

Topics (T)
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Author: Ms. Stephanie María Leitón Ramírez
University of Costa Rica, Costa Rica, stephanie.leitonramirez@ucr.ac.cr

Ms. Maryam Safai Fard
University of Costa Rica, Costa Rica, maryam.safaiyard@ucr.ac.cr
Mr. Alvaro Bermudez
University of Costa Rica, Costa Rica, alvarobermudez04@gmail.com
Ms. Morelia Soto-Garro
Universidad de Costa Rica, Costa Rica, morelia3103@gmail.com
Dr. Leonora de Lemos
Universidad de Costa Rica, Costa Rica, leonora.delemos@ucr.ac.cr
Mr. Josué Alfonso De la Cruz Roa
University of Costa Rica, Costa Rica, josue.delacruz@ucr.ac.cr
Ms. Larisa Torres Dorati
Universidad de Costa Rica, Costa Rica, larisa.torres@ucr.ac.cr

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 protected areas of Guanacaste (Área de Conservación Guanacaste (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 greater the number of seeds that can be dispersed, the higher the likelihood of success. The first stage of reforesting a damaged wildfire forest is to grow a secondary forest. For this, native species and heliophytes are preferred. A list of Guanacastes zone tree flying seeds has been studied, and three of them were selected based on their biological properties: Jicaro (*Crescentia cujete*), Balsa (*Ochroma pyramidale*), and species from the Fabaceae or Leguminosae family like Sota Caballo (*Zygia longifolia*). Their natural resistance to wildfires due to their special tree bark, fast growth, poor soil, low water requirements, high seed density in the fruit with a natural mechanism to open it (dehiscence), and the ability to uphold the dry conditions of Guanacaste during the summer are favored to be chosen for this model. The prototype is designed to release the seeds from inside, inspired by the explosive mechanism of popping cress seeds. The parachute-releasing mechanism utilizes the biomimicry design tool to imitate the "jumping" function of the popping mentor. Because of the performance of a model rocket, this could be an innovative method to spread seeds so the forest can regrow in the affected wildfire areas. In summary, reforesting from the air may creatively help to fight the effects of climate change and benefit biodiversity repopulation.