

EFFECTS OF CHEMICAL FERTILIZERS ON MAIZE (*ZEA MAYS* L.) GROWTH, YIELD, AND PRODUCTIVITY

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The application of chemical fertilizers plays a crucial role in enhancing maize (*Zea mays* L.) growth and yield by supplying essential nutrients. This study evaluates the effects of different fertilizer treatments, namely control, N80+PK, and N160+PK, on maize growth parameters, yield, and grain quality during the 2024 growing season. Fertilizer rates were N 0 kg ha⁻¹ P₂O₅ 0 kg ha⁻¹ K₂O 0 kg ha⁻¹ (control), N 80 kg ha⁻¹ P₂O₅ 60 kg ha⁻¹ K₂O 90 kg ha⁻¹ (N80+PK), and N 160 kg ha⁻¹ P₂O₅ 60 kg ha⁻¹ K₂O 90 kg ha⁻¹ (N160+PK). Data on yield (t/ha) and grain quality (moisture, protein, starch, and oil content) were collected. The results indicated that increasing fertilizer application improved yield and plant height, with the highest application rate producing the tallest plants (278 cm) compared to the control (227 cm). Protein content also increased significantly (p<0.05) with higher nitrogen doses. However, no significant differences were observed between N160+PK and N80+PK, making N80+PK the recommended treatment for economic and sustainability reasons. While fertilizers improve maize productivity by addressing soil nutrient deficiencies, excessive application may degrade soil health and contribute to environmental contamination. The study highlights the importance of balanced fertilizer application and suggests integrating chemical fertilizers with organic amendments to enhance soil fertility and ensure sustainable maize production.

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