

Coating Highland Rice Seeds with Local *Spondias pinnata* Gum Can Reduce Seedling Mortality Caused By Water Deficit During Rain Delay

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Seedling mortality from water deficit during rain delay period is a major problem of highland rice farming. The objective of this project is to investigate a method to protect the rice seeds from damage by water deficit during rain delay. We observed that the local *Spondias pinnata* gum, *Bombax ceiba* gum and *Azelia xylocarpa* gum, normally left to rot, were swollen when soaked in rain. We thought that they should be able to provide moisture to rice seed if the seeds are covered by the gum. We, thus, studied the water absorbency and water retention of the gums compared with guar gum and polyacrylate. We found that *Spondias* gum showed higher water absorbency and water retention than the other gum and similar to polyacrylate but degrade in nature faster than polyacrylate. We coated 3 cultivars of rice seeds with these gums and found that rice seeds coated with local gum could reduce the penetration of bugs and fungi. The coated seeds showed 1.9 times higher water imbibition than uncoated seeds. *Spondias* gum coating resulted in higher germination percentage and survival rate than others. When water was withdrawn for 72 hours, the seeds coated with *Spondias* gum were still able to germinate and grow while the uncoated seeds were not. Coating the seeds can reduce water usage for germination and growth around 30- 40%. Our finding introduce a method using local material to prolong seed germination during rain delay and reduce water usage for their growth.

Awards Won:

U.S. Agency for International Development: USAID Science for Development Second Place Award of \$3,000.