COASTAL BERMUDA GRASS IN TULARE COUNTY

By: Robert F. Miller, Farm Advisor

ORIGIN:

Coastal Bermuda grass is a hybrid between Tift Bermuda and a Bermuda introduced from South Africa. It was developed as follows:

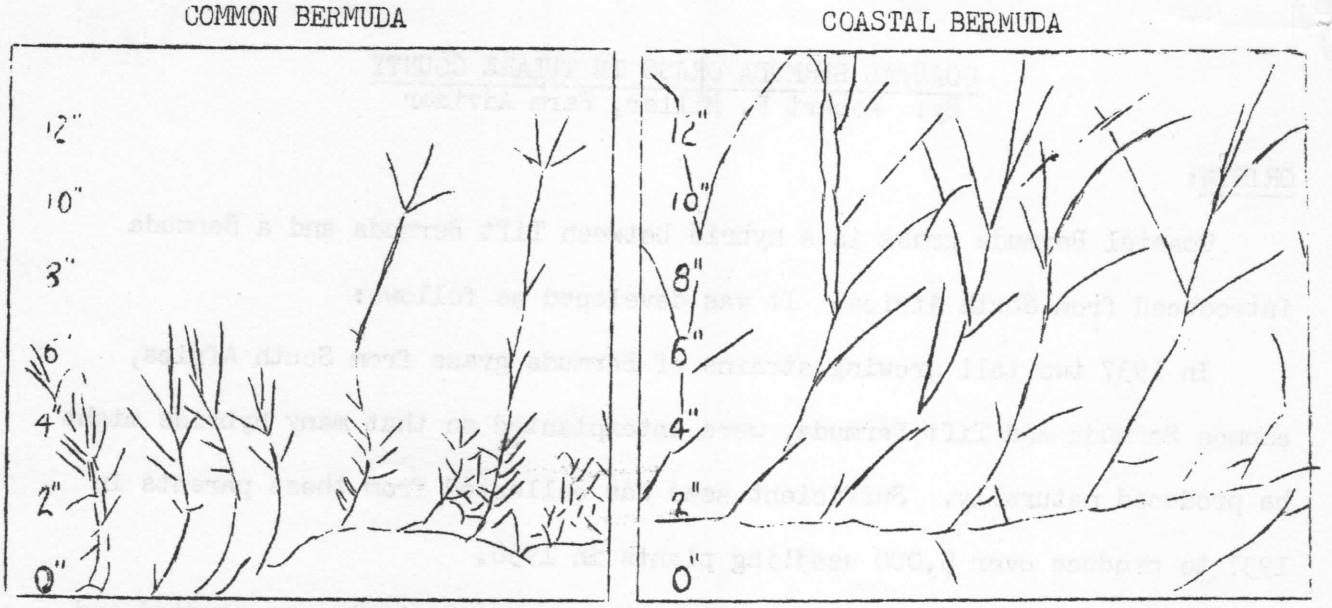
In 1937 two tall growing strains of Bermuda grass from South Africa, common Bermuda and Tift Bermuda, were interplanted so that many hybrids might be produced naturally. Sufficient seed was collected from these parents in 1937 to produce over 5,000 seedling plants in 1938.

During the summer of 1938 each of these seedling plants was studied and the most promising individuals were selected. In 1939, 147 of the most promising individuals were selected and placed in plots. Several of the superior selections spread as much as 18 feet in three months and most of the plots were completely sodded by fall.

In subsequent years, the rate of spread, disease resistance, sod density, cold tolerance, earliness of growth and forage yielding ability of these strains were studied and recorded. In all of these comparisons, selection number 35 ranked unusually high. When it became evident that this hybrid would have a place in Southeastern agriculture, it was named "Coastal Bermuda" in recognition of the experiment station where it was developed.[2] Coastal Bermuda was first planted in Tulare County in August, 1956.

DESCRIPTION:

When compared with common Bermuda, the stems, stolons (above ground runners) and rhizomes (underground runners) of Coastal Bermuda are found to be larger and to have much longer internodes. Its leaves have a light green color and are much longer than the leaves of common Bermuda. It produces fewer seed heads than common Bermuda and those that are produced rarely contain viable seed.[2]



COMPARISON OF COASTAL AND COMMON BERMUDA PLANTS.[2]

In the Central Valley of California, Coastal Bermuda is a summer growing forage crop requiring irrigation every ten days to two weeks, depending on soil type. It requires warm weather and has a growing season from May through October. Its maximum growth is attained during the hottest part of the summer. Coastal Bermuda is generally used as an irrigated pasture but it also grows tall enough to be cut for hay.

ADAPTATION:

Coastal Bermuda can be grown on soils ranging from sandy loams to clays but it appears to do best on well drained fertile sandy loams. However, it will produce fairly well on heavy soils containing a high salt content and has attracted much attention for this characteristic. In Texas, the salt tolerance of Coastal Bermuda was compared to Rhodes grass by adding sodium chloride or salt to the irrigation water. After eleven irrigations with water containing 4,500 parts per million of soluble salts, the yield of Coastal Bermuda was reduced from 6.25 tons/acre to 4.85 tons/acre compared to a reduction in yield of Rhodes grass from 4.98 tons/acre to 4.01 tons/acre.[4]

Coastal Bermuda is an efficient user of plant foods, particularly nitrogen. In a 1955 Texas trial varying rates of nitrogen were applied to Coastal Bermuda

and the amount removed in the harvested forage was measured. When 150 lbs. of N/acre were applied, 120 lbs. of it were recovered in the harvested forage. At the 300 lb. N/acre level, 200 lbs. were recovered and at 450 lbs. N/acre, 280 lbs. were recovered. The yield was increased from 4.4 tons/acre with 150 lbs. N/acre to 9.5 tons/acre with 450 lbs. N/acre. The protein content was also increased from 9% at the 150 N/acre level to 10% at the 450 N/acre level.[3]

ESTABLISHING THE STAND:

Since Coastal Bermuda does not produce seed, it must be started from small shoots of established plants called sprigs. At the present time these can be obtained from commercial concerns specializing in the sale of Coastal Bermuda sprigs. If many acres of Coastal Bermuda are to be planted it would be more economical to establish a small nursery in which to grow planting material. A 1/3 acre Coastal Bermuda nursery that has made good growth should supply sprigs for 15 to 20 acres.[5] If possible, the nursery should be located on sandy soil for ease of digging.

Harvesting the nursery may begin after good growth has been obtained. Top growth should be removed by mowing and raking. The nursery can than be cross cut with a disk and the sprigs can be loosened with a spring tooth harrow and windrowed with a side delivery rake. Many nurseries can be harvested twice a year. The sprigs should be planted as soon as possible after digging to prevent drying which reduces viability. If they are placed in piles deeper than a foot, they will need wetting and turning to prevent heating. Sprigs should not be dug more than 24 hours ahead of planting.

The rate of planting should be determined by the availability of sprigs and the planting method employed. The maximum spacing suggested is one sprig every three feet in a three foot row. This will require about 9 bushels of sprigs per acre when planted by hand.[5] Closer plantings will take proportionately more sprigs but will provide a quicker cover with less weed problems.

Coastal Bermuda can be planted after danger of frost is past in the spring and within one month before frost in the fall. In Tulare County, fall plantings have proven to be most successful because of less competition from weeds. It is necessary to keep new plantings moist until they become established and this moisture encourages the growth of water grass and other water weeds during the summer.

PLANTING METHOD AND SEEDBED PREPARATION:

Coastal Bermuda can be planted by hand or machine on the flat or in the bottom of furrows. Hand planting in the bottom of small furrows is perhaps the surest way of establishing a stand. The sprig can be dropped in the bottom of a furrow that has been irrigated and pushed into the moist soil with a notched stick. Advantages of this method are several. The man planting operates on dry ground and weed competition between rows is lessened. After the plants become established, the furrows can be cultivated closed. Flood irrigation can then be initiated.

In other cases, Coastal Bermuda has been hand planted in checks that have been previously flooded. The man planting cannot operate as efficiently in this case because of the muddy conditions of the field. Weeds are also more of a problem in this situation.

Commercially manufactured sprig planters work satisfactorily but the sprigs are not placed as desirably as by hand and more sprigs are necessary. Vegetable transplanters may also be used with the sprigs being placed by hand in the furrow opened by the machine. In heavy or alkali land, machine planting is generally carried out on dry ground with an irrigation following immediately.

Broadcasting about 50 bushels of sprigs per acre with a manure spreader and covering with a disk and cultipacker is another method sometimes employed.[2] Irrigation must immediately follow this type of planting.

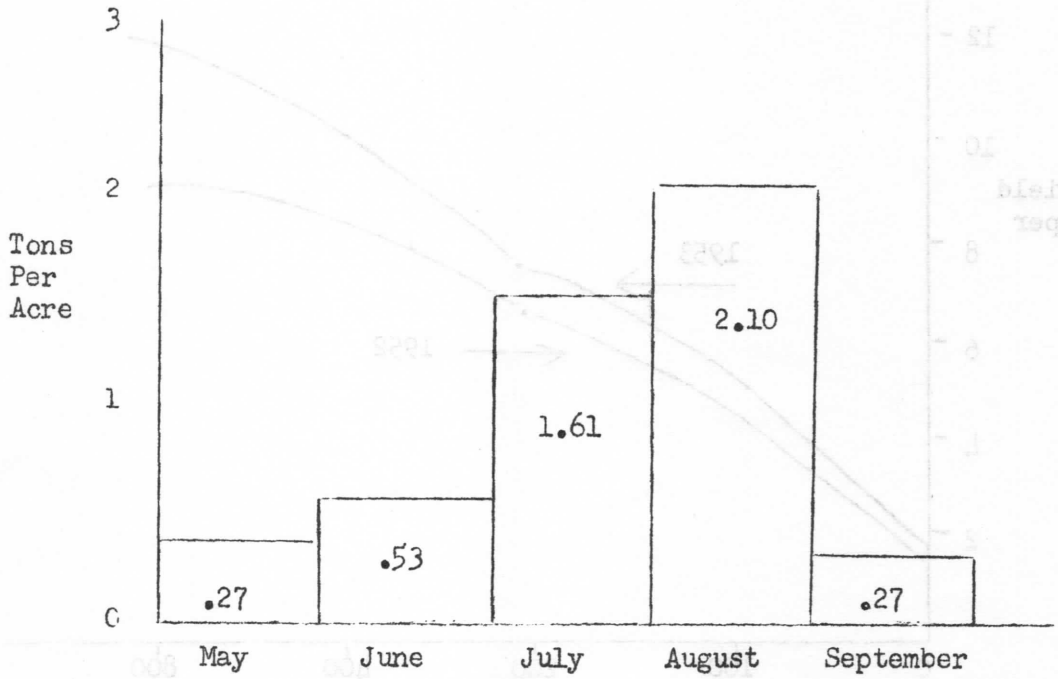
There are commercial companies who contract plant Coastal Bermuda. In this case, everything is furnished including labor, equipment and sprigs and a set price per acre is charged.

Regardless of the planting method used, a well prepared firm and level seedbed is required. Following planting it may be necessary to control weeds between rows by a shallow cultivation. After the stand is established, annual winter weeds can be controlled by mowing and since an established stand is fairly drought resistant, delaying an occasional irrigation should help discourage water-loving weeds.

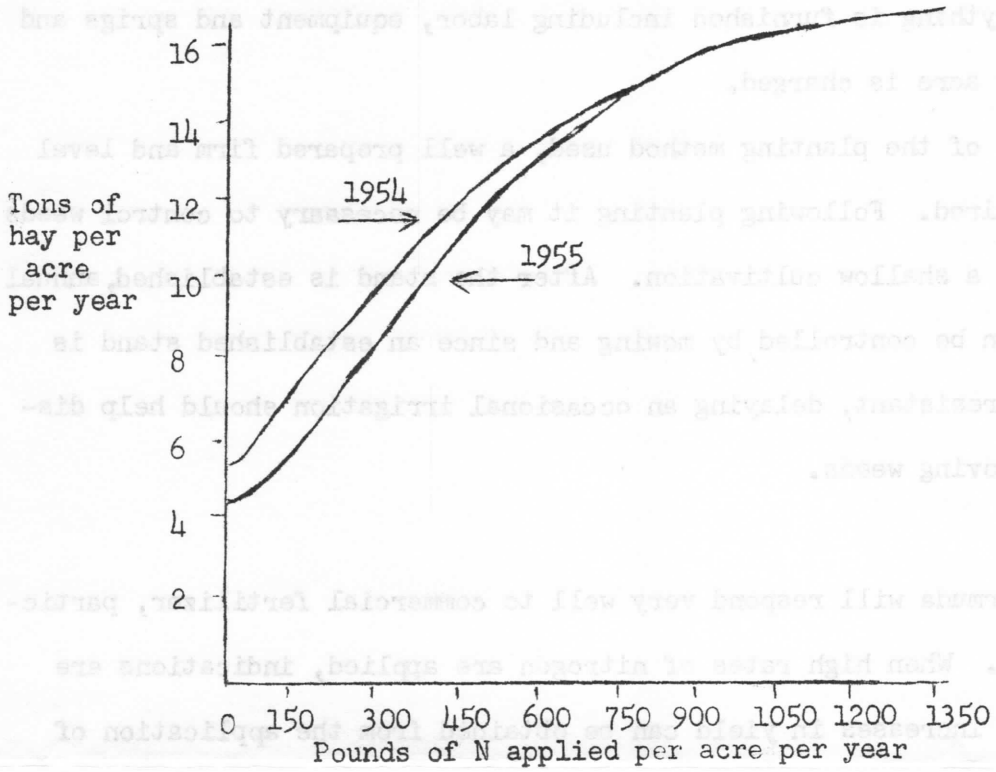
FERTILIZATION:

Coastal Bermuda will respond very well to commercial fertilizer, particularly nitrogen. When high rates of nitrogen are applied, indications are that additional increases in yield can be obtained from the application of phosphorous. The following charts show the results of some yield trials which have been conducted.

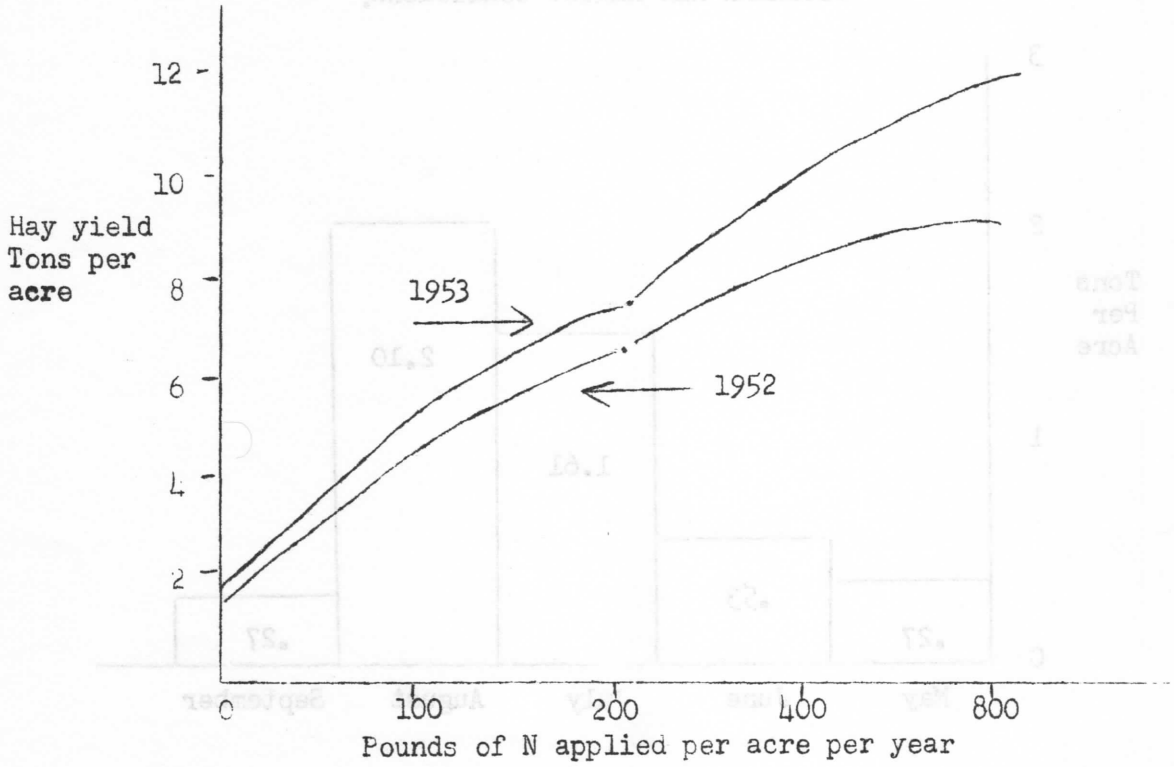
MONTHLY PRODUCTION OF COASTAL BERMUDA GRASS UNDER SOUTHERN NEW MEXICO CONDITIONS[6]



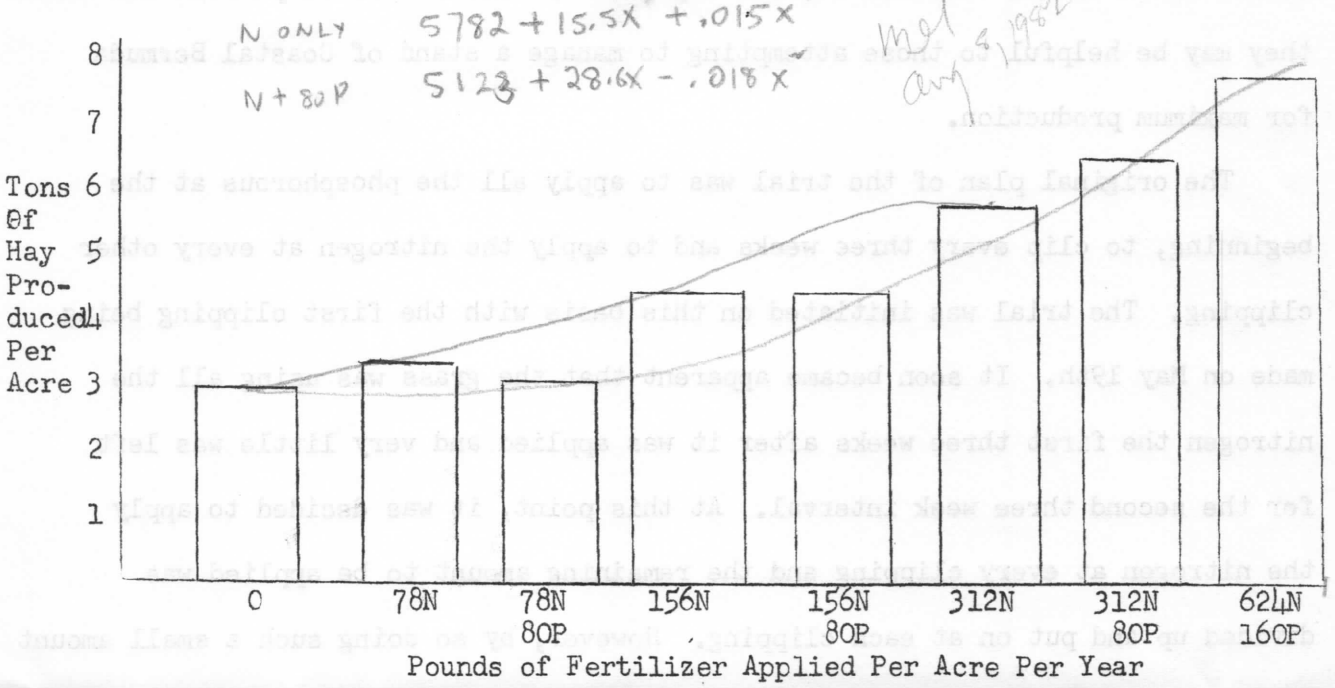
EFFECT OF NITROGEN ON HAY YIELD OF COASTAL BERMUDA GRASS - COLLEGE STATION TEXAS - 1954-55.[3]



THE INFLUENCE OF NITROGEN FERTILIZATION UPON THE YIELD OF COASTAL BERMUDA HAY IN A DRY (1952) AND WET (1953) SEASON IN GEORGIA.[2]



INFLUENCE OF NITROGEN AND NITROGEN PLUS PHOSPHOROUS ON THE YIELD OF COASTAL BERMUDA HAY IN TULARE COUNTY, 1958.[7]



INFLUENCE OF NITROGEN AND NITROGEN PLUS PHOSPHOROUS OF THE CHEMICAL COMPOSITION OF COASTAL BERMUDA GRASS IN TULARE COUNTY, 1958

Fertilizer Applied	Total Dry Matter	Protein	Fat	Fiber	Nitrogen Free Extract	Mineral Matter
0	34.9	4.0	.6	9.8	16.7	3.8
78N	33.4	3.9	.6	9.2	15.9	3.8
78N + 80P	33.5	3.6	.6	9.2	16.3	3.8
156N	33.4	4.1	.6	9.3	15.6	3.8
156N + 80P	33.4	3.8	.6	9.1	16.1	3.8
312N	32.5	3.9	.6	9.0	15.4	3.6
312N + 80P	31.6	3.9	.6	8.7	14.9	3.5
624N + 160P	29.6	4.4	.6	8.0	13.3	3.3

OBSERVATIONS ON TULARE COUNTY TRIAL

Maximum hay yields possible may not have been reached under the conditions of the above trial. The reasons for depressed yields should be pointed out since they may be helpful to those attempting to manage a stand of Coastal Bermuda for maximum production.

The original plan of the trial was to apply all the phosphorous at the beginning, to clip every three weeks and to apply the nitrogen at every other clipping. The trial was initiated on this basis with the first clipping being made on May 19th. It soon became apparent that the grass was using all the nitrogen the first three weeks after it was applied and very little was left for the second three week interval. At this point, it was decided to apply the nitrogen at every clipping and the remaining amount to be applied was divided up and put on at each clipping. However, by so doing such a small amount was applied in the lower rate plots, the nitrogen holding capacity of the sod was not overcome and little, if any, nitrogen was left for the plant to use.

It further appeared that a three week clipping interval was too short. Coastal Bermuda is like many other plants in the respect that the more leaf surface it has the faster it grows up to the time seed heads are formed. For this reason, a four week clipping interval would probably have produced more total yield than the three week interval used. It would also have given the plant a better opportunity to utilize to the fullest extent, the higher rates of nitrogen used.

The third factor which seemed to depress yield was the close clipping job done. For a fast recovery following clipping or grazing, some green leaf area should be left. In the attempt to harvest the total three week growth, not enough of this green leaf surface was left on the plants in the test plots and subsequent recovery was delayed.

These three points - 1. Four week harvest period, 2. heavy fertilization (75#/acre or more) of nitrogen when it is applied and 3. leaving some green leaf area when harvested - will be most important to the Coastal Bermuda grower in his attempt to obtain maximum yields.

FEEDING TRIALS:

Most of the grazing trials with Coastal Bermuda have been carried on in the southern United States. Some of these trials are listed in the charts below.

BEEF PRODUCTION FROM COASTAL BERMUDA GROWING AT TIFTIN, GEORGIA.[2]

Annual Fertilization	Pounds of Animal Gain/Acre Obtained In 1950	1951	1952
No Nitrogen	294	230	252
50 lbs. N/acre	330	301	279
100 lbs. N/acre	526	466	451
200 lbs. N/acre	685	697	669

AVERAGE ANNUAL BEEF YIELDS PER ACRE FROM COASTAL BERMUDA GRASS AT THE WIREGRASS SUBSTATION, ALABAMA, 1953 - 1955.[1]

Rate of Nitrogen/Acre	Pounds of Beef Produced/Acre
No Nitrogen	284
80 lbs. N/acre	358
160 lbs. N/acre	495
320 lbs. N/acre	684

PASTURE MANAGEMENT:

Proper management of a Coastal Bermuda pasture revolves around four main points. These are - 1. rotation, 2. irrigation, 3. fertilization, and 4. weed control.

Some type of rotation system should be followed for maximum production. In general, the more subdivisions a pasture has, the greater will be the grass production which will result in a higher carrying capacity. However, there does not seem to be a correlation between the amount of subdivisions and the daily gain per head. In some instances, when less than the maximum number of head possible are carried on a pasture, a higher daily gain per head can be obtained. Less number of head per acre reduces disease and parasite problems. In addition, what cattle are carried can selectively graze the more palitable and nutritious parts of the plant which results in a greater daily intake of higher quality feed.

Coastal Bermuda is a fairly drought resistant plant and more cases of over-irrigation than under-irrigation have been observed. Over-irrigation is wasteful of water and also contributes to the growth of water-loving weeds. No set irrigation interval can be suggested since this will vary with soil type, temperature, and rate of plant growth. The amount of moisture in the top foot of the soil and the condition of the grass are the best indicators of the proper irrigation interval.

Coastal Bermuda is an efficient user of plant foods. The amount and frequency of application of fertilizer can be varied according to the amount of cattle carried and the condition of the pasture. However, fertilizer should not be applied until after the grass breaks dormancy in the spring. If fertilizer is applied before this, it often contributes to the growth of annual winter weeds at the expense of the grass.

An occasional mowing is advisable to control weeds and to break up grass clumps around droppings. If winter weeds develop, these should be mowed in the early spring to allow the grass to break dormancy quicker.

OTHER CONSIDERATIONS:

There are problems and opportunities regarding Coastal Bermuda which still need answers. These are:

1. Will legumes such as trefoil or ladino clover grow compatibly with Coastal Bermuda?
2. Will burning the dry grass in the winter improve productivity?
3. How well is Coastal Bermuda adapted to other parts of the state?
4. How does it compare to other improved varieties of Bermuda under local conditions?
5. Can Coastal Bermuda be over seeded in the fall with barley, rye or bur clover to provide winter feed production?
6. How easily can it be erradicated?
7. Will renovation of the sod improve productivity?
8. How does it compare in yield, carrying capacity and gain per acre to other irrigated pasture mixes under like conditions of fertilization and management?
9. Will supplemental feeding of livestock being pastured be more economical or profitable than fertilization?
10. Can less expensive methods of stand establishment be developed?

The answers to these questions will decide the ultimate position of Coastal Bermuda as an irrigated pasture grass.

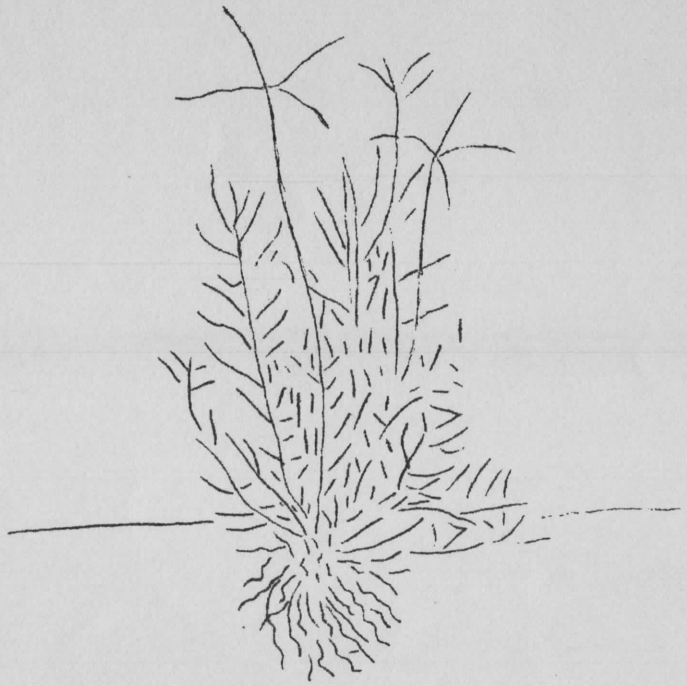
BIBLIOGRAPHY:

1. Andrews, O. N.; Coastal Bermuda For Grazing, Hay, Silage; The Alabama Polytechnic Institute; Circular 476, January 1957
2. Burton, Glenn W.; Coastal Bermuda Grass; Georgia Agricultural Experiment Station Bulletin N.S.2, September 1954
3. Fisher, F. L. et al; Nitrogen Requirements of Coastal Bermuda Grass Under Supplemental Irrigation at College Station; Texas Agricultural Experiment Station Progress Report 1837; December 1955
4. Gausman, H. W.; Salt Tolerance of Five Grasses; Texas Agricultural Experiment Station Progress Report 1620; October 1953
5. Trew, E. M.; Coastal Bermuda Grass; Texas Agricultural Extension Leaflet 281
6. Wilson, M. L. et al; Coastal Bermuda Grass in Southern New Mexico; New Mexico Agricultural Experiment Station Press Bulletin 1133; March 1955
7. Grateful acknowledgment is made to Mr. Robert S. Lard and his personnel whose help and cooperation made the 1958 Coastal Bermuda Grass Trial in Tulare County possible.

dn
2/3/59

Marble

COASTAL BERMUDA GRASS
IN
TULARE COUNTY



University of California
Farm & Home Advisors Office
Tulare County
Post Office Building, Visalia