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REFORESTING FROM AIR: SEED-RELEASING ROCKET INSPIRED BY THE EXPLOSIVE POP
OF POPPING CRESS SEEDS

Abstract

The current paper presents the use of a seed-releasing rocket to assist in the regeneration of the dry forest after a wildfire in the Área de Conservación Guanacaste World Heritage Site (ACG), located in the northwest of Costa Rica. According to the ACG website*, 21 wildfires affected more than 2500 acres of protected forests in 2021. Recolonization of native species is required to restart the forest regeneration cycle in a fire-damaged forest. The first stage of reforesting a damaged wildfire forest is to grow a secondary forest.

For this, fast growing heliophytes native species are preferred. The greater the number of seeds that can be dispersed, the higher the likelihood of success. Two native seeds of Guanacaste have been selected based on their biological properties: Jícaro (*Crescentia cujete*), and Madero Negro (*Gliricidia sepium*). Their quick growth, capacity to germinate in poor soils, minimal water needs, and resistance to the dry conditions of Guanacaste make them suitable for usage in soils damaged by forest fires.

Taking inspiration from the exploding mechanism of cress seeds, the water rocket prototype releases the seeds from within. The parachute opening process mimics the "jump" function of this mentor. This design aims to be an innovative method to reforest in areas affected by forest fires, combat the effects of climate change, and benefit the repopulation of biodiversity.

Keywords: reforestation, wildfire, seed releasing mechanism, rockets, assisted regeneration.

*<https://www.acguanacaste.ac.cr/index.php>