

Improving Germination of Piligrass (*Heteropogon contortus*) Seeds Using Liquid Smoke Flavoring

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INTRODUCTION

Piligrass is a perennial bunchgrass native to the main Hawaiian islands (Figure 1). It is a drought tolerant and fire adapted species found from the coast to about 70 meters above sea level.

It has been mainly used as a restoration/erosion control species. Interest has recently increased in expanding use as an ornamental groundcover, a living mulch for tropical forest tree crops, a native groundcover for roadside re-vegetation and a species for riparian buffer strip plantings.

Piligrass seeds possess dormancy. To break piligrass seed dormancy, an after-ripening period of at least 6 months or soaking in 1% gibberellic acid is required to obtain substantial germination.

Food grade liquid smoke flavoring is a cheap and convenient seed treatment alternative to gibberellic acid. However, it is not known if this is effective in enhancing germination of dormant piligrass seed. In this study, the effectivity of liquid smoke flavoring as an aqueous seed treatment for 1 month old piligrass seeds was evaluated.

MATERIALS AND METHODS

One month old piligrass (Kahoolawe germplasm) seeds were procured from the USDA-NRCS Hoolehua Plant Materials Center.

Aqueous solutions of liquid smoke (1% v/v, Colgin Mesquite Liquid Smoke) and gibberellic acid (10,000 ppm, Falgro 20SP) were prepared using distilled water.

Piligrass seeds were soaked for 15 minutes in each of the prepared solutions and in distilled water (control treatment) (Figure 2).

One hundred seeds from each treatment were planted in square petri dishes lined with moistened filter paper (Whatman No 3).



Figure 1. Piligrass in cultivation

The experiment was laid out in a randomized complete block with 4 replicates (Figure 3).

Seeds were allowed to germinate under ambient office conditions (22°C) with natural daylight (Figure 3).

Percent germination was recorded 1 month after the seeds were sown.

Analysis of variance was carried out using Statistix® 9.0 statistical software.

RESULTS AND DISCUSSION

Both 10,000 ppm gibberellic acid and 1% liquid smoke flavoring significantly improved germination 1 month after treated seeds were sown (Figure 4).

Liquid smoke flavoring was twice as effective as gibberellic acid in improving germination of 1 month old piligrass.

Seeds treated with gibberellic acid produced lanky seedlings while seeds treated with liquid smoke were normal (Figure 5).

Production of lanky seedlings may not be favorable because of its delicate nature (in terms of handling).

CONCLUSION

Liquid smoke flavoring can be used for enhancing germination dormant piligrass seeds. It is recommended to soak piligrass seeds in a 1% v/v dilution for 15 minutes prior to planting.

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Figure 3. Layout of treatments under ambient office conditions. Treatments were blocked according to the light gradient.

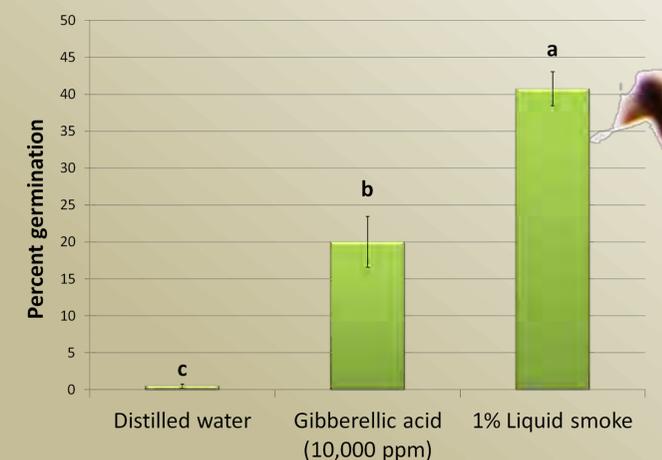


Figure 4. Percent germination of piligrass seeds 1 month after the soaking treatments were applied. Treatments followed by the same letters are not significantly different as determined by Tukey's range test at $P \leq 0.01$. Standard errors of the mean are presented.

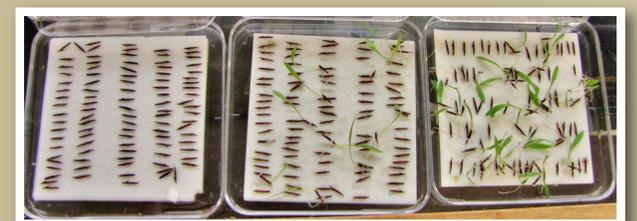


Figure 5. Distilled water (left), 10,000 ppm gibberellic acid (center) and 1% liquid smoke (right) treatments 2 days after sowing. Seedlings produced in the gibberellic acid treatments exhibited elongated stems.

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