

How to Grow Superfoods Ginger and Turmeric in Containers



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October 8, 2018



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Figure 4b. Set up of propagation experiment in the growth chamber to test methods to improve uniformity of sprouting (previous slide). Turmeric rhizome with emerging shoots and roots (right).

Consumer interest in superfoods with high nutritional or health properties and the desire for locally grown and fresh produce provide a commercial opportunity for growers. Consider ginger and turmeric as a profitable option to diversify your operation.

Ginger and turmeric are widely used in cooking for their flavor and color. They are also used in Asian medicine to relieve inflammation, improve joint health, reduce blood sugar, and combat disease. Such properties have been attributed to gingerol and curcumin compounds. Dried ginger and turmeric are used in food packaging, capsules, drinks, and tonics. Fresh rhizomes are sought-after items for smoothies and Asian cooking, and can obtain high prices of up to \$20 per pound from farmers' markets or high-end grocery stores. Nursery owners can sell live ginger and turmeric container plants in the spring to consumers who want to grow and harvest their own product.

If you grow,
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All About Ginger and Turmeric

Ginger and turmeric (Figure 1, see slideshow) are in the Zingiberaceae family, and are ancient crops domesticated centuries ago. There are about 150 species of Zingiber or ginger — 34 of them from India and 24 from China — and edible ginger is *Zingiber officinale*. Edible turmeric is *Curcuma longa*, and *C. amada* (*C. mangga*) is also edible and tastes like green mango. *Curcuma caesia* (black turmeric) has attractive leaves with a dark, central vein, rhizomes with dark-blue centers, a camphoraceous sweet odor, and it is used as a traditional medicine.

Cultivation. Ginger and turmeric are cultivated in tropical and subtropical areas, including India, China, Nigeria, Indonesia, Bangladesh, and Australia. Ginger grows in warm, humid climates and is cultivated from sea level to an altitude of 5,000 feet, while turmeric grows from 1,300 to 3,000 feet. Optimum growing temperatures are 68°F to 77°F, with low temperatures leading to dormancy. In warm areas, plants may require shade during the summer to avoid heat stress and foliar damage.

Planting. To plant ginger or turmeric in the spring, cut rhizome fingers (referred to as seeds) to 2 to 3 inches with two to four buds. The cut areas should be surface sterilized with a 10% bleach solution, and then the seed pieces are dried. Because sprouting of

buds can be uneven, maintain seed pieces in a humid potting mix under 80% humidity before planting. Alternatively, tissue culture plantlets are available, which provide uniform and pathogen-free planting material. However, the yield and quality of the first-year harvest from tissue culture is usually lower than when planting rhizome seed pieces.

When planting containers, a well-aerated potting mix should be used, with components such as coarse coconut coir, peat, or bark. Tissue culture plantlets are planted at the crown, whereas seed pieces are planted about 2 inches below the surface. Enough empty space should be left at the top of the containers to allow for mounding of the plants twice, around 45 and 90 days after planting, which will help increase the rhizome size. Leaves can show tip burn if the substrate is not kept sufficiently moist, or if the fertilizer levels are either too low or too high.

Photoperiod. Ginger and turmeric are quantitative short-day plants for flowering and rhizome swelling. They require long day photoperiod (≥ 12 hours) for continuous growth without entering into dormancy, and gradually reduced daylength (≤ 11 hours) for rhizome production (Figure 2, , see slideshow). Therefore, as the temperature gets colder and the days are shorter in the fall, leaves turn yellow and plants enter dormancy. At this point, irrigation can be stopped and after three weeks the wilted plant tops can be cut off.

Harvesting. Three additional weeks may be allowed for rhizome drying before harvest. The harvest time after planting depends on the end use. Five months after planting is enough for rhizomes that will be sold as fresh vegetables, with low fiber and pungency, and with segments of green leaves attached. Rhizomes harvested between five and seven months after planting are suitable for curing and selling in retail, and for making preserves. Rhizomes with longer growing periods are more suitable to be dried or used to extract essential oils.

After harvest, wash rhizomes with high-pressure water to remove the soil, and then treat with 10% bleach solution for disinfection. Rhizomes to be used for seed can also be treated with fungicides. Storage should be at a low temperature and high relative humidity (55°F and 70%) to prevent drying, and any diseased rhizomes should be discarded.

Ongoing Research to Determine Photoperiod, Rhizome Yield, and Ornamental Value

At the **University of Florida (UF)**

(<https://www.greenhousegrower.com/production/disease-control/university-of-florida-greenhouse-training-courses-will-now-be-offered-in-spanish/>), we are evaluating different species and varieties of ginger and turmeric under two different photoperiods in the greenhouse (natural days, or long days by providing night interruption from 10 p.m. to 2 a.m.). In the first year of our trials, shoots kept growing through the winter under artificial long days, but photoperiod did not affect rhizome yield.

Turmeric grown from rhizomes in our greenhouse had a higher yield (2.2 pounds per plant) compared with first-year tissue culture plantlets (0.6 pounds per plant). For ginger, there were no significant differences in yield between plants started from rhizomes or tissue culture plantlets, and plants yielded on average 1.8 to 2.2 pounds per plant (Figure 3, , see slideshow).

Large containers work best. We harvested only 0.8 pounds of rhizomes per plant of ‘Hawaiian Red’ turmeric in 2-gallon pots, whereas yields were 2.2 pounds per plant in 16-gallon pots.

We are now starting our second year of research and evaluation of species and varieties for rhizome yield, as well as ornamental value as greenhouse or landscape plants. We are also aiming to obtain uniform sprouting of seed pieces by evaluating treatments such as a water soak and hormone treatments with different concentrations of ethephon or

benzyladenine (Figure 4, , see slideshow). Additionally, we will run chemical analyses on the rhizomes, and research the profitability and marketing of rhizomes as local fresh food or for use in the beverage industry.

Alternative crops such as ginger and turmeric provide niche alternatives that fit the consumer trend toward locally grown superfoods. Consider producing live or processed plants at your operation.

*The authors would like to thank their industry partners in the **Floriculture Research Alliance** (<http://floriculturealliance.org/>) for their support. This material is also supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, “Resource Efficiency in the Floriculture Production and Value Chain”, #3607-21000-015-38S. Thanks also to AgriStarts, hawaiianorganicginger.com (<http://hawaiianorganicginger.com>), and justgingerfl.com (<http://justgingerfl.com>) for supplying plant materials.*

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Growing Tips for Bidens From a Plant Expert

By **Mike Fernandez** (<https://www.greenhousegrower.com/author/mike-fernandez/>)

January 10, 2018



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Bidens 'Pretty in Pink'

With bidens breeding and its development increasing exponentially in recent years, we're seeing great advancements in the field. Along with that, I think we'll see the crop become a major player in the market, beyond the niche crop it is now. New colors, forms, and habits are all contributing factors to the increasing popularity of this high-potential plant.

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Even with the ramp up in breeding, producing bidens still takes attention to detail and a focus on quality. Here are a few of the tips we've developed over the years for perfecting and breeding bidens. (Visit the **Danziger website (<http://Danziger.co.il>)** to see bidens breeding.)

Production Recommendations For Growing Bidens Successfully

Rooting: Bidens varieties are easy to root. They typically take off within 10 to 14 days at temperatures of 64°F to 75°F (18°C to 24°C). Consider a preventative drench with a fungicide such as Daconil after sticking trays.

Planting: For 4-inch pots, use one plant per pot. Plants will be ready for sales (from rooted cuttings) within six to eight weeks. For 6-inch (15 cm) pots, use one to two plants per pot, and they'll be ready in about eight to 10 weeks. If you're producing 10-inch (25 cm) hanging baskets, use three to four plants, and the baskets will be ready in 10 to 12 weeks.

Pinching: Bidens benefits from one soft pinch during planting, in about week three after sticking the liner.

Light Intensity: Bidens prefers full sunlight. Provide a minimum of 6,000 footcandles (60,000 LUX) of light.

Temperatures: Keep greenhouses relatively warm when growing bidens. Maintain daytime temperatures at 64°F to 75°F (18°C to 24°C) and keep nighttime temperatures at 55°F to 65°F (13°C to 18°C).

Fertilizer: Provide a constant feed with a balanced fertilizer, at levels of 200 to 250 ppm nitrogen, containing average micronutrient levels.

Irrigation: Bidens benefits from constant moderate moisture. Excessive dryness can cause petal drop.

Growing Media: Choose a well-drained, disease-free potting mix. Maintain pH at 5.5 to 6.3 and electrical conductivity (EC) at 0.6 to 0.9.

Growth Regulators: Plant growth regulators (PGRs) can be considered optional for bidens. They are not necessary under high light intensities. If you decide to do a PGR application, consider one to three sprays of Alar (B-Nine) at approximately 2 gram/Liter according to required plant size. Always read and follow label instructions.

Pests and Diseases: An integrated program is essential to successful pest and disease management. Start with a standard preventive program. Throughout production, continue with a vigilant scouting and monitoring program to prevent any insect and disease activity. Maintain moderate humidity levels and good air circulation as a preventative. In particular, scout and monitor for insects, including whiteflies, aphids, and thrips, and plan for preventative sprays. Diseases to watch for include botrytis and pythium. Drench with broad-spectrum fungicides as a preventative measure.

USDA Hardiness: Most bidens are hardy only in Zones 9 to 11, making them an annual in the majority of North America.

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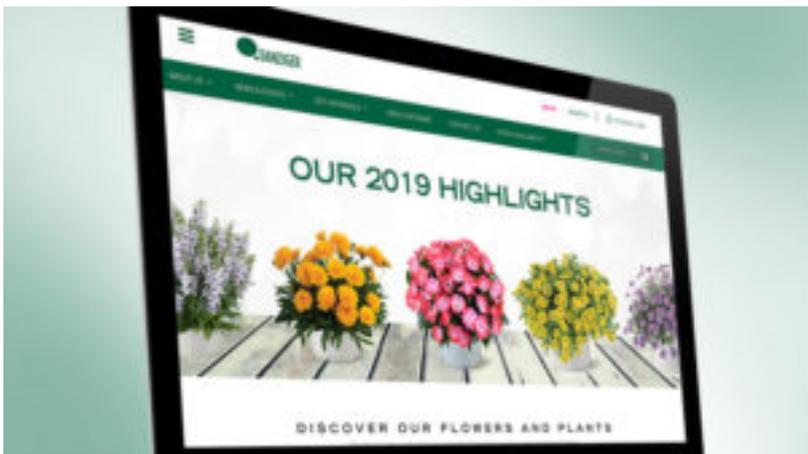
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