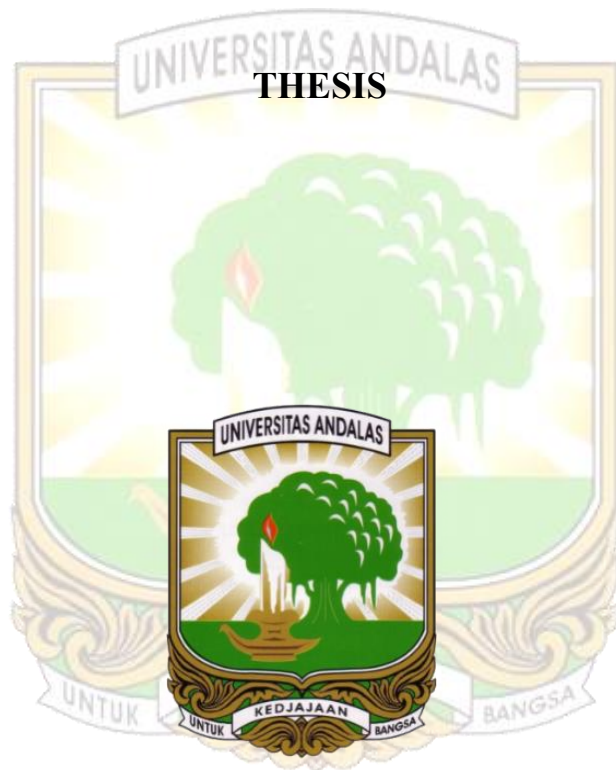


**EFFECTS OF PLANT GROWTH-PROMOTING
MICROORGANISMS, ORGANIC, AND INORGANIC
FERTILIZER APPLICATIONS AND THEIR COMBINATIONS
ON THE GROWTH AND YIELD OF SWEET CORN
(*Zea mays* L. *Saccharata* Sturt) IN ULTISOL**

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RINGKASAN

Penelitian ini bertujuan untuk mengevaluasi efek antara Mikroorganisme Pemacu Pertumbuhan Tanaman (PGPM), pupuk organik, serta kombinasinya terhadap pertumbuhan dan hasil jagung manis (*Zea mays* L. *saccharata* Sturt) pada tanah Ultisol. Percobaan dilaksanakan pada bulan Juli hingga Oktober 2025 di Fakultas Pertanian, Universitas Andalas, Padang, Indonesia. Rancangan yang digunakan adalah Rancangan Acak Lengkap (RAL) dengan enam perlakuan dan tiga ulangan, yaitu: 1: PGPM, 2: Pupuk organik (kompos), 3: Pupuk anorganik (NPK 15-15-15), 4: Organik 50% + PGPM, 5: Anorganik 50% + PGPM, dan 6: Organik 50% + Anorganik 50% + PGPM. Parameter yang diamati meliputi tinggi tanaman, luas daun, diameter batang, rasio akar tajuk, laju asimilasi bersih (NAR), laju pertumbuhan relatif (RGR), umur berbunga, serta komponen hasil seperti bobot tongkol, panjang, diameter, dan hasil panen.

Hasil penelitian menunjukkan bahwa perlakuan pupuk berpengaruh nyata terhadap beberapa parameter pertumbuhan dan hasil. Perlakuan pupuk anorganik menghasilkan tinggi tanaman, diameter batang, dan performa hasil tertinggi, sedangkan perlakuan PGPM tunggal menunjukkan nilai terendah pada sebagian besar parameter. Perlakuan kombinasi organik 50% + anorganik 50% + PGPM menghasilkan pertumbuhan dan hasil yang secara statistik setara dengan perlakuan pupuk anorganik penuh, hal ini menunjukkan adanya efek sinergis yang kuat di antara ketiga input tersebut. Integrasi PGPM dengan pupuk organik dan anorganik meningkatkan efisiensi penyerapan hara, memperbaiki vigor tanaman, serta mempertahankan hasil tinggi dengan penggunaan pupuk kimia yang lebih rendah.

Berdasarkan hasil penelitian, PGPM saja belum mampu memenuhi kebutuhan hara tanaman jagung manis; namun, ketika dikombinasikan dengan pupuk organik dan anorganik, PGPM secara signifikan meningkatkan pertumbuhan dan produktivitas tanaman. kombinasi Organik 50% + Anorganik 50% + PGPM menunjukkan performa hasil tanaman terbaik.

SUMMARY

This study aimed to evaluate the effects of Plant Growth-Promoting Microorganisms (PGPM), organic fertilizer, and inorganic fertilizer and their combination on the growth and yield of sweet corn (*Zea mays* L. *saccharata* Sturt) in Udisol. The experiment was conducted from July to October 2025 at the Faculty of Agriculture, Andalas University, Padang, Indonesia. A Completely Randomized Design (CRD) was used, consisting of six treatments with three replications: 1: PGPM, 2: Organic fertilizer (compost), 3: Inorganic fertilizer (NPK 15-15-15), 4: Organic 50% + PGPM, 5: Inorganic 50% + PGPM, and 6: Organic 50% + inorganic 50% + PGPM. Observed parameters included plant height, leaf area, stem diameter, root shoot ratio, net assimilation rate (NAR), relative growth rate (RGR), age of flowering, and yield components such as cob weight, length, diameter, and crop yield.

The results revealed that fertilizer treatments significantly influenced several growth and yield parameters. The inorganic fertilizer treatment recorded the highest plant height, stem diameter, and yield performance, while the PGPM treatment showed the lowest values across most parameters. The combined treatment of organic 50% + inorganic 50% + PGPM produced growth and yield statistically similar to the full inorganic fertilizer, indicating a strong synergistic effect among the inputs. The integration of PGPM with organic and inorganic fertilizers enhanced nutrient uptake efficiency, improved plant vigor, and maintained high yield performance with reduced chemical fertilizer use.

Based on the results, PGPM was not sufficient to supply the nutrient requirements of sweet corn; however, when combined with organic and inorganic fertilizers, it significantly improved growth and productivity. Inorganic fertilizer and Organic 50%+Inorganic 50%+PGPM showed best crop yield performance.