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Perlakuan Agens Hayati untuk Mengendalikan Hawar Daun Bakteri dan Meningkatkan Produksi Benih Padi Sehat

Biological Agent Treatments to Control Bacterial Leaf Blight and to Improve Production of Healthy Rice Seed

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ABSTRACT

The research objectives were to evaluate biological agent treatments in controlling bacterial leaf blight (BLB) and increasing plant growth and seed production of rice. The experiment was conducted in the greenhouse and field using the same experimental design (randomized block design with two factors) and three replications. The first factor was seed treatments, i.e. negative control, positive control, streptomycin sulphate 0.2%, Pseudomonas diminuta + Bacillus subtilis, matriconditioning + streptomycin sulphate 0.2%, and matriconditioning + P. diminuta + B. subtilis. Spraying plants (second factor): untreated control, streptomycin sulphate 0.2%, biological agent F112, biological agent F198, and biological agent F57. In the greenhouse, matriconditioning + P. diminuta + B. subtilis improved seed germination, plant height, and plant dry weight. Spraying plants with biological agent F112 increased plant dry weight. Meanwhile, matriconditioning + P. diminuta + B. subtilis followed by spraying plants with biological agent F112 reduced the BLB severity. In the field, matriconditioning + P. diminuta + B. subtilis improved seedling dry weight. Matriconditioning + P. diminuta + B. subtilis and spraying plants with biological agents F112 controlled BLB and increased plant growth. However, all treatments were not able to increase healthy seed production.

Keywords: matriconditioning, seed treatment, phyllosphere biological agents, Xanthomonas oryzae pv. oryzae

ABSTRAK

Penelitian bertujuan mengevaluasi perlakuan agens hayati dalam mengendalikan hawar daun bakteri (HDB), meningkatkan pertumbuhan tanaman dan produksi benih padi sehat. Percobaan dilakukan di rumah kaca dan lapangan dengan rancangan yang sama (rancangan kelompok lengkap teracak dua faktor) dan tiga ulangan. Perlakuan benih (faktor pertama): kontrol negatif, kontrol positif, streptomisin sulfat 0.2%, Pseudomonas diminuta + Bacillus subtilis, matriconditioning + streptomisin sulfat 0.2%, dan matriconditioning + P. diminuta + B. subtilis. Penyemprotan tanaman (faktor kedua): kontrol, streptomisin sulfat 0.2%, agens hayati F112, agens hayati F57, dan agens hayati F198. Percobaan di rumah kaca menunjukkan bahwa matriconditioning + P. diminuta + B. subtilis meningkatkan perkecambahan benih, tinggi tanaman, dan bobot kering tanaman. Penyemprotan tanaman menggunakan agens hayati F112 meningkatkan bobot kering tanaman. Sementara itu, perlakuan matriconditioning + P. diminuta + B. subtilis yang diikuti dengan penyemprotan tanaman dengan agens hayati F112 mengurangi keparahan HDB. Percobaan di lapangan menunjukkan bahwa matriconditioning + P. diminuta + B. subtilis meningkatkan bobot kering bibit. Perlakuan benih matriconditioning + P. diminuta + B. subtilis 5B dan penyemprotan tanaman dengan agens hayati F112 dapat mengendalikan HDB dan meningkatkan pertumbuhan tanaman padi. Akan tetapi, semua perlakuan yang dilakukan belum dapat meningkatkan produksi benih sehat.

Kata kunci: agens hayati filosfir, matriconditioning, perlakuan benih, Xanthomonas oryzae pv. oryzae

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