



Sorghum Nutrition

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Some nutrient studies of sorghum (variety Double Dwarf-38) show that this plant is well suited for growing on the alkaline and salty soils typically found in Arizona.

Nutrient Deficiency Symptoms

In University of Arizona tests a series of plants was grown by soilless culture in the greenhouse to determine the nutrient deficiency symptoms. Plants received all the essential nutrients until they were four weeks old, then were divided into groups.

One group continued to receive all the essential nutrients, but each of the other groups received a nutrient medium lacking one essential element. Three months later the plants showed the following deficiency symptoms:

Nitrogen Deficiency — very stunted growth; lower leaves dead; pale green upper leaves.

Phosphorus Deficiency — stunted growth; lower leaves dead; middle leaves with chlorotic or dead tips and the chlorosis progressing toward the leaf base along the margins; upper leaves uniformly green and slightly darker than a normal plant.

Potassium Deficiency—stunted growth; lower leaves dead or chlorotic, dying along the margins; upper leaves striped with chlorosis between veins.

Sulfur Deficiency — stunted growth; leaves uniformly pale green.

Magnesium Deficiency — stunted growth; leaves striped with chlorosis between veins and dark red along the midrib of lower leaves; lowest leaves dead or severely chlorotic.

Iron Deficiency—very stunted growth; leaves chlorotic with upper leaves very chlorotic or white between veins with a pale green midrib.

Calcium Deficiency — very stunted growth; new leaves dead before they unfold; lower leaves with dead leaf margins; deficiency appears suddenly.

Acidity and Salinity

An unusual fact about the nutrition of double dwarf-38 sorghum is that it grows better in an alkaline medium than in an acid medium. This is just the reverse of most other plants. In a soilless culture series, plants were grown in very acid (pH 5.0), slightly acid (pH 6.5), slightly alkaline (pH 8.0), and very alkaline (pH 9.5) nutrient solutions. The solutions contained only 0.5 parts per million of iron.

Plants grown in the acid solutions were severely chlorotic and showed all the symptoms of an iron deficiency. The plants grown on the alkaline solutions were a healthy green and appeared normal in every respect.

BELOW, sorghum in soilless culture prefers alkaline "soil." Plants in acid medium were weak, pale yellow and did not produce a seed stalk.

ABOVE, nutrient deficiencies of sorghum. Plants were grown in soilless culture. The "all present" plant received all essential mineral nutrients.

Further evidence that the stunted growth in acid solutions is due to an iron deficiency is shown by the fact that a group of plants grown on a slightly acid solution became normal when 10 parts per million of iron were added in the form of an iron chelate to the culture solution.

Likes a Little Salt

Sorghum is quite tolerant of saline conditions, as evidenced by the excellent growth of plants grown on culture solutions containing as much as 4500 parts per million of added sodium chloride.

These results show that double dwarf-38 sorghum is well-equipped for growth on Arizona soils that are alkaline and high in salt content. Indeed, the chlorosis sometimes encountered in fields may be due to a lowered alkalinity.

