

ABSTRACT

The rapid decline of timber from natural forests against increasing domestic demand for wood products has caused a steady increase in timber prices in Kenya. Recently, research and development institutions have recognized the ecological and economic value of indigenous tree species and therefore have emphasized the importance of their future production on private smallholder farms rather than in large plantations. This situation has been worsened by climate changes such as the frequent high intensity of prolonged droughts and the nature of soils with poor water retention capacity. As a result, unplanted forest regeneration sites have increased hence a need for re-afforestation of these sites to meet the target for the plantation industry. Therefore, there is a need for mass production of *Olea africana* seedlings for reforestation programs. One such approach is the application of hydrogels or synthetic polymer organic combinations capable of improving the water and nutrient retention of the soil that can support seedling growth. This study sought to investigate the effects of hydrogel application on selected growth characteristics of *O. africana*. Seeds were germinated and transferred into two sets of tubes of the same size arranged in a complete randomized block design (CRBD) experiment. The sets were subjected to different levels of hydrogel concentration. Under (0gm as control) and 7gm, 14gm, and 21gm) concentration levels of hydrogel mixed with soil in open field conditions. The height and shoot collar diameter of germinated seedlings were measured every two weeks for two months. The survival of *O. africana* seedlings decreased with time for all treatments irrespective of the addition of hydrogels with the highest (85%) survival of seedlings on soils mixed with 21gm of hydrogel compared to 0gm hydrogel that recorded (15% survival) eight weeks after