cooperatively with the three parties involved.

Since the permittees need the period from April 1 to September 1 for hay production on the meadows, it is necessary for the cattle to be on the public lands throughout this period. The permittees agreed to take the cattle off the public lands and put them on their cutover hay meadows about September 1.

The reseeding is very successful at the time of this publication and checks indicate that the grazing capacity in Unit I will be increased from seven to nine times. Control fences are being constructed as rapidly as funds are available to provide for rotation and deferment on those parts of the Units requiring further remedial measures.

Prior to the next grazing season, the permits will be rewritten to coincide with the estimated proper period of use for each Unit. The opening dates on each unit will be flexible to insure proper use at the time of range readiness depending on seasonal fluctuations in forage production.

Units I, II and III plus the cutover hay lands will be used in that order with each unit to be grazed only to the extent considered proper. Each unit will be managed by the agency having jurisdiction over the land in close working relationship with the other agency and with the permittees. Specific annual management will be determined by conditions on the ground.

By this action, it is planned to accomplish the objectives of reducing the use of the high mountain areas to provide for reestablishment of desirable forage species and soil stabilization, stop the spread of Halogeto, replace sagebrush with grass and put worn-out grazing land into full production through reseeding, and to eventually provide a more dependable long range supply of forage and water for the livestock grower.

Ultimate success of the whole program now depends on future cooperation in management of the area in order to maintain benefits being received and insure the stability of the rehabilitated range.

Accomplishment to date has been with fullest cooperation of the agencies and permittees involved. It is working here and it is believed there are many other areas where such cooperative planning and action will work as well.

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**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 roadsides 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.

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Site Preference
Under Australian conditions the grass exhibits marked site preference. 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-

Figures 1 and 2. Silky bluestem at late seed maturity.
mittent stream for approximately wintergrass has colonies of silky bluestem established along an inter-head closest to the seed source old field adjoining the pasture. in silky bluestem because of the good stands on old fields that have down-stream. The seed source is an dense grass sod of buffalograss fined to them. A pasture dominated to fields, but it is not always con- fined 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 inter- mittent stream for approximately one-half mile. The colonies are ar- ranged 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 recog- nition or encouragement. Harvesting and planting of the seed were carried on in 1950 and 1951 by some of those ranchers. The ab- normal heat and drought of the past few years have caused high seedling mortality and resulted in poor stands. Breakwell (1915) in- dicates that drought might result in poor stands but that good germina- tion may be secured only by plant- ing in a warm soil.

One field of 11 acres was sown with seed taken from the food caches of the harvest ant (Pogonomyrmex barbatus): The ants stripped the ripe seed from a 3-acre field of silky bluestem immedi- ately 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 dis- tributed by the local Soil Con- servation 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 im- portance. The palatability is rela- tively high both here and in Australia. Palatability is related to vegetative characteristics which are exceptionally varied.

In fields where it has been acci- dentially 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