

Uncommon Occurrence in Buffalograss

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BUFFALOGRASS (*Buchloë dactyloides* (Nutt.) Engelm.) is known to ranchers of the Great Plains from the boundaries of Canada to Mexico as an important, common and easily recognized plant. This sod-forming shortgrass dominates tens of thousands of acres, particularly in the central part of its range.

Commonness can result in the anonymity of abundance. Often we ignore the interesting phases of the familiar to seek the exotic. The erratic character of the sexes of buffalograss, well known to specialists, is commonly unseen or forgotten. Rangemen are prone to consider buffalograss constant in occurrence as vigorously spreading, distinctly separate male and female plants. Difficulty in separating the runners of buffalograss out of a dense sod, plus a lack of curiosity apparently derived from the very commonness of the grass, lessens observance of the occasional, though customary, aberration of the sex habit.

The situation usually observed on the range is given by the authoritative "Manual of the Grasses of the United States" (1935) as "Plants dioecious"—in effect the grass occurring with the sexes separated on different plants. Variation from this condition was, of course, well known to Hitchcock. He includes such variation in the forepart of the manual in the keys to the genera and separated from the grasses' description. Furthermore, the 1950 revision of the Manual by Agnes Chase, describes the genus as "dioecious or monoecious." Beetle (1950) in an excellent discussion of buffalograss and its pertinent literature covers the divers sexual forms thus far observed.

Not uncommonly buffalograss plants are found on which both pollen-producing and seed-bearing organs occur. Most commonly these are seedling plants (Engelmann 1859, Plank 1892, Hitchcock 1895, Savage 1934, 1939, Gernert 1937). Much greater departures from normal were observed in Kansas (Anderson et al. 1937) and in Texas (Hensel 1938). At these two widely separated points male heads occurred with female florets actually interspersed amid the males. Germinable seed was produced in these unusual heads by the Kansas grass. Savage (1939) considered the perfect condition to be analagous with the ancestral form of buffalograss. According to Beetle "perfect" (male and female sex organs together in the flower or floret) florets are most common in Mexico and are found more rarely northward.

Ranges around San Antonio, Texas produce another variation from average, normal plants. Here the stolons of scattered plants vary from sex to sex throughout their length. Figure 1 illustrates one such plant. On the upper left stolon the originating point, a male is succeeded by male and female, both arising from the same node and finally a female on a subsequent node. Buffalograss exhibiting this particular sex habit of growth was collected on several ranches during the spring of 1949. This situation is not common. The intimately interlaced runners of buffalograss make recognition of any of the foregoing variations unusual. Thus, the important manuals covering the flora of the Great Plains vary con-

siderably in the characterization of this phase on buffalograss.

The obscurity surrounding the sexes has prevailed to a degree throughout the history of buffalograss. Naturally the first plants of buffalograss to be discovered were the conspicuous, upstanding males. Describing the staminate plant from a Missouri specimen Nuttall in 1818 called the male *Sesleria*. Texas was to contribute the far less conspicuous female plants. These were collected by

(1859) would recognize the differing grasses as being in actuality the two sexual forms. He received a collection of plants from his brother in Utah. In this were included both male and female plants of buffalograss. The resemblance of the vegetative parts of the grass was such as to cause Engelmann to surmise that rather than two genera he had the two sexes of only one. Then he was fortunate to encounter a group of male plants collected by Fendler near

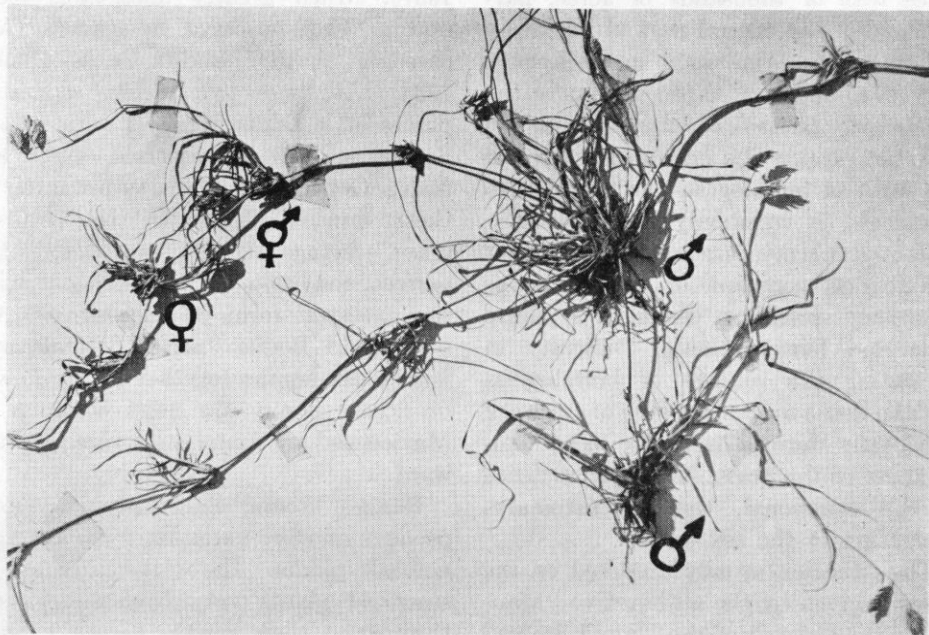


FIG. 1. Stolons of a single buffalograss plant varying from male to female.

Drummond and described by Steudel. But a lapse of thirty-six years had occurred since the naming of the ubiquitous males! At this time, in 1854, Steudel found the females varying so widely from the male buffalograss as to not only give the females a different name but assignment to a different tribe! The name for the female was a mis-spelling of *Antheaphora*, an Old World species, and rendered as *Antephora*. Four more years were yet to elapse before Engelmann

Fort Kearney, Nebraska. Among these he found one on which there were flowers of both *Sesleria* and *Antephora*! With the essential identity of these two plants established by Fendler's specimen Engelmann dropped both older scientific names. He proposed a new name for the new genus. This was *Buchloë*, a contraction founded in Greek, which refers to the common name of "buffalograss."

Engelmann described the plant as dioecious—the sexes occur on separate

plants. Apparently he regarded the monoecious specimen—one on which the sexes occur on the same plant but not the same flower—as entirely a lucky accident. The personal observation of Plank (1892) was in opposition to this view. He found one plant bearing both male and female sex flowers to support his recollection of others of similar character. Then on disturbed soil following a freshet he discovered “scores, if not hundreds,” of monoecious seedlings. He suggested seedlings were 100% monoecious, later separating vegetatively into the two sexes.

Hitchcock (1895) verified this observation by growing one seedling which eventually produced two sexes. In his contribution to Gray’s “New Manual of Botany” (1908) this experiment and Plank’s observations apparently were the basis for the statement, “Seedlings are monoecious, but the staminate and pistillate branches propagate their own kind.” Schaffner (1920), on the basis of his own observation and experimental work, took exception to the accord reached by these two in differing with Engelmann. He grew sixteen naked seeds, stripped from the heavy female “bur,” to flowering. Results were eight males and eight females. Thus, he insisted Engelmann was entirely correct—that the sexes were entirely separate and further intimated both Hitchcock and Plank may have been careless in technique or methods of reporting. Savage (1934) in his circular on revegetation records finding monoecious buffalograss and includes a clear photograph of one such plant. A repetition of earlier experiments by another Kansas worker, Gernert, (1937) verified among other things, Hitchcock’s findings. Other work previously cited (Anderson et al. 1937) has shown in normal germination the occurrence of monoecious seedlings of

the total number as 5.8% and ranging to 7% as determined by Wenger (1940).

Variations in the sex habit of buffalograss are normal and far from uncommon. These are little noted on the range due to physical difficulties of observation. Factors affecting manifestation of these variations are complex. External factors may exert considerable influence. The variation in the stolons noted readily in the spring of 1949, a time of abnormally heavy rainfall, though possibly present, were unnoted in 1950, a time of light rainfall.

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