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TRY SOME "SUPER THICK" SORGHUM

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Large areas of exposed soil characterize sorghum fields planted in wide rows (24-40 inch). This soil is subject to wind and water erosion during the growing season and after harvest. Wide rows contribute to water loss by evaporation. The erosion potential is increased when grazing after harvest decreases residue.

Farmers, always aware of the need to conserve their soil, will soon need to follow more stringent legal requirements. Public Law 208 will be in full effect by 1985. Its principal goal is water quality, which is greatly affected by soil erosion.

So farmers, in the future as in the past, need to use the best soil management techniques known to conserve their soil—to maximize production and to meet legal requirements.

The new management technique discussed here should help sorghum producers achieve this goal. The new idea emphasizes soil conservation while maintaining or increasing yields.

NARROW ROWS

Past and present research has shown that narrow rows, in most cases, give better yields than wide (36- to 40-inch) rows. In this study with grain sorghum, we used a 12-inch hoe drill and planted every row. Yields from narrow rows were as good as or better than those from wider rows (Table 1). An additional advantage is using a grain drill for planting both wheat and grain sorghum. Although the 12-inch row spacing is too close to cultivate, use of herbicides along with the late planting and thick seeding kept weeds under control.

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Table 1. Yields of dryland sorghum grown in a wheat-sorghum-fallow rotation. Average of four sites and five hybrids per site. Planting ranged from June 16 to June 23, 1980.*

Row spacing, inches	Plant population	Yield, bu/A
12	25,000	60
12	75,000	69
36	25,000	51
36	75,000	59
Row spacing averages		
12		64
36		55
Plant population averages		
	25,000	56
	75,000	64

* Precipitation from planting to harvest ranged from 7.74 to 8.13 inches. Long time average is about 10.20 inches.

HIGH SEEDING RATE

On side-by-side plots or fields of wheat stubble and grain sorghum stalks, the sorghum area erodes more than the wheat area, primarily from the type and distribution of residue on the soil surface. Wheat stubble is superior to grain sorghum stalks in reducing soil loss because wheat more completely protects the soil surface.

To simulate wheat stubble density, we planted grain sorghum at 100,000 seeds per acre, hoping for a final stand of about 75,000 plants per acre.

Results with high seeding rates are presented in Tables 1 and 2. The high populations planted in mid- to late-June have, in most cases, yielded more grain than the lower populations. So such thick seeding not only provides more ground cover but usually produces more grain.

PLANTING DATE

Date and rate of planting studies have been conducted at various experimental sites for many years, but most of the studies used late May to early June planting at 20,000 to 40,000 plants per acre. We planted later (mid- to late-June) and included narrow rows and high plant populations. Table 2 shows the results.

Planting in mid- to late-June allows more time to store soil moisture for the sorghum crop, and provides an opportunity to kill one or more crops of weeds.

HYBRID MATURITY

The standard rule for choosing a grain sorghum hybrid is to pick one that will take advantage of the growing season and moisture available in your area. That is still true, but with a given hybrid delayed planting ef-

Table 2. Yields of continuous dryland grain sorghum as influenced by two planting dates and two plant populations. Hays Branch Experiment Station. Data are averages of two sites, 1974-1977 average.

Planting date	Plant population	Yield, bu/A
Mid-June	25,000	55
Mid-June	75,000	64
Late-June	25,000	49
Late-June	75,000	68
Planting date averages		
Mid-June (11-19)		59
Late-June (24-28)		59
Plant population averages		
	25,000	52
	75,000	66

fectively reduces its number of days to half-bloom (maturity index). The vegetative growth is shortened in the later plantings, which should mean that more soil moisture is available for grain development.

When grain sorghum hybrids are planted on a given date, days to half-bloom is the best way to measure differences in maturity. In this study where fallow was in the rotation, hybrids reaching half-bloom in 55 to 65 days yielded the most. In continuous sorghum, where soils tend to be drier, hybrids reaching half-bloom in less than 60 days yielded more than those reaching half-bloom later (Table 3).

Table 3. Effect of days to half-bloom on grain sorghum yields. Sorghum planted in 12-inch rows at 100,000 seeds per acre in mid- to late-June, 1977-1980.

Days to half-bloom	Number of hybrids	Yield, bu/A
Sorghum-fallow-wheat		
Less than 55	7	79
55-59	58	91
60-65	62	86
More than 65	55	73
Continuous sorghum		
Less than 55	15	53
55-59	52	57
60-65	121	48
More than 65	78	34

CONCLUSION

Grain sorghum management practices of conventional and the new "SUPER THICK" method are compared in Table 4. These procedures may be used as a guide until farmers gain experience and additional research information is obtained. Then farmers can adjust their procedures to fit cropping and rainfall areas that differ from the area where these data were collected. So a grower wanting to try the "SUPER THICK" practice should do so on a small acreage, then make the necessary adjustments before expanding to his entire sorghum acreage.

Tables 5 and 6 list the hybrids that have been tested each year for three years.

Planting Dryland Grain Sorghum with a Grain Drill at 75,000 Plants per Acre in Mid to Late June

Advantages

1. Can be planted with a conventional disc or hoe grain drill.
2. Seeding rates can be high (60,000 to 80,000 plants per acre) with little fear of "burning up" sorghum plants.
3. Better weed control
   a. Late planting provides an opportunity to kill more crops of weeds than an early planting.
   b. Thick seeding competes more aggressively with weeds than thinner seeding or wider rows.
4. Provides a denser canopy over the soil during the growing season and after harvest, which should:
   a. Shade the soil rapidly and thus reduce evaporation.
   b. Reduce the chance of soil erosion by wind or water.
   c. Reduce water runoff; increase water intake.
   d. Increase grazing potential with more leaf area and more palatable stalks.
5. Matures evenly because high seeding rate reduces tillering, so most sorghum plants are combine ripe earlier, particularly where thinner stands tiller.
6. Maintain or increase yields.

Disadvantages

1. Some hybrids under certain conditions will lodge; pickup attachments are not presently available for 12-inch rows.
2. Cultivation is not possible; although on most fields, particularly where herbicides are used, cultivation is not needed.
3. More seed is needed for planting, increasing production costs.
4. When reduced or no-till management systems are used, trash may interfere with planting. More tillage may be required or a drill with 3 ranks of rows may be necessary to get through the trash.

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Table 4. Two management procedures for grain sorghum production (central and west central Kansas; 20- to 26-inch rainfall area).

Management practice	Conventional method	"Super Thick" method	
		Sorghum-fallow-wheat	**Continuous sorghum**
Planting date	May 25 to June 10	June 10 to June 20	June 15 to June 25
Hybrid maturity	Reach half-bloom in 60 to 70 days	Reach half-bloom in 55 to 65 days	Reach half-bloom earlier than 60 days
Row spacing	20-inch to 36-inch	10-inch to 12-inch	10-inch to 12-inch
Plant population	20,000 to 30,000	60,000 to 80,000 plants per acre	60,000 to 80,000 plants per acre

Table 5. Performance of 29 grain sorghum hybrids in a sorghum-fallow-wheat rotation, planted in 12-inch rows with a hoe drill at 100,000 seeds per acre. Dates of planting were June 14, 1979; June 17, 1980; and June 19, 1981. Fort Hays Branch Experiment Station. 1979-1981 average.

Brand	Hybrid	Yield, bu/A[1]	Days to half-bloom	Lodging, %
ACCO	GR1018	89	65	2
Asgrow	Dorado E	91	60	2
Asgrow	Corral	86	66	5
DeKalb	A-28+	89	59	1
DeKalb	B-38+	91	61	2
DeKalb	B-39y+	97	63	1
DeKalb	C-46+	102	66	2
Funk's	G-499GBR	91	62	0
Golden Acres	T-E Y-44R	82	58	3
Golden Acres	T-E Y-45	90	63	2
Golden Harvest	H-410B	89	68	11
Growers	SG-10	89	59	2
Growers	SG-39DMR	105	67	3
Growers	GSA-1212	102	71	1
Growers	GSA-1290	97	69	1
Jacques	J404	90	67	2
McNair	3164	90	62	4
NC+	55X	92	58	2
NC+	160	92	62	5
NC+	168	94	65	1
Oro	Recio	81	61	1
Oro	G	92	65	3
P-A-G	4433	85	60	8
P-A-G	5514	95	66	3
Pioneer	8633	86	70	1
Pioneer	8626	86	62	1
Warner	W-545T	79	58	3
Warner	W-564T	83	64	5
Warner	W-655T	99	66	4

[1] Of standing plants only.

Table 6. Performance of 29 grain sorghum hybrids in continuous cropping, planted in 12-inch rows with a hoe drill at 100,000 seeds per acre. Dates of planting were June 26, 1979; June 23, 1980; and June 25, 1981. Fort Hays Branch Experiment Station. 1979-1981 average.

Brand	Hybrid	Yield, bu/A[1]	Days to half-bloom	Lodging, %
ACCO	GR1018	50	62	17
Asgrow	Dorado E	53	58	14
Asgrow	Corral	47	63	35
DeKalb	A-28+	49	58	21
DeKalb	B-38+	48	58	22
DeKalb	B-39y+	54	63	12
DeKalb	C-46+	65	62	8
Funk's	G-499GBR	56	60	7
Golden Acres	T-E Y-44R	45	54	22
Golden Acres	T-E Y-45	41	61	32
Golden Harvest	H-410B	41	64	34
Growers	SG-10	50	56	22
Growers	SG-39DMR	50	64	25
Growers	GSA-1212	50	67	22
Growers	GSA-1290	61	66	8
Jacques	J404	49	64	25
McNair	3164	60	58	19
NC+	55X	46	57	31
NC+	160	39	61	36
NC+	168	61	64	12
Oro	Recio	52	60	19
Oro	G	43	63	26
P-A-G	4433	46	58	26
P-A-G	5514	51	63	21
Pioneer	8633	50	66	14
Pioneer	8626	56	60	14
Warner	W-545T	41	54	29
Warner	W-564T	36	64	28
Warner	W-655T	35	64	40

[1] Of standing plants only.

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