

## **Production and nutrient uptake improvement of sweet corn by organic-inorganic fertilizers and AMF inoculation**

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*Zea mays saccharata* (sweet corn) important as food and ruminant feed in Indonesia. However, most of the land that used for crops production is characterized by a low nitrogen and phosphorus availability. As the high cost of superphosphate (SP) is a major limiting factor, a combination of rock phosphate (RP) fertilization and arbuscular mycorrhizae fungi (AMF) inoculation is a promising technique. Farmyard manure (FYM) is manure made from cattle dung and urine mixed with waste of forages or straw, while it combined with RP called FYM ‘plus’. Farmyard manure and FYM ‘plus’ as organic fertilizer very important to improve soil physical fertility. Inorganic fertilizer important to improve chemical soil fertility, and AMF as biofertilizer could increase soil nutrients availability especially of phosphorus. A field experiment was conducted on acid latosolic soil, low phosphorus and nitrogen availability. The objective of the research is to evaluate the effects of phosphorus and nitrogen fertilizer from different sources combined with AMF inoculation and FYM, on sweet corn yield, nutrient uptake, and dry matter production of stover. The experimental design was a completely randomized block design 8 treatments in 3 replicates. The treatments were T1 (FYM + RP + ZA), T2 (FYM + SP + urea), T3 (FYM + RP + ZA + AMF), T4 (FYM + SP + urea + AMF), T5 (FYM plus + RP + ZA), T6 (FYM plus + SP + urea), T7 (FYM plus + RP + ZA + AMF), T8 (FYM plus + SP + urea + AMF). Size of each plot was 3 m x 3 m, fertilized with 200 kg N ha<sup>-1</sup>, 66 kg P ha<sup>-1</sup>, and inoculated with AMF at level 50 g per hole, according to the assigned treatment at the time of planting. All plot received basal fertilization of KCl (125 kg K ha<sup>-1</sup>). Level of FYM at 1 ton ha<sup>-1</sup> and FYM ‘plus’ at 1 ton ha<sup>-1</sup> + 66 kg P ha<sup>-1</sup>. Fertilizers of organic and inorganic were placed in the planting hole and filled again, before planting of sweet corn seeds, according to the assigned treatment. Sweet corn seed was dibbled into small holes at the rate of two seeds per hole, spaced 100 x 50 cm. Each plot contained 30 plants from 15 holes planting. *Zea mays saccharata* was cut at ground level on 70 days after planting and analyzed for nutritive value of stover. Results showed that corn production at T8 significantly higher compared to another treatments except T7. Fresh stover production did not affected by the treatments. Dry matter production and nutritive value of stover at combination of AMF + FYM plus + NP from difference sources tend to higher compared to combination of FYM + NP without inoculation AMF.

**Keywords:** Nitrogen, phosphorus, farmyard manure, mycorrhizae fungi, *Zea mays saccharata*