

GROWING FOR MARKET

news, advice and resources for market farmers



Get your watermelons when it's hot

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By Pam Dawling



Nothing beats a big slice of watermelon during a break from working in the fields. It's a good cure for dehydration, especially if lightly salted to balance the electrolytes, and helps improve heat tolerance. Watermelon is easily digested, and adds fiber to the diet. Second only to tomatoes as a source of lycopene (said to prevent some cancers), watermelons are also an excellent source of vitamin C, beta carotene, folic acid, biotin, potassium, magnesium and citrulline (an amino acid important for healing wounds and removing toxins from the body). The seeds, if well chewed to break up the indigestible seed-coat, can provide amino acids, fatty acids, vitamin E, potassium and phosphorus. It's good to know watermelons are nutritious, but frankly, their main claim to fame is that they are delicious, and just about everyone wants one when the weather is hot.

Varieties

After trying several varieties, we settled on Crimson Sweet (pictured above), a 20-25 lb striped 10 x 12" oval OP melon which takes 86 days from transplant to harvest. It has tolerance to some strains of Anthracnose and Fusarium. We are saving seed, selecting for size, earliness, disease resistance and flavor. Charleston Gray is another popular large variety, with a redder color but less sweetness than Crimson Sweet.

Black Tail Mountain (OP, 73 days) was made famous by Glenn Drowns, who developed it as a fast

growing, highly productive, rich flavored melon he could grow in a cold climate in northern Idaho. It stores for up to 2 months after harvest.



OrangeGlo (85 days) is an outstanding orange-fleshed variety, with large fruits and great tropical flavor. William Woys Weaver (a contributing editor to Mother Earth News, winner of three cookbook awards and owner of the Roughwood Seed Collection) recommends it for frozen desserts.

Icebox varieties are 6” round, 8-12.5 lbs melons, perfect for small refrigerators. Some varieties are ready as soon as 64 days after transplanting. Seedless triploid varieties Dark Belle (F1 75d) and Fun Belle are said to be better tasting than traditional Sugar Baby (77d) and orange New Orchid (80d). See the 2003 study of icebox watermelons by Washington State University, in the Resources list. Selling portions of larger melons is a way of providing for this need if you don’t want to grow icebox types.

Triploid seedless watermelon seed is expensive and harder to germinate, and the transplants are very fragile and tricky to establish. Triploid varieties are hybridized from a cross between two plants with incompatible sets of chromosomes. This results in sterility (lack of seeds).

Even smaller than the icebox size are “Mini” watermelons, 3-6 lb Golden Midget is an OP seeded mini from Baker Creek 70d, 3 lbs. There are also triploid seedless varieties including Petite Perfection (the smallest in a 2003 University of California trial of Mini Watermelons, with the highest number of melons for the area, and the lowest total yield). Extazy, Demi Sweet and Liliput are some other Mini varieties. Solitaire (triploid, 88d), is a single serving watermelon from Johnny’s. It has 6” diameter fruit. Harvest can begin 78 days after transplanting.

Crop requirements and yield



Watermelons do best in free-draining light soils that warm quickly in spring. Ensure high organic matter content, sufficient boron and a pH of 6.5. Black plastic mulch, either the removable or the biodegradable kind, will speed growth and ripening. If you want to use organic mulches, put them around the plants after the soil has warmed up, or you will have later harvests. Drip irrigation is definitely better than overhead, as it reduces the chance of foliar diseases. Water well during fruit development, then cut back during the

harvest period, for best flavor and to prevent fruit bursting. We often run our irrigation at the same time as harvesting, so we can easily check for leaks.

If drainage is an issue, make ridges or raised beds before planting. You can use straw or spoiled hay in the aisles to absorb some of the water. Watermelons easily die in water-logged soil.

There are on average 24 seeds/gm, 670/oz, 11,000/lb. Large seeded varieties require 1-2 lbs/ac for

direct sowing. Crimson Sweet seeds are about half the size, so need only half as much.

Yield of Crimson Sweet and other varieties can be 20,000 lbs/ac or 460 lbs/1000 ft². For our 6600 ft² we can expect an average of 3000 lbs, whether 150 melons at 20 lbs or 300 at 10 lbs. We get higher yields than these, and have got 300 melons (unweighed) from this area, using 2' x 5.5' spacing.

Rotations

Because watermelon is planted relatively late, there is time in the spring for leguminous winter cover crops such as crimson clover, hairy vetch or (in zones 7-9) Austrian winter peas to reach the flowering stage. For maximum nitrogen, mow and incorporate the cover crops as they start to flower. A good leguminous cover crop can provide all the nitrogen the crop will need. Another possibility is to grow watermelons following a legume food crop the previous year.

Following the watermelon, we like rye, Austrian Winter peas and the higher N-producing crimson clover, which have time to reach flowering before being turned under for our middle sweet corn plantings the next year. Plan at least a three-year gap between cucurbits.

Sowing

Watermelon seeds need a soil temperature of at least 68°F to germinate, taking 12 days at that temperature, but coming up in a mere 3 days at 95°F. If direct seeding, station-sow 4-6 seeds 1-1.5" deep at the final spacing. Later, thin the emerging seedlings to one or two at each spot. Pest attack is more likely on plants stressed by planting in cold conditions. If in doubt, wait.

Transplanting is the way to go for early melons. We use soil blocks for this crop, or Winstrip 50 ventilated plug flats. Soil blocks are more time consuming than plug flats, but the results are so much more dependable that I think it is well worth it. Cells should be at least 1.5 x 1.5". We put two seeds in each block and sow more blocks than our usual 20% extra, because casualties with melons are usually fatal. After emergence, we pinch off the weaker seedling.

We sow 30% more blocks than we hope to take to the field, which is another 30% more than we need to plant because of their fragility. (We expect casualties on planting day.) We sow 4/26 and 4/29. We split the sowing up because we don't have a big enough germinating chamber to accommodate them all at once. They come up very fast in our hot germination chamber, and a 3 day sowing difference is unnoticeable later. We transplant at 15-19 days old. Four weeks old is about the maximum for watermelons – they start to get stunted if held too long.

Once the seedlings emerge, they need maximum light and warmth, but not too much watering. I have a favorite spot in our greenhouse for them: right by the south and west windows.

Transplanting

Transplanting allows the young plants to be raised in close to ideal conditions, and gives the soil

time to warm up. Don't rush transplants into cold soils – cold conditions can permanently stunt the plants. Once outdoor daily mean temperatures have reached at least 60°F and the first true leaf has fully opened, you can plant them out.

We have found watermelons to be amongst the crops needing the most skill at transplanting. The stems are fragile, the roots respond poorly to disturbance. And spending extra time later replacing the dead starts is frustrating and doesn't lead to early melons. It also requires the grower to produce lots of spare plants, which all take time and care. Now we aim to have only the most experienced people plant out melons, and it's so much more satisfying!

Roll out the driptape and the plastic on top, and turn on the irrigation while planting. This helps ensure no-one stabs the driptape, and the plants can be set by the emitters. (Yes, you can still find them, even though they are under the plastic.) Watermelon transplants can easily get leggy in the greenhouse, so make holes deep enough to bury the stem as well as the roots. Some people use bulb transplanters to punch holes through the plastic into the soil. We just use pointed trowels. On a larger scale, waterwheel transplanters work well. Despite the recommendations of the mulch manufacturer, our soil surface is often uneven, so we use small rocks to hold down the edges of the holes in the plastic anywhere they could damage the plants. Provide wide margins at the edges of the patch as the vines will invade other plantings given the chance.

We drape rowcover tent-like over ropes between stakes hammered into the soil at regular intervals along the row. This prevents the rowcover abrading the leaves, and creates a volume of warm air around the plants. A week after transplanting, we fill any gaps with more transplants, or with a few seeds station-sown at each spot where we want a plant. Sowing pre-sprouted seeds will help make up for lost time if something has gone wrong.

Spacing

Spacing can make a difference to size and yield, but not sweetness. There are widely varying recommendations, from 9 - 80 ft² each! Perhaps large spacings suit backyard growers who want “specimen” plants. In commercial growing we are looking for wise use of land and other resources. It doesn't matter if 12 ft² is provided as 1' x 12', 2' x 6' or 3' x 4'. The area is the important factor, so choose a row spacing that works nicely for you, and adapt your in-row spacing to give the area you want for each plant.

We used to transplant our watermelon 2' apart in rows 10' apart. We used spoiled hay as mulch. The melons were nice but were late coming in. Early fruit is a goal for us – not bigger plants, longer vines, or more (later) melons per plant. I read a brief reference to watermelons only needing 10 ft²/plant, so we switched to a spacing of 2' x 5.5', 11 ft² in order to fit more plants in the space and therefore get more first and second melons. 5.5' is just the right width for rolling hay bales. The new spacing seemed fine until someone complained that our melons were smaller since the change and not as sweet. I checked on total yield and that seemed to be in the right range.

Next I researched the questions of sweetness, size and spacing. Scott NeSmith at Georgia Agriculture Experiment Station, Griffin, whose research involved Star Brite and Crimson Sweet, assured me there is no difference in sweetness between melons at different spacings.

Close spacing (down to a point) increases the total yield, but decreases the weight of each melon. A Brazilian study on Crimson Sweet found that 13 ft² per plant gave the highest total yield, but 15-20 ft² gave bigger melons. NeSmith found that reducing plant spacing 50% may reduce the size of each melon 10%. Earlier research (1979, Brinen et al) had shown that reducing plant spacing 50% resulted in increases in yield of 37-48% with only a 13% reduction in average fruit weight. Bigger varieties are more likely to have their size affected by closer spacing than small varieties are.

Here are the factors in deciding spacing:

Total yield (by weight): reduced spacing (to a certain point) increases total yield. Reduced spacing does not increase the percentage of cull fruit.

Number of melons/area (“fruit density”) increases with plant density.

Size: reduced plant spacing sometimes affects melon size, but not linearly. Other (environmental) factors affect melon size. Small size is an advantage in some markets.

Yield/plant: decreases at close spacing, sometimes because number of melons per plant is reduced, sometimes because the size of the fruit decreases.

Melons/plant: the number decreases as plant spacing is reduced, but not in a linear way. At close spacings, there is negligible difference.

Early yield: variety, early transplanting, good conditions and hot weather will provide more early melons. The first melon on each plant is the early harvest. More plants means more first melons.

Plastic mulch produces crops a month before organic mulched crops. Spacing has no influence on the ripening rate.

Sweetness: the flavor of watermelon is not related to the size of the ripe melon, or the plant spacing.

Healthy foliage and long hot sunny days are the biggest factors in building good flavor. July has longer days than August, and September’s days are getting shorter, so don’t expect late season melons to be as sweet.

Plant health: overcrowding can cause foliar diseases to take hold.

Labor requirement: closer spacing = more transplanting. More melons = more time harvesting.

Clarify your goal and choose your variety and spacing accordingly. If your goal is the highest weight of watermelons for a given area, plant Sugar Baby at 10-11 ft² each. If your goal is the highest number of melons, try them even closer! If you like Crimson Sweet and want fairly large melons try 15 ft² if 12 lb melons are an acceptable size (you might still get 15 lb melons!). Otherwise, use 20 ft². Go up to 30 ft² if you want big melons and can accept a lower total yield. I want 5.5’ row spacing. We have tried some at 2 ½’ in-row spacing, some at 3’ and some at 3 ½’. These spacings correspond to areas of almost 14 ft², 16.5 ft² and 19 ft² each. We didn’t keep records, and didn’t notice a difference in size.

Ideally, the ground will be filled with foliage by the time the first blossoms appear so that the crops

can intercept and use all the available sunlight. Given that the market is for early melons, and early ones are sweeter, having many plants (one early melon each), and having them optimally cared for, is important.

Caring for the crop

Remove rowcover from transplants after three weeks (wait longer with direct sown crops) and pull any big weeds. (Cultivate between the rows if you have bare ground.) We wait to remove the rowcover until we see a few open flowers, which indicate that pollination is now the critical step, not warming. Water regularly – drip irrigation set out at planting is the best way to go, as there will be less chance of fungal diseases than with overhead watering.

Weeding is important, and needs to be completed before the vines run. If big weeds get away from you, and pulling them endangers the crop roots, wade in with pruners and clip off the weeds at ground level. This prevents the weeds seeding, and lets the melons get more sunlight again. Flaming around the edges of the patch before the vines get there can set back perennial grass weeds.

Watermelons have separate male and female flowers on the same plant, and insect pollinators are necessary. Many species of native bees pollinate watermelons, but augmenting them with honeybees will help pollination, which means bigger, better-shaped melons as well as more of them.

Do not turn over the vines when weeding – cucurbits don't like it! Older publications refer to pruning vines, leaving only one or two fruits per plant to develop. If you are in marginal watermelon climates, you might try this. It sounds tedious, and technically difficult to find where one plant finishes and another starts. Removing damaged fruit will help the good ones grow better.

We used to keep our watermelons growing until frost, but nowadays we keep an eye on production rates, the weather and the calendar, and “pull the plug” when we think we have satisfied the need for watermelons. This lets us disk the patch and get good winter cover crops established in September or the early part of October.

Season extension

There is not usually a reason to extend the harvest later into the year. Exceptions might be for a special seed crop, or for growers in cold climates trying to ripen any melons. In these cases, protect from cold weather with rowcover, caterpillar tunnels or hoopouses.

As far as ripening melons as early as possible, use transplants, black plastic mulch and rowcover until flowering. Choosing fast ripening varieties is useful, too.

Watermelons take a long time to mature, and the market is for early watermelons, not melons in October, so it is only in the Deep South that more than one planting of watermelons makes much sense.

Pests and diseases

Compared to some crops, watermelons are not often challenged by many pests.

Striped cucumber beetles are our worst pest. They eat not only the leaves (which reduces the sweetness of the melons) but also the rind of the melons, leaving an unattractive russeted surface, thinner than it was originally, and easily damaged. The action level is two beetles per plant.

Cucumber beetles can also interfere with fruit set by eating the stamens and pistils of the flowers.

Aphids (usually Green Peach Aphids) can be a problem to young plants – another reason to use rowcover. If needed, use insecticidal soap, or import ladybugs or lacewings.

Spider mites can be a problem in hot dry weather if populations are driven into the patch by mowing of bordering grassy areas. Heavy rain, vigorous spraying with water or overhead irrigation will reduce numbers.

Root Knot Nematodes can attack roots and produce galls. This leads to loss of vigor and wilting.

Organic growers do not usually get many disease problems with watermelon, provided the soil fertility is well-balanced and the plants are not physically damaged. There are a few diseases to watch for:

Alternaria leaf spot

Cercospora leaf spot

Gummy Stem Blight

Watermelon Fruit Blotch/Bacterial Fruit Blotch is a serious disease which is seed-borne (another reason I like growing our own seeds – we'll never bring it in).

Bacterial wilt - watermelon is resistant, although young seedlings could succumb.

Fusarium wilt is a persistent soil-borne fungal disease that infects the roots, invading the xylem cells.

Anthrachnose is a fungal foliar disease that can cause loss of vigor and can cause fruit spotting.

Harvest

The skill of the harvester in discerning ripeness is a major factor affecting the taste. We switched to having just a select few people do the harvesting, and get better melons.

The first sign we look for is the shriveling and browning of the tendril on the stem directly opposite the watermelon. If this tendril is not shriveled we walk on by. Next we slap or knock on them.

According to Southern Exposure Seed Exchange, when a watermelon is ripe, it will have a hollow sound when you thump with your knuckles: it sounds like thumping your chest. If it sounds like knocking your head, it's not ripe. If it sounds like hitting your belly, it's over-ripe. There is a 10-14 day period of peak ripeness for each variety. We harvest ours from around 7/25 (75 days from transplanting) to the end of August. We hope not to be still harvesting in September.

Lastly, we do the "Scrunch Test": put two hands (heels together) spread out across the melon, press

down quite hard, listen and feel for a scrunch – the flesh in the melon is separating under the pressure. Rumor has it that it only works once, so pay attention!

Other growers with other varieties use different ripeness signs, such as the change in color of the “ground spot” (the area touching the ground), or the change in rind texture from glossy to dull. I like to cut the melon stems with pruners, but some people break them off. Watermelons need gentle handling, as do the vines if you will be returning to harvest again. After harvest, we set the melons out to the side of the row for pickup. This gives time for sap to start to ooze out of the cut stem. If the sap is red or orange, the melon is ripe. If it is straw-colored, the melon was cut too soon. This is useful feedback for new crew.

Post-harvest storage

Watermelons can store for a few weeks, but then flavor deteriorates. We store ours outdoors in the shade of a building or a tree. Rotating the stored stock is a good idea. (They could be dated with a grease pencil/china marker). The ideal storage temperature is 50-60°F with 90% humidity.

Resources

Washington State University, photos of 126 different varieties:

<http://agsyst.wsu.edu/WatermelonPhotos.html>

Washington State University 2003 study of icebox watermelons:

<http://agsyst.wsu.edu/Watermelon2003.html>

University of California 2003 and 2006 trials of Mini Watermelons

http://sfp.ucdavis.edu/pubs/brochures/RM_WTRMLN_RSRCH.pdf

http://ucanr.org/sites/Small_Farms_and_Specialty_Crop/files/90277.pdf

University of Kentucky: www.uky.edu/Ag/CDBREC/introsheets/watermelon.pdf

Virginia Cooperative Extension Organic Production of Watermelon:

<http://pubs.ext.vt.edu/2906/2906-1342/2906-1342.html>

Purdue Extension Diseases and Pests of Muskmelons and Watermelons:

https://mdc.itap.purdue.edu/item.asp?item_number=BP-44

Pam Dawling is garden manager at Twin Oaks Community in Virginia. The gardens provide nearly all the fresh and preserved produce for the community’s 100 residents. Pam’s book, Sustainable Market Farming: Intensive Vegetable Production on a Few Acres, is scheduled for publication this fall. She can be reached at pam@twinoaks.org.

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