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Chapter 10

FORAGE AND ANIMAL PRODUCTION PROGRAM FOR CENTRAL TEXAS

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The Central Texas area includes four major soil subdivisions: the Blackland Prairies, 13 million acres; the Grand Prairie, 7 million acres; the East and West Cross Timbers, 3 million acres; and the North Central Prairies, 6 million acres (Godfrey, Carter, and McKee 1967). The soils are mostly alkaline clays and clay loams except the sandy Cross Timbers area and part of the North Central Prairies where some soils are acid in reaction. Cultivated cropland and tame pastures of the North Central Prairies have forage production problems that are similar to those of the Grand and Blackland Prairies and are included in this chapter; rangeland forage production practices of the North Central Prairies are included in the chapter on West Texas.

Forage production practices for Central Texas, except for coarse textured acid soils, are similar but have varying soil moisture due to soil depth, slope, or differences in rainfall from East to West. The research for this area was conducted on the Blackland and Grand Prairies at Denton, McGregor, Temple, Renner, and Riesel but the results should be useful for most Central Texas.

HAY, SILAGE AND GREENCHOP

Sudangrass type sorghum x sudangrass hybrids are the most widely grown hay crops for Central Texas. Sweet Sudan and other open pollinated varieties are still grown by a few farmers who prefer the smaller stems of the varieties for quick field curing of hay but most farmers plant the hybrids because of the higher yields. The performance of sorghum x sudangrass hybrids with an open pollinated check variety, Sweet Sudan, was reported by Cook (1968) on work conducted at Temple during the 1964-67 period. The annual hay production for the twelve top yielding hybrids ranged from 9,000 to 11,000

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pounds per acre while the open pollinated variety, Sweet Sudan, averaged 6,072 pounds. Hay yields of open pollinated sudangrass varieties at Temple ranged from 5,120 to 6,950 pounds per acre (Cook and Parmer 1955).

Row spacing and planting rate research at McGregor indicated little difference in hay yields from row spacings of 10, 20, and 40 inches and planting rates of 16, 32, and 64 pounds of seed per acre with sorghum x sudangrass hybrids but the 10 inch row spacing and 32 and 64 pound seeding rates produced stalks that were 1/4 inch diameter or smaller and easier to cure for hay. The wider row spacing and 16 pound planting rate had some stalks that were larger than 1/4 inch. For hay production it was concluded that the crop should be drilled in rows more narrow than 20 inches and at seeding rates of 32 pounds or higher for fine stems and quick curing.

Sorgos and hybrid forage sorghums are occasionally used for hay production but are generally too coarse for this use. Sumac sorgo, sown in narrow rows at 60 to 100 pounds of seed per acre, produces stems that are fine enough for hay production. The sorgos and hybrid forage sorghums are grown mostly for silage and greenchop forage. The better performing hybrids produced air-dry forage yields of 14,000 to over 15,000 pounds per acre at Temple and Riesel (Cook 1968). The greenchop or silage yields for these forages were 15 to 20 tons per acre.

Sweetclover is the best adapted legume for hay production on the alkaline clay soils of the area. The yield potential and management practices for this crop were reported by Bashaw et al. (1955) and Potts (1955). Hay yields generally ranged from 4,000 to 6,000 pounds on upland soils and up to 8,000 pounds on Brazos River bottom soils. Potts reported 117 pounds of nitrogen per acre in sweetclover hay averaging 4,750 pounds. The sweetclover roots from this hay crop had an additional 55 pounds of nitrogen making a total of 172 pounds for the roots and tops. The acreage planted to sweetclover declined shortly after World War II when nitrogen fertilizer became plentiful for fertilizing grass hay crops but the energy crisis and fertilizer shortage have resulted in increased interest in the crop.

Small grains, Coastal bermuda, Johnsongrass, Kleingrass 75, and other pasture grasses are also important hay crops but will be discussed in the pasture section below.

Alfalfa is a shortlived crop in this area because of the cotton root rot disease.

It is grown on a limited acreage in river bottoms where the cotton root rot disease is not prevalent.

ANNUAL PASTURES

Winter Pastures

The small grains are the most important winter annual pasture forages for the area and oat forage is more widely used than wheat, barley, rye, and triticales. Oat forage is preferred when the crop is grazed to maturity because it is more palatable after heading than the other small grains. Barley and rye are sometimes preferred over oats for peak early fall and winter forage production and to reduce the risk of winterkilling. Wheat is also used to reduce the risk of winterkilling over oats. Triticales show promise but well adapted forage varieties have not yet been developed and evaluated in the area.

Annual ryegrass has about the same seasonal forage production as small grains but its early production is less. For this reason it is not as widely used in the area.

Grazing research with small grains has been conducted at Temple, Renner, and McGregor. The work at Temple was conducted for a six year period from the fall of 1945 to May 1952 and consisted of stocker beef steers grazing mixtures of oats with sweetclover and barley with sweetclover. Steer gains per acre for the oats with sweetclover averaged 218 pounds with an average of 127 animal grazing days per acre and an average daily gain per animal of 1.7 pounds (Tippit and Jones 1953). During the best grazing season, fall of 1946 to spring 1947, 304 pounds of livestock gain per acre was obtained on 160 animal grazing days per acre with 1.9 pounds average daily gain. Results grazing the barley-sweetclover combination were less than the oat-sweetclover mixture.

Grazing research at Renner was conducted with beef cattle steers on oat pasture from 1954 through 1959 and averaged 298 pounds of gain per acre, 148 steer grazing days, and an average daily gain of 2.01 pounds (Gangstad et al. 1963).

Grazing research at McGregor was conducted during seven seasons from the fall of 1958 through the spring of 1965. Livestock gains per acre averaged 190.8 pounds, 97 grazing days per acre, and 2.1 pounds average daily gain. The best grazing season during this period was fall 1960 through spring 1961 and resulted in livestock gains of 312 pounds per acre, 135 animal days per acre and an average daily gain of 2.3 pounds (Norris and Kruse 1967).

These results indicate that livestock producers can expect an average of about 200 pounds of livestock gains per acre, 100 to 125 animal grazing days per acre, with a gain of 2.0 pounds per animal per day for beef steers grazing oat pasture. During good growing seasons higher production can be obtained but, also, during droughts or cold winters there can be little or no forage production. For emergency forage during winters of low or no forage production, Magee (1956) found that beef cattle producers needed 1 3/4 to 2 tons of hay per animal as reserve feed.

More detailed management problems for small grain pastures were discussed in a previous chapter but some management problems are particularly important in Central Texas and should be mentioned here.

A stocking rate that maintained a visual surplus of forage on 25-30 percent of the pasture resulted in highest gains per acre and good gains per animal in research conducted at McGregor (Norris and Kruse 1968).

Early planting (September) was necessary for good early forage production (Atkins et al. 1959, Holt 1959, 1962, and Holt et al. 1969).

Mixing small grain varieties generally did not increase forage yields over that of the best variety in the mixture, except in a few combinations, and in most cases the difference was insignificant (Waghray et al. 1967).

Summer Pastures

Sudangrass and sorghum x sudangrass hybrids are the most important annual summer pasture forages.

PERENNIAL PASTURES

Winter Perennials

TAM Wintergreen hardinggrass and tall fescue, mostly Kentucky 31 fescue, are the most important perennial wintergrowing pasture grasses used in Central Texas. Descriptions and general management of these two grasses are given in another chapter of this publication.

Grazing results comparing TAM Wintergreen with oat forage are summarized in Table 10-1. Animal performance on this grass was satisfactory but lower than for oat pastures. Digestion trials using mature ewes indicated the digestibility of TAM Wintergreen was similar but slightly lower than oats (Norris et al. 1968). Forage yields have been comparable to small grains during most seasons and higher during fall droughts. The most serious limitation for this grass in Central Texas has been the difficulty in establishing stands because of low seedling vigor and lack of cold tolerance of the young seedlings.

Table 10-1. SUMMARY OF GRAZING RESULTS ON WINTER PASTURES USING BEEF STEERS AT MCGREGOR, TEXAS DURING 1968-71.

	1968	1969	1970	1971	4-year average
TAM WINTERGREEN PASTURES					
Stocking rate acres per animal	2.3	1.5	1.6	1.4	1.7
Animal grazing days per acre	82	138	113	111	111
Livestock gains, pounds per acre	151	194	240	115	175
Average daily gains per animal, pounds	1.8	1.4	2.1	1.0	1.6
ALAMO-X OAT PASTURES					
Stocking rate, acres per animal	1.7	1.4	1.6	1.5	1.5
Animal grazing days per acre	110	129	102	93	108
Livestock gains, pounds per acre	208	257	224	136	206
Average daily gains per animal, pounds	1.9	1.9	2.2	1.5	1.9

Summer Perennials

Descriptions and management of the summer growing perennial grasses were discussed in a previous chapter. Forage yields for major summer perennials at McGregor are reported in Table 10-2. Grazing results are summarized in Table 10-3 and by Norris et al. (1969).

Table 10-2. FORAGE PRODUCTION OF WARM SEASON PERENNIAL GRASSES AT MCGREGOR, TEXAS 1965-68.

	Yield air-dry forage, pounds per acre				
	1965	1966	1967	1968	Average
Kleingrass 75	9026	9260	6040	9938	8566
Blue Panic	10310	6707	6184	8586	7591
Pretoria 90 Bluestem	12842	12111	6408	12500	9873
Coastal bermuda	8012	4983	3978	7027	7181
Common bermuda	5844	3971	3146	5076	4509
Common Weeping Love	7949	4718	2713	6720	5299
Ermelo Weeping Love	6746	6086	2547	8373	5718
Common buffel	9012	4612	3931	3942	5369
Blue buffel	12633	9948	6774	11910	10316

Table 10-3. SUMMARY OF STEER GRAZING RESULTS ON WARM SEASON GRASSES, MCGREGOR, 1964-70 COMPARABLE AVERAGES.

	Johnson-grass	Hybrid sorghum x sudan-grass	Coastal bermuda-grass	Klein-grass 75	Green sprangle top
Years tested	6	7	5	3	3
Stocking rate, acres per animal	1.76	1.40	1.63	1.08	2.42
Animal grazing days, per acre	38.6	117.1	109.5	126.1	81.9
Gain, pounds per acre	129.7	174.3	130.7	180.7	142.0
Average daily gain, pounds per animal	1.46	1.48	1.19	1.44	1.75

Coastal bermuda and Kleingrass 75 are the most widely used improved summer perennials used in the area. Their yield potentials are generally comparable in the central part of the Blackland Prairies but Coastal bermuda has been more productive in heavier rainfall areas and Kleingrass has been more productive on shallow soils, low fertility levels and drought conditions.

The forage evaluation and grazing research at McGregor has indicated Kleingrass 75 starts growth earlier than Coastal bermuda and grows later in the fall. The higher average daily gain of beef steers on Kleingrass 75 indicates better forage quality for Kleingrass.

Coastal bermuda on the heavy clay soils of the area has a tendancy to decline in forage production after 5 to 6 years. Renovating the Coastal sod by plowing or chiseling did not effect yields at Denton (Dudley and Holt 1965).

TAM Wintergreen hardinggrass and Kleingrass 75 in separate pastures at McGregor have been used in a pasture system that approaches 12 months of green forage for livestock during an average rainfall season.

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