



A Simplified Method of Multiplying Bacterial Wilt-Free Edible Ginger (*Zingiber officinale*) in Pots

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In Hawai'i, the primary limiting factor for the commercial production of edible ginger is the disease known as bacterial wilt (caused by *Ralstonia solanacearum* race 4) (Hepperly et al. 2004). First reports of this disease in Hawai'i were made in 1964, with subsequent crop losses reported as high as 60% in 1993 (Ishii and Aragaki 1963, Rohrbach et al. 1993). Symptoms of bacterial wilt of ginger include leaf yellowing and curling followed by necrosis and lethal wilting of the plant (Figure 1). Since ginger is vegetatively propagated, it is important to plant seed pieces that are not infected with the bacterial wilt pathogen, because diseased seed pieces will develop into diseased plants and lead to crop losses.

This article describes how to grow your own *disease-free* ginger in 7-gallon plastic pots. It is possible to produce up to 10 pounds of edible ginger rhizomes per pot after 9 months, which can be used as seed or for culinary purposes. The following steps will help you to successfully grow bacterial wilt-free ginger in pots.

Materials Needed

A clean 7-gallon pot
Peat-perlite growing medium such as Sunshine Mix #2
Slow-release fertilizer (3–4 months)
Dolomite 65AG (finely ground)
Pathogen-free ginger
Measuring spoons
A large, clean plastic garbage bag

Method

1. Finding disease-free ginger pieces is the first step to growing a crop of healthy edible ginger. Sometimes, it is not possible to tell visually whether ginger rhi-



Fig. 1: A field of ginger plants infected with bacterial wilt.



Fig. 2. Two ginger rhizomes—one is infected with bacterial wilt and the other is wilt-free. Can you tell which is the infected one? (See p. 3.)



Fig. 3. Disease-free ginger seed piece about the size of 2 to 3 D-cell batteries.



Fig. 4. A ginger plant, on a bench, growing in a 7-gallon pot. (Photo by Patricia Takako Angle).

zomes are infected with bacterial wilt (Figure 2). Bacterial wilt-free seed is available for purchase on the Big Island through the University of Hawai'i-Mānoa, Hawai'i County Cooperative Extension Office at 875 Komohana Street, Hilo, Hawai'i 96720, (808) 981-5199. Ginger should be planted in March to May, and mature ginger rhizomes can be harvested in about 9 months.

2. Wash a clean knife (non-serrated edge) with detergent and hot water to sanitize the blade. Cut a ginger rhizome into small, 2- to 3-ounce seed pieces (approximately the size of a few D-cell batteries; see Figure 3). Allow the cut seed pieces to cure in a cool, dry location overnight or longer.
3. The pH of the ginger seed growth medium should be between 5.5 and 6.5. However, many popular growth media can be acidic, in which case you will need to add dolomite 65AG (finely ground calcium and magnesium carbonate) to raise the pH and also supply calcium, which is essential for vigorous growth of ginger. There are many different types of growth medium (some have added dolomite already), so it is best to test your medium for pH, such as through the University of Hawai'i's Agricultural Diagnostic Service Center (ADSC). Fill a 7-gallon pot with the growth medium. For a peat-perlite mix without

dolomite added, empty the pot into a mixing tray or a large, clean garbage bag and add 1.5 ounces (2½ tablespoons or 45 grams) of dolomite. Mix the dolomite into the medium.

4. Fill the pot halfway full of the amended growth medium. Plant 2 to 3 ginger seed pieces in each pot, so that 1 inch of medium covers the pieces. Add slow-release fertilizer (see #7 below). Store the remaining medium in a clean plastic garbage bag.
5. Place the pot on a raised surface, such as a table or bench (Figure 4) in full sun. Keep it elevated at least a few feet from the ground level, to avoid possible contamination by soil containing the ginger bacterial wilt pathogen.
6. Add the remaining amount of amended growth medium at two separate intervals: between 2 and 3 and between 4 and 5 months after planting. Ginger grows upwards, and adding medium to cover the base of plants will help the production of longer, larger rhizomes at harvest. Add slow-release fertilizer each time after adding growth medium (see #7 below).
7. The total amount of slow-release fertilizer to be broadcast uniformly over the surface of the growing medium is approximately 0.5 pounds (12 tablespoons or 227 grams). Add a quarter of this total amount



Fig. 5. Rhizomes bursting open a plastic pot.



Fig. 6. Amount of ginger rhizomes produced in a 7-gallon pot at around sea level.

(2 ounces or 3 tablespoons or 56 grams) at planting time. Then add half of the total amount (4 ounces or 6 tablespoons or 112 grams) at 2 to 3 months after planting (May–July). Finally, add the remaining quarter of total amount (2 ounces or 3 tablespoons or 56 grams) at 4 to 5 months after planting (July–Sept.).

8. Water the pot daily until water drips slowly out the bottom of the pot.
9. The ginger plant foliage will die back naturally during the winter months. Harvest mature ginger rhizomes approximately 9 months after planting. Do not be alarmed if rhizomes grow large enough to break the sides of the plastic pot (Figure 5). If successful, you should be able to multiply the volume of ginger by 10 times or more (Figure 6)!
10. Place ginger rhizomes on a drying rack until dry (usually about 3 or 4 days). Then either use for culinary purposes or store in a cool, dark place until it is time to plant for the next crop. Rhizomes store well in a brown paper bag. Do not use a plastic bag for storage, because the rhizomes may rot.

Happy growing!

References

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- Ishii, M. and M. Aragaki (1963). Ginger wilt caused by *Pseudomonas solanacearum* E.F. Smith. *Disease Reporter* 47:710–713.
- Rohrbach, K.G., Sato, D., LeBeck, L., and Kefford, N. (1993). Ginger industry analysis number 3. University of Hawai'i College of Tropical Agriculture and Human Resources. 22 pp.

*Answer to question in Figure 2: The ginger rhizome on the left is infected with bacterial wilt.

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