



Rootless Sorghum Syndrome

- Brace roots are important for plant support and scavenging for nutrients and water.
- Several factors may cause inhibition of brace root formation.
- Cultivation may help bring cool, moist soil around the base of the plant and may lead to resumed root growth.

Brace Root Development

Brace roots develop above ground at the three-leaf growth stage and often reach the soil surface at the five-leaf growth stage. These roots are essentially the same as the nodal roots formed below ground. Brace roots help support the plant during later reproductive stages and can take up nutrients and moisture. Plants lacking proper brace roots can be easily blown over in a strong wind storm.

Causes of Rootless Sorghum

Several factors can inhibit brace root formation:

- Soil compaction can inhibit root penetration and growth. Hard spring rains on bare soil can lead to soil erosion and leave a soil crust, which can be difficult for brace roots to penetrate.
- Hot, dry soil conditions during the seedling stage can restrict root growth and prevent brace root penetration, especially in areas without shading or residue.
- Some growth regulator and root inhibitor herbicides can cause brace root malformation. Pendimethalin herbicides are root inhibitors that can be applied postemergence to sorghum; however, drop nozzles should be used to avoid herbicide contact with the brace roots.

Management

Moist, friable soils are most conducive to brace root development. Where sorghum is still upright and brace roots are lacking, cultivation can bring moist soil up around the base of the plant to help with support and encourage root growth. Crop residue can help keep the soil surface cool and moist to facilitate brace root penetration. Retaining some residue from year to year is a long-term management strategy that could improve soil structure for corn and sorghum brace root development.

Lodging and stalk breakage are issues that can hinder harvest machinery and could lead to loss of yield potential. Sorghum plants that have fallen down may be sustained and regrow if stalks are not broken and rains cool and moisten the soil surface. Tillage is not acceptable in some cases, and farmers may need to take a wait-and-see approach.



Figure 1. Fallen sorghum plants due to lack of brace roots.

Summary

Brace root formation is an important part of sorghum performance and standability. Several factors can inhibit brace root formation in sorghum such as soil compaction, suboptimal soil moisture, and herbicides. Additional factors that can contribute to standability in sorghum include mobilization of root and crown carbohydrates to the grain caused by stress during grain-fill, fungal stalk rots such as charcoal stalk rot and Fusarium stalk rot, insect feeding, fertility issues, high populations, and freeze damage. Keep these factors in mind when scouting fields.

Sources

¹ Trostle, C., Bean, B., Kenny, N., Isakeit, T., Porter, P., Parker, R., Drake, D., and Baughman, T. 2016. United Sorghum Checkoff Program. West Texas Production Guide. ² McClure, A., Ebelhar, S., and Lee, C. United Sorghum Checkoff Program. Mid-South Production Guide. 150716144841

For additional agronomic information, please contact your local seed representative.

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible. **ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.**
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