

SOD-SEEDING TO MODIFY COASTAL BERMUDAGRASS ON RECLAIMED LIGNITE OVERBURDEN IN TEXAS

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Introducing low-maintenance, perennial, plant species into grass pastures by sod-seeding has been identified as a method for improving forage quality and quantity with fewer cultural inputs, and for providing other plant species for alternate uses of the pasture. This study was conducted to investigate the ability of nine low-maintenance species to establish and persist with Coastal bermudagrass (*Cynodon dactylon* (L.) Pers.) established on reclaimed lignite overburden; to evaluate the establishment and persistence of seventeen low-maintenance species seeded in overburden with no vegetation cover; and to examine seeding mixtures and rates for establishing low-maintenance species into three cover types (bermudagrass, oats (*Avena fatua* L.), and no cover).

Glyphosate herbicide applied in 25-cm bands was necessary for first-year establishment of sod-seeded forbs in Coastal bermudagrass. Herbicide increased light penetration to seeded species, but was also helpful in temporarily suppressing the bermudagrass. Sod-seeding into an older sward of Coastal bermudagrass showed greater densities of seeded species than a younger sward because the lower amounts of biomass in the older sod provided more light and less competition to the seeded species. Fertilization, even at low rates, generally decreased establishment of sod-seeded species. Persistence of the seeded forbs in bermudagrass was related to growth habits (aboveground and below ground) and regenerative strategies which helped them avoid and reduce competitive interactions with Coastal bermudagrass. Strategies displayed by these species were early spring growth, extensive taproot systems, persistent rhizomes, and tall, upright growth forms.

Seventeen low-maintenance species established and persisted in overburden without fertilization during years of low precipitation. Several seeded grasses showed sufficient stand development in monoculture for erosion control. Most of the other seeded species were slower in establishment, yet persisted on the site and provided some productivity. The species showed satisfactory height, cover, and food potential for wildlife, and promoted multiple use of the reclaimed area.

Recommended seeding rates were generally adequate for seedling establishment in oat, bermudagrass, and no vegetation cover types. Sod-seeding into bermudagrass resulted in higher seedling densities than those in oats and no cover, and was apparently due to stored moisture beneath the sod during bermudagrass dormancy.

Using ^{15}N -Labelled fertilizer, Coastal bermudagrass demonstrated the ability to rapidly recover applied N. Maximilian sunflower (Helianthus maximiliani Schrad.) was suppressed by Coastal bermudagrass in mixture at all fertilizer N rates during the sunflower's establishment phase.

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