African Computational Pharmaceutical Sciences (Applied aspect)

Precision Agriculture Techniques for Rainfed Maize Farmers in Central Ethiopian Highlands: An Exploration of Seed Soaking Solutions

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Abstract

Precision agriculture techniques are crucial for enhancing crop yields in resource-limited environments such as Ethiopia's Central Ethiopian Highlands, where rainfed maize farming is prevalent. A comparative study was conducted in two primary regions of Central Ethiopian Highlands, focusing on different soil types and climatic conditions. Farmers were trained to use traditional methods alongside new precision agriculture techniques including controlled water volumes, temperature management, and nutrient concentrations for seed soaking solutions. Significant improvements in germination rates (up to 20%) were observed when using optimal seed soaking solutions compared to conventional practices. Analysis of variance revealed a clear difference in yield between the groups, with an average increase of 15% in crop productivity among those who adopted the precision agriculture techniques. The study confirms the effectiveness of precision agriculture methods, particularly in enhancing seed soaking solutions for rainfed maize farming in Ethiopia's Central Ethiopian Highlands. These findings underscore the need to integrate these practices into farmer training programmes and agricultural extension services. Farmers should be provided with comprehensive training on the use of precision agriculture techniques, including optimal seed soaking solutions. Agricultural extension workers should also promote the adoption of these methods through workshops and field demonstrations. Precision Agriculture, Rainfed Maize, Seed Soaking Solutions, Ethiopian Highlands

Keywords: *Ethiopia, Highlands, Precision Agriculture, Rainfed Farming, Seed Treatment, Soil Fertility, Irrigation Management*

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