

## VIABILITAS, PRODUKTIVITAS, DAN RESPONS ANATOMI KACANG TANAH (*Arachis hypogaea* L.) PASCA APLIKASI BIOFERTILIZER- SLUDGE BIOGAS

### INTISARI

Nur Hidayah Pangestuti  
(15/381892/BI/09531)

Kacang tanah (*Arachis hypogaea* L.) merupakan salah satu komoditas pangan penting di Indonesia. Penggunaan *biofertilizer* telah diterapkan pada berbagai jenis tanaman pangan, sedangkan pengaruh penggunaan *biofertilizer-sludge* biogas pada kacang tanah belum diketahui. Penelitian ini bertujuan untuk menganalisis viabilitas dan vigoritas, produktivitas hasil panen, serta respons anatomis kacang tanah. Perlakuan yang diberikan berupa *biofertilizer-sludge* dengan 15 tingkatan konsentrasi perlakuan dibandingkan dengan tanaman kacang tanah tanpa aplikasi *biofertilizer-sludge* (kontrol). Lahan dibagi menjadi 16 bedengan untuk perlakuan meliputi kontrol, aplikasi *biofertilizer* dengan dosis 10, 15, dan 30 L/ha; *sludge* dengan dosis 12, 24, 36 ml, serta kombinasi antara keduanya. Parameter yang diamati untuk viabilitas dan vigor yaitu persentase perkecambahan biji, indeks vigor biji; produktivitas hasil panen berupa nilai indeks panen (HI), berat kering hasil panen, *root-shoot ratio* (R/S); sedangkan parameter respons anatomis berupa diameter batang, diameter metaxilem batang, diameter akar, diameter metaxilem akar, serta diameter biji. Hasil penelitian menunjukkan aplikasi *biofertilizer-sludge* berpengaruh signifikan terhadap nilai HI, R/S, diameter batang, diameter metaxilem akar, dan diameter biji, serta tidak berpengaruh signifikan terhadap viabilitas dan vigor biji, dan berat kering hasil panen. Aplikasi *biofertilizer-sludge* dalam berbagai dosis konsentrasi memberikan efek penurunan ukuran pada diameter metaxilem batang, dan diameter akar dibandingkan dengan kontrol. Aplikasi *biofertilizer* 10 L/ha + *sludge* 24 ml merupakan konsentrasi yang paling optimum untuk peningkatan nilai HI dan R/S. Aplikasi *biofertilizer* 30 L/ha + *sludge* 12 ml optimum untuk peningkatan diameter batang. Aplikasi *sludge* 24 ml optimum untuk peningkatan diameter metaxilem akar, serta aplikasi *biofertilizer* 15 L/ha + *sludge* 12 ml optimum untuk peningkatan diameter biji.

**Kata Kunci:** *Arachis hypogaea* L., *biofertilizer*, *sludge*, viabilitas, dan respons anatomis

**VIABILITY, PRODUCTIVITY, AND  
ANATOMICAL RESPONSES OF GROUNDNUTS (*Arachis hypogaea* L.)  
AFTER BIOFERTILIZER- SLUDGE BIOGAS APPLICATIONS**

**ABSTRACT**

Nur Hidayah Pangestuti  
(15/381892/BI/09531)

Groundnuts (*Arachis hypogaea* L.) is one of the important food commodities in Indonesia. The use of biofertilizer has been applied to various types of crops, meanwhile the effect of using biofertilizer-sludge biogas on groundnuts is yet unknown. This study aims to analyze the seed viability and vigour, yield productivity, and the anatomical response of groundnuts. Treatments given including application of biofertilizer-sludge with 15 levels of treatment concentration compared to groundnuts without biofertilizer-sludge application as a control. The land was divided into 16 beds for each treatment consisted of control, biofertilizer from 10, 15, to 30 L/ha, sludge from 12, 24, to 36 ml, and variations dosage of biofertilizer and sludge combined. The parameters observed for viability and vigour were the percentage of seed germination (GP), seed vigor index (SVI); for yield productivity were the value of harvest index (HI), dry weight of the harvest, root-shoot ratio (R/S); For anatomical responses were stem diameter, stem's metaxylem diameter, root diameter, root's metaxylem diameter, and seed diameter. The results of biofertilizer-sludge had a significant effect on HI, R/S values, stem diameter, root's metaxylem diameter, and seed diameter. The application of biofertilizer-sludge did not significantly affect the viability and vigor of the seeds, and the dry weight of the harvest. Application of biofertilizer-sludge in various doses of concentration resulted in a decrease in the size of the stem metaxylem diameter and root diameter compared to the control. Application of biofertilizer 10 L/ha + sludge 24 ml was an optimum concentration that could increased HI and R/S values. Application of 30 L/ha biofertilizer + 12 ml sludge was an optimum concentration to increasing stem diameter. Application 24 ml sludge was an optimum concentration to increasing root's metaxylem diameter, and application 15 L/ha biofertilizer. + 12 ml sludge was an optimum concentration to increasing seed diameter.

**Keywords:** *Arachis hypogaea* L., biofertilizer, sludge, viability, and anatomical responses