

## **INTRODUKSI AGEN HAYATI DAN PUPUK PADA MEDIA SEBAGAI TINDAKAN PREVENTIF KLOROSIS DAUN DI PERSEMAIAN TUSAM**

### **Intisari**

Kerusakan semai tusam di Persemaian Linggoasri dan beberapa tempat persemaian lain di sekitar Pekalongan sudah sangat mengkhawatirkan dan cukup mengganggu pencapaian target penyediaan bibit. Pemberian pupuk dan fungisida sesuai standar yang diterapkan di persemaian sudah dilakukan namun kerusakan berupa gejala menguning belum bisa diatasi.

Penelitian ini bertujuan untuk mengetahui pengaruh faktor abiotik (unsur hara) dan/atau faktor biotik (*Trichoderma* serta jamur pembentuk mikoriza) terhadap kesehatan semai tusam sebagai dasar pengembangan strategi perlindungan semai tusam dari kerusakan di persemaian. Perlakuan yang digunakan dalam penelitian ini antara lain: M<sub>0</sub> (tanpa mikoriza), M<sub>1</sub> (dengan mikoriza), P<sub>0</sub> (tanpa pupuk lambat tersedia), P<sub>1</sub> (dengan pupuk lambat tersedia), T<sub>0</sub> (tanpa *Trichoderma reesei*) serta T<sub>1</sub> (dengan *T. reesei*). Kombinasi perlakuan tersebut menghasilkan delapan kombinasi perlakuan, yaitu: M<sub>0</sub>P<sub>0</sub>T<sub>0</sub>, M<sub>0</sub>P<sub>0</sub>T<sub>1</sub>, M<sub>1</sub>P<sub>0</sub>T<sub>0</sub>, M<sub>1</sub>P<sub>0</sub>T<sub>1</sub>, M<sub>0</sub>P<sub>1</sub>T<sub>0</sub>, M<sub>0</sub>P<sub>1</sub>T<sub>1</sub>, M<sub>1</sub>P<sub>1</sub>T<sub>0</sub>, dan M<sub>1</sub>P<sub>1</sub>T<sub>1</sub>. Parameter yang digunakan untuk mendukung tujuan tersebut, yaitu: 1) Kematian semai, 2) Pertumbuhan semai, 3) Perakaran semai, dan 4) Kesehatan semai.

Pengamatan terhadap gejala menguning di persemaian diduga kuat terjadi karena semai mengalami kekahatan hara sehingga menjadi lebih rentan terhadap patogen. Hal ini didukung oleh fakta di lapangan bahwa curah hujan di daerah Pekalongan Timur sangat tinggi sehingga kemungkinan terjadinya pelindihan hara oleh air hujan sangat besar dan terjadinya kelembaban yang tinggi sehingga memungkinkan bertumbuhnya jamur. Hasil analisis tanah pada media semai tusam di persemaian Linggoasri juga menunjukkan kecenderungan terjadinya kekahatan unsur hara pada media semai yaitu unsur nitrogen (N), fosfor (P), dan Kalium (K) yang merupakan unsur makro bagi tanaman.

Hasil penelitian menunjukkan bahwa perlakuan M<sub>1</sub>P<sub>1</sub>T<sub>1</sub> (kombinasi mikoriza, pupuk lambat tersedia dan pelet *T. reesei*) memberikan efek yang paling baik dari segi kematian semai yaitu 0 % (tidak ada semai yang mati), pertumbuhan semai berupa rata-rata tinggi pada akhir pengamatan sebesar 14,70 cm, sedangkan rata-rata diameter pada akhir pengamatan sebesar 3,38 mm, perakaran semai (persentase infeksi mikoriza) yaitu 87,29 % serta kesehatan semai sebesar 90 % (pada skor 1). Kombinasi ketiga perlakuan bekerja secara sinergis dan saling menguntungkan untuk mencegah kerusakan dan meningkatkan pertumbuhan semai tusam.

Kata kunci: tusam, semai, *Trichoderma reesei*, mikoriza, pupuk lambat tersedia.

## BIOLOGICAL AGENT AND FERTILIZER INTRODUCTION INTO THE MEDIA AS LEAF CHLOROSIS PREVENTIVE IN PINE NURSERY

### Abstract

Pine seedling damages in Linggoasri Nursery and in some other nursery in around Pekalongan has already worrying and disturbing seedling supply. Fertilizer and fungicide distribution at seedling media had been conducted but the damage in the form of yellowish symptom can not be cured yet.

This research is aimed for knowing abiotic factor (nutrient) and/or biotic (*Trichoderma* and mycorrhizae forming fungi) towards the pine seedling health as basic development of pine seedling protection strategy from the damage in nursery. The treatment used in this study include: M<sub>0</sub> (without mycorrhizae), M<sub>1</sub> (with mycorrhizae), P<sub>0</sub> (without slow release fertilizer), P<sub>1</sub> (with slow release fertilizer), T<sub>0</sub> (without *Trichoderma reesei*) and T<sub>1</sub> (with *T. reesei*). The combination treatment resulted in eight treatment combinations, namely: M<sub>0</sub>P<sub>0</sub>T<sub>0</sub>, M<sub>0</sub>P<sub>0</sub>T<sub>1</sub>, M<sub>1</sub>P<sub>0</sub>T<sub>0</sub>, M<sub>1</sub>P<sub>0</sub>T<sub>1</sub>, M<sub>0</sub>P<sub>1</sub>T<sub>0</sub>, M<sub>0</sub>P<sub>1</sub>T<sub>1</sub>, M<sub>1</sub>P<sub>1</sub>T<sub>0</sub>, and M<sub>1</sub>P<sub>1</sub>T<sub>1</sub>. Several parameters that used to support are: 1) the seedling mortality, 2) the seedling growth, 3) the seedling rooting and 4) the seedling health.

The observation of yellowish symptom in nursery is firmly suspect caused by nutrient deficiency of seedling so it becomes more susceptible towards pathogen. This is supported by the field facts of high rainfall in East Pekalongan, so the possibility of nutrient leaching was big, and high humidity happened then causing fungi growth easily. Soil analysis in pine seedling media in Linggoasri nursery also show the tendency of nutrient deficiency in seedling media i.e. Nitrogen (N), Phosphorus (P), and Pottasium (K) which are macro elements for the plants.

The research findings show that M<sub>1</sub>P<sub>1</sub>T<sub>1</sub> (combination of mycorrhizae, slow release fertilizer and pellets of *T. reesei*) treatment give the best effect from seedling mortality, seedling growth, seedling rooting and seedling health were 0 % (no seedling dead), seedling growth of average height at the end of the research was 14,70 cm, while the average diameter at the end of research was 3,38 mm, seedling rooting (percentage of mycorrhizae infection) was 87,29 % and the seedling health is 90% (on score 1). The three combination treatment synergistically work, cause the mutually benefit, damage prevention, and tusam seedlings enhance.

Keywords: pines, seedlings, *Trichoderma reesei*, mycorrhiza, slow release fertilizer