MIDLAND

Bermuda Grass

A NEW VARIETY

FOR OKLAHOMA PASTURES

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BULLETIN NO. B-416 FEBRUARY, 1954

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By Jack R. Harlan, Glenn W. Burton, and W. C. Elder*

Since Coastal Bermuda-grass was introduced into southern agriculture, considerable interest has arisen in the possibility of other improved types of Bermuda-grass for pasture and hay. This publication describes a new strain of Bermuda-grass that is similar to Coastal, but is more winter hardy. It is adapted to areas north and west of the section where Coastal gives its best performance.

Midland, like Coastal, was developed in Georgia. It is a hybrid between Coastal and a hardy variety from Indiana. Tests at Stillwater, Oklahoma, since 1949 show that:

- Midland can be recommended for use throughout the Bermuda-grass area of Oklahoma.
- It is two to four times as productive as unselected common Bermuda-grass on fertile soils. However, where fertility is low, it is no more productive than common Bermuda-grass.
- Midland has somewhat less desirable forage than Coastal, but is much more winter hardy.
- Midland is palatable, has good disease resistance, and does not produce as many seed heads as most common types of Bermuda-grass.
- Midland is a better companion crop for legumes than common types because it has fewer rootstocks. However, this also makes it somewhat slower to increase.

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Origin and Description

Midland Bermuda-grass is a first generation hybrid between Coastal Bermuda and a hardy variety from Indiana. The cross was made at Tifton, Georgia, in 1942; and in 1943 several of the resulting hybrids were selected as being especially productive and vigorous. In 1949, several of these hybrids were brought to Oklahoma for trial. It was quickly apparent that one (designated as No. 13) was an outstanding variety for Oklahoma conditions. After further testing, No. 13 was released by the Oklahoma station with the name "Midland."

Midland Bermuda-grass is a tall, leafy, forage type producing a lax, open sod. It is both cold and drought resistant, starts growth in the early spring, and has good resistance to foliar diseases.

Midland resembles Coastal in many ways but can be distinguished by its darker green leaf, somewhat harsher texture, somewhat greater

A plot of Midland Bermuda-grass (left) compared with one of the Oklahoma common types of Bermuda (right). The rhizomes of Midland are long and straight and do not form a dense mat below the ground surface as do common types. This new strain is both cold and drought resistant, starts growth in early spring, and has good resistance to foliar diseases.

tendency to produce seed heads, and its earlier spring growth and greater cold hardiness. It may be distinguished from common Bermuda-grass types by its lax, open sod, tall leafy growth, greater disease resistance, and comparative paucity of rootstocks.

The rhizomes of Midland are long and straight and do not form a dense mat below the ground surface as do common types. This quality makes it a superior variety as a companion crop for legumes, but also makes it more difficult to increase vegetatively because rootstock production per acre is rather low.

Like any grass with a high productive capacity, Midland requires high soil fertility levels for maximum results. On medium fertility soils, Midland may produce no more than unselected common types, and may even fail to persist on very low fertility soils. As the fertility level is raised, its superiority in productive capacity becomes more and more evident. There is little or no reason for using Midland unless relatively high fertility levels are maintained.

Forage Production

Under ideal conditions Coastal will yield somewhat more than Midland in Oklahoma, and it has somewhat leafier forage. Following a severe winter, however, the advantage of Midland is clearly apparent. Midland begins growth as early in the spring as the common types, while Coastal is slow starting at best and may take until mid-summer to recover from winter injury.

The relative yields of Coastal, Midland, and local types are shown for both Tifton, Ga., and Stillwater, Okla., in Table I. The effect of the severe winter of 1950-51 on Coastal at Stillwater is quite evident.

Seasonal trends in forage production also point up the differences in both hardiness and growth habit of the varieties. Midland begins growth earlier in the spring, but the fall growth of Coastal is greater than that of Midland, as indicated in Table II.

The comparative protein content of the forage of the three varieties was determined for two of the cuttings in 1950 and for a dormant mid-winter cutting in January 1951. The latter indicates the excellent curing qualities of Bermuda-grass in dry winters. Results are shown in Table III.

There appears to be no really significant difference between the three types. All compare favorably to native grass in spring and sum-

Table I.—Comparative Forage Yields of Midland, Coastal, and Common Bermuda-grass at Stillwater, Oklahoma, and Tifton, Georgia.
(Pounds of dry matter per acre)

Variety	Stillwater, Oklahoma				Tifton, Georgia			
	1949	1950	1951	Avg.	1944	1945	1946	Avg.
Midland	3,494	10,008	7,969	7,157	8,820	3,400	2,907	5,042
Coastal	3,151	10,762	3,273	5,729	11,480	4,400	4,293	6,724
Okla. Common	166	2,651	2,925	1,914	----	----	----	----
Ga. Common	----	----	----	----	5,040	1,200	2,343	2,861

Table II.—Seasonal Trends in Forage Production of Midland, Coastal, and Oklahoma Common Bermuda-grass at Stillwater, Okla.; 1950 and 1951.
(Pounds of dry matter per acre)

	Date of Cutting	Midland	Coastal	Oklahoma Common
1950				
	May 31	2241	758	666
	July 18	3354	4146	548
	August 26	3049	3136	1437
	November 1	1364	2722	0
	Total for season	10,008	10,762	2,651
1951				
	June 1	2337	0	232
	July 23	3934	1393*	1626
	September 25	1698	1880*	1067
	Total for season	7969	3273*	2925

* Mixed with crabgrass which invaded following winter injury.

Table III.—Crude Protein Content of Midland, Coastal, and Oklahoma Common at Three Dates; Stillwater, Okla., 1950-1951.
(Percent)

Date	Midland	Coastal	Oklahoma Common
May 31, 1950	14.50	15.94	16.25
July 18, 1950	11.75	11.31	12.38
January 26, 1951	7.38	6.94	7.31

mer and maintain somewhat more protein in winter than the native tall grasses.

Pasture Production

Two 3-acre pastures of Midland Bermuda-grass were established on the Agronomy Farm at Stillwater in 1951. Sprigs were spaced in plowed ground at approximately 3½ foot check row intervals in July. Pasture A was overseeded in October with 10 pounds hairy vetch, 5 pounds crimson clover and ½ pound Ladino clover per acre, and 200 pounds of superphosphate were applied at the same time. Pasture B received an application of 150 pounds of ammonium nitrate per acre in April and the same amount in June for a total of 300 pounds in 1952.

Both pastures were grazed in 1952 and 1953. The results in terms of beef production are shown in Table IV.

Table IV.—Beef Production in Midland Bermuda-grass Pastures, With and Without Legumes Overseeded; Agronomy Farm, Stillwater, 1952 and 1953.

Date	Pasture A with legumes* *Animal gain (pounds)*			Pasture B with ammonium nitrate** *Animal gain (pounds)*		
	Acres per head	Per acre	Per head (daily)	Acres per head	Per acre	Per head (daily)
1952†						
May 15	.9	76	2.11	1.5	18	1.8
June 12	.75	87	2.03	1.5	40	2.1
July 8	.75	41	1.04	1.0	43	1.5
August 8	1.0	32	1.00	1.0	17	0.6
Sept. 6	1.0	40	1.03	1.0	36	1.2
October 4	1.0	37	1.00	1.0	26	0.7
Total, season		313			180	
1953††						
June 4	1.0	37	1.4	1.0	41	1.7
July 3	1.0	43	1.4	1.0	34	1.1
August 5	1.0	44	1.2	1.0	32	1.0
Sept. 10	.75	55	1.1	1.0	45	1.3
Oct. 10	.75	52	1.3	1.0	30	1.0
Total, season		231			182	

* Overseeded with hairy vetch, crimson clover and Ladino clover; fertilized with 200 pounds per acre of superphosphate (0-20-0).
** Fertilized with 300 pounds per acre of ammonium nitrate (32.5% nitrogen).
† Grade Hereford yearling steers weighing approximately 450 pounds turned on pasture April 14.
†† Grade Hereford yearling heifers weighing approximately 500 pounds turned on pasture April 25.

The advantage of Pasture A in 1952 was primarily in the early grazing period when legumes were present. It was apparent, however, that the nitrogen supply in this pasture was superior throughout the summer, indicating that the heavy growth of vetch (primarily) was more than equivalent as a source of nitrogen to the 300 pounds per acre of ammonium nitrate applied to Pasture B.

The excellent yields of 1952 were produced under very dry and climatically adverse conditions.

The fall and winter of 1952-53 were extremely dry, so that a very poor stand of vetch was obtained and there was very little early grazing. Late frosts burned back the early growth of Bermuda-grass, and the cattle were not turned into the pastures until April 25.

The chief advantage of Pasture A in 1953 is attributable to a stand of early Korean lespedeza established by spring sowing. Response to mid-summer rains permitted a heavier stocking rate in this pasture in late summer. It is evident, however, that even a poor growth of legumes in Pasture A during the winter was approximately comparable to the 300 pounds per acre of ammonium nitrate applied to Pasture B.

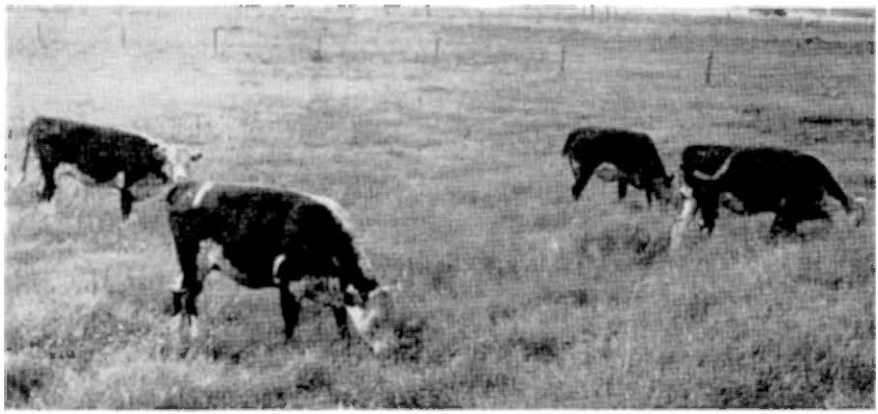
Sources of Planting Stock

The Oklahoma Agricultural Experiment Station has assumed responsibility for producing the Foundation planting stock of Midland Bermuda-grass. The Georgia Experiment Station is maintaining a block of Breeder class stock for reserve; and the Oklahoma station will maintain a specimen planting for reference for an indefinite time.

Foundation rootstocks for the establishment of Registered fields in a regular certification program may be purchased from Oklahoma Foundation Seed Stocks, Inc., Oklahoma A. & M. College, Stillwater, Okla. Standards as established by the International Crop Improvement Association for vegetatively propagated grasses will be followed. A field, to be eligible for the production of Registered or Certified planting stock, must be free of other varieties of Bermuda-grass the year before establishment and must be officially inspected before rootstocks are dug for sale.

Increase and Establishment

Midland is propagated by rootstocks or runners only. May is the best time to dig and plant, although work may be continued until mid-July if moisture conditions are favorable. Since rootstocks of Midland



Cattle grazing on Midland Bermuda-grass at the Agronomy Farm at Stillwater, Okla. Midland is a better companion crop for legumes than common types because it has fewer rootstocks, is palatable, and does not produce as many seed heads as most common types of Bermuda-grass.

will be in short supply and the price relatively high for several years, planting material should not be wasted. Most mechanical root spriggers are rather wasteful of material, and it may be more economical to plant Midland by hand.

The seedbed should be well prepared beforehand, and the soil worked to a depth of several inches. Rootstocks may be dropped by hand in a shallow furrow and covered or put in with a hoe or shovel on small acreages. A tobacco or sweet potato transplanter is an excellent machine for establishing improved varieties of Bermuda-grass because it is economical of material.

Soil fertility should be high, especially with respect to nitrogen. Midland is not a poor-land variety, but most soils in Oklahoma can be brought to satisfactory fertility levels for its growth by application of proper fertilizers. Midland spaced on 4-foot centers in May or June should cover the soil almost completely by fall in an average growing season.

The first fall after planting is the ideal time to establish companion legumes such as vetch or white clover. In older sods, a rather complete renovation would be necessary in the fall to establish most legumes. If soil moisture is good the sod can be completely plowed under, a good seedbed prepared, and the legumes seeded without danger to the grass. Fertilizer should be applied for best growth of the legume.

If considerable acreages are to be established, it would be most economical to establish a rootstock nursery to provide planting material. This should be established on an area of sandy, well-drained soil to facilitate digging the rootstocks when soil moisture is good. A complete fertilizer or barnyard manure should be applied unless the soil is very fertile. Midland is slow in producing rootstocks and may not produce enough the first season to warrant digging. After the second season, however, well-cared-for nurseries should produce rootstocks consistently over an indefinite period of time. One acre of nursery can easily produce enough planting material for 30 to 40 acres of pasture. If very extensive areas are to be established, several nurseries should be planted to Midland to reduce the hauling required and to permit the planting of fresher material.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