FUSARIUM BLIGHT: POTENTIAL PROBLEM ON BUFFALOGRASS LAWNS IN TEXAS

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ABSTRACT
Following an extended period of drought in 1980 and 1981, ranchers in the Texas High Plains began to realize that large acreages of buffalograss were dying-off. Favorable spring rains and intermittent summer showers that followed did not revive many short grass ranges. Scattered areas throughout the High Plains were severely damaged. A stem and crown rot disease was observed on native stands of buffalograss during the summer. Fusarium roseum f. sp. cerealis "culmorum" was consistently isolated from diseased buffalograss crown tissue. The fungus has previously been described as the causal agent of the Fusarium blight disease which causes a root and crown rot of Kentucky bluegrass, tall fescue and centipedegrass grown in the South. On cultivated lawn grasses, severe forms of Fusarium blight are observed during hot dry weather on drought affected turfs receiving higher levels of nitrogen fertility. Increasing cultural intensity of buffalo-grass used in water conserving landscapes may result in increased severity of the Fusarium blight disease under dry growing conditions.

INTRODUCTION
Many counties throughout the High Plains and Rolling Plains of Texas complained of a decline or die-off of native grasses following the severe summer drought of 1980. Large acreages of buffalograss and bluegramma, the two major grasses affected, did not green up the following spring. The extent of the damage appeared to be widespread throughout much of the Texas Plains; however, some areas showed more damage than others.

With such a widespread concern, many agricultural professionals and ranchers combined efforts to explain the die-off phenomena. Theories were proposed blaming the decline on the severe drought and high soil temperatures during the hot summer months. Others cited the ground-dwelling termite as a primary culprit. It was possible that any one or a combination of these proposed factors could account for grass death at any one location. Soil temperatures in the upper inch of soil reached as high as 150°F (66°C) over parts of the Rolling Plains during the summer months. It is possible that high temperatures combined with severe moisture stress was lethal to the plants, although these conditions are considered to be common in Texas during the summer. The suspicion of termites infesting rangeslands was not borne out by the presence of tell-tale signs of tubular mud casts around the surface of plants in large affected areas.

The occurrence of a fungus disease called Fusarium blight was confirmed on dead and dying buffalograss plants taken from several dying pastures in the Texas High Plains. The disease is known to occur on turfgrasses during the hot summer months and causes the death of affected grasses. The disease is principally a problem on turfgrasses during the stressful summer period. Temporary periods of drought are thought to exert an additional, but undetermined role on the host plant following infection.

METHODS AND MATERIALS
During the summer of 1981, several samples of dying buffalograss were received to observe suspected disease activity. Samples were washed in running tap water to separate adhering soil and organic debris from the plants. The foliage of infected plants was typical of root and crown infected plants where the foliage of infected plants dies back following the death of the stem and crown. Diseased crowns were affected with a dark brown to black, dry, firm rot; roots arising from infected crowns were often killed as well.

Following surface sterilization of diseased crown tissue in 0.05% sodium hypochlorite for 3 minutes, sections were plated into water agar. Petri dishes containing the seeded agar with diseased tissue were incubated on a laboratory bench for 48 to 96 hours until fungal colonies originating from the tissue could be detected. Colonies growing on the agar were transferred to sterilized potato-dextrose agar for establishing isolated fungi in pure culture. Fungi were identified by microscopic observation of colonies and prepared slides using the cellulose tape technique of Endo (2).

RESULTS AND DISCUSSION
Fusarium roseum f. sp. cerealis 'Culmorum' was consistently isolated from diseased crowns of buffalograss plants obtained from affected pastures in the High Plains. Plants taken from these areas during the hot summer months could be diagnosed most readily by removing the healthy tillers and dead leaves and examining the crown or basal stems of dead and dying plants. In advanced stages, the affected crown, as well as some of the roots attached directly to the crown, appear dark brown or black. The disease was characterized as a firm hard rot of affected root and crown tissue.

Disease symptoms and isolation results indicate the crown rot disease of buffalograss is the same disease described as Fusarium blight of cool- and warm-season turfgrasses (1). Fusarium blight is a severely damaging disease problem on Kentucky bluegrass (4) and has also been reported on tall fescue and centipedegrass (5). On mowed turfgrasses, the disease appears as roughly circular areas of dead grass ranging from 15-50 cm in diameter. In the midwestern and eastern United States, the disease patterns can give a "frog-eye" appearance on affected turf where the center of affected areas remain a darker green color than plants
at the periphery which are bleached or brown in color (3).

This report is thought to be the first observation of the Fusarium blight disease on buffalograss. The destructiveness of the disease on other grasses used in lawns and landscapes suggests the problem could be increased with higher cultural intensity in landscapes (3). The Fusarium blight disease typically appears in late June or July, as soon as the weather turns hot. Hot, dry, and windy weather is especially favorable for expression of severe symptoms of the disease. These stressful conditions are undoubtedly compounded by reductions in the passage of water and nutrients through infested crown tissue.

The Fusarium blight disease is known to occur on turfgrasses with all levels of management; however, higher levels of nitrogen fertility coupled with high temperature stress and moisture deficient growing conditions are known to incite severe forms of the disease. While native stands of buffalograss appear to be relatively free from the disease, domestication for use in water conserving landscapes could result in severe disease activity, particularly where nitrogen fertility is applied during the hot summer months.

Since the disease occurs on other turfgrasses in areas that have been stressed for moisture and exposed for long periods to direct sunlight, research workers in other states have found that supplemental irrigation helps to prevent the disease on Kentucky bluegrass. In the summer, localized dry spots occur that become very water repellant. These areas favor Fusarium blight disease activity. Such areas should be detected and corrected as soon as the weather turns hot. Water run-off due to soil compaction is also a common problem in Texas Blackland soils. Aerification and careful water scheduling can correct this situation, thereby reducing the possibility of disease incidence.

LITERATURE CITED


