

Enterprise Guide for Southern Maryland: Growing Cantaloupes

This fact sheet is one in the series Enterprise Guide for Southern Maryland, providing information about alternative agricultural enterprises for farmers.

With the decline of the tobacco industry, many farmers in Southern Maryland are turning to alternative agricultural enterprises as an additional source of income. Growing cantaloupes (muskmelon) is an enterprise that you may want to consider as an alternative to tobacco. However, if you choose to grow cantaloupes, you need to start planning early.

Varieties

Cantaloupes come in many varieties. Some types grow well specifically in this area and meet the market demand; many kinds are resistant to diseases. Table 1 gives you a listing of recommended varieties for the Maryland area.

Table 1. Varieties of cantaloupe recommended for Maryland

Type of Melon	Varieties
Shipping	Goldstar (F ₁) Saticoy (F ₁), (FR, DMR, PMR, LBR) Summit (F ₁) Superstar (F ₁)
Roadstand	Burpee Hybrid (F ₁) Goldstar (F ₁) Harper Hybrid (F ₁) Superstar (F ₁)
Honeydew	Earli-dew Tamdew

^aF₁ = Hybrid; PR = Fusarium wilt resistant; DMR = downy mildew resistant; PMR = powdery mildew resistant; LBR = leaf blight resistant

Soil Preparation

Fertilizing

Cantaloupes thrive best in well-drained, sandy or silt loam soil, but they grow well also in other types of soil. To prepare your soil for planting, start by having the soil pH and fertility tested at The University of Maryland Soil Testing Lab. This will help you determine the amounts of fertilizer and lime to use.

If needed, add magnesium as magnesium sulfate (Epsom salts) to the soil if soil pH is adequate and no liming materials are needed. Use dolomitic limestone if pH needs to be adjusted and magnesium is also required. Ideally, you should do this 6 months before planting the crop. A fall cover crop planted and plowed down before cantaloupes are planted gives the soil a higher organic matter content. You also may apply manure to raise the organic content of the soil and to add nutrients, but test the nutrient content of the manure before using it.

Apply 1 to 2 pounds of boron (B) per acre with broadcast fertilizer on sandy soils. Do not apply as a band or side-dress application.

You may use Table 2 as a guide to fertilize your soil. The recommended rates should be based on soil test results.

Table 2. Recommended rates for fertilization

Remarks	Nitrogen (N) ^a (lb/acre)	Soil phosphorus levels (lb/acre)				Soil potassium levels (lb/acre)			
		low	medium	high	very high	low	medium	high	very high
Broadcast/disk-in or drill deep	25-50	100	50	0	0	150	100	50	0
Band-place with planter	25	25	25	25	0	25	25	25	25
Sidedress when vines start to run	25-50	25	25	25	25	25	25	25	25
Total recommended	85-100	150	100	50	25	200	150	100	50

^a Where plastic mulches are being used, broadcast 150 pounds of nitrogen (N) per acre with recommended phosphorus and potassium, then disk-in or drill deep prior to laying mulch.

Mulching

You may want to use plastic mulch--black or clear plastic--to increase crop yield and ensure earliness. To conserve soil moisture and increase soil temperature, use clear 1½-mil plastic before planting the field. It also increases early and total yield. However, if you use clear plastic as mulch, you have to fumigate the soil to control weeds.

Fumigate with Vorlex (20 to 30 gallons per acre) or Vapam (40 to 50 gallons per acre) and lay plastic mulch on well-prepared plant beds 30 days before planting. The plastic cover should be 4 feet wide (4,000-foot rolls) and laid on 5- to 6-foot centers immediately over the fumigated soil. The soil must be moist (not wet or dry) when you lay the plastic. Custom operators are normally hired to perform this operation, although some growers with larger acreages have their own equipment to do the work themselves.

If you use clear plastic without fumigation, it is important that you treat the soil first with herbicides. This practice, however, often results in weeds or grass growing under the plastic and choking out the cantaloupe.

If you use black plastic, herbicides are not necessary. Fumigation will aid in the control of soil-borne diseases, but is not a cure for them. Fumigation under black plastic, therefore, is not required and should not be used in place of long rotations. It should be used where nematodes are a problem, whether clear or black plastic is being used.

It is important to apply your fertilizer during bed preparation. At least 50 percent of the nitrogen should be in the nitrate form.

You may also wish to place trickle irrigation under the mulch to supply an even plentiful supply of water to the plants.

Planting

Seed Treatment

Check with your seed supplier to determine if your seed supply has been treated with an insecticide and fungicide. If it has not been treated, use a mixture of Thiram 75WP ($\frac{1}{2}$ teaspoon per pound or 3 ounces per 100 pounds) and an approved commercially available insecticide.

Growing Transplants

Gain some experience with cantaloupe before you attempt to grow transplants. When growing transplants, there are several guidelines for you to follow.

First, the amount of seed you will need for growing transplants depends on the spacing you select. If the seed is of good quality with a high germination test, one seed per pot is sufficient. One ounce of muskmelon seed contains 950 to 1,250 seeds. Here is a table to help you determine the amount of seed to buy.

- 6 x 2 ft = 3,630 plants per acre
- 6 x 3 ft = 2,420 plants per acre
- 6 x 4 ft = 1,815 plants per acre

Second, grow your transplants in pots or flats that provide a space of at least 2 inches by 2 inches for each plant. Smaller pots or cells restrict root growth and provide less protection to the newly set transplant. Do not allow transplants to become too large prior to planting. You want a transplant with two true leaves of the desired size.

Third, *recommended* field spacing for muskmelons is rows 6 feet apart with plants 3 to 4 feet apart in the row.

Direct Seeding

If the crop is direct-seeded into bare ground (without plastic mulch), seed 3 to 4 pounds of seed per acre. Seeded fields will not be ready for harvest as soon as transplanted fields.

Planting Into Plastic Mulch

If you use container-grown plants, plant them through the plastic when daily mean temperatures have reached 60°F. Planting dates vary between May 1 and May 15. Transplants usually are used for early plantings and should be protected by small grain strips left in the field from the cover crop. Strips protect the crop a distance of 10 times the height of the small grain. (A 3-foot-tall small grain strip will protect the cantaloupe crop for a distance of 30 feet.)

If you use cantaloupe seed, direct-seed through the mulch for maximum virus protection of the plants. Use the old-type, hand-potato planter when planting seed through the mulch.

Pollination

A sufficient number of pollinating insects is needed in cucumber, melon and squash fields to ensure an adequate distribution of pollen to female flowers.

Local bees are seldom numerous enough to provide adequate pollination, so you should rent honeybees for this purpose. You need one strong hive per acre in the field when female blossoms start appearing. Each hive should contain at least 800 square inches of brood and enough adult bees to care for the brood, regardless of weather conditions.

Also, you should have a clean water supply available within one-fourth of a mile of hive bees. If you have to treat fields with insecticides during bloom, make the application toward evening when bee activity is reduced. This protects both wild and rented bees. Beehives may also be removed from the field, if necessary. Be sure to warn the beekeeper so that he/she may remove the hives if there is serious potential danger to the bees.

Cucumber, watermelon and cantaloupe do not cross-pollinate with each other and none of these will cross-pollinate with pumpkin or squash. Varieties of the same crop, such as two cantaloupe varieties, cross-pollinate readily, however. This does not affect the quality of fruit from either variety in the year the cross-pollination occurs. But seeds saved from these melons and planted the following year will produce various forms of "off-type" melons. Never save seed from hybrids as these will segregate into different types when planted. Any seed carried over from one year to the next may carry seed-borne diseases.

Irrigation

To help ensure a crop during drought periods, invest in an irrigation system. With such a high outlay in cash to produce the crop, it is a wise investment.

There are several irrigation systems available to suit your needs: trickle, traveling gun, center pivot or solid set. These systems are all available in the market. Consider cost, water supply and water quality when you select a system.

Weeds, Diseases and Insects

Weed Control

You may use herbicides on weeds and grasses, but they are not 100 percent effective. You still need to hoe and cultivate the soil to keep weeds under control. Tables 3 and 4 contain recommendations for controlling weeds.

For soil strips between rows of plastic mulch, use the following land preparation, treatment and planting sequences or crop injury may result.

- Complete soil preparation and lay plastic and trickle irrigation (optional) before herbicide application.
- Spray herbicide(s) on the soil and the shoulders of the plastic strips in bands before weeds germinate. Wet the outside 3 to 6 inches of plastic but **do not spray herbicide broadcast onto plastic**. Herbicides may wash from a large area of plastic into the plant hole and result in crop injury.
- Incorporate herbicide into the soil with ½ to 1 inch of rainfall or overhead irrigation within 48 hours of application and **before planting or transplanting**.

Table 3. Weed control for soil without plastic mulch

Herbicide	Treatment	Use	Remarks
Prefar 4EC	Apply 1 to 1.5 gallons per acre. Preplant incorporate 2 inches or less before seeding or transplanting.	Used primarily for grass control. Weak on many broadleaf weeds, including common lambsquarters, common cocklebur and jimsonweed.	For best results, broadcast and irrigate Prefar in. Do not plant unlabeled crops in treated fields for 18 months. Labeled crops include tomatoes, some cole crops, lettuce and other vegetables.
Prefar 4 EC and Alanap 2 SC	Apply 1 to 1.5 gallons of Prefar 4EC and 1 gallon of Alanap 2 SC per acre. Incorporate 2 inches or less before seeding or transplanting.		Tank mix is approved.
Gramoxone Super	Apply 1.33 pints per acre before emergence of crop. Use wetting agent as directed on the label.	Controls early germinating weeds. Labeled up to 5 pints per acre maximum rate for no-tillage.	Use sufficient water to give thorough coverage. Emerged melon seedlings will be killed.

Table 4. Weed control for soil strips between rows of plastic mulch^a

Herbicide	Treatment	Use	Remarks
Prefar 4EC	Apply 1 to 1.5 gallons per acre.	Used primarily for annual grass control. Weak on many broadleaf weeds, including lambsquarters, common cocklebur and jimsonweed.	For best results, broadcast and irrigate Prefar in. Do not plant unlabeled crops in treated field for 18 months. Labeled crops include tomatoes, cole crops, lettuce and other vegetables.
Alanap 2SC	Apply 1 gallon per acre.	Used primarily for broadleaf weed control. Tank-mix with Prefar to control annual grasses.	Weed control may not be satisfactory on sandy soils with less than 1 percent organic matter.

^a All herbicide rate recommendations are made for spraying a broadcast acre (43,560 ft²).

Disease Control

Diseases normally can be controlled by a regular fungicide spray schedule. Other diseases, when detected, sometimes can be controlled by fungicides applied at the time of appearance. Long rotations (5 years, if possible) and planting resistant varieties are two main methods of control for many diseases. Insecticides are sometimes applied with the fungicide treatment if they are both needed at the same time. Be sure to check compatibility before mixing two or more pesticides together.

Weekly fungicide treatments for control of diseases are required. Control foliage diseases by spraying with Bravo 720 at a normal rate of 2 pints per acre. Begin when the vines start to run. A 7-day schedule is recommended. Shorter 5-day intervals during wet spells and longer 10-day intervals during dry

periods are suggested. If rain is expected, apply the fungicide treatment before it starts raining to protect the plants during high moisture periods. Allow the spray enough time to dry before it starts raining so the material will stick to the plants and provide protection.

Ridomil MZ or other recommended fungicides are recommended for downy mildew. Ridomil MZ should be used *only* when downy mildew occurs. Table 5 contains recommendations for disease control in cantaloupes.

Table 5. Controlling diseases in cantaloupes

Disease	Description and damage	Treatment	Remarks
Seedling damping-off and root rot	Characterized by preemergence seed decay and by seedling wilting and death. Roots or affected seedlings may be discolored and rotted. Stems may be discolored and constricted at the soil line; these plants usually die.	Apply Ridomil 2E. (Use on a limited basis.)	Use fungicide-treated seed. Grow transplants in a soil-free artificial mix. Do not use soil mixes because of drainage, fertility and pest problems. The disease-causing fungus is almost always present in soil. Disease is promoted by wet conditions.
Viruses	Transmitted by aphids and by equipment; greenish-yellowish leaves and fruit result, also malformed leaves. Occur late summer, early fall.	Control aphids and other insects. Also, control weeds, especially pokeweed, around fields.	Up to July 1, control aphids; after July 1, plant as far away as possible from existing cucurbit fields.
Bacterial wilt	Initially, individual leaves wilt and dry and may be damaged by cucumber beetles. Later, all leaves wilt on one or more laterals or on entire plants. Wilted parts recover at night but eventually die.	Apply Furadan (applied at planting) or use other insecticides for cucumber beetle control.	Wilt-causing bacteria overwinter in striped and spotted cucumber beetles. The bacteria are carried to plants when beetles feed. Therefore, if you control the cucumber beetles you will help control bacterial wilt.
Fusarium wilt	Stunts, yellows, wilts and kills vines. A streak, at first water-soaked, later turning yellow to tan and finally dark brown, often appears at the soil line on one side of the vine.		To control, use resistant varieties and long rotations. The disease-causing fungus survives in soil for many years. High soil temperature favors disease development.
Cucumber mosaic virus (CMV) Watermelon mosaic-2 (WM-2) Squash mosaic virus (SMV)	Stunts vines and dwarfs, mottles and distorts leaves. New leaves on CMV-infected muskmelons wilt and die while old crown leaves turn yellow and dry up, resulting in plant's slow decline.		To control, use resistant varieties, reduce severity of CMV and WM-2 by killing perennial weeds (virus source plants) within 150 feet of plantings. Control aphids and other insects which spread the virus.

Disease	Description and damage	Treatment	Remarks
Powdery mildew	Fungus appears as a white powdery growth on leaves. Crown leaves are affected first and may wither and die.	Apply Bayleton 50WP at 2 ounces per acre rate.	To control, grow resistant varieties. The disease-causing fungus may be introduced on greenhouse grown plants or from southern areas by wind. High soil temperature favors disease development. Locate new plantings away from established plantings.
Alternaria leaf spot	Leaf spots begin as small, circular, concentric circles within spots. Spots affect large areas of leaves. Defoliation begins with crown leaves.	Apply Bravo 720 on a regular schedule.	Disease-causing fungus overwinters on and in seed, as well as in refuse from diseased plants. Disease-causing spores are spread by wind, running or splashing water, workers and implements.
Anthracnose	Leaf spots begin as yellowish or water-soaked areas that enlarge rapidly, turn brown and create ragged holes. Elongated dark spots with light centers often develop on petioles. Young fruit may be killed, but large fruit tend to develop depressed dark-bordered cankers with flesh-colored ooze in the centers.	Apply Bravo 720 on a regular schedule.	Rotate crops. Fungus overwinters in seed and in refuse from diseased plants and is spread by splashing water. Humidity and frequent rains promote disease.
Scab	Dry, corky spots up to ½-inch diameter develop on the muskmelon. When moist, a dark olive-green velvety growth covers the spot. Spots also develop on young terminal stem growth and on petioles.	Apply Bravo 720 on a regular schedule.	Plant on well-drained soil; rotate crops. Disease-causing fungus overwinters on seed and in refuse from diseased plants. Foggy, cool weather and cool night temperatures promote disease.

Insect Control

Insect control in cantaloupes, like the control of weeds and diseases, requires a great deal of management skill to produce a profitable, high quality crop. Always try to use the least toxic but effective pesticides that are labeled for the crop (Table 6).

Table 6. Controlling insects in cantaloupes

Pest	Description and damage	Pesticide ^a	Remarks
Cucumber beetles	Small, yellowish green, with longitudinal black stripes or black spots; striped beetle is the more destructive of the two. Feed on young seedlings.	Apply Furadan 15G at a rate of 1.5 pounds per 1,000 feet of row (special needs Label 24 (c) in effect.) Thiodan 3E at a rate of 1.33 to 2.67 pints per acre.	Apply at planting for control. If you do not use Furadan, treat young plants to prevent bacterial wilt when populations reach one beetle per 100 feet of row. As plants mature, treatments for bacterial wilt prevention may not be necessary. To prevent feeding damage, treat when populations reach an average of one beetle per 10 feet of row. Reentry interval--2 days; harvest interval--0 days.
Aphids	Small, green, soft-sucking insects often clustered on stems near tips of new growth; most numerous in July and August; virus vectors.	Thiodan 3E. Apply at rate of 1.33 to 2.67 pints per acre.	Reentry interval--2 days; harvest interval--0 days.
Melonworm and pickleworm	Sometimes attack melons and cucumbers.	Thiodan 3E at a rate of 1.33 to 2.67 pints per acre; once, before fruit set; weekly, where these insects are a problem.	Reentry interval--2 days; harvest interval--0 days.
Spider mites	Tiny, yellowish-red, 8-legged, soft, active spiders; can become numerous and can sap much vigor from plants; most numerous in hot, dry weather. A 10 x magnifying glass is useful to detect mites on undersides of leaves.	Kelthane. Apply 35WP at a rate of 1 to 1.67 pounds per acre.	Reentry interval--0 days; harvest interval--2 days. Do not feed treated crops or crop residue to animals. Continuous use of Furadan, Sevin or pyrethroids may result in mite outbreaks. Check registration of Kelthane before use.

^a Use caution when using insecticides during bloom.

Harvesting

Harvest cantaloupes no sooner than half-slip and preferably at full-slip for optimum fruit quality. Melons are harvested at half-slip for shipping. Maintain the vines and leaves until the melons are mature to ensure a high quality harvest. Harvest daily or twice daily in hot weather. Carefully consider harvest maturity and refrigeration if melons are to be shipped.

If you decide to harvest melons at full-slip, make sure that the background color between the netting has turned yellowish before picking the cantaloupes. Eating maturity follows in 1 to 3 days. Fruit flavor is at its best if the melons are stored at a temperature near 70°F for this final ripening. If melons are to be stored longer, store them at 50 to 55°F.

To determine the full-slip stage, press your thumb against the stem. If the stem separates easily from the melon, leaving a clean cavity, the melon is ripe. If part of the stem separates and part does not, the condition is called the half-slip stage, which is the stage of harvest for long-distance shipping.

After harvesting your cantaloupes, keep them shaded to reduce heat absorption from direct sunlight.

Marketing

Make contacts with buyers early to establish your market, price and fruit quality standards, and shipping/transportation requirements. Sometimes, it takes several years to develop a rapport between yourself--the seller--and the buyer, to allow each of you to benefit from the transaction. Start with small acreage, learn production and marketing skills, then expand.

References

The Pennsylvania State University, Cooperative Extension Service. *Special Circular 207: Growing Vine Crops*. University Park, Pennsylvania.

The University of Maryland, Cooperative Extension Service. 1987. *Extension Bulletin 236: Commercial Vegetable Production Recommendations*. The University of Maryland, College Park; The University of Maryland, Eastern Shore.

Costs and Returns

Yield and price assumptions

Yield/acre	Price/unit	
	\$0.50	
7,000 melons		\$ 3,500.00

Estimated costs per acre

Seed expense (3.5 lb @ \$148.50).....	\$ 519.75
Bees	25.00
Cover Crop	10.80
Fertilizer	
(N = 95 lb @ \$0.22)	20.90
(P = 100 lb @ \$0.21)	21.00
(K = 50 lb @ \$0.09)	13.50
Lime (.33 ton @ \$26.00)	8.58
Chemicals	
(Kelthane, 1.5 pt; Cygon, 1 pt)	
(Lannate, 3 pt; Bravo, 16 qt)	
(Prefar, 1 gal; Alanap, 1 gal).....	134.00
Fumigant	200.00
Plastic	300.00
Diesel fuel & oil (14.7 gal @ \$1.05)	15.44
Marketing (\$0.10 per melon @ 7,000)	700.00
Interest (6 mo APR 10)	98.45
Labor (33.5 hr @ \$4.50 per hr)	<u>150.75</u>
Total	\$2,218.17
Net (Total cash yield minus total costs).....	\$1,281.83

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