

## Intisari

Kekeringan merupakan suatu cekaman bagi tanaman yang memicu sintesis etilen secara berlebihan dan berdampak pada penghambatan pertumbuhan dan produktivitas tanaman padi. PGPB (*Plant Growth Promoting Bacteria*) dapat meningkatkan ketahanan tanaman terhadap cekaman kekeringan. Penelitian ini bertujuan untuk mengetahui pengaruh inokulasi PGPB terhadap pertumbuhan tanaman padi varietas Situ Bagendit pada tanah grumusol dalam cekaman kekeringan. Taraf kekeringan yang digunakan yaitu kadar air pada TLP (titik layu permanen,  $pF = 4.2$ ), KLP yakni 85.84 % kapasitas lapang, dan KL (kapasitas lapang,  $pF = 2.54$ ). Strain bakteri yang digunakan adalah *Pseudomonas putida* (PIR3), *Stenotrophomonas maltophilia* (PIR5), *Lysinibacillus pakistanensis* (PIC5), *Bacillus aryabhatai* (PIC11), dan *Raoultella terrigena* (PCM8). Tanaman padi diinokulasi campuran bakteri PGPB tersebut, kemudian dibandingkan dengan perlakuan tanpa inokulasi. Parameter pertumbuhan yang diamati meliputi tinggi tanaman, kandungan klorofil daun, dan bobot tanaman. Visualisasi keberadaan bakteri PGPB pada akar tanaman diamati dengan *Scanning Electron Microscope* (SEM). Hasil penelitian menunjukkan bahwa inokulasi PGPB mampu meningkatkan tinggi tanaman berturut-turut pada taraf kekeringan TLP, KLP, dan KL sebesar 28,62 %, 7,15%, dan 6,47%; meningkatkan kandungan klorofil daun hingga 15,35%, 5,04%, dan 5,25%; serta berat kering tanaman sebesar 791,94%, 40,88%, dan 55,81%. Bakteri PGPB yang diinokulasikan mampu mengkoloni perakaran tanaman padi. Berdasarkan hasil tersebut dapat disimpulkan bahwa inokulasi PGPB dapat meningkatkan secara signifikan pertumbuhan padi varietas Situ Bagendit di tanah grumusol dalam cekaman kekeringan.

Kata kunci: padi var. Situ Bagendit, grumusol, cekaman kekeringan, *Plant Growth Promoting Bacteria*

### Abstract

Drought is a stressor for plants that triggers excessive ethylene synthesis, inhibits growth and productivity in rice crops. PGPB (Plant Growth Promoting Bacteria) can enhance plant resilience to drought stress. This study aimed to investigate the effect of PGPB inoculation on the growth of rice var. Situ Bagendit in grumusol soil under drought stress. The drought levels used were the moisture content at PWP (permanent wilting point,  $pF=4.2$ ), HFC (85.84% of field capacity), and FC (field capacity,  $pF=2.54$ ). The bacterial strains used were *Pseudomonas putida* (PIR3), *Stenotrophomonas maltophilia* (PIR5), *Lysinibacillus pakistanensis* (PIC5), *Bacillus aryabhatai* (PIC11), and *Raoultella terrigena* (PCM8). Rice plants were inoculated with a mixture of these PGPB strains and compared with a treatment without inoculation. The growth parameters observed included plant height, leaf chlorophyll content, and plant weight. The presence of PGPB on plant roots was observed using Scanning Electron Microscopy (SEM). The results showed that PGPB inoculation increased plant height by 28.62%, 7.15%, and 6.47% at the drought levels PWP, HFC, and FC, respectively; increased leaf chlorophyll content by 15.35%, 5.04%, and 5.25%; and dry plant weight by 791.94%, 40.88%, and 55.81%. The inoculated PGPB was able to colonize the rice plant roots. Based on these results, it can be concluded that PGPB inoculation can significantly enhance the growth of the Situ Bagendit rice variety in grumusol soil under drought stress.

**Keywords:** Rice var. Situ Bagendit, grumusol, drought stress, *Plant Growth Promoting Bacteria*