



# Growing Hard Shelled Gourds (*Lagenaria siceraria*) in New York\*

A guide for the backyard gardener

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It is pretty easy to grow a gourd plant. To increase your chances of getting a large crop of nice, sturdy gourds to craft you can choose to focus on one or more of the following bits of information.

## Gourd Variety

One early decision will be to decide what kind of gourds you want to grow.

- **Yield:** For an average sized gourd such as an apple or a cannonball you will get 15 or so gourds per plant with attention to details. Smaller types yield more and large types yield less per plant.
- **Growing Season:** smaller varieties (eg, egg, banana, bottle, cannonball) require around 100 days to maturity, while larger varieties (eg, bushel, African wine kettle, and luffa) require up to 180 days to maturity.
- **Generally,** gourds will grow to their maximum size based on the variety, and then the walls of the gourd will thicken. Shorter growing seasons yield thinner gourds.
- **Obtaining Seeds.** If you want a certain type of gourd you need to purchase seed from a reputable grower.
  - If you plant saved seed or seed that someone gives you, you cannot be sure what type of gourds you will get. When you take the seeds out of a gourd you are only seeing one parent. This can be fun as long as you are flexible in your expectations.
  - Go to AGS and choose "Links and Sources" and then page down to "Seed Sources."  
<http://www.americangourdsociety.org/>. P.O. Box 2186, Kokomo, IN 46904-2186.

## Growing Season

- Gourds need between 100 and 180 day growing season to reach maturity and thus dry successfully (larger varieties require the longer growing time). This means gourds need to be started in early May and continue to grow until late September.
- The soil temperature should be 60 degrees when planting seeds or transplanting seedlings in the garden. Gourd seeds will often rot when planted outside in cold, wet soil and transplanted gourd plants are sensitive to frost and chilly winds.
- This far north of the Mason-Dixon line it will be too cool to plant your gourd seeds directly in the garden until early June; Start seeds indoors in mid-to-late April and begin hardening off seedling plants started inside in late May.
- Monitoring the soil temperature and weather is very helpful. When soil temp is 60° for 5 consecutive mornings it is probably safe to plant in the garden.

## Preparing the Garden Area

### Space

- Gourds need full sun, plenty of space and access to water in times of drought. Soaker hoses are recommended so water goes to plant root area, not leaves.
- Gourds do well when the plants are 6 to 10 feet apart
  - If the gourds are too crowded they will grow higher as they compete for light and the female flowers will tend to be hidden under this canopy, out of sight from pollinators.
  - It will also be more difficult to get into your patch to check for disease and insect damage and set the gourds upright for a more flat bottom.
- You might decide to trellis your gourds to conserve space. Trellised gourds have their own pluses and issues.
  - The longer varieties will have a better chance of growing straight as opposed to coiling on the ground.
  - You have a better chance of getting under the leaves when spraying and the gourds will tend to be cleaner and less bothered by things that crawl on the ground like slugs.
  - But trellised gourds are more susceptible to drought as they have fewer auxiliary roots growing from the vines to help collect water.
  - Working the soil between seasons may be more difficult with permanent trellises as well.

### Soil

- It is very valuable to have the soil tested in the area where you plan to grow.
  - Cornell Cooperative Extension tests soil inexpensively and there are private labs which will also provide results and recommendations for soil pH, Nitrogen (N), Phosphorus (P), and Potassium (K). Your county extension office can also provide help with interpreting your report and its recommendations.
  - The optimal pH for gourds is 6.5, nitrogen should be 75 lbs. per acre, Phosphorous should be 60-155 ppm, Potassium should be 100-170 ppm and Magnesium should be 100 ppm.
- To amend your soil there are both inorganic and organic fertilizers and other compounds.
  - To learn more about fertilizers and the pros and cons of the two basic types, visit Wikipedia here <http://en.wikipedia.org/wiki/Fertilizer> .
  - Manure and compost are good for the gourd patch but can come with their own set of problems if over used and not guided by soil testing. Manure improves the quality of your soil structure and harbors beneficial soil organisms but it does not contain a lot of basic nutrients that are immediately available.
- Some folks just skip the testing and go right for the fertilizer hoping for the best, but if, for example, the soil pH is fairly high or low for gourds the nutrients that are there may be unavailable to the plant.

## Watering Gourd Plants (in the Garden)

- Soaker hoses let you water the roots and not the leaves, which will mean you will use less water and reduce the risk of some diseases, such as powdery mildew.
  - Lay the soaker hoses when you are planting and mulching b/c doing so later will be difficult once the plants send out their runners and leaves.
  - Flag the end of each soaker hose that needs to be hooked up to your household hose, for no matter how obvious the location is at the beginning of the season, it will be obscured by thousands of leaves before long.
- Aqua cones allow you to add something like compost tea or water to each plant without having to use a large amount. 1-2 cones per plant are sufficient. You connect the pouring spout of soda bottles or quart milk jugs to the cones (bottoms of the bottles are cut off and are where you add your water or tea). This is great when the plants are small.
  - As the plants grow it is harder to get to and find the cones as the patch fills with foliage, so at some point the hoses are needed.
  - Once you can no longer add things like compost tea via the aqua cones you might be able to use a fertilizer siphon to siphon into your soaker hose lines.
- Avoid working in your garden when the leaves are wet.

## Layout

- Mark planting locations 6 to 10' apart with garden stakes.
- Place soaker hoses for later in the season watering needs.
- Spread mulch (3" depth is plenty) in the garden, except where plant holes will be dug.
- Place 6' squares of weed block fabric at each stake, and pin in place with garden staples or rocks.

## Mulching

- Do not place the mulch while the soil is cold. Mulched soil warms more slowly so it is best to wait until the soil is warmer.
  - Anytime after the soil is warm, and stakes, hoses and plastic are in place you can mulch your entire patch
- There are a number of potential mulches, but none are problem-free.
  - Straw eventually yields rye grass growing in your patch
  - Chopped leaves drive the pH up.
  - Three inches of mulch is enough. More is not better— it will cut down the infiltration of water and air into your soil.
  - Keep mulch a few inches away from the plant stems to reduce the invasion of pests and disease.
  - Have some sort of covers available for young plants in case of extreme weather (eg, strong winds, hail) while the plants are young. Peach baskets are ideal, but in a pinch paper bags held down with rocks, will work.

## Starting Seeds Indoors

There must be enough time for the seedling to develop true leaves but not get too big and long and you never want the stem to get thin and leggy. You are also going to need time to acclimate the gourd to the out of doors for several days prior to transplanting into the garden. This translates to approximately 4-5 weeks while you are waiting for the soil to warm up.

### Preparing the Seeds

- New York (northeast US), start the 3<sup>rd</sup> or 4<sup>th</sup> week of April
- Trim the corners off the "shoulders" of the seeds with fingernail clippers
- Lay the trimmed seeds on white paper towels that have been dampened and then cover them with another layer of damp paper towels and all of this rests between two ceramic dinner plates.
- Write directly on the old ceramic plate (or masking tape) with a Sharpie marker as to what kind of seeds are inside.
- Put your ceramic plates on cookie cooling racks suspended over seedling heat mats.
- You want to maintain a temperature of 85 degrees if you can, but not over 90 degrees or under 80 degrees. Keeping a little thermometer in a small plastic bag within the damp paper towels lets you keep a close eye on the temperature.
- Keep an eye on the paper towels as well. DO NOT let them dry out. Add water 1-2 times per day as needed. You don't want standing water, just damp paper towels.
- If the seeds are vigorous they will germinate within two days. If they don't germinate within four days start more of that kind.

### Preparing the Pots

- Prepare 5" pots with a dampened, soilless seed starting mixture, such as ProMix. This near sterile mixture provides the loose support young plants and roots need while reducing exposure to disease.
- If you use potting soil or garden soil you should sterilize it in an oven until the internal temperature reaches 180 degrees and remains there for 30 minutes. Make sure there are no small stones in it for if a stone has a cavity it can explode in your oven.
- Fill the pot with the soilless mix and press down (you can use another pot to do this). Add more soilless mix and repack until the pots are filled to within  $\frac{1}{2}$ " of the top of the pot.
- Make a 3" slanted indentation with your finger in the center of each pot.
- Insert 1 sprouted seed per pot with the sprouted end up. Scratch soil to surround the seed and press it slightly.
  - You can put two germinated seeds in every pot but you will have to cut the less vigorous of the two seedlings off at some point so that the roots do not become tangled. Sooner is better than later. Never pull one seedling out as this can be very disrupting for the seedling's roots that remain in the pot.

## Watering Seedlings

- Water the pot gently by spritzing; keep the pots moist but not sopping wet.
- The seedling's bent-over, white stem should appear within two days.
  - This will straighten and pull from the soil; two "seed leaves" that appear will rapidly become green.
  - The seed leaves are not the same shape as the true gourd leaves, which on gourds have lovely lobes and points. Be sure to move the pots to the light as soon as the bent over stem emerges from the soil.
  - If your original two leaves are stuck together via the seed coat, resist the temptation to pull the seed cover off as this may damage the leaves. But if the first set of true leaves is struggling to come out between the two original leaves you can gently snip the tip of those initial leaves off thus freeing them from their seed cover.
  - You may start fertilizing the plants as soon as they have true leaves, but it is easy to damage them with too much. Make the fertilizer more dilute than instructed on the package (perhaps 40%) and add this every week

## Light Requirement

- Give them plenty of light from regular shop lights suspended just above the plants as well as bottom heat from the mats you used to start the seeds.
- Plants need 14-16 hours of light each day and the light should be maintained within a few inches of the plants. A timer works well for controlling the light, and bricks to lift the lights or chains if the lights are able to be suspended will allow you to raise the lights as the plants grow.

## Hardening Off

- Plants are usually ready for "hardening off" in about 3 weeks from sprouting.
- Hardening can take up to 2 weeks.
- Weather permitting, take your gourd plants outdoors for 30 minutes the first day, place in a shaded spot and protect from wind or rain.
- Increase the time outdoors each day until they have spent the night outdoors.
  - You can rush this process if you need to, but not when it is extremely hot or the weather conditions change drastically.
  - It is possible for the sun to burn plants if they are too tender. A little burn gives them a metallic sheen. A bad burn can cause a plant to defoliate and start over.
  - Beware of inadvertently giving them extra (unintended) light by putting them in full sun, or near a reflective surface such as light colored aluminum siding or along the driveway.
  - Gourd plants can be moved outdoors permanently when the soil temperature stays above 60 degrees. Measure the spring soil temperature first thing each morning.

## Plant the Gourds in June; Care for Them Through Fall

**Starter Solution.** Once the weather, plants and patch are ready soak your potted gourds thoroughly with a high phosphorous starter solution such as 2 TBS of 10-55-10 fertilizer dissolved in one gallon of water. Phosphorous is the middle number of the fertilizer x-x-x ratio. Submerge the entire pot till the bubbles stop and then let the pot drain.

**Transplant.** Dig a hole slightly bigger than your pot and gently tap the gourd plant from its pot, set it in the hole, fill in with the surrounding soil and press down firmly all the way around it. Transplant shock is when there is a period of slow growth for a week after the plant is set in the ground. This is usually short-lived and less noticeable when the soil temp is above 60.

Make sure the soil is not too wet.

- To check for this, push a long handled shovel down into the soil as far as it will go and then push the handle forward to pack the soil. Gently slide the shovel out. You should be able to see the back of the packed soil.
- If the surface of this packed soil is shiny the soil is too wet to work. Working the soil when it is too wet will damage soil structure.

**Fertilize.** Once your gourds are planted in the garden, you may fertilize them as often as once every two weeks but be sure to follow the instructions for the specific product that you have. **Switch to a fertilizer without nitrogen once the vines begin to blossom.** Nitrogen is the first number in the standard x-x-x ratio

**Pinning the Vines.** Especially if you are going to be training the gourd to grow up a trellis consider letting the main vine grow along the ground for a few feet before training it to go up the trellis. At each leaf axel (the place where the leaf comes off the vine) the vine has the opportunity to put down auxiliary roots which can gather more water to help withstand drought. You can encourage this by making sure the axel makes good contact with the ground, brushing away the mulch and even pinning it in place gently with a landscape pin. A second benefit to pinning is less injury if a strong wind arises.

**Check for Disease.** Visit your gourd patch every day. Close scrutiny might reveal a few gourd pests or early diseases when they are much easier to deal with. Take a small tool carrier into the patch which includes a dental mirror and small paint brush. A quick check with the mirror along the undersides of the main stems for a few inches can reveal the early work of a stem borer when it is easy to deal with. Small infestations of aphids on the undersides of the older leaves can be brushed off before they have a chance to spread to the entire plant.

**Watering.** It is important that your gourd plants get enough water without getting too much.

- Watering in the early morning is best, especially if you have to water overhead with a hose or sprinkler.
- Avoiding too much water is a matter of planting them at a well-drained site in well-drained soil.
  - A rain gauge should be placed into the patch and checked often.
  - An inch of water a week is the general recommendation. While it can seem to have rained a lot, check the gauge rather than going by your guesstimate. You'll be surprised by results.

- When the vines are very young, and especially if they are thin, the spindly vine can split from too much internal water pressure.
- Too much water for too long (as in heavy clay or poorly drained areas) can result in thin shelled gourds.
- It is normal for the leaves to show some signs of wilting in the very hottest part of the afternoon but they should be well recovered by evening.
  - If recovery in the evening is not complete you should water.
- Thin shells can also be a sign of missing nutrients and not enough time on the vine.

**Trimming the Vines.** Ginger Summit and others recommend trimming your vines when they get to be about 10 feet long or when they reach the top of your trellis. This encourages lateral branches.

- It is on the lateral branches that the female flowers develop. Watch for the male flowers, which appear first and are on the main vine.
- The flowers of hard shelled gourds blossom in the evening and are white. The blossoms only last for one evening. Each female blossom can result in one gourd if it receives enough pollen.
- The flowers of Luffa gourds are yellow and blossom during the day.

**Flowering.** Most seasons you don't see the first male flowers until the vine is 6 feet long or so.

- Most seasons it is late June before you will see the first gourds developing.
- As the lateral vines age they may begin producing male flowers and female flowers will be prevalent on the tertiary vines.
- Sometimes near the end of the season you may see male and female flowers on the same vines. Extremes of temperature can also effect the maturation of female flowers especially, so nothing is really set in stone. See photos of the female (left) and male (right) flowers.

**Hand Pollination.** If you watch the base of the female flowers on the lateral vines, you should see the future gourds beginning to develop.

- You can remove the male flowers just after they open and tap and brush them over the female flowers.
- You can also use a Q-tip or small paint brush to take pollen from the center of the male flower and brush it gently onto the center of the female flower.
- Doing this routinely most evenings from when the female blossoms first appear till near the end of July will increase your yield substantially.
- Pollen production drops when it is very hot and hand pollination in the rain doesn't work well, so those are the nights to take a break.

## Winding Down (July/August)

- You might want to spend some time setting the gourds upright so that they have flat bottoms.
- When to stop pollinating? Consider removing flowers/little gourds may be beneficial to the plant and the quality of the other gourds on the vine.
  - Two large African kettles or 3-4 large zuccas are enough for the vine.
  - For a mid-sized gourd such as an average sized martin or apple stop pollinating at the beginning of August.
  - For the smaller varieties you can continue with pollination through mid-August.
  - For the very small ones, banana and sub-mini gourds, you can continue hand pollination till early September.
- Consider cutting down on watering to help them harden. However, never let your plants suffer from drought, though so play it by ear.
  - Once a plant has had restricted water intake, a sudden increase in water will cause the gourd to suffer a crack from the intake of water after it has hardened. Even watering is preferred over drastic swings between water - drought - water.

## Winding Down (September/October)

- Once September arrives, the productive stages of the vine are winding down.
  - The first frost will kill the vines, but you should allow the gourds to remain in place until the stem that connects the gourds to the vine are brown and dried.
  - If you have a type of gourd that was slow to mature, however and the stems are still bright green- and even drip sap when they are cut, do not despair: many of them still mature and dry quite well.
- Harvesting.
  - Some folks leave the gourds outside in the gourd patch until after the first snows of winter or even till the following spring.
  - Others harvest them and move them into a shed or barn until they are dried and ready for cleaning.
  - Once your gourds are harvested they will dry on their own. You don't need to do anything special.
  - Dried gourds should be very light weight. The seeds may or may not rattle.
  - A gourd that seems mostly dry but has a semi-translucent patch somewhere on the lower part of its surface as it sat needs more time to dry.
  - Don't bring the gourds into the house or any enclosed space to dry. The thin, outer layer that covers the gourd gets moldy. This is normal, but the spores of the mold will decrease your indoor air quality and may even be unhealthy.



## Pests and Disease

- A very good resource for learning about gourd pests and diseases is [Gourds in Your Garden](#) by Ginger Summit.
- Become familiar with potential pitfalls (especially learning to identify the adult insects and their eggs) early on will allow you to be more proactive than reactive.
- Remember, some bugs are good bugs and are there to eat the bad guys. There aren't that many bad guys so if you can identify them just assume everything else is either good or neutral.
- Avoid working in your gourd patch when the leaves are wet.
- Avoid watering the leaves when watering your gourd plants.
  - Enemies of gourds are splashed soil and the diseases it carries, spore fronts such as those for powdery and downy mildews blowing from other areas, and uncontrolled pests.
- Turn to your county's Cooperative Extension office for assistance.
- Avoid wounding the plants in any way as this often creates an entry point for disease and pests.
- Avoid spraying until you know what you are spraying for. Some sprays are preventative but they may kill off your good insects, so use with care and only as needed.

### Internet Resources.

- Search for "Integrated Pest Management" and diseases and pests of Cucurbits
- Visit Penn State's Integrated Pest Management site. <http://extension.psu.edu/ipm> .
- Visit Cornell [http://vegetablemdonline.ppath.cornell.edu/factsheets/Cucurbit\\_List.htm](http://vegetablemdonline.ppath.cornell.edu/factsheets/Cucurbit_List.htm)
- or the Texas A&M sites <http://aggie-horticulture.tamu.edu/publications/cucurbitproblemsolver/>
- Visit Cornell's site for information on organic options <http://web.pppmb.cals.cornell.edu/resourceguide/cmp/cucurbit.php>

### **Learning More**

One of the best books I have found to date is the "Pumpkin Production Guide", edited by Dale Ila Miles Riggs and produced by the Natural Resource, Agriculture and Engineering Service. For more information on this book visit

[http://www.nraes.org/nra\\_order.taf?\\_function=detail&pr\\_booknum=nraes-123](http://www.nraes.org/nra_order.taf?_function=detail&pr_booknum=nraes-123)

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## SUMMARY

### Sequence of Soil/Garden/Planting Preparations

#### April:

- Remove all visible dirt from your tools and portable trellis' using a stiff brush and then disinfect by immersing the item in a 9% bleach solution for 10 minutes.
- Gather all of your seed starting supplies and set up your area for germinating and potting.
- Take a soil sample from 2-3 places in your garden and combine and send for soil testing.
- Start seeds indoors

#### May:

- As soon as the ground is thawed, you can work in any recommended amendments. Till in or scratch-in if No Till is your approach!
- Make sure the soil is not too wet.
- Monitor soil temperature in the morning

#### June:

- Mark planting locations with garden stakes and place soaker hoses for later in the season watering needs.
- Dig and place seedlings.
- Mulch around plants (leaves work well and reduce the grasses and weeds that come from straw & hay mulch) and place 4' squares of weed block fabric around each plant
- Set in 1-2 Aqua spikes with bottles for adding compost tea and nutrients near main roots of each plants

#### July/August:

- Evenings hand pollinate flowers for greater yield
- Check for pests
- Water as needed
- Set gourds on their bottoms on a piece of cardboard or wood

#### September/October:

- Cut back on watering
- Harvest when plants have finished growing and stems are brown
- Store/cure 6 months in barn, shed, or in the field (do not bring them in the house, basement, or attic)