An Australian Grass in Texas

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SILKY BLUESTEM (*Andropogon sericeus* R. Br.), a subtropical grass of major importance on certain Australian ranges, is encountered more and more frequently on Texas grasslands. It has appeared, with but few exceptions, on Texas pastures through the accidental importation of its seed with those of other grasses, usually rhodesgrass (*Chloris gayana*). At present collections and field observations by personnel of the Soil Conservation Service have established occurrence of the Australian grass in 20 counties in South Texas with the northern limit of its range in Bexar, Medina, Comal and Guadalupe counties (Fig. 1).

This grass was not reported in the first edition of "Manual of the Grasses of the United States" by Hitchcock (1935). In the revised edition (Hitchcock, 1951) it is reported as "spontaneous on roadside banks, Cameron County, Texas." Swallen (1950) says of the grass "It has been cultivated at experiment stations and occurs along roadsides in South Texas."

The spread of silky bluestem, or Queensland bluegrass as it is known in Australia (Hartley *et al.*, 1942), should excite interest. It is highly regarded as a forage grass in its native country as indicated by White (1934):

> "Bluegrass has an exceptionally high reputation as a fodder among pastoralists. It is usually one of the earliest grasses to shoot in response to spring and early summer rains, but it is not particularly drought resistant. It makes one of the best grass hays possible and as it produces an abundance of seed it is worthy of study by the agrostologist and plant breeder."

Breakwell (1915, 1923) stated that reasonable rainfall would produce nine months of highly palatable grazing and the grass would recover quickly from use. He commented that the grass stood heavy trampling, made good hay and a good seed crop. McTaggart (1936) and Roe (1940) refer to silky bluestem as one of the better grasses.

Silky bluestem is highly variable in vegetative characters. Smooth, bright-green or dull-blue plants, with but a ring of silky hairs at the nodes, may intermingle with specimens on which the white hairs of the foliage almost obscure the color of the leaves and sheaths (Fig. 2). Little variation occurs on the seed heads. All are covered densely with silky white hairs which contrast with the deep brown awns of the fertile florets. White (1934) comments on the large number of distinguishable forms of the species in its native habitat.

The grass is generally palatable to livestock but stockmen disagree as to its relative palatability. All will agree that it is not as good as bermudagrass (*Cynodon dactylon*) which possesses a preferential status in pastures throughout much of Texas. Variations in palatability are associated with the variations in vegetative characteristics. On one pasture observed in June 1952 the variant preferred by cattle was the "blue" form densely covered with white hairs. Plants of that aspect were grazed to the ground. Few observations have been made on this point.

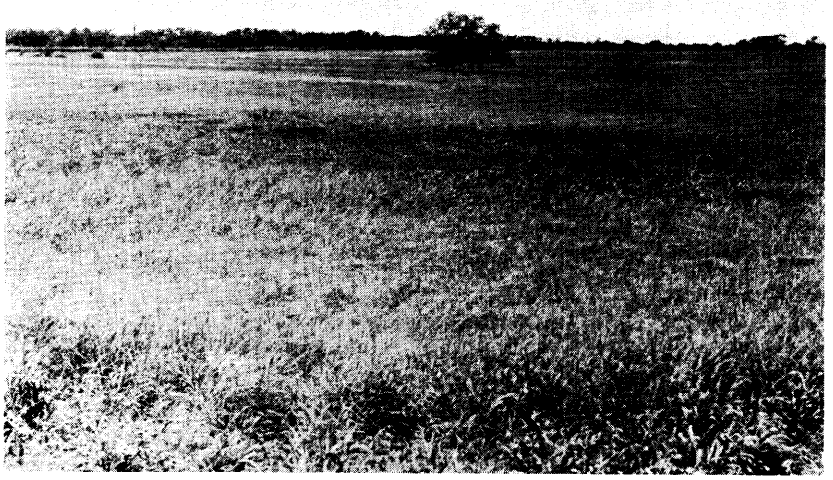

FIGURE 1. Light colored colonies of silky bluestem cover this abandoned field. It was planted in 1944 to Australian-harvested rhodesgrass.

Climatic Limitations

Silky bluestem is the most common of Australian bluestems (Breakwell, 1923) and the limits of its range occur in New Caledonia and the Philippines. In Australia, silky bluestem is a dominant or co-dominant in an area including the Darling Downs and Liverpool Plains of Queensland and New South Wales near the east coast in latitudes 25 to 32°S., according to McTaggart (1936). This area approximates the latitudinal range in Texas from Comal County (30°N. Lat.) south to Cameron County (26°N. Lat.). A north-south strip in this portion of Texas with an average rainfall of 20 to 30 inches, of which 40 percent falls in the winter, is markedly similar to the larger portion of the two Australian sections. Silky bluestem would seem adapted in this area of Texas. This inference is substantiated by its behavior through natural increase in areas of introduction. On the other hand, its extended range into the Tropics indicates a degree of adaptability southward into Mexico but would limit northward extension of its present limits in the United States.

Site Preference

Under Australian conditions the grass exhibits marked site preferences. Breakwell (1923) says that the grass "will fight shy of poor country". In his ecological account of Australian grasses, McTaggart (1936) consistently correlates the occurrence of silky bluestem with the better soils of all localities.

A corroborative check was made of the establishment of silky bluestem on various soil types in a tame pasture in eastern Medina County seeded in 1944 to Australian-produced rhodesgrass. Silky bluestem was present as an impurity in this seed. Colonies of silky bluestem have become established and spread while the original pasture grass has disappeared.

Nearly all established colonies of silky bluestem were found to be confined to the deepest of three calcareous soil types of the area (Orrben, 1942). Virtually no plants occurred on the very shallow soil type.

Typical Pastures Planted to Australian-grown Rhodesgrass Seed

Most stands of silky bluestem in Texas seem to have come from plantings of a tame pasture grass, usually rhodesgrass, harvested in Australia. Three such pastures occur within a one-mile radius of the eastern city limits of San Antonio. In three fields selected as typical, the initial planting in 1944–45 was to rhodesgrass. Examination in 1951 and 1952, by line intercepts of basal areas of the grasses revealed that rhodesgrass had almost completely disappeared from the fields and Australian and native grasses were established. Silky bluestem had become the dominant grass in all fields (Table 1). The native species were those normally established on fields turned-out from cultivation: red threeawn (*Aristida longiseta*), pinhole bluestem (*Andropogon perforatus*) and silver bluestem (*Andropogon saccharoides*). Texas wintergrass (*Stipa leucotricha*) was also present. All native grasses listed in Table 1 occur in limited quantities in the climax vegetation of the locality involved. Tanglehead (*Heteropogon contortus*) is included with the exotic species. This grass is native to Texas but does not occur na-

FIGURE 2. Silky bluestem at late seed maturity.

Table 1. Basal cover and percentage composition in 1953 of grasses on three fields planted in 1944 to Australian-grown rhodesgrass

	Field 1		Field 2		Field 3	
	Basal cover	Comp.	Basal cover	Comp.	Basal cover	Comp.
	percent					
Australian	9.1	76.5	9.7	87.4	16.5	93.2
Silky bluestem	9.1	76.5	9.7	87.4	14.3	80.8
Other species*	—	—	—	—	2.2	12.4
Native	2.8	23.5	1.4	12.6	1.2	6.8
Red threeawn	2.6	21.9	1.4	12.6	0.6	3.4
Texas wintergrass	0.2	1.6	—	—	—	T
Silver bluestem	—	T	—	T	0.6	3.4
Total Grasses	11.9	100.0	11.1	100.0	17.7	100.0

* Consisting of *Andropogon intermedius*, *A. spicigerus* and *Heteropogon contortus* (native of Texas but not occurring locally).

tively in the local area. However, it does occur in the area of Australia from which the seed was collected so it is inferred that this seed was also introduced. The form noted also was not typical of the grass on Texas rangelands. Neither bermudagrass nor rhodesgrass were encountered on any of the transects.

As observed in a 50-mile radius of San Antonio, the establishment of silky bluestem is usually limited to fields, but it is not always confined to them. A pasture dominated by an overstory of mesquite (*Prosopis juliflora* var. *glandulosa*) and a dense grass sod of buffalograss (*Buchloe dactyloides*) and Texas wintergrass has colonies of silky bluestem established along an intermittent stream for approximately one-half mile. The colonies are arranged in narrow wedge with its head closest to the seed source and the edge accordingly lying down-stream. The seed source is an old field adjoining the pasture.

Establishment of Seed

Stockmen aware of the identity of the grass have become interested in silky bluestem because of the good stands on old fields that have become established without recognition or encouragement. Harvesting and planting of the seed were carried on in 1950 and 1951 by some of those ranchers. The abnormal heat and drought of the past few years have caused high seedling mortality and resulted in poor stands. Breakwell (1915) indicates that drought might result in poor stands but that good germination may be secured only by planting in a warm soil.

One field of 11 acres was sown with seed taken from the food caches of the harvest ant (*Pogonomyrex barbatus*)! The ants stripped the ripe seed from a 3-acre field of silky bluestem immediately prior to harvest time. The rancher promptly poisoned the ant beds (74 in all), ripped open the pocket-watch sized caches and saved his seed! The germination of this seed was 27.5%, despite testing immediately upon harvesting. Another Comal County field of 100 acres was established, more prosaically, from a seed source of 19 acres by raking seed hay across the remainder of the field. This field was the source of 3-pound packets of silky bluestem seed distributed by the local Soil Conservation District for trial under all conditions. No records are as yet available as to the results.

Summary

An Australian range grass has been introduced into a widespread area of South Texas primarily through impurities of Australian-produced seed. This grass, silky bluestem or Queensland bluegrass (*Andropogon sericeus*) is of major importance on eastern Australian ranges, especially in the Provinces of Queensland and New South Wales. It is held in high esteem in its native land.

Silky bluestem seems well adpated to that portion of the United States (South Texas) that approximates the climatic and edaphic conditions of Australia wherein it reaches its greatest importance. The palatability is relatively high both here and in Australia. Palatability is related to vegetative characteristics which are exceptionally varied.

In fields where it has been accidentally established the grass has become dominant. In the vicinity of San Antonio, Texas, interest has been aroused in the species and seed harvesting and planting have been done by ranchers.

LITERATURE CITED

BREAKWELL, E. 1915. Pasture grasses. New South Wales Dept. Agr Farmers Bull. 96. 106 pp.

———. 1923. The grasses and fodder plants of New South Wales. A. J. Kent, Sydney, Australia. 370 pp.

HARTLEY, W. *et al.* 1942. Standardized plant names. Austral. Council. Sci. and Ind. Res. Bull. 156. 99 pp.

HITCHCOCK, A. S. 1935. Manual of the grasses of the United States. U. S. Dept. Agr. Misc. Pub. 200.

——. 1951. Manual of the grasses of the United States. U. S. Dept. Agr. Misc. Publ. 200. 1051 pp. (2nd. ed., rev. by Agnes Chase).

KELSEY, H. P. *et al.* 1942. Standardized plant names. J. H. McFarland Co., Harrisburg, Pa. 673 pp. 2nd. ed.

MCTAGGART, A. 1936. A survey of the pastures of Australia. Austral. Counc. Sci. and Ind. Res. Bull. 99. 71 pp.

ORRBEN, C. L. 1942. Procedure for making utilitarian soil conservation surveys, Region IV. Soil Conservation Service, Region IV Memo. no. 6. mimeo.

ROE, R. 1940. The natural semi-arid pastures of northern Australia. *In* Grassland investigations in Australia. Commonwealth Bur. Pasture and Field Crops Herb. Publ. Ser. Bull. 29: 26–34.

SWALLEN, J. R. 1950. Some introduced forage grasses of the genus *Andropogon* and related species. Contr. Tex. Res. Found. 1(2): 15–19.

WHITE, C. T. 1934. Queensland grasses. Queensland Agr. Jour. 41: 54–58.