

## Coontie Propagation and Production®

### Laura M. Miller

Texas AgriLife Extension, Tarrant County, P.O. Box 1540, Fort Worth, Texas 76101

Email: lmmiller@ag.tamu.edu

### Roger Newton

Suncoast Plant Nursery, 5512 W. Thonotosassa Rd., Plant City, Florida 33563

### Shawn Steed

University of Florida/IFAS Extension, Hillsborough County, 5339 County Rd. 579, Seffner, Florida 33584

## INTRODUCTION

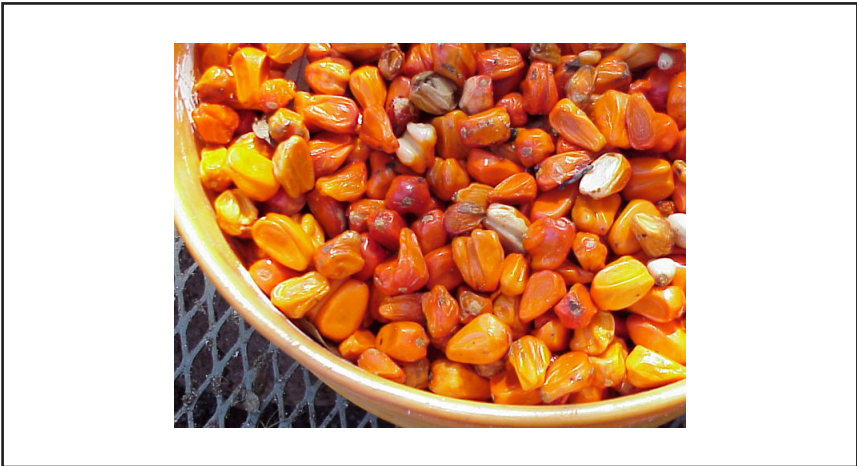
The coontie, *Zamia pumila* L., syn. *Z. floridana*, is a cycad native to most counties in peninsular Florida and three counties in southeast Georgia. It is the only *Zamia* that is native to the United States, and is a larval food source for the Florida Atala butterfly, *Eumaeus atala*. Coontie has also been historically utilized as a human food source. The name 'coontie' is thought to come from a Native American word meaning "flour root." Another common name for this plant is "arrow root," and during the early 20th Century, it was widely harvested and processed into starch in factories all over South Florida.

In modern times, coontie are rarely consumed but rather produced for their value as a landscape plants. The potential planting range for the coontie is USDA Hardiness Zones 8b–11, encompassing the Gulf Coast and much of the West Coast, as well as the most significant population centers of Texas and Arizona. Coontie are best adapted to partial shade, but do well in full sun. In Florida, they are frequently used in low-maintenance landscape situations including urban highway medians. Coontie do best in soils with moderate to good drainage. Soil pH is not usually a limiting factor, and coontie is considered to be salt tolerant. The plant stores carbohydrates in a caudex which allows it to survive relatively long periods without water. The caudex also makes it possible to sell bare-root plants, which can be a great advantage when shipping long distances.

There are at least two distinct plant forms: (1) A thin-leaf form that is primarily found growing in sandy soils on the West Coast of Florida and in far south Florida, and (2) A wide-leaf form that is found in oak and pine hammocks in the northeastern part of Florida, west to Alachua County. Both forms have survived occasional salt water inundation. The wide-leaf form is generally considered to be more desirable for ornamental use, but the thin-leaf form is sometimes thought to be more tolerant of drought and low temperatures and might be best for certain landscape applications. The wide-leaf form is probably more shade tolerant and therefore best suited for interiorscapes and indoor/outdoor containers. All coontie are slow growing and long lived.



**Figure 1.** Coontie (*Zamia pumila* L.) cone color can range from black to brown to orange for both male and female cones.



**Figure 2.** Coontie (*Zamia pumila* L.) seed before cleaning.

### COLLECTING SEED

Cycads are dioecious plants. Male coontie plants produce cones that emerge in August and shed pollen in November and December. Male cones can be up to 16 cm in length and are usually 3–5 cm in diameter. Female cones emerge at the same time and may be up to 76 cm (30 in.) length and 14 cm (6 in.) in diameter. Female cones are generally shorter and always broader than male cones. Cone color can range from black to brown to orange for both male and female cones (Fig. 1). There are two species of snout beetles that pollinate coontie, *Pharaxonotha zamiae* and *Phopalotria slossoni*. Coontie is probably also wind pollinated.

Seed may be collected from landscape and container plants in December. Some female cones will break up and scatter their seed, but other cones will remain tight even though the seeds are mature.

### CLEANING SEED

Separate seed from cone litter anytime after the cone begins to break apart. Soak seed in water for 6 to 8 weeks to soften the seed coat. The seed coat is thought to inhibit germination. Around March 1, clean the seed by filling a 19-L (5-gal) bucket  $\frac{1}{4}$  to  $\frac{1}{2}$  full of uncleaned seed (Fig. 2). Add sufficient water to barely cover the seed. Use an electric drill equipped with a long shank and a round wire brush to agitate the seed in the bucket. When the water is thick with seed coat residue, empty the bucket into a strainer or onto a wire mesh screen and wash with a stream of high pressure water. Repeat the entire procedure until the seed is clean and free of seed coat residue. This will typically require three or more cycles. Some growers add pectinase enzyme to help break down the seed coat. Pectinex is a brand of pectinase enzyme (Novozymes Biologicals Inc., 5400 Corporate Circle, Salem, VA 24153). Other brands are available. Use of the wire brush also scarifies the seed. Cleaned seed can be sown immediately, stored, or sold.

### PLANTING SEED

Suncoast Plant Nursery uses a 25-cm-deep (10 in.) bed of sharp builder's sand in full sun for seed germination. The seeds are spread in a single row on the sand surface and then covered with 1.3 cm (0.5 in.) of sand. Seed will germinate in 3–4 weeks with daily irrigation. Other nurseries use recycled growing media amended with sand to construct outdoor seed beds. If the seed coats are not removed, seeds will germinate erratically over a period of 2 years. Fungal diseases are not usually a problem in coontie seed beds.

Seedlings remain in the seed bed for approximately 1 year after germination. During this year, continue to irrigate daily or every other day. Apply a controlled-release fertilizer in June and October. If temperatures are predicted to drop below freezing, covering the entire seed bed with ground cloth or frost protection fabric will prevent cold damage.

### CONTAINERIZED PLANT PRODUCTION

Bare-root seedlings should be removed from the seed bed in approximately 1 year after sowing. These seedlings may be sold bare root or planted in small containers. Suncoast Plant Nursery uses 5 cm (2 in.) diameter deep containers developed for rose production and placed in 46 × 46 cm (18 × 18 in.) trays. Coontie do best in a substrate with good drainage. Suncoast Plant Nursery uses a pine bark-peat mix and sand media (1 : 2, v/v), and makes a broadcast application of controlled-release fertilizer.

Plants may be grown in full sun or partial shade. Irrigate three times per week. Florida red scale, *Chrysomphalus aonidium*, is the only significant pest of coontie. Scout for Florida red scale beginning in April and treat as necessary. Suncoast Plant Nursery uses dimethoate and/or horticultural oil to control Florida red scale, typically applying pesticide in mid April and mid May.

After 1 year in the 5-cm (2-in.) containers, seedlings can be transplanted to #1 containers. Suncoast Plant Nursery puts two seedlings per pot in a pine bark sub-

strate amended with sand. Other nurseries market the caudex with the leaves removed as a bare root plant at this time.

Any controlled-release fertilizer may be used in production. Place containers in either full sun or partial shade and irrigate three times per week. Continue to monitor for and control Florida red scale.

After 1 year in #1 containers, plants can be sold or transplanted into #3 containers. The plants will remain in #3 containers for 2 years. Substrate, irrigation, fertilization, and pest management recommendations are the same as for the #1 container phase. At the end of this production period, a marketable #3 plant will be about 30–36 cm (12–14 in.) tall with 10–20 mature leaves.

If plants are not sold as #3s, there is some demand for 46–51 cm (18–20 in.) tall #7 container specimen plants. A finished #7 can be obtained in 2 more years using the same production techniques.

## CONCLUSION

The key to coontie seed germination is removal of the seed coat residue. Coontie remains a slow crop to produce, but the result is a versatile, low-maintenance landscape or interiorscape plant.

## LITERATURE CITED

- Black, R.J.** 1985. Salt tolerant plants for Florida. Univ. of Florida/IFAS Fact Sheet ENH-26. <edis.ifas.ufl.edu>.
- Broome, T.** 1998. The coontie of Florida. Virtual cycad encyclopedia. <www.plantapalm.com>.
- Broome, T.** 2006. Personal Communication.
- Chaippini, D.** 2007. Propagation protocol for the native cycad coontie (*Zamia pumila* L.) Native Plants J. 8(2):123–124.
- Gilman, E.F.** 1999. *Zamia floridana*. Univ. Florida/IFAS Fact Sheet FPS-617, <edis.ifas.ufl.edu>.