



Environmental Horticulture Notes

EHN 99

GROWING MELONS IN SACRAMENTO

A melon picked at its peak of ripeness can be absolutely delicious. Because melons require high temperatures during the growing season, they grow very well in warm interior valleys. This warm-season crop requires approximately 90 days from sowing seed to harvest, although some varieties produce fruit earlier and some take longer to ripen. Years ago, there were only cantaloupes and honeydews, but now many hybrid and exotic melons are available. Melons are sweet-flavored members of the cucurbit (*Cucurbitaceae*) family. The major cultivated members of this family include cucumber, melon, pumpkin, squash, and watermelon. Minor cultivated types include chayote, citron, gherkin, gourds, horned cucumber, and wild cucumber. They all suffer from similar pests and diseases.

There is some confusion about the specific classification of melon types. This publication will not provide in-depth information about the taxonomy of cultivated melons (*Cucumis melo*), but instead will provide general cultural and harvest information. While cultural information about watermelons (*Citrullus lanatus*) is similar to that of melons, watermelons are not covered by this publication. Melons here fall into two main groups:

- **Muskmelons** - Usually called cantaloupes, these melons have a sweet musky aroma and a netted rind (covered with a network of corky tissue that may be rope-like and prominent or flat-surfaced, fine, and less conspicuous). The rind may also be ribbed or grooved and may be white, grayish green, golden yellow, orange, or black in color. Fruit is generally oval or round, and flesh color is usually orange but may also be white, green, or salmon pink depending on the variety. The flesh may be sweet, spicy, bland, or a combination of these. It is the most common melon grown in home gardens and is also the easiest melon to test accurately for ripeness (see Harvesting on page 3). Varieties include 'Ambrosia', 'Sweet 'n Early', 'Charmel', 'Charentais', and 'Galia'.
- **Late melons** - The fruit may be oval, oblong, or very long and slender and may be quite large. The surface may be white, golden yellow, or green; it is usually smooth, but may be wrinkled or have fine netting. Depending upon the variety, the flesh may be white, green, or orange. Varieties include Honeydew, Casaba, Crenshaw, and Santa Claus. There are other types of melons in this group (such as Juan Canary and Persian), but these are the most commonly grown in home gardens.

It is possible for there to be crosses between muskmelons and late melons, and there are melons with unknown ancestry. Because traditional melon categories are sometimes unclear, some melon hybrids are called "specialty melons".

POLLINATION

Vines have separate male and female flowers on the same plant. Pollen must be transferred to the female flowers for fruit to develop. The pollen is sticky, so wind-blown pollination does not occur. Bees are the principal means by which pollen is transferred from the male to the female flower; other insects cannot be depended upon for pollination. If bees are absent, fruit set is very poor and often nonexistent. To prevent killing bees, avoid applying bee-toxic pesticides whenever possible. If pesticides toxic to bees must be used, apply them late in the evening when bees have returned to their hives.

When no bees are present in the garden or the bee population is too low for good fruit set, a dedicated gardener can be a substitute for the bee by pollinating by hand. Hand-pollination is a tedious chore, but it is the only means of obtaining fruit set in the absence of bees. The pollen is yellow and is produced on the

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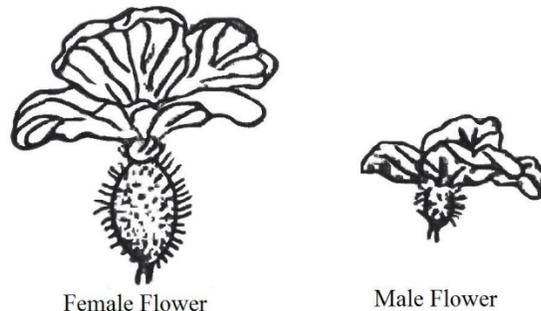
structure in the center of the male flower. A small artist's paintbrush can be used to transfer pollen, or you can take off a male flower, remove its petals to expose the pollen-bearing structure, and roll the pollen onto the stigma in the center of the female flower. When hand-pollinating, it is important to use only freshly-opened flowers. Flowers open early in the morning and are receptive for only one day. Very hot or cool weather, wind, and rain can shorten the pollination period. The length of time from pollination to fruit maturation varies considerably depending on the temperature and the particular type of melon grown.

Even with multiple bee visits to each flower, about 80 percent of female melon flowers will be aborted without setting fruit. Even when pollinating by hand, which is quite time consuming and less effective than bee pollination, there is no way to determine which hand-pollinated flowers will be aborted by the plant. Under optimal conditions, and depending upon varieties grown, melon fruits can mature within approximately 30 to 45 days of pollination.

Male blooms generally form first. They do not set fruit, but they supply pollen that fertilizes female flowers; therefore, do not be concerned when male flowers fall off. Male flowers can be identified by their short stem and are generally borne in clusters of three to five. Female flowers are borne singly on somewhat longer stems and can be identified by the miniature fruit (ovary) at the flower base. (See drawings at right)

A common misconception is that melons will cross-pollinate with squash, cucumbers, and watermelons (other members of the cucurbit family). This is not true—the female flowers of each can be fertilized only by pollen from that same species. Therefore, all varieties of melons (*Cucumis melo*) have the potential to cross-pollinate with one another. When more than one variety of melon is grown in the garden, they can readily cross-pollinate, and seed saved from these plants will likely produce fruit that will be different from either of the parents (see Saving Seeds on page 6).

MUSKMELON



SOIL CONDITIONS

Melons can be grown in most types of soils, but they prefer light, well-drained soils high in organic matter and nitrogen content with pH of 6.5 to 7.5. Add organic matter (such as compost, well-rotted manures, composted pesticide-free lawn clippings, and composted leaves) to clay soils to improve soil structure and to help avoid surface crusting after irrigation or rainfall. For poorly drained sites, consider growing melons in raised beds. For additional information on soil preparation, see “*Vegetable Garden Basics*” (ANR Publication 8059) available at <http://www.anrcatalog.ucdavis.edu>).

PLANTING

For optimum growth, choose a site in the garden that gets full sunlight. Seeds germinate best when soil temperatures are between 68° and 78°F. Because melon plants suffer if temperatures are too low, it is best to wait until the nighttime air temperatures are consistently above 50°F. To help raise the soil temperature, black plastic can be placed on the soil several weeks prior to planting (black plastic will also conserve moisture, eliminate weeds, and keep fruits clean and free of rot). When the soil has warmed sufficiently, sow seeds in the ground ½ to 1 inch deep (check the seed packet for planting depth specific to each variety) on a mound to keep the roots warm and well-drained, spacing them 3 feet apart in rows 3 to 5 feet apart. If black plastic is used to warm the soil, cut an “X” in the plastic wherever a seed is to be placed. To reduce the risk of rotting, place the seeds on their edge. If plants are grown on a trellis, they can be spaced 18 to 24 inches apart.

Plants can be started indoors in pots a few weeks before planting outdoors (which should be done when temperatures are consistently warm—see above). Sow two seeds (on their sides) per 3-inch pot filled with moist seed starting mix and water evenly. Keep the pots in a warm place, preferably around 64° to 70°F (placement of a propagation/heating mat beneath the pots will aid in germination). After germination, place the pots under fluorescent lights for 14 to 16 hours per day, keeping the plants 2 to 3 inches from the light source. Thin out the weaker seedling in each pot by snipping it off at the soil level with a small pair of scissors rather than pulling it out; this will prevent disturbance of the roots of the other seedling. When each plant has developed its first true leaf, begin fertilizing with diluted fish emulsion or other water soluble fertilizer (diluted to half strength of label recommendation) and water it in. Fertilize with diluted fertilizer once a week until the plants are planted outdoors.

When seedlings have developed 2 to 3 true leaves, prepare them for outdoor conditions by “hardening them off” for at least a week before planting them outdoors. Hardening off involves setting the plants outside in an area protected from wind and direct sunlight (a semi-shady location is best) for a few hours each day and bringing them inside at night. Leave them outside longer each day, gradually increasing their exposure to wind and sun. If taken from indoor conditions and planted directly in the garden without hardening them off, they may not survive the shock. Because melon plants do not like to have their roots disturbed, avoid leaving the plants in the pots too long. If plants get too big before transplanting, they may become rootbound.

A single melon plant may spread its vines over 16 to 24 square feet of soil, so training melons to grow on a trellis is a good solution to save space. In order to encourage the melon vines to climb rather than sprawl, the plants can be trained up a support system such as concrete reinforcing wire. Growing melons on a trellis also simplifies harvesting, and the improved air circulation helps prevent powdery mildew. A melon stem will not support the weight of the maturing melons that hang down behind the trellis, so each fruit must be given extra support. When the melons are about 2 inches in diameter, they should be cradled in slings made of netting, old nylon stockings, or tee-shirts cut into strips.

MAINTENANCE AND CARE

Keep the soil evenly moist and give deep soakings until the fruits reach their mature size. Reduce the frequency of irrigation at the first ripe melon to concentrate flavors and eliminate cracking, but do not allow the plant to wilt. After harvesting the first melons, return to the original watering schedule so the next crop of melons can obtain size. Mulch soil around plants to help maintain consistent moisture and suppress weeds.

Apply a liquid fertilizer such as fish emulsion when the first true leaves emerge. Fish emulsion and seaweed/kelp can also be applied when the vines begin to sprawl and again when fruits begin to form. Fruit in contact with soil may develop rotten spots or be damaged by insects on the bottom. To avoid this, place a board or a few inches of mulching material, such as sawdust or straw, beneath each fruit when it is nearly full-sized. A better solution, and also a space-saving technique, is to train the melon plants up a trellis (see Planting above).

Floating row covers (lightweight spun-bonded polyester or polypropylene fabric) can be used to protect plants from pests or to provide a bit of protection from weather. Be sure to remove the row covers when the plants begin to flower so the bees can do their thing.

HARVESTING

Melons should not be harvested until they are completely ripe. After they are picked, melons will get softer, but they will not become sweeter. As a general rule, melon varieties with netted skins, such as muskmelon (cantaloupes and galia-types), are easy to tell when they are ripe because the fruit pulls off easily or “slips” from the vine. Varieties with smooth, harder skins, such as honeydew, crenshaw, or casaba, do not slip and must be cut from the vine. The skins of these varieties may actually feel hairy when the fruit is not ripe. As the fruit matures, the skin becomes smooth and slippery, and some varieties change color. When the fruit is fully ripe, the skin changes again to have a waxy feel. In addition, the blossom end should soften and have a ripe, fruity smell. Melons may only be stored for a short time, except casaba and honeydew, which store well for several weeks.

Following are clues to help you determine when to harvest the more commonly-grown melons.

Muskmelon (Cantaloupe, Ananas, and Galia) - When ripe, fruit “slips” (detaches easily from the stem when lifted). “Full slip” is when a slight crack completely circles the stem where it is attached to the fruit. If you harvest at the right time, you can pull off the stem, leaving a smooth cavity. Fruit will have a strong, sweet aroma, which is especially evident when the melon is at room temperature.

Charentais - Fruit is ripe when the skin takes on a tan/golden color and has a strong, sweet aroma. There may be a slight split at the bottom (blossom end). Melon will be overripe if the rind turns orange, has a strong musky smell, or the fruit “slips” from the vine.

Honeydew and Canary - Ready to harvest when the blossom end is soft when a little pressure is applied, the stem end is slightly springy, and the skin begins to take on a creamy yellow/cream appearance. The skin will have a waxy feel, and the blossom end should have a ripe, fruity smell.

Casaba - Leave fruit on the vine until the blossom end softens and the rind turns yellow. Harvest when the skin is slightly golden and has a waxy feel.

Crenshaw - It is ripe when the blossom end begins to soften and the dark green skin develops yellow streaks, or freckles turn orange. Shade fruit to protect from sunburn.

Santa Claus (also known as Christmas melon or Piel de Sapo melon) - When ripe, it should have a distinct yellow tinge to the skin and also be slightly soft, especially on the ends.

STORAGE AND FOOD SAFETY

If possible, store melons in the refrigerator crisper drawer where the humidity tends to be high. Under these conditions, freshly harvested, fully ripe melons last about 5 to 15 days depending on variety and growing conditions. Melons should be washed just before preparing and eating. It is best not to wash them before storage; this helps ensure a longer shelf life for the uncut fruit.

Melons are grown in close contact with the ground, which may occasionally introduce bacterial contamination from soil, water, and animals. Bacteria present on the melon rind can transfer to the edible flesh when the melon is cut. It is important to wash and scrub the melon's skin with a clean vegetable brush under clean running water before cutting the melon. After washing, blot the melon with clean paper towels to remove excess water. Place on a clean surface (cutting within a kitchen sink is not recommended) and cut the melon at the stem end about 1 inch from the end. Place the melon on a clean cutting board, plate, or other surface with the cut end facing down. With a clean knife, cut the melon in half from the blossom end to the stem end. Wash the knife with clean running water and set aside. Gently scrape out the seeds with a clean spoon. Continue to cut into slices or as desired.

The use of dish soap or detergent during the washing process is not recommended, as melons (especially cantaloupes) are porous and can absorb detergent residues. Always peel, cover, and refrigerate cut melons. Refrigeration inhibits the growth of bacteria. For more information, see "*Cantaloupe: Safe Methods to Store, Preserve, and Enjoy*" (ANR Publication 8095) available at <http://www.anrcatalog.ucdavis.edu>

SAVING SEEDS

All varieties of melons (*Cucumis melo*) have the potential to cross-pollinate with one another. When more than one variety of melon is grown in the garden, seed saved from these plants may produce fruit that will be different from either of the parents. The easiest way to successfully save seed from melons is to isolate varieties ½ mile from each other (admittedly not a very practical method for the home gardener). It may be more practical for the home gardener to purchase melon seeds rather than saving seeds; however, the procedure to follow in order to save melon seeds is set out below.

The seeds are considered mature when melons are ready to eat. When ripe melons are opened for eating, the seeds that are scooped out can be saved. Alternatively, uncut ripe melons can be left to continue ripening, almost to the point of being rotten, since slightly overripe fruits have a higher percentage of mature seeds. Scoop out the seeds and place them in a bowl; massage the seeds with your hands to remove the pulp or other material. Fill the bowl with water and allow hollow seeds to float to the top; then pour off the water, floating seeds, and other debris. Continue this process until the seeds are completely clean (any pulp that is left on the seeds will inhibit germination). Pour the seeds into a strainer and rinse thoroughly under cool running water. Spread the clean seeds onto dry paper towels in a warm, airy place and allow to dry for 7-10 days. Once the seeds are thoroughly dry, store them in a cool, dry place. If properly stored, melon seeds should remain viable for five years. Additional information about saving melon seeds is available in Susanne Ashworth's book "*Seed to Seed – Seed Saving and Growing Techniques for Vegetable Gardeners*" (see reference on page 6).

VARIETIES

Sacramento County Master Gardeners have had success growing the following melon varieties:

Muskmelons: 'Ambrosia' Cantaloupe, 'Hale's Best' Cantaloupe, 'Sweet 'n Early' Cantaloupe, 'Hearts of Gold' Cantaloupe, 'Honey Girl Hybrid' Charentais, 'Arava' Galia, 'Crème de la Crème Hybrid' Ananas.

Late melons: 'Bartlett' Honeydew, 'Crane' Crenshaw, 'Burpee's Early Hybrid' Crenshaw, 'Lambkin Hybrid' Piel de Sapo, 'Amy Hybrid' Canary.

DISEASES AND PESTS

The following table describes common melon diseases, pests, and other problems. For additional integrated pest management techniques, see "*Pests of the Garden and Small Farm*" (ANR Publication 3332) available at <http://www.anrcatalog.ucdavis.edu>, or check out UC IPM Online (Statewide Integrated Pest Management Program) at <http://www.ipm.ucdavis.edu>. **Before using a pesticide, read the label, and always follow cautions, warnings, and directions.**

Problem	Probable Cause
Deformed, curled leaves; small, soft-bodied insects on undersides of leaves. Sticky honeydew or black mold may be present.	Aphids. Wash off insects with a strong blast of water from a hose. Spray with insecticidal soap.
Fine stippling on leaves; yellow or brown leaves. Leaf undersides are silver-gray with fine webbing and yellow, orange, or red dots.	Spider mites. To reduce dusty conditions, use regular forceful sprays of water on plants, or use insecticidal soap or insecticidal oil (petroleum-based horticultural oils or neem oils). Do not use soaps or oils on water-stressed plants or when temperatures exceed 90°F.
Leaves turn yellow. Honeydew or sooty mold present. Clouds of tiny white insects fly up when plant is disturbed.	Whiteflies. Remove infested plants as quickly as possible. Remove lower, infested leaves of plants not totally infested.
Angular necrotic areas on leaves.	Angular leafspot. Caused by waterborne bacterium. Avoid wetting foliage with irrigation water.
Swelling or beads on roots. Wilted plants. Poor yields.	Nematodes. Rotate crops. Use soil solarization.
Holes chewed in leaves. Scarring of runners, young fruit, and crown. Wilting. Beetles are visible.	Cucumber beetles. Ladybug-like beetles are yellow-green with black stripes or spots. Pick off beetles.
Leaves have small specks that turn yellow, then brown. Vines wilt from point of attack to end of vine.	Squash bug. Trap adults beneath boards in spring. Turn over boards in morning and kill bugs. Pick off adults, young, and egg masses.
White, powdery spots on leaves and stems. Spots may enlarge and completely cover leaf. Defoliation may occur. Yields reduced.	Powdery mildew. Spores of powdery mildew fungus are spread by wind and air currents. Disease is less severe in hot, dry weather. Use resistant varieties. Dusting with sulfur can be effective. Remove old plant debris.
Yellow spots on upper leaf surfaces; fuzzy, grayish growth on undersides of spots.	Downy mildew. A fungal disease. Use resistant varieties. Remove old plant debris.
Stunted plants, small leaves with irregularly-shaped light and dark spots (mottled). Yields reduced.	Mosaic virus. Transmitted by aphids. Remove infected plants as soon as detected. Control aphids. Control weeds. Aluminum foil is effective as soil mulch to reduce aphid population. Deformed fruit is edible.
Poor fruit set.	Insufficient pollination; lack of bee pollinators. Hand-pollinate using an artist's paintbrush if you have too few bee pollinators. Bee activity may be low due to cool weather or use of insecticides.
Misshapen fruit.	Inadequate pollination. See comments above. Dry soil or high temperatures. Supply water.
Poor flavor; lack of sweetness.	Poor soil fertility; low potassium, magnesium, or boron. Get soil tested and adjust fertilizer.
Plants wilt and die, beginning with older crown leaves. Light brown streaks occur inside lower stem, runners, and roots (visible when split lengthwise).	Verticillium wilt. Caused by <i>Verticillium</i> fungus. Rotate crops. Avoid soil previously planted in potatoes, peppers, eggplant, tomatoes, and cucurbits.

Chart continued on next page

Problem	Probable Cause
Plants wilt suddenly. Roots rot.	Sudden wilt. Caused by <i>Pythium</i> fungus. Avoid water stress after fruit set. Avoid wetting soil to the crown. Improve drainage. Plant on raised beds.
Runners turn yellow and wilt. Entire plant collapses. One-sided brown lesion may form on affected runner for 1 to 2 feet.	Fusarium wilt. Caused by <i>Fusarium</i> fungus. Use resistant varieties. Rotate out of melons for 5 years.

FOR ADDITIONAL INFORMATION:

- *The California Master Gardener Handbook*, 2002, ANR Publication 3382
- *Vegetable Garden Basics*, 2002, ANR Publication 8059
- *Pests of the Garden and Small Farm*, 1998, ANR Publication 3332
- *Western Garden Book of Edibles*, 2010, Sunset Publishing Corporation
- *Seed to Seed – Seed Saving and Growing Techniques for Vegetable Gardeners*, (Suzanne Ashworth) 2002, Seed Savers Exchange

WEBSITES:

- www.anrcatalog.ucdavis.edu/pdf/8059.pdf (University of California Agriculture and Natural Resources, *Vegetable Garden Basics* – Publication 8059)
- www.anrcatalog.ucdavis.edu/pdf/8095.pdf (University of California Agriculture and Natural Resources, *Cantaloupe: Safe Methods to Store, Preserve, and Enjoy* – Publication 8095)
- www.vric.ucdavis.edu/main/veg (UC Davis, Vegetable Research and Information Center, *Home Vegetable Gardening, Cantaloupe and Honeydew*)
- www.ipm.ucdavis.edu (University of California Integrated Pest Management Online)

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