ABSTRAK

Mucuna bracteata DC. is a crucial legume ground cover crop for oil palm plantations, but its seeds undergo physical dormancy due to hard seed shelling, inhibiting germination, and existing mechanical methods are often inefficient due to small seed sizes. This study aims to investigate the effectiveness of tofu wastewater, which is rich in nutrients, in breaking this dormancy by examining the effect of concentration and soaking duration, as well as the combined effects, on the germination of *Mucuna bracteata seeds*. The study, which was conducted at the Laboratory of the Faculty of Agriculture, Malikussaleh University, from February to March 2025, used a factorial Complete Random Design with four concentrations of tofu water waste (0%, 30%, 60%, 90%) and four soaking durations (0, 4, 8, 12 hours), repeated three times with 25 seeds per repeat, so that the total seeds used were 1200. Seeds were treated, washed, and sown on sand and compost media (1:1), with parameters such as maximum growing potential, germination power, vigor index, growing density, and growth rate observed. Statistical analysis involved the F-test and the Duncan test (0.05). The results showed that the concentration of tofu wastewater and the length of immersion significantly affected germination. The concentration of 90% tofu wastewater gave the best results for maximum growing potential (67.50%), germination power (64.83%), vigor index (31.00%), and growing density (43.50%). Similarly, the duration of the 12-hour immersion also produced optimal results for maximum growth potential (66.00%), germination power (63.41%), vigor index (31.25%), and simultaneous growth (44.08%). A significant interaction between concentration and immersion time was observed only at growing speed, with a combination of 30% tofu waste water and 12-hour immersion (K1L4) resulting in the highest speed (50.00%). Tofu waste water is thought to accelerate water imbibition and break dormancy due to its macro-nutrient content (nitrogen, phosphorus, potassium) that stimulates enzyme activity and seed metabolism. In conclusion, the tofu waste water concentration of 90% and the 12-hour soaking duration were most effective for most of the germination parameters *of Mucuna bracteata* seeds, demonstrating the efficacy of tofu waste water in breaking seed dormancy.

Keywords: Effect of tofu wastewater, soaking concentration, *Mucuna bracteata*, dormancy breaking, seed germination