

ABSTRACT

Plant breeding is one of the methods to improve plant genotypes and obtain superior varieties through various means such as crossing, mutation, or genetic engineering. Mutations can be applied to improve the genetic traits of plants. Colchicine can be used to obtain mutant plants, resulting in changes in seed color, pod color, and affecting the number of seeds per pod. EMS (Ethyl Methane Sulfonate) is an alkylating mutagen that can induce point mutations at the DNA level. This study aims to determine the morphological, agronomic, and vegetative diversity, as well as the genetic diversity and heritability in the Galur M.1.1.3 population due to the administration of colchicine and EMS in the M2 generation. The research was conducted in Reulet Timur and the laboratory of the Faculty of Agriculture, Universitas Malikussaleh, using a non-factorial randomized block design. In the M1 generation, each plant at each concentration was harvested and 3 pods per plant were taken to be planted as the M2 generation. There are 5 soybean populations in the M2 generation that will be tested: (P0) Control Population, (P1) 0.01% Colchicine Population, (P2) 0.02% Colchicine Population, (P3) 0.2% EMS Population, (P4) 0.3% EMS Population. The results of the study showed that the treatment of colchicine and EMS (Ethyl Methane Sulfonate) mutagens caused morphological changes in the M.1.1.3 soybean line in the M2 generation. The morphological changes included changes in germination morphology, leaf color, leaf shape, and Undervelovet Rasim Flower. The treatment of colchicine and EMS (Ethyl Methane Sulfonate) mutagens caused agronomic changes in the M.1.1.3 soybean line in the M2 generation. The agronomic changes included plant height at ages 2, 4, 6, and 8 MST, the number of branches, flowering time, harvest time, the number of pods per plant, seed weight per plant, 100 seed weight, seed weight per plot, and yield.

Keywords: Kipas Putih Soybean, EMS (Ethyl Methane Sulfonate), M₂ Generation