

Evaluation of the effectiveness of waste mica and poultry manure as potassium sources on maize in comparison to Muriate of Potash in soil fertilization

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ABSTRACT

This study investigates the potential of waste mica and poultry manure as alternative potassium sources in soil fertilization, compared to the conventional use of muriate of potash (KCl). Potassium is an essential nutrient for plant growth, and its traditional supply from muriate of potash has environmental and economic drawbacks. Utilizing waste mica and poultry manure could offer sustainable and cost-effective alternatives. A field experiment was conducted in a randomized block design (RBD) to evaluate the effectiveness of these materials on crop yield and soil health. Soil was treated with varying proportions of waste mica, poultry manure, and muriate of potash. Key parameters such as soil macronutrient content, crop yield were monitored and analyzed. The results indicated that treatment with 100% RDK through MOP showed the highest kernal yield, stover yield and available potassium. The treatments with 75% RDK through MOP + 25% through Poultry manure and treatment with 75% RDK through MOP + 25% through waste mica were found to be on par with 100% RDK through MOP. The results demonstrated that both waste mica and poultry manure significantly improved soil potassium levels and crop yield, showing their potential as viable potassium sources. The combination of these alternative materials with muriate of potash yielded optimal results, suggesting a synergistic effect. Additionally, the use of poultry manure enhanced soil, contributing to overall soil health. This study highlights the potential benefits of integrating waste mica and poultry manure into conventional fertilization practices. Such an approach not only addresses the disposal issues of waste mica and poultry manure but also promotes sustainable agriculture by reducing reliance on synthetic fertilizers.

Key words: *Muriate of potash, Poultry manure, Potassium and Waste mica.*