

Cooperative Extension Service
College of Tropical Agriculture and Human Resources
University of Hawai'i at Mānoa

Hawaiian Noni Seed Processing and Germination

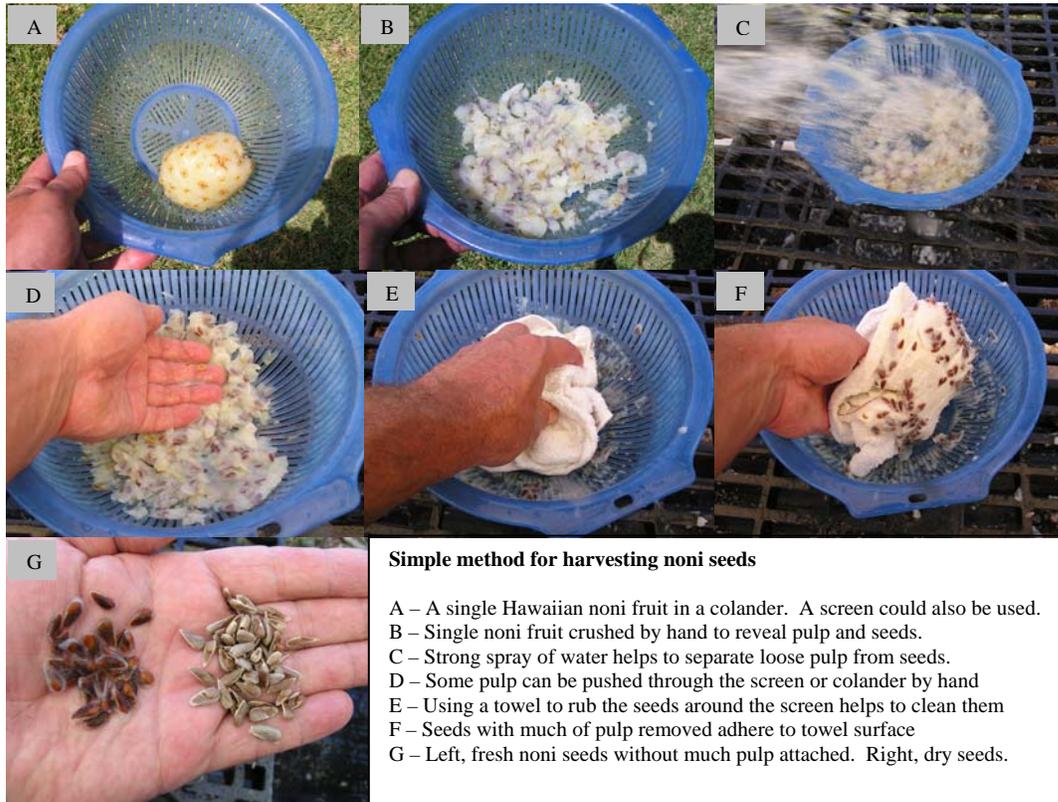
Dr. Scot C. Nelson
University of Hawaii at Manoa
Cooperative Extension Service
79-7381 Mamalahoa Highway, Kealahou, HI 96750-7911
snelson@hawaii.edu
808-322-4892 (tel)
808-322-4895 (fax)

This brief document provides a description of noni seed anatomy and detailed instructions for the processing and successful germination of Hawaiian noni seeds.

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1) Processing Noni Seeds



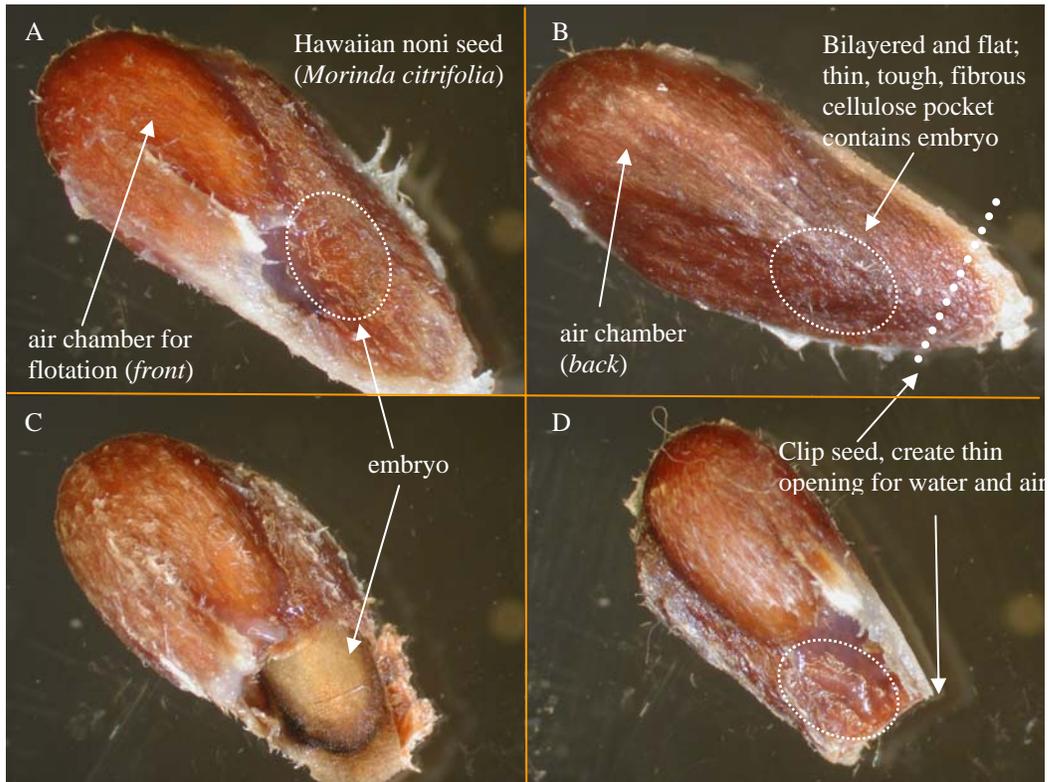
When to harvest noni fruits for seed production. Noni fruits are harvested for seed production after the fruit falls naturally from the tree onto the ground. When they are picked from the ground, the fruits are very soft and ripe. The seeds in this shipment were obtained from fruits harvested in the final week of May, 2004.

How to separate the noni seeds from the fruit pulp. The pulp of the noni fruit must be cleaned away from the seeds. This process is labor-intensive. The pulp is rubbed through a screen or colander using mechanical force and a strong spray of water, which rubs the pulp away from the seeds.

The number of seeds per noni fruit. The average ripe Hawaiian noni fruit contains between 200 and 250 seeds. Therefore, to obtain a yield of 50,000 noni seeds one must process at least 225 fruits.

Drying the seeds. After the pulp has been separated from the seeds, the noni seeds are placed on a screen and dried in the sun for 2 hours while stirring them occasionally. Then, the noni seeds are placed in a dry, breezy location in the shade to dry for another two days at ambient relative humidity, which was about 80% in Kona.

2) Noni Seed Anatomy



THE BULBOUS AIR CHAMBER DOES NOT CONTAIN THE EMBRYO

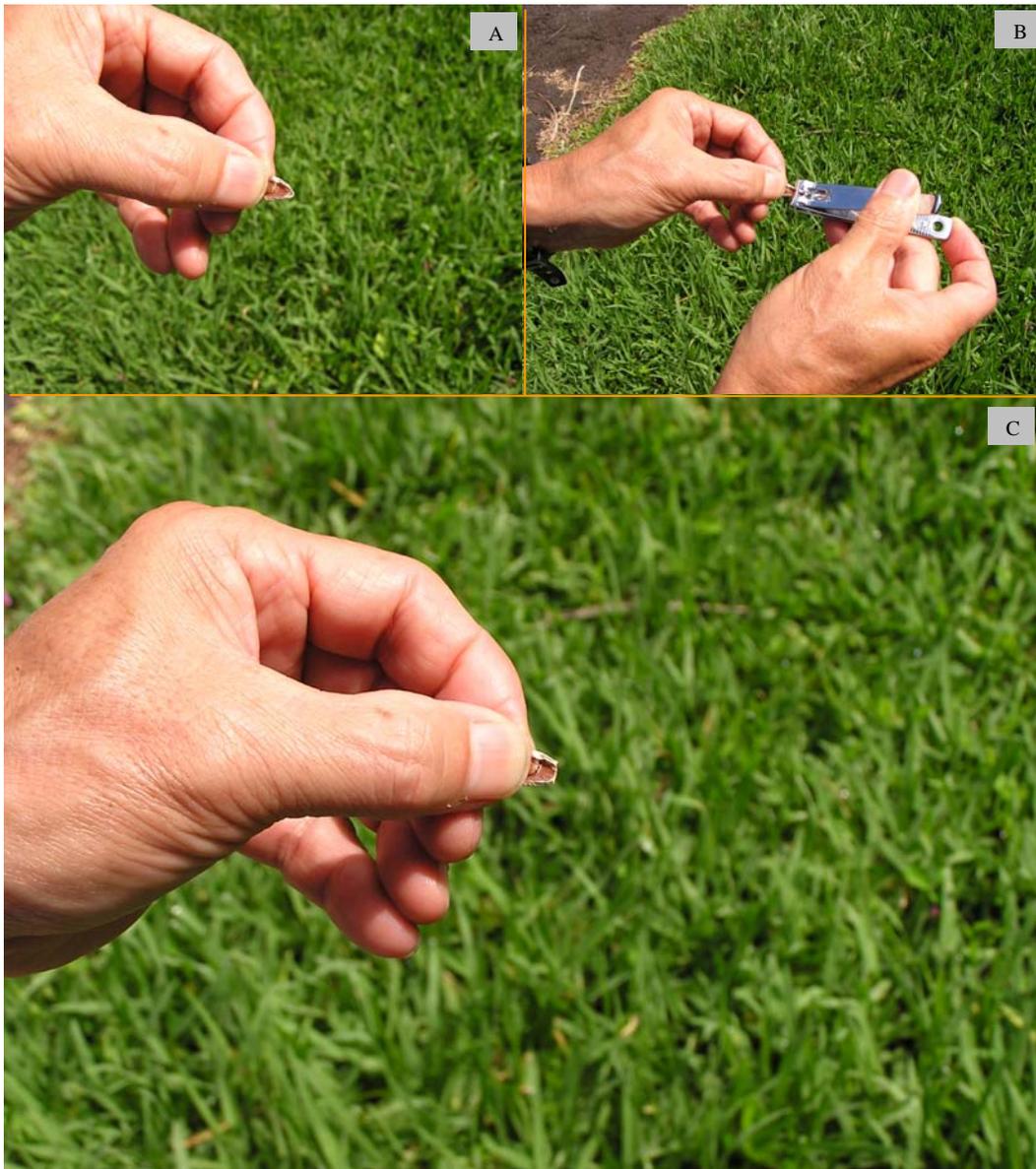
A - Typical fresh Hawaiian noni seed, frontal view. The seed coat is comprised of extremely tough, cellulose fibers. There is a bulbous, ovoid air chamber and a flattened, bi-layered, tapering paddle. The ovoid with dotted lines represents the approximate position, shape and size of the embryo.

B - The reverse side of the noni seed figure A. Noni seeds float and the seed coat is extremely tough, durable and resistant to penetration, scratching and breaking.

C - Noni seed, frontal view with top layer of cellulose fibers removed and seed tip clipped to reveal a portion of the rounded noni seed embryo. The noni seed embryo is very tender; it is high in oils.

E - Clip noni seeds to reduce time required for germination. Be careful not to clip into the embryo.

3) Clipping Noni Seeds to Improve Germination



Noni seeds can be clipped using an ordinary fingernail clipper to create an opening in the tough seed coat, so that water and air may enter and contact the embryo. This clipping can increase the germination percentage and also reduce the time required for germination from several months to only 4 weeks or more.

A – Hold noni seed with one hand

B – Use a fingernail clipper to remove approximately 1/16th of an inch from the tip of the seed from the end opposite the air chamber. Be careful not to clip off too much of the seed coat and damage the embryo inside. Practice on a few seeds first.

C – Clipped noni seed ready for planting.

3) Clipping Noni Seeds to Improve Germination (continued)



Left, clipped seed ready for planting.
Right, seed not yet clipped.

4) Noni Seed Germination

Clipping improves seed germination. Clipping is a form of seed scarification which can reduce the time required for noni seeds to germinate. A small opening is created in the tip of the seed, near the embryo, which allows water and air to contact the embryo.

Time required for germination of Hawaiian noni seeds. Hawaiian noni seeds can require from 2-6 months germinating without treatment. When seeds are clipped and placed under optimum germination conditions, the time required for seed germination can be reduced to 4-6 weeks.

Instructions.

1. First, soak the seeds in sterile water for 1-2 days to hydrate the seed coat. Noni seeds float, so it may be desirable to place the seeds into nylon bags with weights to keep them under water while soaking.
2. Rinse the soaked seeds with clean water.
3. Clip the noni seeds (if desired) with clean hands and tools.
4. Fill the seed germination containers (seedling flats, pots, etc.) to 3 inches deep with new Vermiculite[®]. Soak the Vermiculite[®] with water, using a hose with spray nozzle.
5. Scatter the noni seeds on the surface of the vermiculite. Seeds can be planted like this in groups within germination trays or pots and then transplanted later, or they can be planted singly in pots.
6. Cover the noni seeds with about ½ inch of additional Vermiculite[®].
7. Soak the newly placed vermiculite with clean water as in Step 4.
8. Apply some pressure by hand to press down the surface of the vermiculite in the trays or pots. The objective is to pack down the vermiculite on top of the seeds to ensure good contact between vermiculite and the seeds. Make sure hands are clean.
9. Place the germination trays or pots in a sunny, warm location on benches. The benches should be in a greenhouse or plastic shade-house where temperature can be controlled or regulated and the pots or flats can be protected from rainfall and wind and dirt. The noni seeds will germinate most rapidly if they are held between 90 – 100 degrees Fahrenheit in a sunny location. Partial shade is okay.
10. Sprinkle clean water into the pots or flats each day, or as needed to keep them moist but not waterlogged.
11. The noni seeds should begin to germinate about 4-6 weeks after planting under these conditions. There is no need to fertilize the noni seedlings until after the seeds have germinated.
12. After the noni seeds germinate, the small plants will grow very slowly. When the tap root reaches the bottom of the germination container (flats or pots), it is time to transplant the seedlings to a larger container, such as ½-gallon or 1-gallon pot.
13. Plants can be grown in pots for about 1 year before plants are transplanted into the field.



Above: A handful of Vermiculite[®]. This substance is well-suited for noni seed germination (holds water, is well-aerated, is pathogen-free, and will not become overly compacted or soggy). It has very little nutritional value for the plant, but there is enough stored energy in the noni seed to compensate for that.

Below: a bag of Vermiculite[®]





Above: noni seedlings after germination in a pot full of Vermiculite.

Below: noni seedling pulled from the pot, and with a nice tap root is now ready for transplanting to another, larger pot.



Please feel free to contact Dr. Scot Nelson with any questions.