

MUTATION INDUCTION OF SOYBEAN VARIETY DEGA 1 (*Glycine max* L) WITH MUTAGEN EMS (*Ethyl Methane Sulfonate*) AND IDENTIFICATION OF DROUGHT STRESS TOLERANCE USING PEG 6000 (*Polyethylene Glycol*)

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ABSTRACT

Soybeans (*Glycine max* L) are a food commodity with very high economic value. Increasing soybean productivity can be achieved through induced mutation using chemical mutagens like *Ethyl Methane Sulfonate* (EMS). This study aims to investigate the effects and optimal treatment of EMS-induced mutation on drought tolerance in Dega 1 soybean variety using PEG 6000 (*Polyethylene Glycol*). The research was conducted in a greenhouse at PT. Rahasia Wasiat Alam, Klaten Regency. The research method used a Completely Randomized Design (CRD) with two factors and three replications. The first factor was the concentration of EMS: 0, 10, 20, and 30 mM. The second factor was the level of drought: 0% and 5% PEG 6000. Data analysis included *Analysis of Variance* (ANOVA) and *Duncan's Multiple Range Test* (DMRT) at 5% significance level. The research results showed that a concentration of 31.4 mM caused 50% mortality in the population (LD50). A concentration of 30 mM and a dryness level of 5% produced the largest root volume, the heaviest root dry weight, the highest ratio of root dry weight to stover, the highest number of pods per plant, and the heaviest weight of 100 seeds. The 30mM concentration had the best scoring results, namely 6 observation variables with a score of 6 (very resistant) and 2 observation variables with a score of 5 (resistant).

Keywords: Induction of Mutations, EMS (*Ethyl Methane Sulfonate*), Drought, PEG (*Polyethylene Glycol*), Soybeans