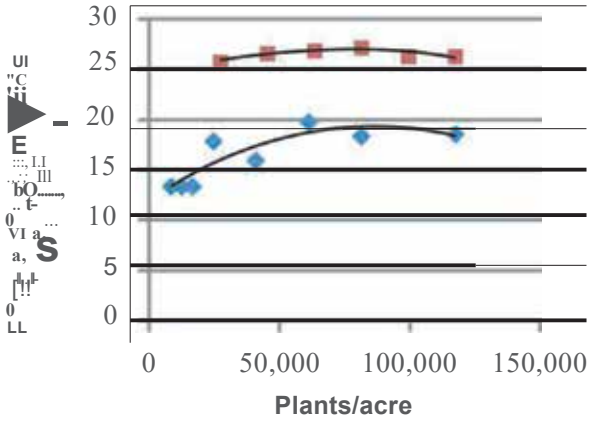

Figure 1. Diminishing yield returns are typical with seeding rates exceeding 100,000 plants/acre.

FERTILIZER RECOMMENDATIONS

Forage sorghum is a tremendous scavenger of nitrogen {N), so depending the previous crop, N fertilizer can be reduced 1Oto 15%. In general, the recommended rates are 6 to 8 lbs of N per wet ton of expected yield. In the High Plains, approximately 50 lbs of $P_20_{5/}$ acre should be added to fields that test low in soil P. This amount can be reduced to 30 lbs of $P_20_{5/}$ acre in medium testing soils and no applications are needed in soils that test high in P. Potassium (K) is not likely needed since most soils will test high or very high. If soil test K levels are medium or lower, it is recommended that 80 to 100 lbs K2D/acre be applied.

WEED CONTROL

Forage sorghum weed control can be accomplished by planting into a weed free field and applying a pre-emerge herbicide. Check with your consultant or local ag retailer for a list of currently available products. This combination will adequately control broadleaf and grassy weeds for the first six to eight weeks of the growing season. Because forage sorghum grows so fast and is quite competitive, post emerge applications are seldom needed and many times cannot be accomplished because of the height of the crop. Atrazine rates should be carefully managed on high pH soils to reduce carry over to sensitive crops in the following year. A range of post-emergence herbicides are labeled for silage sorghums. Follow label instructions for these chemicals and always take care to mitigate the potential for drift.

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WATER USE/IRRIGATION

Forage sorghum will produce yield similar to corn with approximately 1/3 less irrigation water on the High Plains (Table 3). There has been very little research conducted on irrigation timing and forage sorghum yield. Grain sorghum and corn have clearly defined critical growth stages where water stress causes yield reductions. In forage sorghum timing of irrigation water should not have as big an impact. Minimizing water stress during the early half of the growing season will improve root growth, stalk quality, and standability. Severe water stress late in the growing season has been known to cause lodging and subsequent harvest problems. It is possible to produce high yield and highly profitable forage sorghum yields with as little as 8 to 10 inches of irrigation water, depending on the growing season (Figure 2).

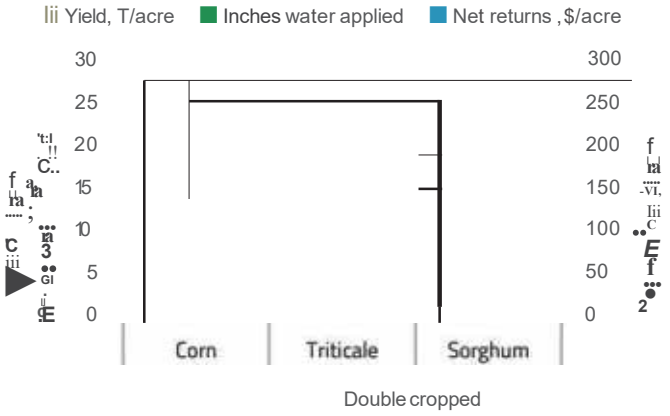

Figure 2. 2006 Results for Texas Alliance for Water Conservation Site :It:20 by yield, water applied, and net returns.

Table 4. Corn, forage sorghum, and BMR forage sorghum yields in NM during two growing seasons under deficit irrigation.

	200 5	2006	2-Year
Opti mum Harvest - - - -Wet Ton / acre - - - (60 -65 %Moisture)			
Corn	21.7	24.7	23.2
Forage Sorghum	27.4	26.4	26.9
BMR- FS	23	20	21.6
Late Harvest (50-60% Moisture)			
Corn	25.6	25.1	25.4
Forage Sorghum	24.5	25.5	25
BMR- FS	20.8	19.4	20.2
SEM	0.6	0.6	0.5

Irrigation: 18-20 inches or about 2/3 of full
Source: Marsalis et al., NMSU Bui. 799

HARVEST TIMING

For hybrids that contain a significant amount of grain (NK300), silage harvest should occur when the grain is in the soft dough stage. Other hybrids should be monitored for appropriate harvest moisture (Table 5).

Table 5. Forage sorghum harvested at three different maturity stages and the effect on DM and Nutritive Value (Bolson, 2004, SE Herd Mgmt. Conf. Proc.)

	Late Milk	Late Dough	Hard Dough
OM %	25.4	30	38
Dry Yield (Tia)	4.53	4.98	5.46
CP (o/.)	10.2	9.6	9.3
NDF	60.2	54.1	53.9
ADF (o/.)	33.7	31.2	31.6

SUMMARY

Forage sorghum hybrid selection should be based on operation size and final use. Hybrids with high grain yields must be harvested at the soft dough stage to optimize starch digestibility. Other hybrids, which are lower in starch can be harvested based on crop moisture content. Brown Mid-Rib (BMR) hybrids have higher digestibility then conventional hybrids, but yields should be evaluated carefully. Plant forage sorghum in mid to late May at 100,000 seed per acre under irrigation and 60,000 seed per acre if dryland. Apply fertilizer based on soil test recommendations and weed control can typically be achieved with a single pre-emerge herbicide application. Sorghum will produce similar yields as corn with about 1/3 less water than corn.

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