

# Fruiting Banana Cultivation In Non-Tropical Climates

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**Note: Florida is not tropical.** In terms of horticulture, tropical climates have temperatures exclusively above 55°F among other factors.

**What they are.** Bananas grow from a tropical corm - a bulb-like structure. They are monocots, meaning that growth sprouts from the center and not exterior surfaces. Their roots are shallow and rhizomatous, generally not deeper than 18" at maturity. Bananas can multiply asexually by calving off new corms called "pups" from the main or "mother" corm and also by rhizomes. The term "ornamental banana" refers to plants that produce inedible seeded fruit. Edible bananas are natural and human-propagated hybrids that do not have seeds. When discussing banana height, we refer to the pseudostem -- the trunk-like structure formed by leaf stems. The pstem height is from the ground to the apex where the latest leaves are emerging. A 6-foot high (pstem height) banana with 4-foot long leaves will be 10-feet high as the leaves emerge. The fruiting height of a banana refers to the pstem height at which the inflorescence emerges. Once fruit forms it can take 1 to 3 months of 80°F weather for it to fully develop and ripen. Cooler temperatures will require a longer ripening period. Edible banana plants that undergo prolonged freezing temperatures usually die. After a banana corm develops fruit it slowly dies but life is typically carried on by pups. They are neither perennials nor annuals.

**Effects of temperature on growth.** In non-tropic climates, bananas will go into a sort-of hibernation when temperatures drop below 50°F. After an episode of sustained temperatures (continuous for hours) in the 40°sF it will take weeks of warmer weather before they resume growing. Taking them indoors (doing the banana shuffle!) requires a full-on greenhouse with 1200 Watts of T5HO 6500 Kelvin color temperature fluorescent lights overhead per plant to avoid the hibernation. Because of the hibernation, a plant that would normally take 9 months from pup to fruit harvest in the tropics takes 18 months in coastal portions of San Diego where it does not freeze. In other areas of the country where the plants must be brought indoors for hibernation (e.g., Cincinnati OH) it takes 3-5 years from pup to fruit.

**Fruit flavor in non-tropical climates.** Someone's favorite tasting banana in the tropics often tastes different when grown in a non-tropical climate. However, there are fruiting bananas that when grown in USDA zones 9b through 12 have a very good taste. Examples include Brazilian, Namwa, and Pisang Ceylon.

**Dwarf bananas.** Many fruiting banana cultivars grow to pstem heights well over 10'. Some of these have dwarfed cultivars (e.g., Dwarf Namwa). They usually have fruiting heights from 6' to 9' but be sure to check - a few 24' standard varieties have named dwarfs that fruit at 16'. There are also fruiting banana cultivars that are inherently short and do not have "Dwarf" in their given name.

**Edible banana plants indoors year-round.** Growing a banana solely indoors for fruit production is a fallacy promoted by marketeers. One problem is the height. Bananas sprout their leaves upwards at first so most people would need a plant that fruits at a pstem height of 6 feet or less. So that restricts us to Super Dwarf Cavendish and a few others. The second problem is light. You'll need about 1200 Watts at 10 hours per day of 6400-6500 Kelvin color temperature light overhead for 9 to 18 months per plant to bring it to fruit. Now unless you have a geothermal or hydroelectric power source on the property (or really deep pockets) this isn't going to happen. Instead, people taken in by these scammers usually end up with sick plants and feeling like they are poor gardeners. The sad thing is that they are probably good gardeners - they just chose the wrong plant to grow indoors.

**Short-season and Fast-fruiting banana plants.** Fruiting bananas grown in the tropics typically grow from pup to ready-to-harvest fruit in 6 to 9 months. The fastest of them is called 40-days (Cuarenta Dias) which grows from pup to inflorescence in less than 2 months *in the tropics*. Don't expect it to grow that fast or have an acceptable taste elsewhere. It will have to obey the speed limit of your growing environment.

**Outdoor Site Selection.** Nearly all ornamental and fruiting bananas prefer full sun all day, with the exception of variegated hybrids. Note that new banana plants from tissue culture should be progressed from shade to sun as they gain strength and size. There are some ornamental bananas that can withstand sustained temperatures in the 20F to 30F range (e.g., Basjoo) but others should be planted with caution. For bananas producing edible fruit, temperatures below 40F should be a rarity and never sustained for more than an hour or two. In all cases, temperatures over 100F should be a rarity. Fruiting banana plants can handle daily breezes below 5 mph, but anything greater than that should be seasonal and not a regular occurrence. You can compensate for winds with supports at 4' intervals.

**Planting.** Plants grown in pots under 45 gallon size will be stunted and produce lesser quality fruit. If you must use a pot then choose an upright 15-gallon nursery pot at a minimum. Bananas need a soil with moderate drainage; i.e., not slow and not fast. A soil mix designed for citrus is usually about right. If your native soil is like that then most of the rest of us are very jealous. If your ground is clayish, you will need to build either a partially- or fully-raised bed with total depth of 24-32 inches. If necessary, install a french drain pipe so that water does not accumulate in the root zone during the rainy season. Make sure your planter has at least a 7-inch rim, so that you can maintain a 5-inch layer of 1-inch diameter cured mulch (not compost) on top of the soil level. Allow at least a 3-foot radius of dedicated, mulched root space from each banana plant. If planting multiple banana plants, place them at least 6 feet on center apart from each other.

**Watering.** Drip irrigation is not effective for bananas (ornamental or fruiting) or for most fruiting plants in the ground. The volume of harvest is proportional to the volume of roots, and therefore you want to develop a large canopy of roots around the plant. Drip does not do this. Install at least two 1/2 inch risers with streamer-type shrub heads per plant. The goal is to completely saturate the mulch each time the water comes on. The frequency of watering depends a lot on your local climate. Consider these degrees of wetness, from most to least: soggy, wet, moist, less-than-moist, dry. Bananas like moist soil. If the soil stays soggy they will rot, and if it stays dry they will wither. After each watering, the soil should be temporarily wet and then after several hours (or a day) drain to moist. When the soil at the root depth becomes less than moist, it is time to water again.

**Maintenance.** As the banana plant gains height it will discontinue use of lower leaves. If the leaves still have some chlorophyll green then the plant is still utilizing them a bit. If they are unsightly, you can remove them with little detriment to the plant. When a leaf is completely brown you can remove it or wait for it to fall off. During their lifespan banana plants will sprout pups from the base and rhizomes. These should be removed with a spade-type shovel by the time they reach knee high. They can be replanted in 5-15 gallon pots until enough new roots have been generated for replanting the ground. An exception to removing pups is in the Spring following a Fall and Winter in the ground by the mother corm. Keep this pup for the follow-on harvest. After harvest of ornamental flowers or banana fruit from a stalk, cut it to ground level and let the remaining pup continue.

**Corm pruning.** After several generations of growth the planting area for a single banana will be full of both adventurous rhizomes and dead corms. Select one active plant to continue and prop it if necessary, then aggressively remove all other material except its roots. Afterwards backfill, compact, and mulch.

**Fertilizing.** At no point feed an edible banana a flower or bloom formula. Attempting to force early flowering will result in poor quality fruit.

- Tissue culture (TC) starts and Transplanted Pups.
  - Apply a single dosage of a general purpose growth hormone. Use 1/8th of the listed dosage:
    - organic - liquid seaweed extract made from *Ascophyllum nodosum*OR
    - non-organic - Grow More “Jump Start”
  - For subsequent feedings use approximately 3:1:2 NPK ratios at 1/8th listed dosage.
    - organic - Job’s, Planet Natural, etc. 3-1-2OR
    - non-organic - Dyna-Gro 9-3-6, Grow More or Scotts 20-5-16, 30-10-20.
- Young plants up to 4 foot pstem height
  - Use full dosage of approximately 3:1:2 NPK ratio
    - organic - Job’s, Planet Natural, etc. 3-1-2OR
    - non-organic - Dyna-Gro 9-3-6, Grow More 20-5-16, 30-10-20.
- Post-juvenile through Fruiting stage:
  - Use approximately 2:1:3 NPK ratio
    - organic - Granular 5-5-5 plus Sul-Po-Mag supplementOR
    - non-organic - Grow More 16-8-24 Fruit Fuel or similar.

