

**Effect of soil texture, nutrient stress and
water stress on yield of *Andropogon
gayanus* Kunth and *Schizachyrium
Sanguineum* (Retz.) Alston.**

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Abstract:

Two grasses, Andropogon gayanus and Schizachyrium sanguineum grown to maturity in fine and coarse sand culture were subjected to nitrogen and water stresses to study how these stresses interact with soil texture in affecting growth and nitrogen accumulation in these grasses. Nutrient-stressing involved administering 200ml of a nutrient solution containing. 35 parts per million nitrogen once in four days while for water-stressing the same volume of water was fed to the plants at the same frequency. These treatments, if administered once in two days, were considered adequate for the plants.

There were two other intermediate treatments. Plants grown in fine sand produced more dry matter the highest yield was adequate nitrogen and water stressing while nutrient and water stressing gave the lowest. The biomass of the two grasses increased with increased nutrient addition to the growth medium. Nutrient stress had a more noticeable effect in reducing yield than water stress. Plants grown in coarse sand had a higher nitrogen concentration than those grown in fine sand. This is attributable to high organic matter content of fine sand the highest yield was adequate nitrogen and water stressing while nutrient and water stressing gave the lowest.

The biomass of the two grasses increased with increased nutrient addition to the growth medium. Nutrient stress had a more noticeable effect in reducing yield than water stress. Plants grown in coarse sand had a higher nitrogen concentration than those grown in fine sand. This is attributable to high organic matter content of fine sand grown grasses which led to dilution of nitrogen concentration. In absolute terms, plants grown in fine sand had more nitrogen content. Increasing frequency of nitrogen addition resulted in higher nitrogen content of the grasses. As with yield, giving adequate nitrogen and water-stressing resulted in the highest nitrogen accumulation while water and nutrient stressing gave the lowest.

Schizachyrium sanguineum accumulated more nitrogen than Andropogon gayanus because it is more efficient in utilizing nutrients in a low concentration medium. As for plant parts more nitrogen was accumulated in the roots than leaves or stems. The implications of these observations in relation to the natural conditions in which these grasses grow are discussed.

Keywords: Soil/ nitrogen/ soil yield/ plant/ biomass/ organic matter/ water/ nutrient

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