

P27: Application of microbial Inoculants as a sustainable practice for the production of grain legumes under water stress

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Introduction: Grain legumes contain high level of protein and adequate proportions of carbohydrates and oil, making them valuable as human food. Unlike protein products of animal origin, legumes contain much less fat, which makes them healthier. The nutritional value of legumes has been associated with reduction of incidence of chronic diseases such as cancer, type-2 diabetes and heart disease. Arbuscular mycorrhizal fungi (AMF) and nitrogen fixing bacteria (NFB) are beneficial soil microorganisms that can improve plant nutrition and increase drought tolerance.

Objectives: The study aimed at assessing the effect of AMF and NFB in promoting the growth and yield of grain legumes as a sustainable agricultural practice.

Materials and Methods: Chickpea (*Cicer arietinum* L.) and cowpea [*Vigna unguiculata* (L.) Walp.] were inoculated with AMF and NFB and subjected to three levels of water stress: no stress, moderate stress or severe stress. Plant growth (shoot length and biomass) and grain yield (number of grains per plant) were evaluated.

Results and Discussion: Inoculated plants produced larger numbers of grain under water stress when compared with non-inoculated controls. Shoot length and leaf chlorophyll concentration were also significantly increased in inoculated plants.

Conclusion: Inoculation with AMF and NFB can improve the productivity of grain legumes. These microbial inoculants can contribute for sustainable production of healthy food under adverse environmental conditions.

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References

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