

PENGARUH *SEED PRIMING* DAN PEMBERIAN KALSIMUM SILIKAT TERHADAP KARAKTER FISILOGIS DAN KETAHANAN TANAMAN TEMBAKAU (*Nicotiana tabacum* L.) PADA LAHAN SALIN

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INTISARI

Tanaman tembakau (*Nicotiana tabacum* L.) menjadi salah satu komoditas penting karena memiliki banyak manfaat. Namun, produktivitas tembakau masih belum optimal. Hal tersebut terjadi salah satunya karena faktor lingkungan berupa tanah salin. Perlakuan *seed priming* dengan cara mengontrol hidrasi biji dapat meningkatkan perkecambahan biji. Penelitian ini bertujuan untuk menganalisis pengaruh *seed priming* dan pemberian kalsium silikat (CaSiO_3) terhadap karakter fisiologis dan ketahanan tanaman tembakau pada lahan salin. Ruang lingkup penelitian berfokus pada tanaman tembakau (*Nicotiana tabacum* L.) kultivar Jember Sili. Penelitian Rancangan Acak Lengkap (RAL) ini terdiri atas 2 faktor yaitu *seed priming* kalsium silikat (0 mM, 1 mM, 2 mM) dan pemberian kalsium silikat (CaSiO_3) pada media tanam (0 mM, 1 mM, 2 mM). Parameter yang diamati berupa perkecambahan, pertumbuhan dan fisiologis. Data dianalisis menggunakan SPSS versi 26 untuk uji ANOVA dan jika terdapat pengaruh maka dilanjutkan dengan uji DMRT (*Duncan's Multiple Range Test*) pada taraf signifikansi 95%. *Priming* kalsium silikat menunjukkan respons positif terhadap perkecambahan dan pertumbuhan tanaman tembakau (*Nicotiana tabacum* L. 'Jember Sili') pada lahan salin rendah. *Priming* 1 mM memberikan hasil paling optimal dalam meningkatkan daya berkecambah, kecepatan tumbuh, indeks vigor, *Time Germination Index* (TGI), tinggi tanaman, jumlah daun, berat segar tajuk dan akar, berat kering tajuk dan akar, serta panjang akar secara signifikan. Selain itu, ketika dikombinasikan dengan aplikasi silikat pada tanah salin rendah mampu meningkatkan parameter fisiologis seperti kandungan klorofil dan karotenoid, kadar gula, kandungan air nisbi, indeks stabilitas membran (ISM), kadar superoksida dismutase (SOD), dan kadar nikotin yang didukung oleh lokalisasi alkaloid pada daun. Hal tersebut diiringi dengan penurunan kadar prolin, H_2O_2 , dan *Malondialdehyde* (MDA) pada konsentrasi silikat yang lebih tinggi.

Kata Kunci: Kalsium Silikat, Salinitas, *Seed Priming*, Tembakau.

**THE EFFECT OF SEED PRIMING AND APPLYING CALCIUM SILICATE
ON THE PHYSIOLOGICAL CHARACTERS AND RESISTANCE OF
TOBACCO PLANT (*Nicotiana tabacum* L.) ON SALINE SOIL**

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ABSTRACT

Tobacco plants (*Nicotiana tabacum* L.) are an important commodity due to their numerous benefits. However, tobacco productivity is still suboptimal. This is partly due to environmental factors such as saline soil. Seed priming treatment by controlling seed hydration can improve seed germination. This study aims to analyze the effect of seed priming and calcium silicate (CaSiO_3) application on the physiological characteristics and resistance of tobacco plants to saline soil. The scope of the study focuses on the Jember Sili cultivar of tobacco (*Nicotiana tabacum* L.). This Completely Randomized Design (CRD) study consisted of two factors: seed priming with calcium silicate (0 mM, 1 mM, 2 mM) and calcium silicate (CaSiO_3) application to the growing medium (0 mM, 1 mM, 2 mM). The observed parameters were germination, growth, and physiological parameters. Data were analyzed using SPSS version 26 for ANOVA, and if there was an effect, it was continued with DMRT (Duncan's Multiple Range Test) at a significance level of 95%. Calcium silicate priming showed a positive response to the germination and growth of tobacco plants (*Nicotiana tabacum* L. 'Jember Sili') on low saline soils. 1 mM priming provided the most optimal results in increasing germination, growth rate, vigor index, Time Germination Index (TGI), plant height, number of leaves, fresh weight of shoots and roots, dry weight of shoots and roots, and root length significantly. In addition, when combined with silicate application on low saline soils, it was able to increase physiological parameters such as chlorophyll and carotenoid content, sugar content, relative water content, membrane stability index (MSI), superoxide dismutase (SOD) levels, and nicotine levels supported by alkaloid localization in leaves. This was accompanied by a decrease in proline, H_2O_2 , and Malondialdehyde (MDA) levels at higher silicate concentrations.

Keywords: Calcium Silicate, Salinity, Seed Priming, Tobacco.