

Physalis angustifolia

Coastal groundcherry



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Front Cover: *Physalis angustifolia* (coastal groundcherry) in a coastal landscape in Bon Secour National Wildlife Refuge, AL. Photo by Gabriel Campbell.

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Physalis angustifolia

Plant description

Coastal groundcherry occurs on beach dunes, coastal grasslands, coastal scrub, and disturbed areas (FNAI, 2010; USDA and NRCS, 2017). This plant is found throughout coastal counties on the west coast of Florida—except for the Big Bend region and the extreme southeastern most counties—and more broadly west to Louisiana. The following plant description is based on Duncan and Duncan, 1987, Long and Lakela, 1971, and Wunderlin and Hansen, 2011. Coastal groundcherry is an herbaceous perennial in the Solanaceae plant family (nightshade family). It forms thickened tuberous roots and stolons that spread asexually belowground, creating a sparse groundcover (Figure 1). Stems are stellate pubescent when young and glabrous when mature. Leaves are simple, alternate, linear to lanceolate, usually longer than 7 cm, 5-10 (mostly 8) times longer than wide, glabrous, and tapered to the petiole. Inflorescences are solitary, axillary and bell- to wheel-shaped with a yellow corolla (Figure 2). The calyx is glabrous except with stellate-ciliate lobed margins and persistent, becoming enlarged and bladder-like when fruit matures. Flowers occur most months in frost-free areas. Fruits are yellow to orange edible berries that resemble a miniature tomatillo, surrounded by a 10-ribbed papery husk (persistent calyx) that resembles a tiny lantern (Figure 1). Many species of insects and animals utilize coastal groundcherry, including threatened and endangered beach mice.



Figure 1. Coastal *Physalis angustifolia* plants with fruits surrounded by a papery husk.



Figure 2. Flower of *Physalis angustifolia*.

Fruit and seed collection, processing, storage, and characteristics

Fruits of *Physalis angustifolia* can be collected from summer to late fall. Berries resemble the fruit of tomato and should only be collected when they are mature (yellow to orange) (Figure 3). Avoid collecting immature fruits (green fruits) as much as possible (Figure 3; Note the color of the husk surrounding the fruit is not always indicative of the fruit's color and should not be used to determine fruit maturity).

Once collected, seeds should be removed from fruits as soon as possible. If fruits are stored intact, they need to be kept in a cool dry place as the fruits will mold and may decompose, possibly harming the seeds. Seeds that are gold to yellow and plump are normal while discolored seeds and flattened seeds are deformed (Figure 4). Deformed seeds should be discarded. Fruits generally contain approximately 36 seeds, and cleaned seeds weigh $\approx 0.77\text{mg}$ (1300 seeds per gram). Seeds can be extracted from fruit using the following procedure (Figure 5):

1. First mash seeds in water in order to begin to separate fruit tissues from seed and to break the fruit's exocarp.
2. Run seeds and fruit tissue through a series of sieves under water to remove fleshy components.
3. Remove seeds from any remaining fruit tissue and allow to air dry on paper towels for at least 2 weeks in a cool dry place.
4. Place seeds in an air tight container and store in the dark in a cool dry location.

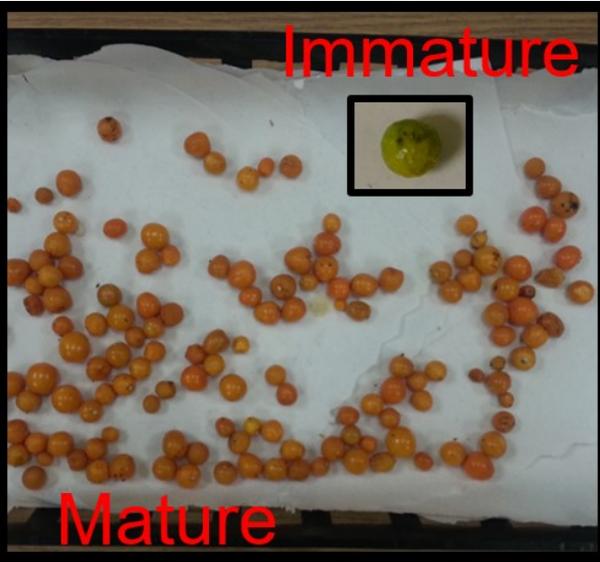


Figure 3. Immature and mature fruits (berries) of *Physalis*.

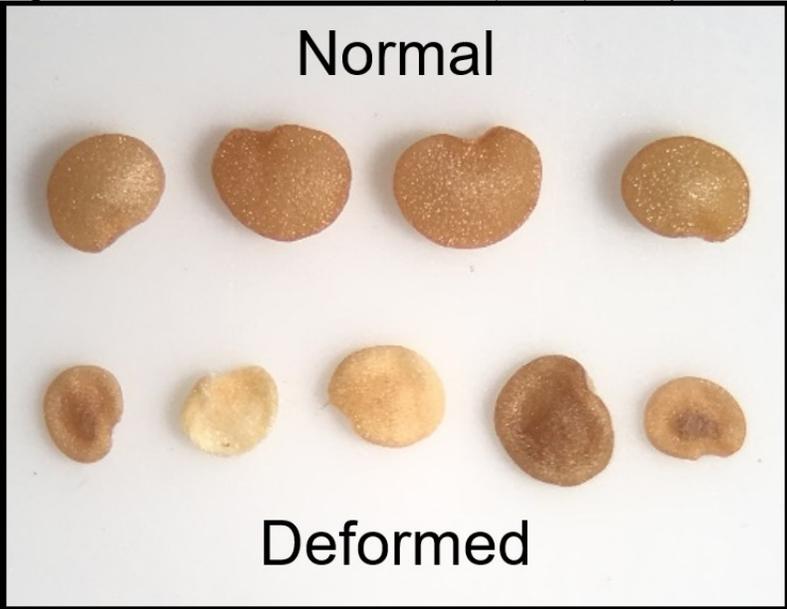


Figure 4. Normal and deformed seeds of *Physalis angustifolia*.



Fruits mashed in water → Seeds and fruit ran through sieve → Seeds placed on paper towels and air dried

Figure 5. Seed extraction schematic for *Physalis*.

Propagation

Stem cutting propagation of *Physalis angustifolia* is readily accomplished from 4- to 6-in cuttings (Figure 6). Vegetative cuttings should be collected when possible but reproductive cuttings will root also. Plants do not require auxin application to initiate roots, though auxin may decrease the time to rooting and improve rooting uniformity. Cuttings are placed under intermittent mist with root formation occurring within 2 weeks. Rooted cuttings should be removed from mist at the first sign of rooting, or they will quickly deteriorate and express signs of foliar edema. Hand water until plants form sufficient roots to hold the propagation substrate when they are removed from the propagation cell.

Propagation of *Physalis angustifolia* from seed is also easily accomplished. Sow seeds on the surface of a standard greenhouse media, keep them moist, and expose them to a natural photoperiod. The authors found dry, cleaned seed stored at room temperature in glass jars retain viability for at least 5 years.

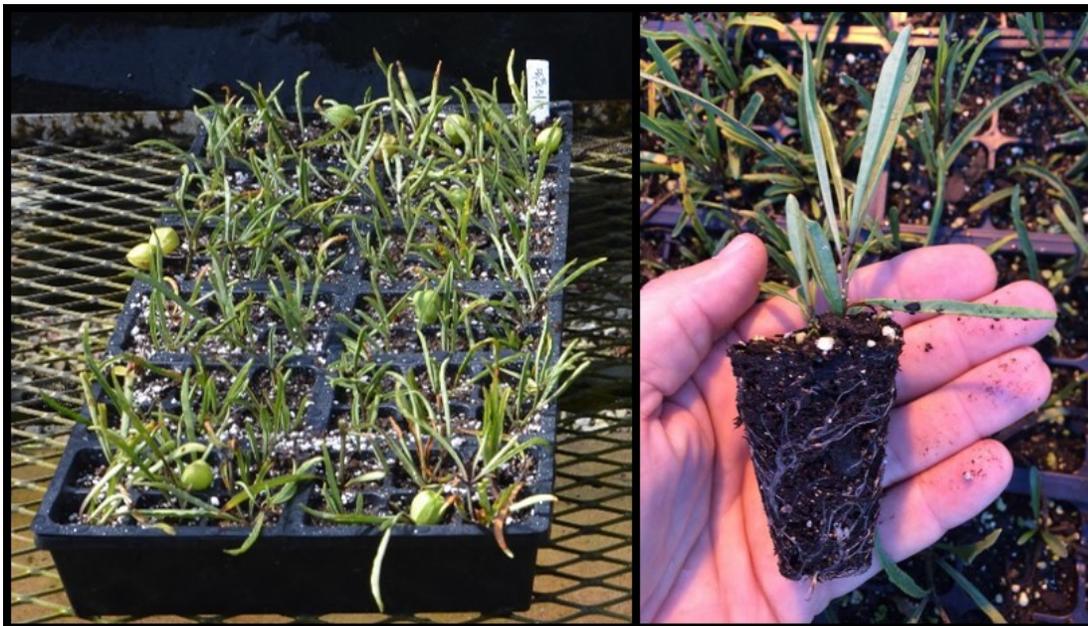


Figure 6. 72-cell trays of *Physalis angustifolia* cuttings under intermittent mist on a propagation bench (left) and rooted stem cutting (right).

Production

Plants are easily grown in a variety of pot sizes (Figure 7). Plants can be grown in a standard greenhouse media mixed (Fafard Metro Mix 830) with pine bark at a 2:1 pine bark to media ratio. Plants respond well to controlled release fertilizers and liquid fertilizers. Product rates recommended for standard nursery production should be used. Plants can be overhead watered using standard nursery procedures. Plants can be sprayed with manufacturer recommended rates of horticultural oils and horticultural soaps to control for common greenhouse and nursery pests, such as aphids or white fly. Plants produced in 4-inch pots and tall (8-inch) ray leach tubes produce a larger proportion of stolons compared to short (6-inch) ray leach tubes and may be desirable as a restoration explant.

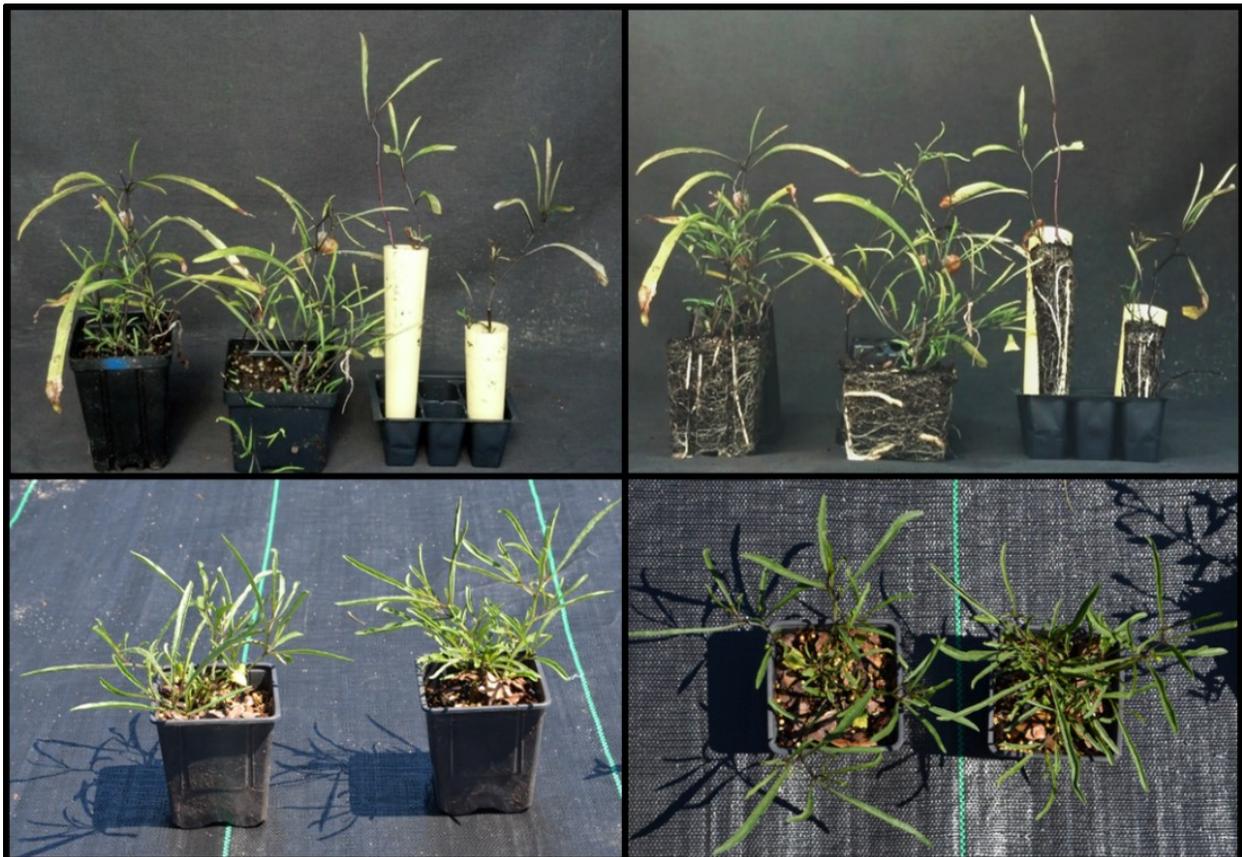


Figure 7. *Physalis angustifolia* plants grown in a variety of pots; note stolon development for seedlings grown in differing production containers for the same time period in the upper right.

Outplanting

Plants in 4-in pots with fully developed rootballs and canopies have successfully been outplanted in secondary dunes and the backside of berms in both bare sand and within extant perennial grasses. When planted in July on open beach areas behind low frontal dunes, transplant success was high. Plants grown in 4-in pots and in 72- cell flats with well-developed rootballs and canopies have been outplanted successfully in early February. Plants from 4-inch pots had higher survival and were far more robust than smaller transplants. Plants were outplanted on the secondary dunes at mid- slope at least 12 in from each other and from perennial grasses. Fertilizer ($\frac{1}{2}$ tsp Osmocote 18-6-12) placed in the bottom of the planting hole improved the aesthetics and increased biomass but did not improve transplant survival. Plants grown in 4-in pots can be successfully outplanted in fall on the mid- or bottom slope of the landward side of manufactured berms with or without wheat straw mulch (Figure 8). Planting holes should be 50% wider and slightly deeper than the pot. Plants should be placed deep enough to cover the production substrate with approximately 1 cm of native soil (Figure 9). Make sure transplants are well watered prior to outplanting and where possible, outplant *Physalis* within 24 hours of a soaking rain (i.e., preferably before).



Figure 8. Fall outplanted *Physalis angustifolia* outplanted on a berm at Bon Secour National Wildlife Refuge in Alabama (right) and Perdido Key, Florida (left).



Figure 9. Outplanted *Physalis angustifolia* grown in a 4-inch pot.

Seed viability testing

Where questions arise regarding the viability of collected seed a simple rolled towel germination test can be conducted. Alternatively, a Tetrazolium test may be used. Imbibe seeds for 24 hours in distilled water before testing. Once imbibed, cut seed in half (bisect) and immerse in a 5% solution of Tetrazolium and distilled water for 24 hours at room temperature. Viable seeds are distinctly pink while non-pink seeds are non-viable.

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