

Zamia floridana

(ZAY-mee-uh flor-rid-DAY-nuh)

Coontie; Florida arrowroot; comfort root; Seminole bread

Family: *Zamiaceae*



S. H. Brown

Toddler with underground caudex

Coontie

Synonyms (Discarded Names): *Zamia integrifolia*;
Z. pumila; *Z. umbrosa*

Origin: Florida

U.S.D.A. Zone: 8B-11 (Leaf damage 17°F)

Growth Rate: Slow

Form: Upright herbaceous

Stem: Subterranean

Flowering Months: No flowers

Leaf Persistence: Evergreen

Salt Tolerance: Tolerant of salt drift

Drought Tolerance: High, once established

Soil: Well-drained

Nutritional Requirements: Low

Potential Pests: Florida red scales; hemispherical scales; mealybugs; sooty mold

Typical Dimensions: 2-4' tall; 3-5' spread

Propagation: Seeds; offsets

Human hazards: Caudex is poisonous. Toxin can be removed by properly processing.

Uses: Containers; groundcover; edging; foundation plant; shady gardens



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A recently planted female plant. Note the cone.



S. H. Brown

Coontie has stiff, mostly recurved pinnate leaves.

Natural Geographic Distribution

There are two recognized forms of coontie, *Zamia floridana*. The thin-leaf form was historically found along a thin strip of land on Florida's east coast from St. Lucie County into the Florida Keys. On the west coast it ranges from Everglades National Park to Taylor County, near the panhandle. The broad-leaf form is native to northeastern Florida from Jacksonville into Brevard County. Intensive land development has reduced the ranges of both forms. They are now uncommon in their natural habitats. Coontie is adapted to growing in well-drained soils. It was primarily found in open pinelands, hammocks, pine-oak woods, scrub forests and coastal woodlands. Generally, plants growing in partial shade are more vigorous than plants found in full sun. *Z. floridana* is commonly sold as *Z. pumila*. The latter is a distinct species native to the Dominican Republic.

Ecological Function

Often mistaken for a fern or palm, the coontie is in the order Cycadales, a living relic of plants that predate the dinosaurs. Coontie provides food in exchange for pollination services for one species of beetle (*Pharaxonotha zamiae*) and one species of weevil (*Rhopalotria slossoni*). Seeds are a source of food for mockingbirds, blue jays and other birds and small animals. Even more importantly, the coontie provides a larval food for the rare slow-flying atala butterfly (*Eumaeus atala florida*), a small black butterfly with bands of blue spots on both the underside and the topside of the hind wing. The atala has been reported from Dade County north into Martin County but is often confused with the oleander moth (*Syntomeida epilais* Walker). The atala caterpillar devours the foliage at a rapid rate for about two weeks, then disappears. Another occasional insect feeder on the coontie foliage is the larvae of the echo moth, *Seirarctia echo*. Florida's indigenous people and later the European settlers used an extended process to extract an edible starch from the coontie's large caudex, giving the plant the common names of arrowroot and Seminole bread. It is illegal to collect these plants from the wild. Nursery grown plants are the source of coontie for the landscape.



Marc C. Minno

The larval stage of the atala butterfly is distinctively orange-red with a double row of raised yellow bumps down the back.



Marc C. Minno

Atala butterfly



Marc C. Minno

Echo moth caterpillar on coontie



Marc C. Minno

Adult echo moth

Growth Habit and Morphology

The coontie is an extremely variable plant with two primary forms; narrow and wide-leaf. It has a large underground stem, properly called a caudex, that terminates with a crown of stiff, evergreen leaves and cones. Unless a plant is growing in coral rock or shallow soil, the caudex is almost always subterranean. The caudex branches as the plant reproduces thus expanding a plant's size. The process is slow but it allows closely spaced caudices to form large colonies. If a caudex is not broken apart, it remains a single plant. As a colony increases in size it grows in height forming a mound. This forces the leaves closer together and a dense groundcover is formed. There are two to three leaf flushes during the year but the most significant time for producing leaves is in late spring. The length of the leaf often quadruples in size as the colony ages. The recurved pinnate leaves are dark green, leathery and up to 38 inches long. They are highly variable, often twisted. There are 5 to 30 alternate to opposite pairs of leaflets on a rachis. Leaflets are up to 6 inches long. The coontie is a gymnosperm, that produces seeds without flowers. It is also dioecious, with male and female cones borne on separate plants. The sex of a plant cannot be determined until the plant produce cones. Male cones are long-cylindrical, up to 7 inches long, on a 3 inch pedicle, and often clustered together in groups of 2 or more. Female cones are a stout-ovoid, typically 3 to 4 1/2 inches long and often singularly borne. The exterior faces have hexagonal pattern. Male cones are quick to shed. Female cones remain on a plant for a year or more. They develop seeds with a fleshy red to orange coat. Seeds are angular and approximately 1 inch long. Of three fully developed cones, there was an average of 40 seeds per cone.



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New fronds emerging from the terminal end of a caudex.



Leaves and male cones on the top portion of a caudex.



S. H. Brown

Leaf sizes of three mature, cone bearing coonties. The leaf on the right is 38 inches long.



Two coonties of approximately the same age growing feet apart exhibit differences in forms. The plant on the right is a thin-leaved west coast form.



S. H. Brown

Male cones are often clustered together.



S. H. Brown

Female cones are typically 3 to 4 1/2 inches in length on a 1 1/4 to 2 1/2 inch pedicel.



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Comparison of male and female cones.



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Two disintegrating female cones reveal their cache of seeds.



S. H. Brown

Angular seeds of the coontie.



M. Beardslee-Lakatos



Left: Stephen Brown holds a 21 pound plant. **Top:** The starchy caudex of the coontie was processed to produce a staple bread consumed by Florida’s indigenous people and European settlers.

Planting and Maintenance Guidelines

Growing best in some shade, coontie can tolerate full sun and grows on a variety of soils as long as it is well-draining. Space plants 3 to 5 feet on centers as a specimen or foundation plant or 12 to 20 inches on center if a groundcover is intended. Coonties are very sensitive to root disturbances when planting. Ensure a healthy transition by following these important steps: first, let the soil in the pot become somewhat dry. If you try to install a plant with wet, heavy soil, the soil often falls off in the process, taking the delicate roots with it. This causes a lot of root disturbance for the plant. Next, dig a hole wider than the diameter of the pot. Make sure you are not planting the coontie too deeply. The soil level should be no deeper than what it was in the pot. Caudices can also be planted so that the top 2 to 3 inches is above the soil level. Do not amend the soil. Back-fill the hole with the same material taken from the hole. Then lightly press around the hole to make sure that there are no air gaps left in the planting hole. Do not press so hard that you break the delicate roots in the process. Mulch very lightly around the base of the coontie. Lastly, to establish the coontie, err on the side of too little water. Coontie is an extremely drought tolerant plant, and once established needs no irrigation for most of the year. While it makes a good groundcover, coontie is not tolerant of foot traffic. It will take about six years to form an adequate groundcover with plants from one gallon pots. The use of fertilizer in February or March will help to produce more as well as larger leaves.



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The start of a groundcover planted in the isle of a parking lot.



S. H. Brown

Fully developed groundcover

Propagation

Coontie is predominately produced from seeds. The brightly colored seed coat must be removed to induce germination. The embryo, contained in the seed, becomes fully developed in March through May. Seeds planted in January are slower to germinate as the embryos are not fully developed and nighttime temperatures are not adequately warm. Seeds may be slow to germinate but soaking them in water for a day or two helps to promote germination. In some cases, germination is initiated while some seeds are still in the water. Nursery professionals may use an acid bath followed by growth regulator treatment to accomplish the same results. Place the seeds in potting media or coarse sand with the sprouting or pointed end facing up. Within six days after germination transplant the seedlings into individual pots or community containers. Be careful not to damage the roots. The growing media should be free draining. A soggy mixture contributes to root rot of transplants. One grower's successful growing media consists of 40% Canadian peat, 30% coarse sand, 20% cypress saw dust and 10% perlite.

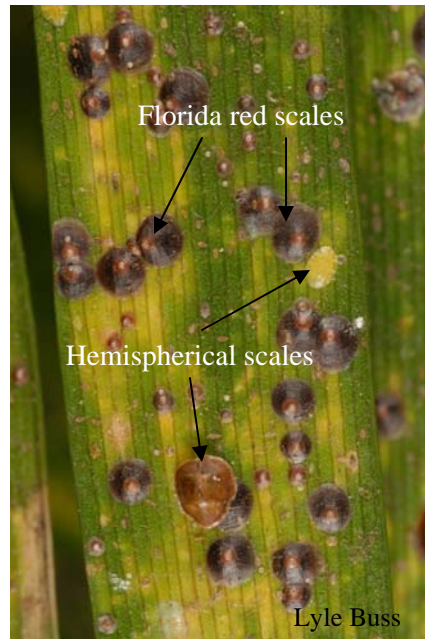
Pests and Pest Management

Florida red scales (*Chrysomphalus aonidum*), hemispherical scales (*Saissetia coffeae*) and longtailed mealybugs (*Pseudococcus longispinus*) are common pests of coonties. All three species are polyphagous and can be found on many other ornamental plants as well. Mixed species infestations on coonties are common. Heavy scale infestation leads to stunted plants, laden with sooty mold and having a generally distressed appearance. Mealybug destroyers (*Cryptolaemus montrouzieri*) can also be seen on coontie feeding on scales and mealybugs. Often their presence is sufficient to avoid pesticide applications. They should be given adequate time to control common coontie insect pests. All of these pests can be controlled with insecticidal oils. When oil is used, make at least two applications about 10 days apart. Read and follow label directions.



Lyle Buss

Adult female hemispherical scales plus a lone longtailed mealybug at left.



Lyle Buss

Mostly Florida red scales and two hemispherical scales.



Lyle Buss

Leaf top showing discoloration damage caused by hemispherical and Florida red scales feeding on the underside.



Lyle Buss



S.H. Brown

Far Left: Longtailed mealybugs feeding on cycad leaflet. Scales and mealybugs feed by piercing the plant and sucking the sap from their hosts. **Left:** The beneficial mealybug destroyer, seen here in pursuit of scales, should not be confused for mealybugs.

Video Clip

View a 4 minutes video clip that will help you to learn the difference between male and female coontie plants. http://www.youtube.com/user/FloridaLandscape#p/u/0/4TeJQ5mqT_c

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