

RINGKASAN

UNTARI PRAWITA WARDHANI. 135040200111108. Efektivitas *Rhizobium* Endogen pada Tanah Bekas Penanaman Kedelai terhadap Pertumbuhan Enam Varietas Kedelai (*Glycine max* L.). Di bawah bimbingan Yulia Nuraini dan Didik Sucahyono

Rhizobium adalah bakteri yang dapat mengikat nitrogen dari alam dan menyediakan nitrogen bagi tanaman. Akan tetapi populasi *Rhizobium* dalam tanah dapat terdiri dari bakteri yang tidak efektif hingga sangat efektif. Penelitian ini bertujuan untuk mengetahui pengaruh sifat kimia dari tanah bekas penanaman kedelai terhadap populasi *Rhizobium* endogen dari tanah bekas penanaman kedelai dan pengaruh *Rhizobium* endogen dari tanah bekas penanaman kedelai terhadap nodulasi akar dan pertumbuhan dari enam varietas tanaman kedelai. Penelitian ini dilaksanakan pada bulan Juni hingga Oktober 2017. Penanaman dilaksanakan di rumah kaca Balai Penelitian Tanaman Aneka Kacang dan Umbi (Balitkabi). Analisis variabel pengamatan dilaksanakan di Laboratorium Kimia Tanah, Fakultas Pertanian, Universitas Brawijaya dan Laboratorium Mikrobiologi Tanah Balitkabi.

Rancangan penelitian menggunakan Rancangan Acak Kelompok (RAK) sederhana yang terdiri dari 12 kombinasi perlakuan dan tiga ulangan sehingga terdapat 36 unit perlakuan. Kombinasi perlakuan yaitu terdiri dari, T₁V₁ (Tanah non steril + varietas Argomulyo), T₁V₂ (Tanah non steril + varietas Burangrang), T₁V₃ (Tanah non steril + varietas Grobogan), T₁V₄ (Tanah non steril + varietas Dering I), T₁V₅ (Tanah non steril + varietas Devon I), T₁V₆ (Tanah non steril + varietas Dega I), T₂V₁ (Tanah steril + varietas Argomulyo), T₂V₂ (Tanah steril + varietas Burangrang), T₂V₃ (Tanah steril + varietas Grobogan), T₂V₄ (Tanah steril + varietas Dering I), T₂V₅ (Tanah steril + varietas Devon I), T₂V₆ (Tanah steril + varietas Dega I). Data dianalisis dengan menggunakan sidik ragam (ANOVA) dengan taraf 5% dan apabila berpengaruh nyata dilakukan uji lanjut menggunakan uji *Duncan Multiple Range Test* (DMRT) dengan taraf 5% dan dilakukan uji korelasi untuk mengetahui hubungan antar variabel.

Perlakuan tanah non steril dengan varietas Dering I (T₁V₄) menunjukkan hasil yang terbaik dengan nilai C-organik sebesar 1,67%, pH tanah sebesar 5,89, N-total tanah sebesar 0,172% dan populasi *Rhizobium* sebesar 89,00 x 10⁹ cfu ml⁻¹. Perlakuan tanah non steril dengan varietas Dering I (T₁V₄) menunjukkan hasil yang terbaik terhadap infektivitas dengan jumlah bintil sebanyak 80 butir tan⁻¹ dan bobot bintil sebesar 0,73 g tan⁻¹ serta efektivitas dengan serapan N tanaman sebesar 14,23 g tan⁻¹, tinggi tanaman (42 HST) 39,83 cm dan kadar klorofil (42 HST) sebesar 41,43 unit. Populasi *Rhizobium* menunjukkan hubungan yang sangat kuat dengan jumlah bintil (r=0,86), serapan N tanaman (r=0,87), tinggi tanaman (r=0,96), kadar klorofil (r=0,91), C-organik (r=0,97), pH (r=0,89) dan N-total (r=0,88). Populasi *Rhizobium* menunjukkan hubungan yang kuat dengan bobot bintil (r=0,75).

SUMMARY

UNTARI PRAWITA WARDHANI. 135040200111108. The Effectiveness of Endogenous Rhizobium in Former Soil of Soybean Planting on Growth of Six Soybean Varieties (*Glycine max* L.). Supervised by Yulia Nuraini and Didik Sucahyono

Rhizobium is bacterium that can fixed nitrogen from nature and supplied nitrogen for plants. However, population of *Rhizobium* in the soil may consist of ineffective strains to very effectively. This study purpose to understand the effected of soil chemical properties on endogenous *Rhizobium* populations from former soil of soybean planting and the endogenous *Rhizobium* from former soil of soybean planting of soybean effected on root nodulation and growth of six varieties of soybean plants. This study conducted on June to October 2017. Cultivation held in the green house of Balai Penelitian Tanaman Aneka Kacang dan Umbi (Balitkabi). The observation variables analysist held in Laboratory of Chemistry at Faculty of Agriculture, Brawijaya University and Laboratory of Soil Microbiology at Balitkabi.

This study was using simple Completely Randomize Block Design consists of 12 treatment combinations with 3 replication that occur in 36 treatments. The treatment combinations consist of T₁V₁ (Non sterile soil + Argomulyo varieties), T₁V₂ (Non sterile soil + Burangrang varieties), T₁V₃ (Non sterile soil + Grobogan varieties), T₁V₄ (Non sterile soil + Dering I varieties), T₁V₅ (Non sterile soil + Devon I varieties), T₁V₆ (Non sterile soil + Dega I varieties), T₂V₁ (Sterile soil + Argomulyo varieties), T₂V₂ (Sterile soil + Burangrang varieties), T₂V₃ (Sterile soil + Grobogan varieties), T₂V₄ (Sterile soil + Dering I varieties), T₂V₅ (Sterile soil + Devon I varieties), T₂V₆ (Sterile soil + Dega I varieties). The data analysis was using analysist of variance at 5% significant and Duncan Multiple Range Test (DMRT) and conducted a correlation test to determine the relationship between variables.

The non steril soil with Dering I varieties treatment (T₁V₄) showed the best result of C-organic is 1,67%, soil pH is 5,89, soil N-total is 0,172% and *Rhizobium* population is 89,00 x 10⁹ cfu ml⁻¹. The non steril soil with Dering varieties (T₁V₄) showed the best result of infectivity with the nodule number is 80 g plant⁻¹ and nodule weight is 0,73 g plant⁻¹ and effectivity with N plant uptake is 14,23 g plant⁻¹, plant height (42 DAP) 39,83 cm and chlorophyll content (42 DAP) is 41,43 unit. Population of *Rhizobium* showed a very strong association with the number of nodules (r=0,86), N plant uptake (r=0,87), height of plant (r=0,96), chlorophyll content (r=0,91), C-organic (r=0,97), pH (r=0,89) and N-total (r=0,88). Population of *Rhizobium* showed a strong association with the weight of nodules (r=0,75).