



Propagation

Pomegranates are easily propagated either by seed or as cuttings. There are many ways described on the internet to propagate pomegranates. The following information is based on our limited, but growing experience with propagation in the UF project, reputable pomegranate experiences shared by others in Florida and elsewhere and a compilation of valid research studies.

Seed. Propagation by seed is generally less desirable than by cuttings when trying to preserve the characteristics of a plant that produces fruit on a perennial tree or shrub like pomegranate. Seeds (with a few exceptions) are a *sexual means of propagation; cuttings are an asexual or vegetative method*. The importance of that distinction is the reason seeds are often not used to propagate perennial fruit plants. Seeds, as a sexual method, can lead to genetic diversity and variability among seedlings. Cuttings reproduce the plant without variability and are true-to-type. The plants propagated from a single, original plant by asexual methods constitute a *clone*. That means that the resulting plants will essentially be identical to the original or mother plant.

Seedling juvenility. Another often overlooked aspect of seed propagation is juvenility. Seeds are a stage in the normal sexual life cycle of a plant like pomegranate. Therefore, when seeds are sown, they must grow for a while before they are capable of producing flowers. That period of time is called the juvenile period. When the juvenile period ends, the plant begins to produce flowers and is once again capable of undergoing sexual reproduction by producing a fruit with the enclosed seeds. The length of the juvenile period varies from months to years among different plants. Experience with pomegranate indicates it is relatively short (i.e., 1-2 years); however, seedling pomegranates may have a longer period to flowering than cuttings as with many perennial fruit crops.

Germinating Seeds/Transplanting Seedlings

- **Seed extraction and preparation.** Remember: the seed is the entire entity removed from the fruit. It consists of the embryo and the aril together. So, should the aril be removed?
 - Freshly extracted seeds can be sown, but the germination percentage may be lower than for seeds treated as follows.
 - Remove the aril. Simply roll the seeds in a paper towel to break the aril and absorb the fluid. Thoroughly rinse the seeds.
 - Dry the seeds 30 minutes to an hour or two, or longer.

- Refrigerate for up to a few weeks before sowing.
- Washed, dried and stored seeds apparently tend to germinate better because the combined effect of the treatments is to remove germination inhibitors and maybe satisfy a dormancy requirement.
- Seeds will germinate okay in just about any common potting medium as long as the seeds are kept moist and warm after sowing. Sow the seeds about ½ to 1 inch deep.
- **Warm temperatures** (75 to 85°F) are important for germination.
- **Seed pre-sowing treatment** may be beneficial. We are presently experimenting with an idea brought to us by a cooperator who dusted freshly extracted seeds with a commercial root-enhancement product commonly available in home and garden stores. It may be important that the product contain at least 1000 ppm indole-3-butyric acid (IBA). Also, dusting the seeds with a fungicide like Banrot®WP may help prevent any losses during storage and germination.
- **Transplant the seedlings** when they are about 4 to 6 inches tall.
- **Expectations:** According to experience in pomegranate breeding, seedlings have flowered within one year with substantial flowering over the next year or so.

Cuttings. It is usually recommended that cuttings be harvested when the plant is dormant, i.e., during the winter. Our experience in cooperation with a commercial mist-bed propagator is that cuttings taken at any time of the year will root. What may be more important is the diameter of the cutting.

Rooting Cuttings: UF/CREC Experience

- **Type.** Semi-hardwood to hardwood.
- **Size.** Quill to pencil diameter or about 1/8 to ¼ inch caliper and 4 to 6 inches or longer in length. We have successfully rooted cuttings 3/8 inches in diameter.
- **Time of harvest.** Cuttings can be harvested at any time of year in Florida.
- **Source.** Take cuttings judiciously. Remove branches to thin out the canopy. Suckers or sprouts from the base of the plant are an excellent source of cuttings especially when harvested in the winter when they are dormant.
- **Rooting medium.** Cuttings can be successfully rooted in just about any medium from sand to a peat mixture that drains well without becoming soggy. Commonly used media contain some peat and other ingredients like perlite.
- **Rooting container.** The type or size of the container is not very important, thus, anything available will probably work just fine. Cuttings can also be rooted directly in place as described below.
- **Handling/preparation.** We have not re-cut the stem or made a fresh angled cut. Also, it is not clear whether it is critical to cut the stem in the internode region or close to a node, but having at least one node in the medium is recommended.
 - *Cutting one end of the stem at an angle is helpful to distinguish the top from the bottom of the cutting.*
 - *Furthermore, our propagator has been using a knife to scrape the bark before sticking the cuttings (Fig. 1)*



Fig. 1. Each cutting is about 6 inches long, the diameter of a thin pencil and has 3-4 nodes. The base of the cuttings is to the left and was cut about midway between nodes, or in the middle of the internode. The top cutting has square-cut ends; the middle cutting has the bark scraped to reveal the underlying green color in 4 places around the circumference; and. The bottom cutting has an angle cut at the base. The base of each cutting would be dipped in a growth regular (hormone) compound from the tip to just below the first node then stuck in rooting medium with that node just below the surface of the medium.

- **Environmental conditions.** The trick is to control moisture so that the base of the cutting is not constantly soaking wet.
 - The same temperature range for germinating seeds is suitable for rooting.
 - Our commercial propagator uses a mist bed with misting for 10 seconds every 20 minutes in a peat-heavy rooting medium.
 - Also, as cuttings are usually rooted leafless, they can be in the dark if that is the only warm place available. After they strike roots and begin to produce new leaves, move them to a place with light or sunshine.
- **Rooting hormone.** Are hormone dips essential? Probably not, but dipping or dusting cuttings with a commonly available rooting hormone powder or solution containing indole-3-butyric acid (IBA) helps insure good rooting.
 - Our propagator uses a dip in Hormodin 2, a compound containing 0.3% IBA or 3000 ppm.
- **Expectations:**
 - Rooting will take place under warm conditions in 4 to 8 weeks (Fig. 2).



Fig. 2. Plant development of a 6-inch, thin, pencil-sized cutting after 6 weeks in a mist bed. The bark of the cutting was scraped and dusted with indole-3-butyric acid growth regulator prior to sticking. Excellent rooting is evident along with shoot development illustrating the positioning of the nodes opposite each other.

- Our experience has been that the percentage varies according to cultivar and size of cutting with 60% to 85% common and the larger diameter cuttings rooting better than the smaller sized ones.
- **Cuttings taken from young seedling plants may not root as well as those harvested from older, more mature plants.**

Rooting Cuttings: An Enthusiast's Experience in Mississippi

The following relates to a location about 2 miles inland from the Mississippi coast near Biloxi and cuttings being received there from the U.S. National Clonal Germplasm Repository during the dormant season. The instructions are for placing cuttings directly into a planting site and essentially to root them in place.

- If time is a factor after the cuttings are received, place them in a zip-lock bag with a damp (not soggy) paper towel for moisture.
- **Procedure to root pomegranate cuttings:**
 - Use cuttings 8 or 9 inches long and the diameter of a pencil (1/4 inch), but cuttings of the recommended length and 1/8 inch in diameter also root well.
 - When ready to stick, cut the cutting in half and re-cut as necessary to distinguish the top from the bottom of each cutting".
 - Dip the cuttings in a rooting hormone, e.g., Dip-N-Grow.
 - After preparing a planting hole and re-cutting the cuttings, prepare the cuttings for rooting hormone by removing a thin layer of bark on bottom end of cutting on two sides about one inch in length. Do this by placing a knife blade on cutting about one inch from end and scrape with slight pressure just enough to remove the bark. Just do not put enough pressure to remove hardwood with the bark.
 - Apply rooting hormone. If Dip-N-Grow is used, pour the entire contents (2 oz) and do not dilute; use it at full strength. Submerge bottom of prepared cutting into rooting concentrate not to exceed 5 seconds. Immediately place cutting into place prepared site or medium.
 - Do not fertilize cuttings when starting them. About 3 months after stuck, use a weak solution (1/2 strength) of a water soluble fertilizer to water cuttings. This could be continued every month. No shade for cuttings

required.

- **Preparing the site.** If planning to root dormant cuttings and field plant in the spring, in September, I spray with a grass/weed killing product containing the ingredient glyphosate. In October or November, prepare the holes where cuttings to be placed/stuck. Use an ordinary post-hole digger that will produce a hole approximately 4 inches in diameter and 7 inches deep. Put the soil removed in a container for later use. Place one measure of the soil removed in a container and one measure of Perlite, mix thoroughly and fill the hole with this mix. We get 60-70 inches of rain/year. In a drier area, it would probably help to add a measure of peat to the mix. After the hole is refilled with the mix, use the remaining soil to build a ridge about 18 inches from center from the hole to retain water. If no rain occurs for two weeks once the cuttings are in place, water them thoroughly every 7 days until it rains.

Rooting Cuttings: Procedure Used at The National Clonal Germplasm Repository

Click [here](#) to see a collection of photos illustrating the equipment and method that has been used at the repository.