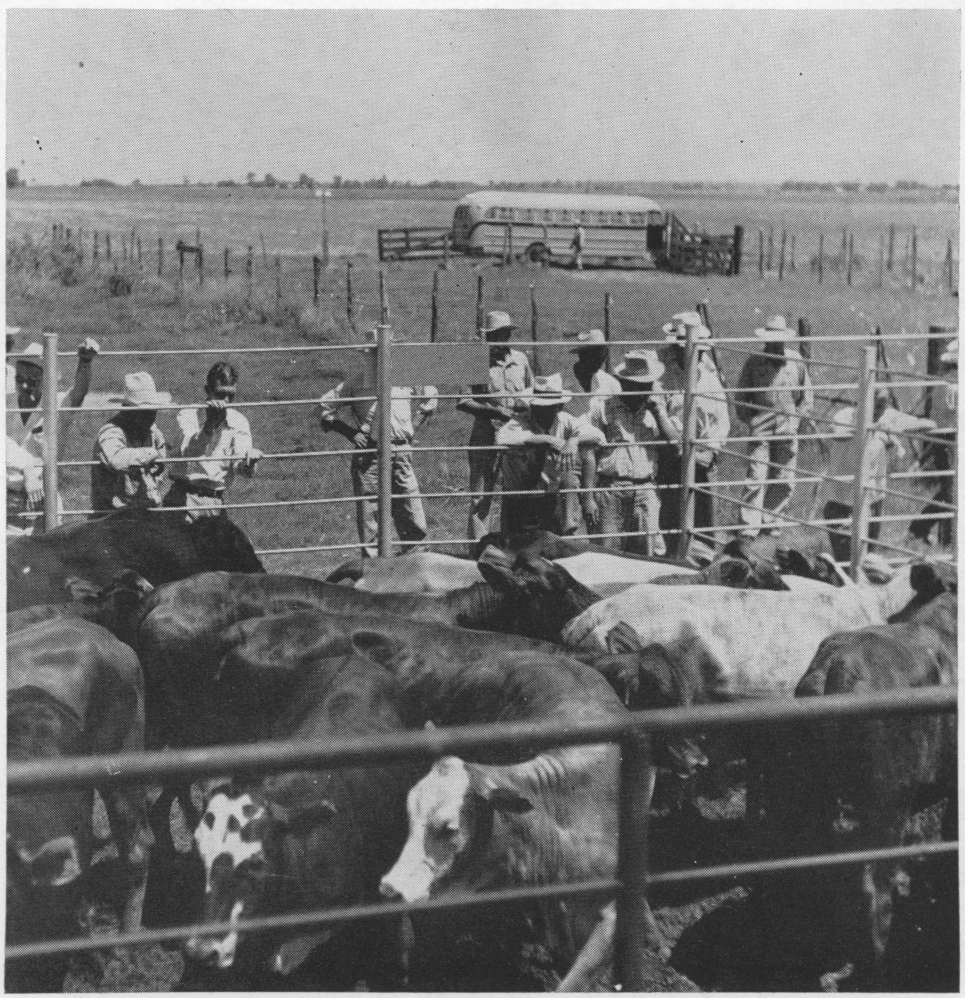
Miscellaneous Publication 103 *December 1953*

• Beef Cattle Management • on • Brazos River Bottomland



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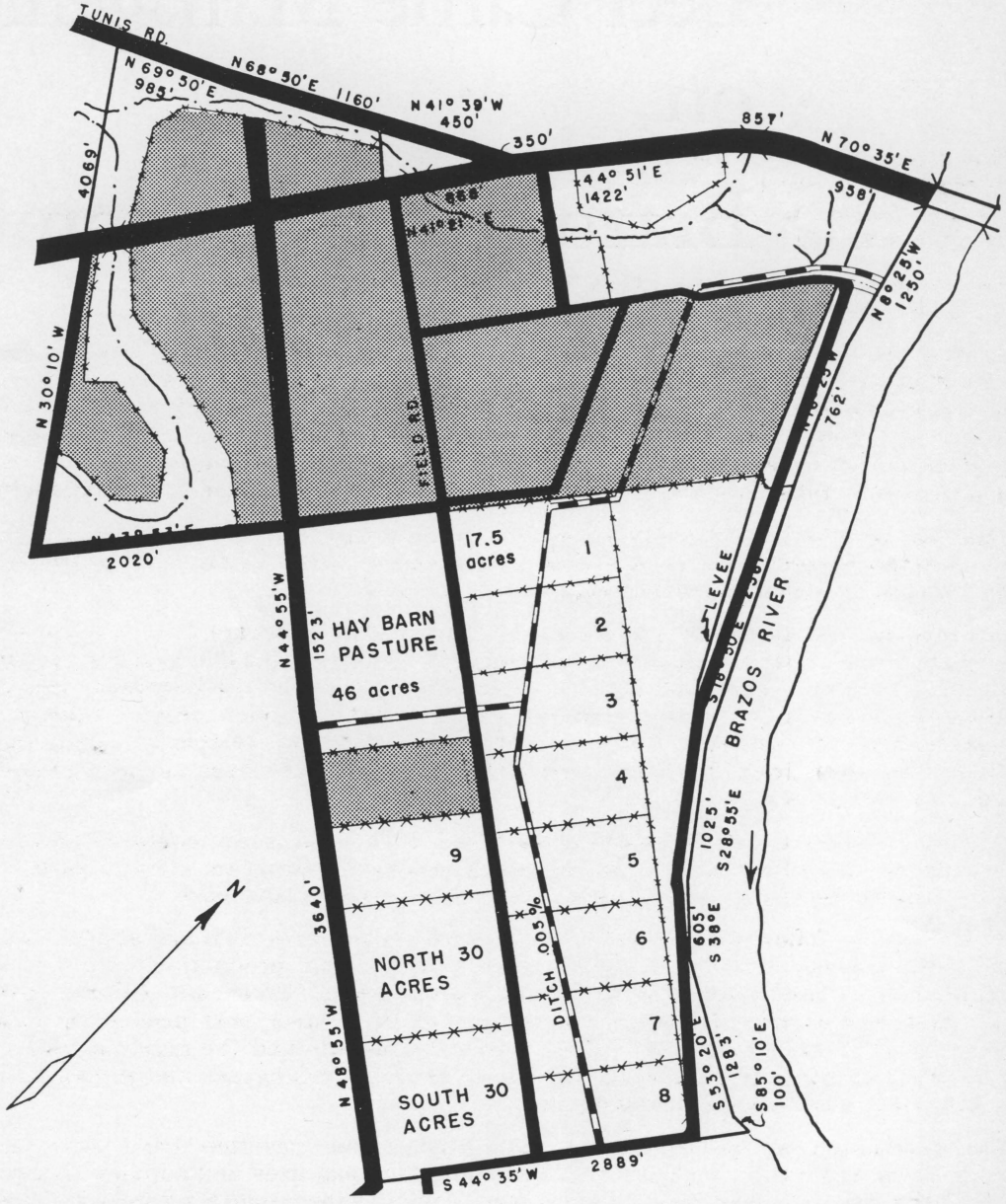

Figure 1. Brazos River Valley Laboratory of the Texas Agricultural Experiment Station, 8 miles southwest of College Station in Burleson county. Pasture and beef cattle management investigations are conducted in pastures 1 through 9, each containing 17.5 acres, the hay barn pasture of 46 acres and the north and south 30-acre pastures. The cross-hatched areas are used in field crop investigations, the dark lines are dirt roads and the broken lines are drainage ditches. The laboratory comprises 821.2 acres.

DIGEST

This publication gives the results of a beef cattle management program conducted during the past 7 years by the Texas Agricultural Experiment Station on the Brazos River Valley Laboratory near College Station. Stock farming problems encountered on alluvial type soils are described.

Results of the program are given under three main headings: pasture management, steer grazing and feeding, and slaughter calf production.

Grazing observations made between 1946 and 1949 showed that year-round, intensive cattle production could not be maintained on the soils of the Brazos River Valley with perennial permanent-type grass pastures. Year-round grazing, which permits intensive production and continuous gains, was obtained by the use of fall-planted oats and spring-planted Sudangrass. Steer gains per animal and per acre were greatly increased by the inclusion of these crops in the pasture rotation and by the use of nitrate fertilizer.

Corn was included in the pasture rotation to guarantee feed reserves for unproductive periods. After harvest, the corn fields were cleaned with cattle. Clean cultivation was not necessary when a grazing crop followed corn.

Common Bermudagrass was necessary in the pasture program although its production of forage was well below that of Sudangrass. Under intensive grazing and during wet periods cattle need good footing such as may be supplied by the Bermuda. Bur clover furnished an abundance of spring feed and was productive under proper management. Steps preliminary to sprinkler irrigation of permanent and temporary pastures are described. However, irrigated areas were not involved in the beef cattle management practices for the 7-year period.

It was determined that a cow and calf, and a steer program could be carried out successfully on the same farm. The livestock production program affords an excellent outlet for alfalfa resulting from rotations of cotton, alfalfa and corn.

Steer grazing, followed by steer fattening with farm-grown corn and alfalfa, required a more intensive use of land and labor than cow and calf production. Corn and hay were produced in the pasture areas in such amounts as to permit feedlot gains of approximately 250 pounds per head. The method of farm steer beef production required the purchase of Choice grade steer calves, wintering on oats and the necessary harvested feeds, spring and summer grazing using bur clover and Sudangrass and fall finishing in drylot with corn, alfalfa and cottonseed meal.

The production of milk-grass-fat slaughter calves resulted from fall calving, wintering cows and calves on oats and Bermudagrass pastures and supplementing with hays until the rise of spring feed. Calves were sold at approximately 8 months of age in June and July and were a dependable source of revenue.

A simple method of keeping records of both calf and steer production is described.

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Beef Cattle Management on Brazos River Bottomland

F. A. WOLTERS, J. E. ROBERTS and J. H. JONES*

PASTURE MANAGEMENT

Why Was the Pasture Program Started?

In 1945, plantation owners in the Brazos River Valley asked the Texas Agricultural Experiment Station to determine methods of establishing productive pastures on bottomlands historically farmed in cotton. The problem of getting higher returns per acre from cattle being pastured on land not planted to cotton prompted the request for pasture development. This work began in 1946 at the Brazos River Valley Laboratory in Burleson county (Figure 1), 8 miles southwest of College Station.

This publication reports the successive development in land use, which involved a change from non-tilled, little-used, poorly-drained land of low productivity to drained and tilled land having reasonably high productivity. This change was brought about by drainage, tillage, use of legumes, fertilizer and other management practices. In the process, the land has been used for slaughter calf production and the grazing and fattening of steers. It is believed that these findings will be applicable to similar land in the southern reaches of the Brazos, Colorado and Trinity Rivers.

What Is the Average Rainfall?

The average annual rainfall for College Station, where records have been kept for 64 years, is 38.52 inches. For the Brazos River Valley Laboratory, records are available for only 12 years and the annual average is 40.69 inches. The distribution of rainfall is varied. For example, in 1952, 75 percent of the rainfall occurred in 5 months—February, April, May, November and December; and only 1.3 percent of the year's total fell in 3 months—June, August and October.

How Long Is the Growing Season?

The average length of the growing season, expressed as the number of consecutive frost-free days, is 264 days—March 7 to November 26. Temperatures have varied from −3 degrees in January to 111 degrees in August.

How Much Land Is Used?

The Brazos River Valley Laboratory has approximately 480 acres of land for cattle operations. About 35 acres of this land were reclaimed from bayous in 1951 and 1952. Of the 480 acres used, 397 were assigned to the Laboratory by the A&M College Plantation in 1946. Experimental pastures at first comprised 281 acres, being ten 17.5-acre pastures, one 46-acre and one 60-acre block, each with stock water. The 60-acre block later was divided into two 30-acre blocks, and one 17.5-acre pasture was converted to experimental field crops. The remainder of the untilled acreage is levee and riverbank land.

Figure 1 shows the division of the 480 acres of pasture land and the respective pasture numbers, in relation to the total of 821.2 acres in the Laboratory. The shaded area represents land that is comparatively level and is used for experimental field crops.

What Was the Original Condition of the Land?

Much of the 397 acres received from the A&M College Plantation was originally ponded and in high weeds (Figure 2), having been abandoned from field crops for 12 years. Drainage work necessary to initiate reclaiming the experimental area cost approximately $35 per acre. Numerous land operations (Figure 3) were necessary to condition the land for planting. A good seedbed (Figure 4) was essential before planting grass seed.

What Grasses Were Planted at the Start?

The object in 1946 was to establish pure stands of five species of grasses—Dallis, Rhodes, K. R. bluestem, common Bermuda and Johnson. Each grass was to be seeded on two 17.5-acre pastures. The 46 and 60-acre blocks were held for reserve grazing. The blocks were native pastures with the vegetation consisting largely of bur clover, yellow blossom sweetclover, Johnsongrass and common Bermuda. On occasions, these blocks were mowed for hay. They were much better pastures than the 17.5-acre blocks.

Were Pure Stands Easy to Establish?

It was not possible to establish pure stands of the grasses in any of the experimental blocks because of the bur clover. There was a solid stand of bur clover (Figure 5) on the land from about February 1 to May 15 nearly every year. In addition, the areas had some Bermudagrass, rescuegrass, numerous weeds, water grasses, sedges and rushes in them.

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Figure 2

Abandoned cotton land showing the invasion of various weeds and the absence of desirable forage.

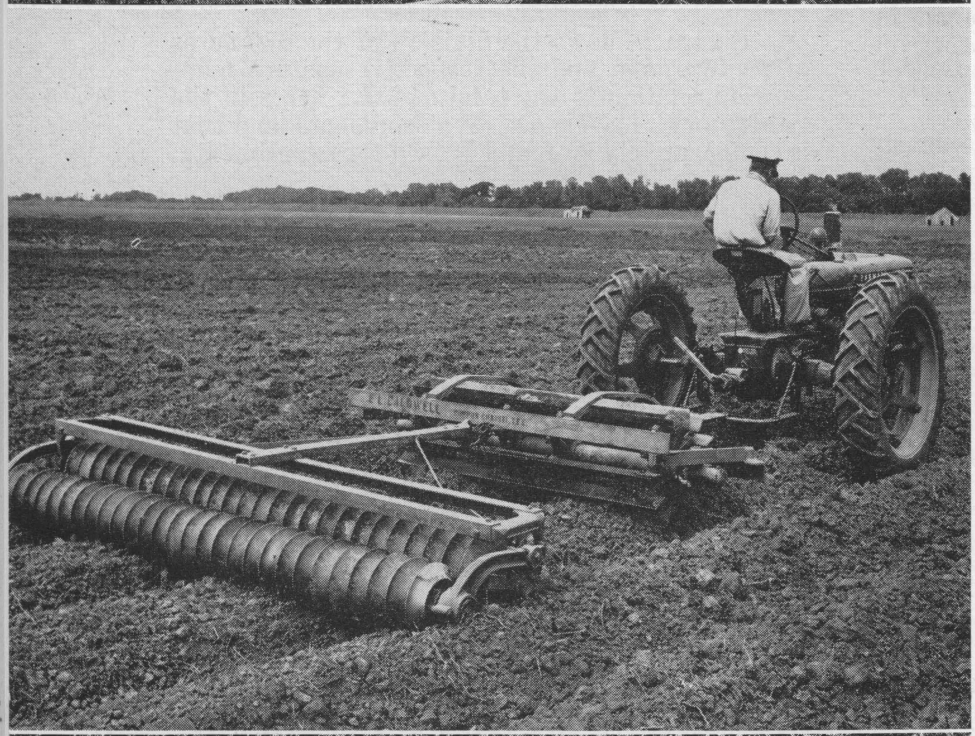

Figure 3

A great deal of land preparation was done to bring the land in Figure 2 to the stage shown in Figure 4. Notice the houses in the background where cotton tenants once lived.

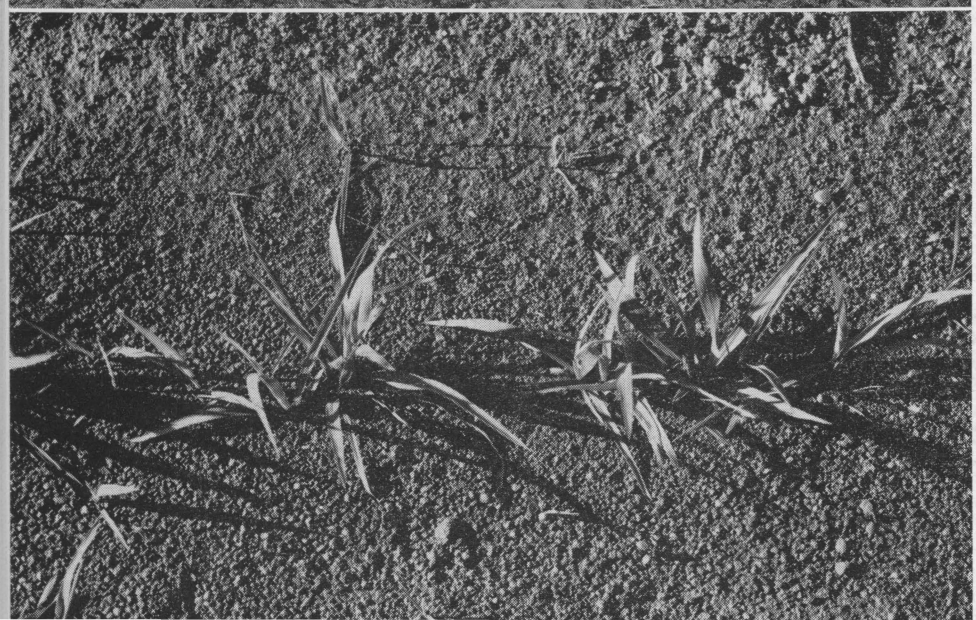

Figure 4

Dallisgrass in pasture 4, October 7, 1946. A good seedbed is important in obtaining good results from planting grass seed.

What Was the Production of the Grasses?

Steer gains per acre, from March 2 to August 28, 1950, were 152 pounds for the area in Johnsongrass, 190 pounds for common Bermuda, 171 pounds for Dallisgrass and 155 pounds for K. R. bluestem. Bur clover furnished most of the grazing in these pastures from March 2 to May 11.

Near maximum production was realized from bur clover in 1950. From March 2 to May 11, one 17.5-acre bur clover pasture produced 289 pounds of steer gain per acre. Four steers out of 36 head were lost from bloat during that period.

Rainfall was very favorable in the fall of 1949 and in the spring and summer of 1950.

Why Were Most of the Grasses Eliminated?

Rhodesgrass, seeded in rows, was established and furnished a small amount of grazing in the summer of 1947, but failed to survive because of cold weather.

Dallisgrass was finally established and furnished good grazing and a seed crop in 1950 but was completely killed by the 1951 drouth.

Johnsongrass was easily established but by 1950 the stand was very thin. This grass must be managed as a temporary crop and under such management makes good pasturage.

K. R. bluestem, seeded in rows, was easily established and after 1950 furnished seed for combining and summer grazing for steers. It did not produce appreciable forage until late in the spring. Steer gains from grazing it were low and the stands were plowed up in 1951.

Common Bermuda, where sprigged in 40-inch rows, made satisfactory cover in 1 year. Where sprigged in 80-inch rows, it was very slow to attain a cover and in some areas had not made solid cover by 1952, or after 5 years.

Of the original plantings of grasses, only common Bermuda is left. While it does not compete with temporary pastures or tilled crops in the production of feed, it provides a holding place in wet weather and a feeding ground in winter. In combination with bur clover, rescuegrass, ryegrass or oats, Bermudagrass areas furnish good spring feed. The grass is badly weakened after bur clover dies but, with summer moisture, it furnishes late summer and fall grazing.

What Clovers Were Tried?

One of the pastures originally seeded to Rhodesgrass was planted to Madrid sweetclover in the fall of 1949. It was fertilized with 200 pounds per acre of 20 percent superphosphate at the time of seeding. Madrid came to an excellent stand, but by April 1950 it had been choked out by bur clover.

An application of phosphate is not necessary for an abundant growth of bur clover (Figure 5). It has never failed to reseed, cows graze it readily and by grazing real heavy or strip-planting with oats, rescuegrass or ryegrass, losses from bloat can be greatly reduced.

What Is Used for Winter Grazing?

Broadcast oats furnish the principal amount of high quality winter grazing. A 22-acre area (Figure 6), was planted to oats in September 1949. It was grazed from November 16, 1949 to March 2, 1950 by 85 steer calves and produced 283 pounds of gain per acre. In addition, it furnished pasturage for 88 cows and 30 calves for

Figure 5. Bur clover is a very hardy plant. Cattle graze it readily. It has never failed to reseed and come up during the fall.

Figure 6. Oats is one of the better winter-grazing crops for this part of Texas. It will stand hard grazing during wet weather without appreciable damage to the stand. During early spring, if it is not needed for grazing, it will make very good hay. Oat grain cannot be saved in most years because of lodging.

21 days during November and February. The oats received a top-dressing of 150 pounds of 33.5 percent ammonium nitrate per acre in January.

Grazing records for 1948 through 1952 (Figure 11) show market advantages for winter oat grazing for steer calves over native bur clover and permanent-type pasture grazing. Calves wintered in 1948-49 on permanent-type pasture with supplemental feed failed to gain from November to March. Satisfactory gains were realized when oat grazing was available.

Does Corn Do Well?

The 46-acre reserve block was bedded and rebedded in the fall of 1949, preparatory to planting corn in 1950. The area produced 55 bushels of corn per acre with three cultivations after planting. No fertilizer was applied. Corn rootworms did considerable damage to the stand. In 1951, corn was planted on half of the 60-acre reserve block. The rootworm was controlled by a furrow treatment at planting time of one-half pound per acre of heptachlor used as a spray. Very little hand labor was required to produce this corn crop because clean cultivation was not necessary. By following the corn with a grazing crop, weeds and Johnsongrass did not have to be kept under control as they would if cotton followed the corn the next year.

In 1952, corn was planted on the other half of the 60-acre block. Texas 24 was planted at the rate of 1 bushel to 6 acres, heptachlor was put out for rootworms, and the corn was side-dressed when about 18 inches high with 200 pounds per acre of 33.5 percent ammonium nitrate. The yield was 80.4 bushels per acre. By planting thick and fertilizing, the corn (Figure 7) had less competition from weeds and grasses.

How Were the Pastures Used in 1952?

Results from 1946 to 1949 showed that year-round, intensive cattle production could not be maintained with perennial permanent-type grass pastures. Drouth and cold weather limited production too severely. There was ample lush feed in the spring but little growth in the summer, fall and winter. The same pastures (Figure 1) used in 1946 had the following crops during 1952: No.'s 1 and 2, oats and bur clover; 3, Coastal Bermuda; 4, red top cane; 5, common Bermuda; 6, plowed to kill K. R. bluestem; 7 and 8, Sudan; 9, common Bermuda and Sudangrass; south 30, 20 acres oats, 10 acres Johnsongrass; north 30, corn; and the 45-acre reserve was in Johnsongrass and annual field grasses and weeds. Considerable

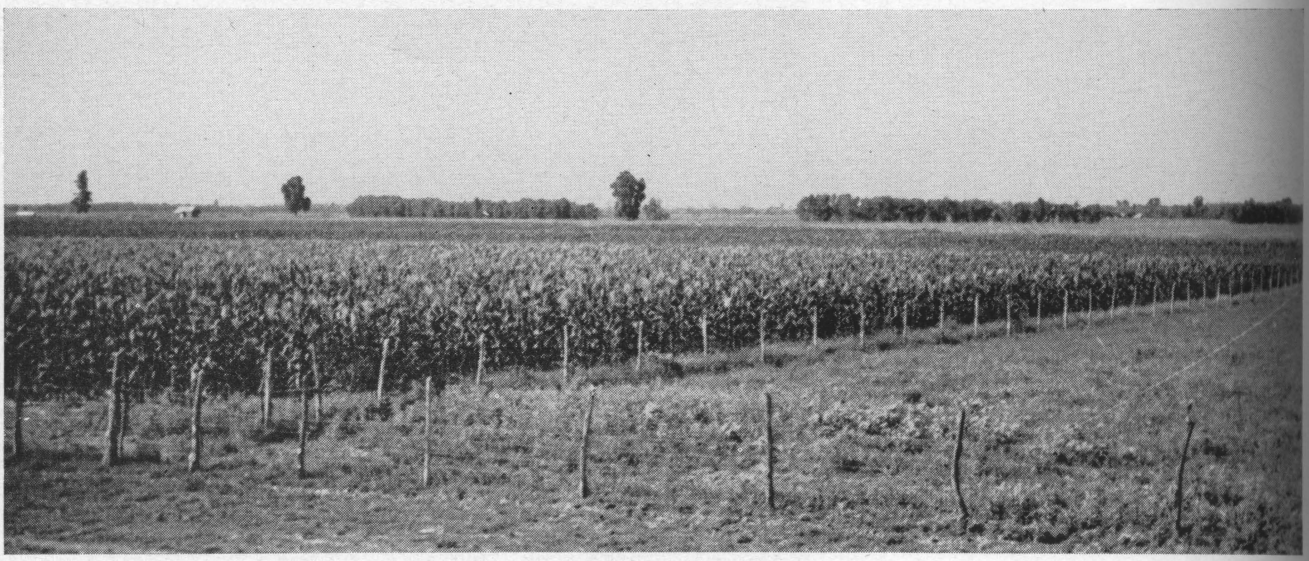

Figure 7. Corn has proved to be a good cash crop in our pasture rotation system.

Figure 8

This 17.5-acre common Sudan pasture had good seedbed preparation and an application of 250 pounds of 33.5 percent ammonium nitrate per acre. It produced 384 pounds of steer gain per acre and furnished 630 cow-days and 385 calf-days of grazing.

Figure 9

Hay is processed from surplus Sudan and other surplus grazing. If enough grass is planted to graze cattle during short rainfall periods, there will be surplus grazing if normal rainfall is received.

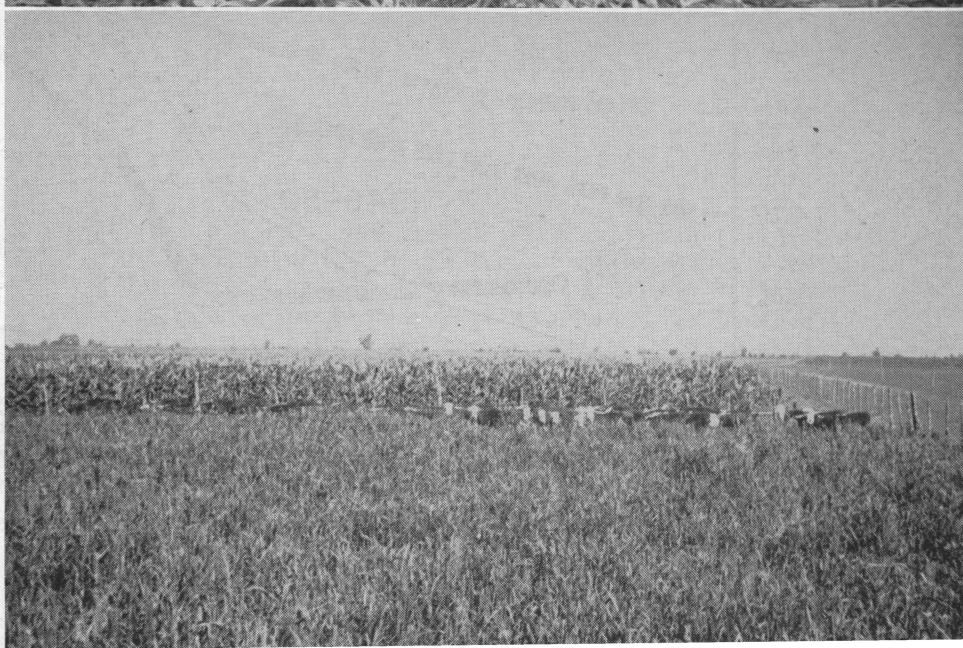

Figure 10

Sudan should be grazed rather short and growth should be controlled by grazing and mowing. Cattle do not make efficient gains on Sudan when it gets as tall as shown in Figure 8.

Table 1. Gain per head from various types of grazing, 1949-52

Year	No. head	Gain per head	Type of grazing
1948-49	98	271	Bur clover and permanent-type grazing
1949-50	85	311	Oats, bur clover and permanent-type grazing
1950-51	69	242	Oats, bur clover and permanent-type grazing
1951-52	84	389	Oats, bur clover and Sudan

difficulty was encountered in curing the three cuttings of red top cane hay in pasture 4.

What Were the Grazing Results in 1952?

The planting of oats and common Sudan greatly increased the acre gains and the days of grazing. In 1951-52, 55 acres of fall-seeded oats (two 17.5-acre blocks and 20 acres of reserve land) produced 298 pounds of steer gain per acre from February 14 to May 16, 1952. In addition, the reserve area produced 25 tons of oat hay. Other grazing was furnished, as shown in Table 2, from December to February.

Three of the 17.5-acre pastures planted to Sudangrass produced 210 pounds of steer gain per acre, 14.6 tons of hay and furnished 630 cow-days and 385 calf-days of grazing from May 16 to September 8. One of the 17.5-acre blocks, which had a good seedbed and was fertilized with 250 pounds of 33.5 percent ammonium nitrate per acre, produced 384 pounds of steer gain per acre. The type of Sudan pasture produced is shown in Figures 8, 9 and 10.

How Much Did the Steers Gain Each Year?

Figure 11 shows the gains by months of steers pastured on the Laboratory for 4 years. The gains were based on weights of the calves at purchase and their weights as yearlings in late summer or fall.

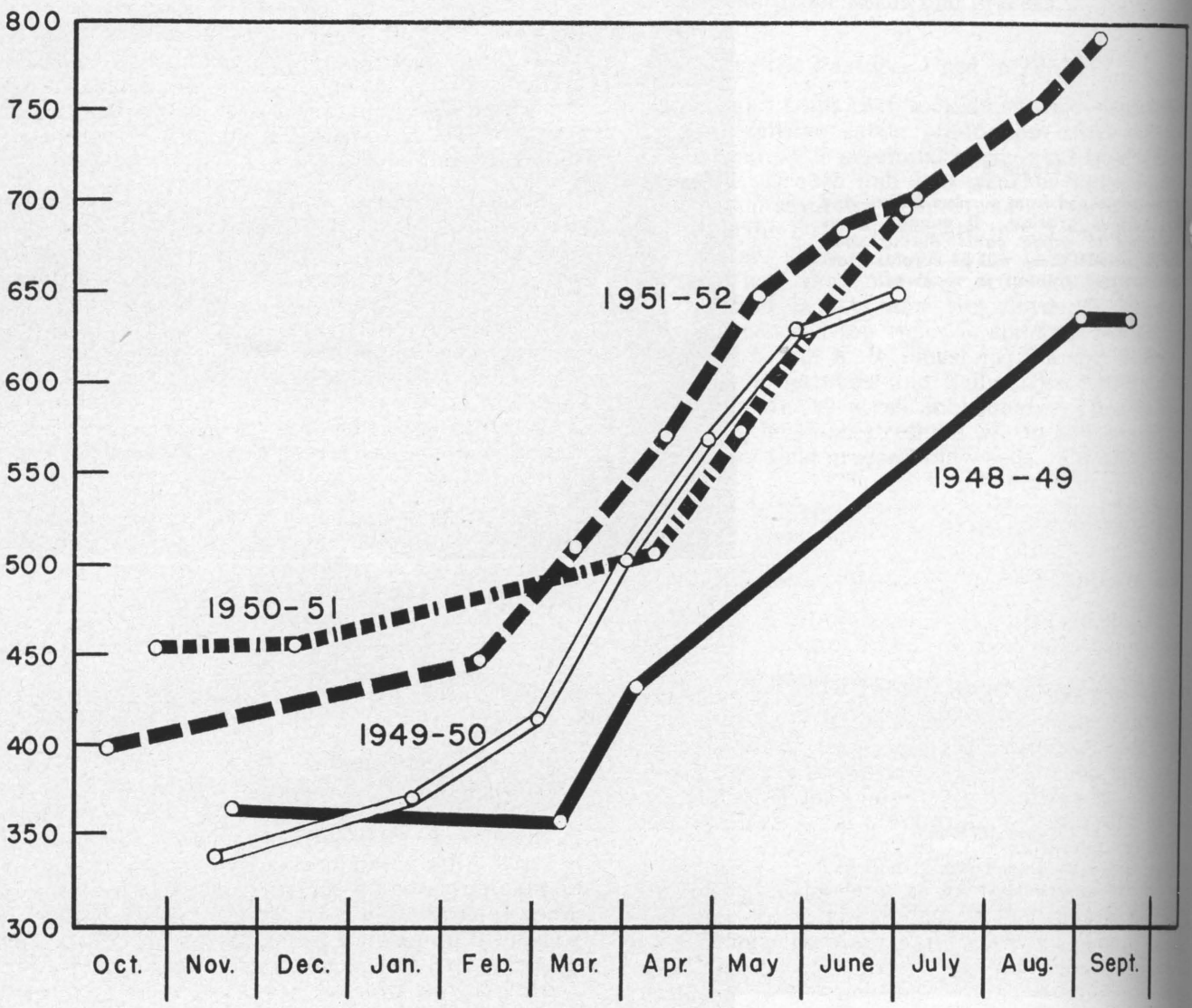

Figure 11. Gain in pounds made by yearling steers, 1948-52.

Table 1 gives the year, number of steers, the gain per head and the type of grazing for each year from 1948-49 through 1951-52. Since seasonal conditions affect annual crops, differences in gain between years may result from differences in both the amount and quality of the grazing.

The 98 steers used in 1948-49 grazed bur clover and the permanent-type pasture grasses. They made an average gain of 271 pounds from November 1948 to September 1949, but this gain was actually produced from March to September.

The 85 steers used in 1949-50 made an average gain of 311 pounds from November to July. Oat pasture was used for the first time. A fair rate of gain was noted from November to March. The 1949 calves were 26 pounds lighter when purchased than the 1948 calves but gained 93 pounds more during the winter. Spring gains on bur clover and the permanent-type grasses were rapid, but drouth ended the grazing season in July. As a result of improved wintering from oats, these steers were as heavy in July as were the 1948 steers in September.

Spring growth was extremely late in 1951 and steers did not begin to make rapid gains until April. The 69 steers used in 1950-51 were much heavier at the time of purchase than those bought in 1948 and 1949. An early failure of pasture and lack of Sundangrass again shortened the summer grazing season and resulted in an annual gain averaging only 242 pounds, or less than in any previous year.

The 85 steers used in 1951-52 made an average gain of 389 pounds from October 1951 to September 1952. Early oat pasture was scant because of drouth, but was abundant after February 13. At this time, gains increased and continued at a good rate until September 8. The gains resulted from grazing oat and bur clover pasture and common Sudan. The gains were made on much less land than in any previous year, chiefly because of the large yield of Sudan.

How Are Oats, Sudangrass and Corn Managed?

High quality seed, high fertility, good seedbed preparation and adequate moisture are the main requirements for high production of oats, Sudan and corn. Unless irrigation is available, moisture requirements cannot be controlled but the other factors respond to proper management. Oats and Sudangrass are planted to graze a given number of cattle under a short amount of rain. If an adequate amount of rain is received, excess grazing is available.

Oats are planted in early October in dry soil if moisture is not available. They are planted deep enough so that a small rain will not germinate the seed. Planting before early October may result in getting a stand and then losing the plants from hot weather. Three bushels of seed per acre are planted to get a good, thick stand. About 100 pounds per acre of 33.5 percent ammonium nitrate are applied as a top-dressing once or twice during the year, or as the oats begin to look yellow. Some years, no fertilizer is used. Oats need to have a good stand and get off to a good start before bur clover begins to grow.

Bur clover reseeds each year and comes to a good stand along with the oats. Bloat from bur clover has not been a problem in areas where at least half the grazing is obtained from oats. By providing the oats with ammonium nitrate fertilizer, they are able to compete with the fast-growing bur clover. Oats require more careful management in grazing than bur clover because of the bunch-type growth it makes. If oats are over-grazed, especially in wet weather, and the oat forage is reduced very much below 50 percent of the total forage available, then death losses may be expected from clover bloat.

Where bur clover provides a large portion of the available grazing, the bloat problem can be helped somewhat by mowing strips 40 to 50 feet wide every 4 or 5 days to provide dry forage. The clover is left on the ground to cure and the cattle will supplement their green forage with this cured or semi-cured clover hay. This practice also provides fresh, green bur clover after the hay is eaten.

Sudan is planted in late March or early April in 10-inch rows at 30 to 35 pounds of seed per acre. Planting in 40-inch rows will not give enough tonnage per acre under grazing conditions. Also, because of the clay soil, the Sudan cannot be cultivated after it is grazed. Ammonium nitrate is applied as a top-dressing after the grass has been grazed down the first time. Fertilizer applied at the time of planting may result in the grass growing so fast that the cattle cannot keep it grazed down. As a result, it will become coarse (Figure 8).

Sudan planted the first part of April should be ready to graze by May 15, at which time bur clover usually plays out. Good quality oat hay is usually produced after Sudangrass starts furnishing grazing. Common Sudan is used and has furnished grazing from May through September. It furnished grazing through the summer of 1952 with only 1.69 inches of rain from June to September.

Corn in our pasture rotation system (Figure 7) is a good cash crop and provides reserve feed. A thick stand is obtained from Texas 24 seed planted in 40-inch rows at about 1 bushel per 6 acres. Two hundred pounds of 33.5 percent ammonium nitrate per acre are applied during land preparation or as a side-dressing. A furrow treatment of one-half pound per acre of heptachlor is sprayed on the ground just behind the opening shovel at the time of planting to control corn rootworms. Clean cultivation is not necessary

Figure 12

Several yards of river bank had to be pushed away before an irrigation pump could be pulled near the water.

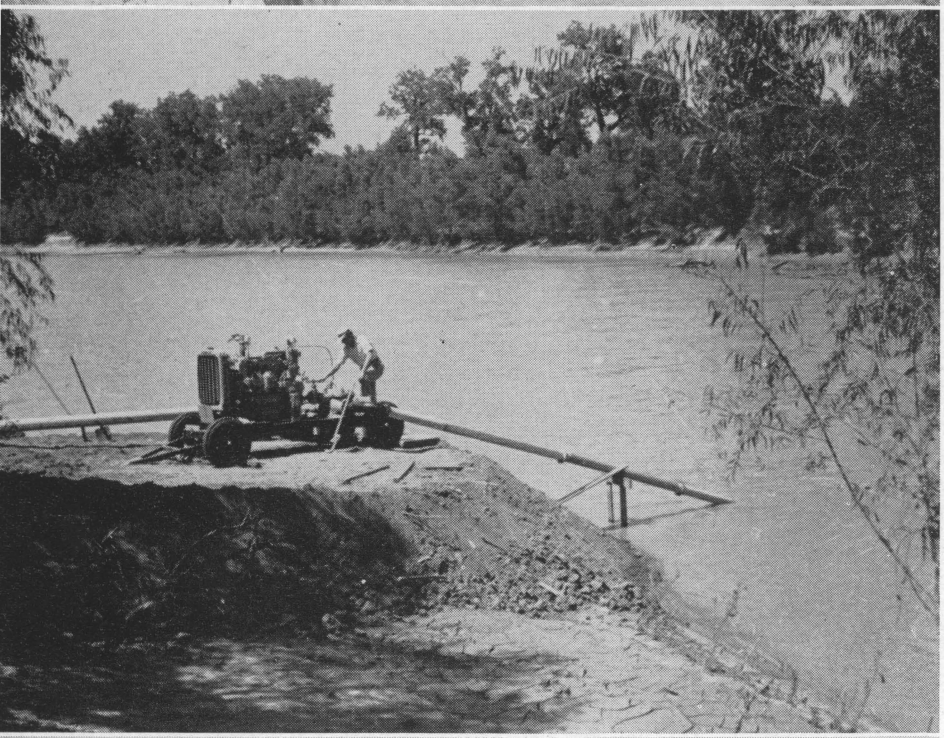

Figure 13

A dirt ramp is used to hold the irrigation pump. This is satisfactory until it begins to rain.

Figure 14

This sprinkler type system was used on the Sudan and Bermudagrass areas. Alfalfa is being irrigated in this picture.

when corn is followed by a grazing crop. It is desirable to plant oats or a similar crop after corn so that cockleburs can be controlled by mowing or plowing before they mature and after most or all the grazing is gone. Corn planted thick and fertilized will shade out most of the weeds.

Sudan and oats are planted so as to provide 2 acres for 3 yearling steers. With a favorable growing season, this rate of planting will give surplus grazing which can be processed for feed.

Corn is planted so as to provide 1 acre for two 800-pound steers on a drylot ration for 120 days. Fifty bushels per acre is a conservative production estimate; therefore, plenty of corn will be available if it averages 80 bushels per acre, as in 1952. Cows are used to harvest the corn the picker misses. The corn that is shelled off and comes up in the oats will be grazed off unless frost kills it.

Will Irrigation Improve the Pasture Program?

All the work covered in this report was planned and managed without irrigation. The forage crops and corn used in the pasture program will respond to irrigation water during a drouth. The first irrigation work at the Laboratory began in 1952. The sprinkler-type system (Figures 12, 13 and 14) was used on common Sudan and common Bermuda and grazing results were obtained.

On August 26, 1952, a 9.25-acre pasture of common Sudan was irrigated after dry weather had stopped all growth. The grass had been grazed close to the ground. An application of 100 pounds of 33.5 percent ammonium nitrate per acre was added and about 4 inches of irrigation water were applied. The Sudan responded quickly to the water and fertilizer, and 10 days later the grass was about 8 inches high. Twenty-six 835-pound steers were put on the pasture from September 8 until September 26. This was approximately 3 steers per acre and the gain was 12 pounds per steer during the 17 days. The weather was extremely hot and the steers seemed to enjoy the portable shades (Figure 16), which were in the middle of the pasture. Because of the lateness of the season, the Sudan began to make seed heads and became coarse at a much shorter height than it would have earlier in the season.

The same area was irrigated again on September 26 but no fertilizer was added. Five days later, as soon as the ground dried on top, fifteen 750-pound steers were put on the pasture. They gained 13 pounds per head in 12 days. At the end of this period the steers were put on full feed and cows grazed the area for several days.

Twenty-two 750-pound steers grazed a small area of irrigated common Bermuda from September 8 until October 1; they gained one-half pound per day. These gains are not outstanding but in all other areas the ground was almost bare and steers could not have gained without feed. With irrigation, year-round grazing will be possible and the number of cattle carried per unit area could be increased.

STEER GRAZING AND FEEDING

Steer grazing and feeding calls for a more intensive use of both land and labor than straight grazing. Good grazing and high quality feed should be available so that the steers can be kept in a gaining condition at all times.

When Are Steer Calves Purchased?

Stocker steer calves can be purchased at any time in the late summer or fall if feed is available for them. Getting calves over the shock of handling incident to delivery is the first object. They should be weaned in close quarters, fed good quality hay and taught to eat concentrates before they are turned out to pasture. Calves that do not start eating are usually sick and must be treated accordingly. Although practically all calves have been vaccinated for blackleg when purchased, the Laboratory revaccinates for blackleg and malignant edema.

What Is the Best Size?

A 400-pound steer calf (Figure 15) is a good size to buy. A calf this size seems to go through less shock at weaning than a lighter calf and normally will have enough size at the end of the grazing period to make a good feeder steer. Lighter calves can be used when conditions for wintering are very good.

Is Quality Important?

Quality is extremely important if the gain made on the farm is to be sold at a high price. In some years, calves were purchased from local producers of commercial Hereford cattle and in 1950 calves were purchased from three local auctions. The steers made satisfactory gains on grass but did not have enough quality to make Choice grade slaughter steers after fattening in drylot. Steer calves of the quality shown in Figure 15 are suitable for finishing to Choice grade after wintering and summer grazing.

How Long Are the Steers Kept?

Steers are normally kept on the Laboratory about 15 months. The length of time depends on whether they are fed in drylot; and if so, what date they go on feed. A new crop of steers is purchased before the last group is sold.

How Are These Steers Cared for?

Normally the steers go through four different phases of management before they are sold: (1) fall and winter feeding and grazing, (2) spring

Figure 15

Eighty-four head of 398-pound steer calves purchased October 10, 1951 at 38.25 cents per pound.

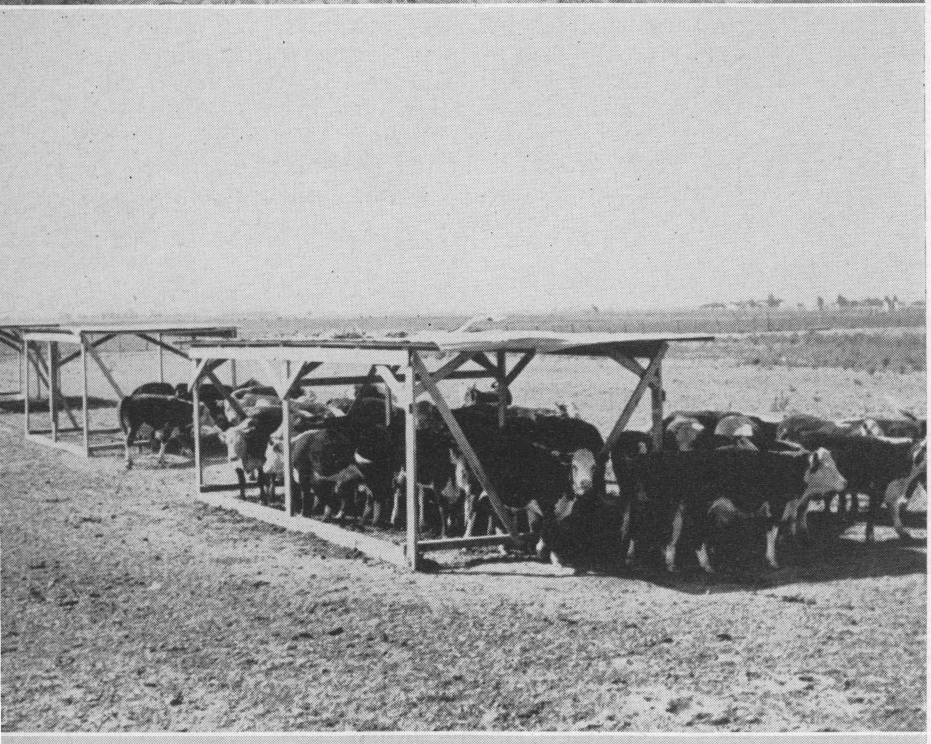

Figure 16

Portable shades, 10 feet wide, 7 feet high, 30 feet long, with a sheet iron top, are moved about in the pastures where other shade is not available.

Figure 17

Sudan makes satisfactory growth in July and August, but it is difficult to keep the steers gaining because of the heat. The grass will make seed heads much quicker at this time than it will in April, May and June. The steers may not stay on a pasture more than 4 or 5 consecutive days in July and August.

grazing, (3) summer grazing and (4) drylot feeding. A record of the steers purchased in October 1951 shows the four different phases of management.

FALL AND WINTER FEEDING AND GRAZING

What Grazing Is Available at This Time?

Normally little grazing can be expected from native pastures in early fall and winter. Therefore, adequate, good quality grazing must be provided. Land is prepared so that oats can be planted in early October. With reasonably favorable conditions prevailing, grazing from oats can be expected around December 1. Bur clover will come up in the oats when the weather gets cool.

What Feed Was Required?

The amount of feed used depends on the amount of good grazing available. Table 2 gives the periods of grazing and the amount of feed used in wintering steer calves from October 15, 1951 to February 13, 1952.

What Was the Cost of the Feed?

452 pounds dehydrated sorghum plants	@ 2.0¢	=	$ 9.04
87 pounds ear corn	@ 2.0¢	=	1.74
94 pounds cottonseed meal	@ 4.5¢	=	4.23
177 pounds alfalfa hay	@ 2.25¢	=	3.98
124 pounds gin trash	@ .5¢	=	.62
Total per head			$19.61

This was the cost of the feed consumed before the steers went on full grazing, February 13.

SPRING GRAZING

The following outline shows the number of steers, period of grazing, number of acres and the results obtained:

No. head: 81
Period: February 14 to May 16, 1952
Type of grazing: oats and bur clover combination (Figure 18)
No. of acres: 55 acres in three pastures
Steer weights: February 13, 446 pounds; May 16, 649 pounds
Gain per steer: total, 203 pounds; per day, 2.2 pounds
Gain per acre: 298 pounds
Surplus baled hay produced: 25 tons good quality oat hay on 20 acres.

SUMMER GRAZING

To obtain satisfactory gain during the heat of July, August and September, the cattle must be kept as comfortable as possible (Figure 16). Portable shades are moved each time the steers are placed in another pasture. Regardless of the amount and quality of the forage (Figure 17), cattle will seek comfort rather than attempt to gain weight. Fresh water, shade, salt and minerals are available in all pastures.

An outline of the summer grazing period follows:

No. head: 80
Period: May 16 to September 8, 1952
Type of grazing: Sudan (common)
No. of acres: 52.5 in three 17.5-acre pastures
Steer weights: May 16, 649 pounds, September 8, 787 pounds
Gain per steer: total, 138 pounds; per day, 1.2 pounds
Gain per acre: 210 pounds
Surplus baled hay produced: 14.6 tons hay off one pasture
Other grazing: 630 cow-days grazing; 385 calf-days grazing

The steers just about maintained their weight during two weigh periods while on one pasture of Sudangrass, which was seeded on Bermudagrass sod without fertilizer. The gains were made on the two pastures of straight Sudan, one of which was heavily fertilized with ammonium nitrate.

Grazing 80 steers on 52.2 acres for 115 days with 1.2 pounds daily gain seems extremely good when only 1.69 inches of rain fell between June 1 and September 8. Also, these steers had grazed lush pasture and made high gains before they were turned on Sudan.

Table 2. **Feed required for fall and winter feeding and grazing of steer calves, October 15, 1951 to February 13, 1952, 120 days**

Daily ration	Period							
	Oct. 15 Nov. 30	Dec. 1 Dec. 5	Dec. 6 Dec. 18	Dec. 19 Dec. 31	Jan. 1 Jan. 5	Jan. 6 Jan. 14	Jan. 15 Jan. 31	Feb. 1 Feb. 13
	Pounds per head							
Dehydrated sorghum plants	3.8	8.5	Grazed	8.5	4.00	Grazed	4.00	Grazed
Ground ear corn	1.9	—	oats	—	—	oats	—	oats
Cottonseed meal	.8	1.25		1.25	1.25	—	1.25	1.25
Alfalfa hay	1.0	—	4.0	—	—	3.00	—	—
Gin trash	—	—	—	—	4.00	—	4.00	8.00
Total	7.50	9.75	4.00	9.75	9.25	3.00	9.25	9.25

Average weight: Oct. 15, 398 pounds; Dec. 6, 426 pounds; Feb. 13, 446 pounds.

Figure 18. Steers grazing oats and bur clover with the stand about 50 percent each. Bloat from bur clover gives little trouble with this combination.

From September 8 until they went on feed in October, part of the steers grazed the 52.5 acres of Sudan, some grazed a 9.25-acre plot of irrigated Sudan and some grazed a small area of irrigated common Bermuda. The steers gained an average of 23 pounds per head from September 8 to October 1.

What Were the Returns on Pasture Before Drylot Feeding?

Net returns from pasture and wintering feeding were small because of a sharp decline in cattle prices. The calves used were purchased on the Fort Worth stockyards. On a base weight of 398 pounds, they cost $38.85 per cwt. delivered to the Laboratory. Three head died. Death loss, winter feed, veterinary service and delivered cost totaled $183.92 per head.

The steers averaged 810 pounds per head on October 1 and were appraised at $23 per cwt., or $186.30 per head, (Figure 19). This left only $2.38 per head for pasturage returns despite the very good average gain of 412 pounds from the weight at purchase.

DRYLOT FEEDING

What Is the Purpose of Drylot Feeding?

Drylot feeding raises the carcass grade of summer-grazed yearling steers and permits the sale of low cost grass gains at finished beef prices. Corn, alfalfa, oat hay and Johnsongrass hay are marketed through the steers. Steers can be finished to Choice grade (Figure 20), but winter feeding in this section normally is at a disadvantage because of mud (Figure 21). The fattening operation may or may not be profitable, depending on market prices. But the marketing of both grazing and feed crops through steers appears to be one means for using land retired from cotton.

The drylot feeding of the steers is summarized in Table 3 according to the dates of marketing. A truckload, or 20 head of the fattest steers, Lot 1, were started on feed in a separate pen on October 1. They were marketed December 16, 1952, or after 76 days in drylot.

Lots 2 and 3 also were started on feed October 1 and were fed together. Lot 2 steers were sorted and sold December 28, 1952, or after 87 days on feed. Lot 2 could not be weighed before shipment because of the mud. The market was declining and the steers were sold when they were Good to Choice in grade. The third group of steers, identified at Lot 3, was sold February 16, 1953.

Lot 4 steers, which were kept on Sudangrass until October 28 and 5 steers cut back from the other lots, were sold March 3, 1953, or 152 days after October 1, 1952. The average ration and feed cost were based on the period October 28 to March 3.

At current feed costs and at no charge for labor, equipment or interest, the steers showed an average loss of approximately $20. Considering that the steers were not shrunk at the outset, gains were fair to good and 59 of the 80 steers reached Choice grade.

SLAUGHTER CALF PRODUCTION

Slaughter calves have furnished a dependable source of revenue for the Laboratory since 1942 when 12 grade Hereford cows were purchased. The object since that time has been to determine the best pasture and cattle management for Brazos River bottomlands.

What Kind of Cattle Are Used?

Grade Hereford and half Brahman-Hereford cows make up the cow herd. Registered Hereford bulls are used.

How Many Cows Are Used?

When the pasture improvement program was started in 1946, there were 46 cows which dropped calves, some of them being born during almost every month. In 1953, there were 108 cows with approximately 85 percent of their calves being born between September 29 and January 16.

Of the 480 acres of available land, 70 acres were used in 1952 for corn production and experimental field crops. Therefore, 410 acres furnished grazing and winter hay for 80 steers and heifers, 5 bulls, and 108 cows and calves, with the calves being sold at about 8 months of age.

Figure 19

Eighty steers averaged 810 pounds after summer grazing. Some of the steers stood the heat better than others and carried much more finish.

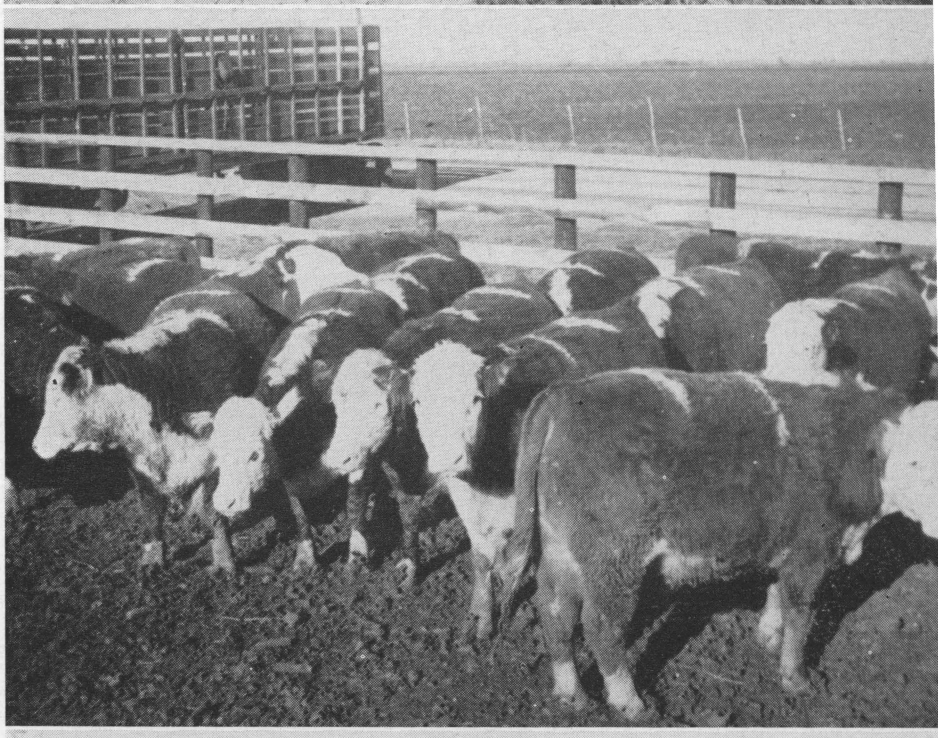

Figure 20

Lot 3 (Table 4) steers just before they left for market. Average weight was 1,093 pounds. These steers were fed 133 days and gained an average of 2.25 pounds per day.

Figure 21

Mud is one of the disadvantages of feeding cattle in the Brazos bottoms. The daily gain is low when cattle have to bed down on cold, wet ground.

Figure 22

Replacement heifers are branded with an individual number. A record is kept on each cow.

Figure 23

Dehorned cattle cause much less damage and are easier to feed and house.

Figure 24

Spraying cattle is effective in the control of external parasites.

How Do We Get Fall Calves?

The Laboratory leaves the bulls with the cows from January 1 to July 1. In changing from year-round calving, taking the bulls away from the cows in October, November and December the first year will eliminate most of the summer calves. The bulls should be taken out the second year by September 1.

What Percentage Calf Crop Is Obtained?

The calf crops sold from 1946 through 1952 have ranged from 85 to 94 percent. A 97 percent calf crop was born in 1952-53; 94 percent lived and were sold in 1953.

How Many Bulls Are Used?

Five bulls were used on 108 cows and heifers during 1952. Two of the bulls were young and one old bull was lame most of the year. Where cows are grazed in small pastures, only one bull is used at a time. The bulls are moved in and out of the pastures as they need rest. It is more important to get a high percentage calf crop than to know exactly how many calves each bull gets. However, each cow has an individual number brand (Figure 22) and records are kept of the cows in each herd. Some of the calves can be identified by this method but not all because of changing bulls.

Do We Dehorn?

All cows are dehorned. Calves that are to be kept for replacements and for feeder steers are dehorned while they are small. Dehorned cattle can be fed and housed in much less space than those that are not dehorned (Figure 23).

Do We Control External Parasites?

Cattle must be kept as comfortable as possible if they are to make maximum gains. A cow cannot graze and produce a normal supply of milk if she is aggravated by lice, mange, flies and other parasites. The cattle are sprayed as often as necessary (Figure 24).

Is It Necessary to Use Minerals?

Salt and minerals should be kept before the cattle the year round. If they do not need it, they will not eat it. The Laboratory keeps granulated salt and a granulated salt-steamed bonemeal mixture before the cattle at all times (Figure 25).

During the past 3 years, only one cow had any trouble after calving and all our calves have been born strong.

Is Shade Near Water an Advantage?

Plenty of good water is a "must" for cattle. Shade and water together in different parts of

Table 3. Summary of drylot fattening, October 1, 1952 to March 3, 1953

Lot number	1	2	3	4
Number of steers	20	20	20	20
Date sold in Fort Worth	12/16/52	1/28/53	2/16/53	3/3/53
Days on feed	75	87	137	152[1]
Averages in pounds per steer unless otherwise noted				
Initial weight	881	806	794	759
Final weight at feedlot	1042	[2]	1093	1065
Market weight	996	927	1028	1019
Daily gain, market basis	1.53	1.39	1.71	1.71
Shrink enroute market, %	4.41	[2]	5.95	4.32
Warm carcass weight	598	549	640	608
Dressing percent, basis warm carcass and market weights	60.04	59.20	62.3	59.7
Carcass grades: U.S. Prime	0	0	1	0
Choice	16	10	14	19
Good	4	10	5	1
Average ration fed				
Ground ear corn	14.50	13.26	14.54	16.30
Cottonseed meal	1.80	1.78	1.96	2.00
Alfalfa hay	8.00	9.24	8.24	8.25
Oat hay	4.70	5.39	4.04	0
Cost in feedlot @ $23 per cwt.	$202.63	$185.38	$182.62	$174.57
Feed cost[3]	51.36	60.91	94.09	82.53
Marketing cost @ $.67 per cwt.	6.67	6.21	6.89	6.83
Selling price per cwt.	28.00	25.00	23.35	22.25
Amount received	278.88	231.75	240.04	226.73
Net return	18.22	–20.75	–43.56	–37.20

[1]Fed in drylot 126 days.
[2]Could not be weighed because of the mud.
[3]Feed prices per ton: ground ear corn, $44; cottonseed meal, $90; alfalfa hay, $50; oat hay, $36.

Figure 25

Salt and minerals should be available for cattle at all times.

Figure 26

Good, clean water and shade contribute to a more profitable cattle program.

Figure 27

Ear-notching baby calves is easily done and causes little bleeding. This calf is ear-notched number 6.

Table 4. Calving record

Cow & calf no.	Date born	Sex	Castrate	Vaccinate	Date 7 mos. old	Date sold	Sale weight	Total sale value
13	Oct. 1	H	—		May 1			
99	Oct. 15	B	x		May 15			
22	Oct. 15	B	x		May 15			

the pastures will cause more uniform grazing. Shade should be near the water if possible, (Figure 26). Half-Brahman cows do not use shade as much as Hereford cows.

Are Baby Calves Marked?

Each calf is ear-notched (Figure 27) the same number as its mother. When the calves are 1 to 4 days old, they are ear-notched, the naval cord is clipped and bull calves are castrated.

What Is the Ear-notching System?

Different notches in the left and right ear are given a number value (Figure 28). The values of all notches are added. Each ear notched all the way around would be 99. Two notches on the top of the left ear would be 100.

If the cows are not branded, the calves as born may be ear-notched, starting with No. 1 and continuing through the total number of cows that have calves. They can be notched once a week or as they are penned. All replacement heifers are branded as well as ear-notched.

Why Mark Each Calf and Brand Each Cow?

A production record can be kept on each cow if both the cow and calf can be identified. A simple form of record keeping can be used to show the kind of calf each cow produces. After a few years, a study of these records will indicate two things to be done: (1) cull out the cows that produce light, poor quality calves and (2) determine the best time of the year for calves to be born to return the most profit. It is much better to build a herd around good producers than around good looks. Performance is the only reliable guide to use for selection.

After the calves are ear-notched with the same number as the mother, the cow and calf are observed as a pair. If a calf is not doing well, it is easy to locate the mother to see if she is sick and not giving enough milk, or if she is permitting another calf to suck. If it becomes necessary to separate the cattle for grazing purposes or for selling, it is very easy to pair up the cows and calves. When a calf is sold, the weight, age and selling price are credited to its mother. It also is easy to locate any animal for treatment and re-treatment or to locate the vaccinated calves.

Table 4 shows the information kept on each calf.

When Do We Vaccinate?

The calves are vaccinated as they accumulate into groups of 10 to 30 head. Each calf is checked off the list as it is given a combination vaccine for malignant edema and blackleg.

How Do We Select Replacement Heifers?

Large, fast-growing heifers are selected from cows which have produced good calves. Most of the replacements come from the early calves.

Do We Creep Feed?

Calves are creep fed, principally in the winter while the cows receive supplemental feed. The calves were creeped for about 5 weeks during the winter of 1952-53 (Figure 29). After bur clover and oats begin to furnish grazing, the cows and calves are rotated often and it is not convenient to move the creep near the calves.

About 75 percent of the calves produced are sold in May and June and at the top of the market for milk-grass-fat slaughter calves. Good to Choice grass-and-milk-fat calves (Figure 30) have been profitable, particularly when sold early. Quality is important in producing Choice grade, either with or without supplemental feeding. A good beef-type bull and a good milking cow are required to produce a Choice calf off milk and grass alone.

Why Breed for Fall Calves?

Calves dropped in the fall fit into a crop-farming system with some definite advantages:

1. Fat calves normally bring a better price in April, May and June.
2. Early revenue is needed to carry on other farm operations, when no other revenue is available.
3. Fall calves are heavier at weaning time than spring calves.
4. Fall calves are large enough to graze and utilize milk produced during the flush of spring grazing.
5. Fall calves normally carry enough bloom off milk and grass and do not require additional feed.
6. Few cows develop bad udders when calves are dropped in the fall and winter.
7. Calves can be sold ahead of midsummer heat when both pasturage and milk may become short.
8. In a crop-farming system, more labor is available for cattle operations during the fall and winter.

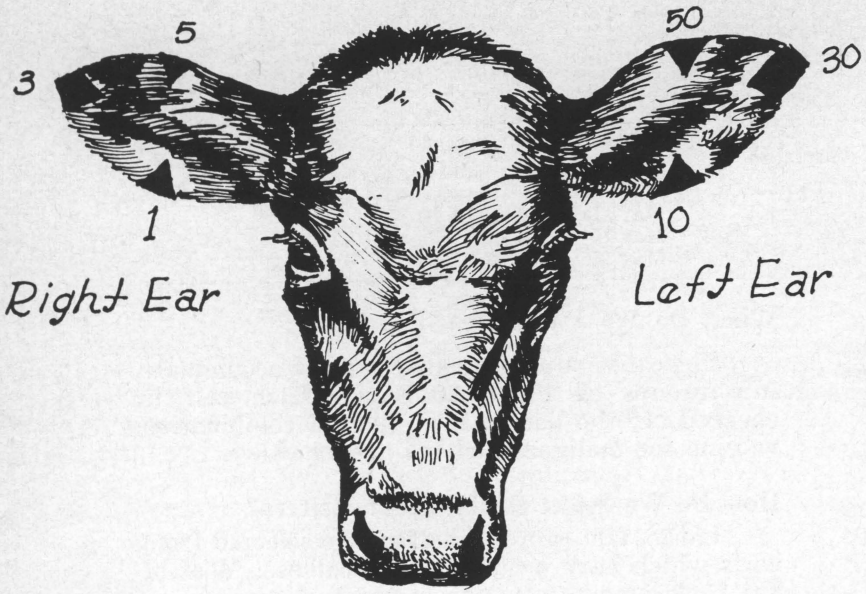

Figure 28

This diagram shows the number value of each notch. A calf ear-notched all the way around would be 99.

Figure 29

A calf creep should be located where the mother cows stay during some part of the day. A young calf will not wander far from its mother to eat.

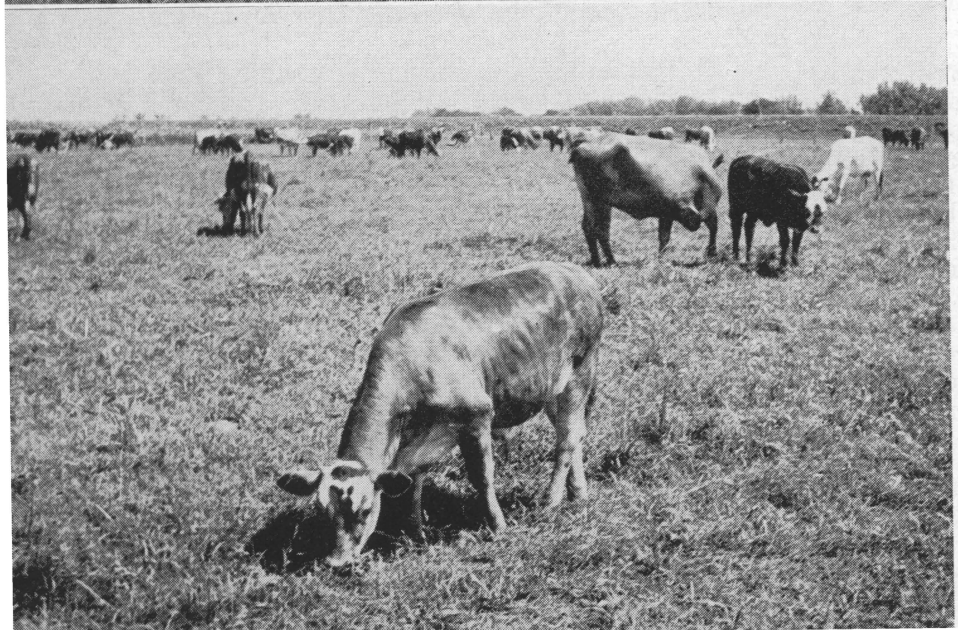

Figure 30

This calf was 214 days old when sold and it weighed 490 pounds with a 12-hour shrink. The calf in the background weighed 460 pounds with the same shrink.

Are Labor and Feed Requirements Greater for Fall Calves?

Cows must be cared for during calving, regardless of the time calves are dropped. More severe weather is expected for calves dropped in the fall and winter, but there is little trouble from flies and worms.

When grazing is short, cows must be fed regardless of the time of calving. A large cow, dry during the summer, will go into the winter 200 to 250 pounds heavier than a cow nursing a calf during the summer. If a cow bred to calve in the spring is not fed right during the winter, her calf will be born weak.

All the cows are grazed together except during calving when the cows with baby calves are pastured separately.

MANAGING THE STEER-SLAUGHTER CALF PROGRAM

The cows and the steers are pastured and fed separately. The steers are given first choice of the grazing. The cows follow the steers and they tend to graze down the tall grasses and clean up the stalk fields more uniformly than the steers. Sudan is mowed after the cows leave the coarser stems. Then the steers get the first use of the regrowth.

Yearling steers are either sold or put on feed in late summer or fall. The yearlings are followed by the purchased steer calves but the calves do not make a heavy grazing load at first. This is because of weaning and the lighter weight. Oat grazing usually becomes available after the calves are weaned. As spring comes, the steer calves have enough growth to make good use of the flush feed.

The storage of both hay and corn affords insurance for the grazing program. The use of both cows and steers permits a flexible program and efficient use of both high and low quality farm feeds.

ACKNOWLEDGMENTS

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