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Optimizing Germination of Papaya Seeds

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In 1992, establishment of the papaya ringspot virus (PRV) disease in the Puna District of the island of Hawaii significantly reduced papaya production there. Subsequently, the transgenic papaya variety 'UH SunUp', which is resistant to PRV, was developed to overcome this barrier to production. The yellow-fleshed 'UH Rainbow' hybrid, which is highly resistant to PRV, was then developed by crossing 'SunUp' with 'Kapoho', which was commonly grown in Puna before the PRV outbreak. The introduction of 'Rainbow' to the industry led to the re-establishment of commercial papaya production in Puna.

Because 'Rainbow' is a hybrid, its seeds must be produced under controlled conditions. If seeds are taken from a 'Rainbow' fruit grown under "normal" field conditions, some of the resulting plants will lack PRV resistance and produce fruits of varying size and fruit flesh color. Recent observations of the industry indicate that seeds taken from hybrid 'Rainbow' fruits are being planted. *It is imperative that growers do not plant seeds from fruits that they harvest but rather continue to purchase true hybrid 'Rainbow' seeds from certified suppliers.* This protects the industry by ensuring virus resistance and consistent fruit size and flesh color.

At over \$50.00 an ounce, the cost of 'Rainbow' seed is significant, and growers need to optimize seed germination. Chemical growth inhibitors within papaya seeds are partly responsible for the poor and slow germination often experienced when establishing papaya seed-

lings. Germination can be accelerated by removing the fleshy material (called sarcotesta) found around each seed, but germination inhibitors are found in both the sarcotesta and the seed coat beneath it.

Field germination of papaya seeds can be greatly improved by soaking them before planting in an aqueous solution of potassium nitrate (KNO_3). Germination percentage of both fresh and dried seeds can be increased with this method. The time to germination after the soaking treatment is reduced, and maximum germination is achieved sooner than when untreated seeds are planted.

Seeds soaked in KNO_3 solution also produce seedlings that are initially more vigorous than seedlings from untreated seeds. Growers can obtain hydroponic-grade KNO_3 fertilizer from fertilizer suppliers or reagent-grade KNO_3 from laboratory chemical suppliers.

Steps to improve papaya seed germination:

1. Mix 100 grams of potassium nitrate in 1 liter of water (3.4 ounces in 1 quart).
2. Soak seeds for 30 minutes.
3. Plant immediately after soaking.

KNO_3 solution soak makes seedlings more vigorous.

Soaking seeds in KNO_3 solution improves germination.

