Combined effect of seed size and biofertilizer on the initial establishment of mulungu (*Erythrina velutina* Willd.) seedlings

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Keywords: germination, seed vigor, seed biometrics, organic input

Erythrina velutina (mulungu) is a Brazilian native tree with medicinal, ornamental, and ecological importance, widely used in the restoration of degraded areas. Seed physiological quality is a key factor for successful seedling production, and seed size may influence germination performance and early growth. This study evaluated the effect of seed size and biofertilizer application on the emergence and initial development of *E. velutina* seedlings.

The experiment was conducted in a greenhouse using a completely randomized design with four treatments: small seeds with biofertilizer, small seeds without biofertilizer, large seeds with biofertilizer, and large seeds without biofertilizer. Seeds were classified by biometric measurements and subjected to imbibition in a 50% biofertilizer solution. Germination was performed in autoclaved sand, and emergence, emergence speed index, mean germination time, seedling height, abnormal seedlings, and dry biomass were evaluated.

Large seeds produced significantly more vigorous seedlings, with higher emergence rates (up to 83%), faster emergence, greater height (15.92 cm), and higher dry mass than small seeds. Seedlings from small seeds showed lower vigor, reduced biomass, and a higher proportion of abnormal individuals. Biofertilizer application did not significantly influence any evaluated parameter. The superiority of large seeds is attributed to their greater reserve quantity and density, which support faster germination metabolism and seedling establishment. Results indicate that seed size is the main determinant of early seedling performance in *E. velutina*, while the tested biofertilizer concentration and application method were ineffective under the experimental conditions. Selecting larger seeds is therefore recommended to improve mulungu seedling production for restoration and cultivation purposes.