

Physiological Mechanisms of Overwintering in Sorghum



Sorghum is an important annual warm-season crop in the southern Great Plains, used for silage, hay, and bio-fuel production. Overwintering types of sorghum may extend the period of biomass production and reduce production costs.

Rationale

Sorghum originates from semi-arid tropics. It is generally sensitive to low temperature stress and will suffer chilling injury at 10-15°C. Research by Clegg et al. (1983) has shown that genetic variability exists in sorghum for cold tolerance when in mature plant stage. Cold tolerance and overwintering in sorghum could eventually extend sorghum cultivation to the highlands and temperate zones, stabilizing forage and grain production during the growing season in fringe areas where severe losses occur due to occasional low temperatures, increase its importance as an alternative biomass crop to corn, and a perennial source of biomass for bio-fuel production, serve as alternative crop in frost free mild winter areas, and be suitable for early-spring planting where low soil temperatures restrict germination and stand establishment. Furthermore, this might shine more light on the variability of expressions or inheritance of the cold tolerance traits in sorghum.

Objectives

The main objective of this project is to identify physiological and agronomic determinants of cold tolerance and overwintering capabilities in candidate sorghum lines in environments of the southern Great Plains classified as USDA Zone 7. In the next step, these lines will be used to create new cultivars of sorghum with a perennial type of growth.

Funding Sources

Texas AgriLife Research

[Forage Systems Program Homepage](#)