

2020 vegetable

GROWING GUIDE



TIPS FOR PLANTING,
MANAGEMENT, HARVEST,
AND STORAGE



DESPERADO NEW

BEANS

PLANTING

Plant green beans in soil temperatures of 65 degrees or greater. Planting depth should be $\frac{1}{2}$ " to 1". Row spacing should be 30" for handpicking. There should be approximately 2" between plants. Some commercial growers are using 15" rows for late planted green beans that are going to be mechanically harvested.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Weed pressure and insect pressure are the hardest things to control in green beans. If conditions are wet, diseases are more prevalent.

HARVEST

Harvest green beans when 50% of the beans are 3 - 4 sieve.

STORAGE

Store beans at 40 - 45°F and 95% humidity.

BEAN SIEVE SIZE

1 sieve - 7/32"
2 sieve - 5/16"
3 sieve - 11/32"
4 sieve - 3/8"
5 sieve - 7/16"



TOUCHSTONE GOLD

BEETS

PLANTING

Plant seed 1" apart and thin to 2" apart. Row spacing ranges from 15" - 24". Seed depth should be $\frac{1}{4}$ " - $\frac{1}{2}$ " deep. Poor stands are often the result of planting too deeply or the soil's crusting after a heavy rain. The seedlings may emerge over a relatively long period of time, making a stand of different sizes and ages of seedlings.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

It is extremely important to thin beets because they are a multigerm seed meaning each seed will produce several plants. Beets that are thinned when they reach approximately 3" tall can be used as greens. Frequent and shallow cultivation is important to keep the soil loose around the growing beet to ensure uniform roots. Note: There is monogerm beet seed (Solo F¹) available.

HARVEST

Beets can be harvested whenever they grow to the desired size. About 60 days are required for beets to reach 1½" in diameter, the size often used for cooking, pickling or canning.

STORAGE

Beets may be stored in a polyethylene bag in a refrigerator for several weeks. Cut off the tops of the beets one inch above the roots. Beets store the best at 32°F and 95% humidity. Do not freeze.



SAKATA®

EASTERN CROWN NEW

BROCCOLI

PLANTING

For spring broccoli, plant in greenhouse in flats. Sow $\frac{1}{4}$ " to $\frac{1}{2}$ " deep. For fresh market broccoli, plant on 30" beds with trickle irrigation. On a 30" bed, plant two rows of broccoli. Plants should be 15" apart. When planting fall broccoli, count backward from the first fall frost in your area and add about 30 days from planting. This can be either started in a greenhouse or direct seeded into the field.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Use starter fertilizer for transplants and side-dress with nitrogen fertilizer when the plants are half grown. Provide ample soil moisture, especially as the heads develop. Scout fields for aphids and cabbage worms.

HARVEST

Harvest when the head is large and firm, with a compact cluster of small flower buds. The buds should not have bright yellow flowers showing. Look for bright green or purplish-green heads. Yellow flowers and enlarged buds are signs of over-maturity.

STORAGE

Store the broccoli, unwashed, in loose or perforated plastic bags in the vegetable crisper of the refrigerator. Broccoli left unrefrigerated quickly becomes fibrous and woody. Wet broccoli quickly becomes limp and moldy in the refrigerator—so wash it just before using. Store fresh broccoli in the refrigerator for 3 - 5 days. Old broccoli may look fine, but it develops strong undesirable flavors. It tastes best and is highest in nutritional value when storage time is brief.



BRUSSELS SPROUTS

PLANTING

Start in the greenhouse and transplant in early to mid summer, when one would start long season cabbage. Seeds should be planted 4 - 5 weeks before transplanting. Allow 90 - 100 days for plants to mature. For summer harvest, you must plant transplants of an early, heat-resistant variety in very early spring. Sprouts maturing in hot weather or under dry conditions are more likely to develop bitterness. Fall production is the most desirable in a large portion of the country. Plant 24" - 36" apart in the row and 30" - 36" apart in rows.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Brussels are grown much like cole crops, cabbage and broccoli.

HARVEST

Harvest sprouts when buds form heads one to two inches in diameter. Pick sprouts when they are firm. Lower sprouts mature first.



STELLAR VANTAGE

CABBAGE

PLANTING

Transplant early cabbage soon enough that it matures before the heat of summer. Planting two or three varieties with different maturities can provide harvest over a longer period of time. Late cabbage must be started during the heat of mid-summer, but it develops its main head during the cooling weather of fall. It may be transplanted or direct seeded. Plants should be planted 12" - 24" apart depending on variety and the desired head size. Sow cabbage seeds $\frac{1}{4}$ " - $\frac{1}{2}$ " deep.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Use starter fertilizer when transplanting and side-dress with nitrogen after plants are half grown. Keep plants out of intense sunlight and heat of summer. Common problems are Yellow or Fusarium Wilt, as well as cabbage worms.

HARVEST

Cabbage can be harvested anytime after the head has formed. For highest yield, cut the cabbage heads when they are solid (firm to hand pressure) but before they crack or split. When heads are mature, a rain may cause heads to crack or split.

STORAGE

Fresh, uncut heads of cabbage can be stored in the refrigerator for up to two weeks. Cover loosely with a plastic bag or use perforated bags. Do not wash cabbage before storing; the extra moisture will hasten deterioration.



CARROTS

PLANTING

Carrots can be planted in soils as cool as 40°F with the ideal temperature ranging from 50 to 75°F. They take anywhere from 7 - 21 days to emerge from the soil depending on soil temperatures. Spring carrots are planted 2 - 3 weeks before the last frost. For fall harvest, plant carrots 10 - 12 weeks before the first frost. Seed carrots $\frac{1}{4}$ " - $\frac{1}{2}$ " deep and 15" between rows. Using seed tapes or pelleted seed will help prevent over seeding.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Soil nutrients are very important. Test the soil to check for optimal levels. Also scout for insect and fungal infestations. Root quality is best when soil temperatures are 60 - 70°F. The shape of the root is determined within the first few weeks after germination when the new plant extends its taproot deep into the soil. Sometimes growers will mix radish seed with carrot seed to help with emergence. Radishes tend to have the ability to break through soil crusting which in turn helps the carrots emerge.

HARVEST

Fresh market carrots are harvested when they are $\frac{3}{4}$ " - $1\frac{1}{2}$ " in diameter.

STORAGE

Store carrots at 32 - 34°F and at 98 - 100% humidity. Store clean carrots away from other fruits and vegetables.



FLAME STAR

CAULIFLOWER

PLANTING

Cauliflower is best started from transplants for both spring and fall crops. Do not transplant sooner than 2 - 3 weeks before the average frost free date in the spring. Cauliflower is more sensitive to the cold than its cabbage-family relatives. It is important to start cauliflower early enough that it matures before the heat of the summer, but not so early that it will be injured by the cold. Transplant autumn cauliflower and cabbage at the same time. Use starter fertilizer when transplanting. Start the transplants so that they grow actively until transplanting and never cease growth. Space transplants 18 - 24" apart in the row. Use wider spacing for fall plantings.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Cauliflower plants should be kept growing vigorously from the seedling stage through harvest. When the heads begin to form (shows 2 to 3" of white curd at the growing point), it is ready to blanch. Tie the outer leaves together over the center of the plant to protect the head from sunburn, to keep it from turning green and developing an off-flavor. When selecting cauliflower choose varieties that are self wrapping. This will help in the blanching process.

HARVEST

The curd develops rapidly under proper growing conditions. It grows 6 - 8" in diameter and is ready to harvest within 7 - 12 days after blanching begins. The mature heads should be compact, firm, and white. Harvest the heads by cutting the main stem. Leave a few green outer leaves attached to protect the heads. Cut the heads before they become over mature and develop a coarse "ricey" appearance. Once individual florets can be seen, quality deteriorates rapidly.



CORN

PLANTING

Plant seeds 8 - 12 inches apart on 30 inch rows to achieve optimum yield. Seed depth should be $\frac{3}{4}$ " - 1 $\frac{1}{2}$ " depending on soil conditions, and genetic type. Plant when soil temperature is 60° F plus. Planting in blocks will also help increase uniformity in pollination.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

SEEDING RATE

18,000 - 22,000 seeds per acre or one seed every 8 - 12 inches. To achieve this singulation use a finger or air seed delivery system.

MANAGEMENT

Scout field every 7 days to check for insect, weed, and disease pressure. For identification of weeds, insects, and diseases consult your local extension office or view the Midwest Vegetable Production Guide.

<https://www.extension.purdue.edu/extmedia/ID/ID-56-W%202020.pdf>

ISOLATION

For all high quality sweet corn varieties, maintaining an isolation is required to protect the high sugar and flavor characteristics of the sweet corn as cross pollination from other types of sweet corn or different types of corn will result in starchy kernels.

SE/Synergistic types and SH2/Improved Super Sweet types should be isolated both from each other and from other types of corn including field corn, popcorn, and ornamental corn.

An isolation can be achieved either by distance or by a difference in maturity. Preferable isolations would require 700 – 1000 feet distance from other corns, or 10 – 14 days between pollination.

RELATIVE MATURITY

Sweet corn maturities are publicized as days to relative maturity. This information comes from supplier data, as well as our trial observations in the Midwest. Prolonged excessive heat or cool temperatures can cause maturity dates to fluctuate to some degree. Monitor your crop through the growing season in order to pick at optimum freshness.

HARVEST

Harvest sweet corn when the end kernels of the ear feel developed. Approximately 21 - 25 days after half silk. Sample sweet corn to ensure quality.

STORAGE

Pre-cool cob temperature to 50°F. After pre-cooling store at 34°F and 95% humidity.



VITALY

CUCUMBERS

PLANTING

Direct seed $\frac{1}{2}$ " - 1" soils with 60°F+ temperatures. Row spacing should range from 30" - 36" apart. Space plants 12" apart in the row.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Scout fields weekly to make sure weed, insect, and disease pressure are kept in check.

HARVEST

Harvest every other day. Slicing cucumbers should be picked when diameter is approximately 2". Cucumbers should be approximately 7 - 8" long and have a smooth surface. Pickling cucumbers should be 3" long by 1" wide when ready to pick.

STORAGE

Store at 50 - 55° F and 90 - 95% humidity to ensure long shelf life.



GIZMO

GOURLDS

PLANTING

Direct seed in soils that are above 70° F. Plant gourds $\frac{1}{2}$ " - 1" deep. For a general rule of thumb plant seed the depth of three times the thickness of the seed. Plant spacing varies depending on fruit size. For small and miniature gourds plant at approximately 5 - 10 sq. ft. per plant. For large gourds plant them at 30 sq. ft. per plant.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Scout fields every 7 days to ensure crop health. Look for insect, weed, and disease pressure. The first three weeks focus on weeds and insect pressure. Then focus on disease pressure. For weed, insect, and disease identification and treatments consult the Midwest Vegetable Production Guide: <https://www.extension.purdue.edu/extmedia/ID/ID-56-W%202020.pdf> or your local extension. Place pollinators in field to ensure maximum fruit set.

HARVEST

Harvest when fruit have developed deep vibrant color or when plants start to die down. Clean gourds of dirt, then dip them in a 5% chlorine solution to ensure long shelf life.

STORAGE

Place gourds in a dry place that will have good air circulation to prevent rotting.



BLACK MAGIC

KALE

PLANTING

Plant rows 2' - 3' apart with plants 8" - 16" apart. Seeding rate should be approximately 2 to 4 pounds per acre. Preplant fertilizer should be 60 pounds per acre of nitrogen, 0 - 60 pounds of phosphorus, and 0 - 200 pounds of potassium per acre depending on soil test results.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Sidedress 30 - 60 pounds of nitrogen after transplants are established. Use crop rotation to help combat disease pressure. Scout fields for disease, mildew, and insects.

HARVEST

Kale can be harvested three ways: whole plant, bunched leaves, or "stripped" leaves. "Stripped" kale is pre-packaged for fresh market in all methods; yellow or damaged leaves must be removed before packing.

STORAGE

Leafy greens can be stored close to 32°F. At this temperature, they can be held for 10 - 14 days.



SUGAR RUSH

MELONS

PLANTING

When direct seeding plant $\frac{1}{2}$ " - 1" deep. Soil temperature should be 75 - 85°F. Five to six feet is the recommended row spacing with 18 - 24 inches between plants. If starting with transplants sow 3 - 5 weeks prior to planting outside.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

To ensure high yield place pollinators near fields. A melon needs to be visited by a bee three times to ensure proper pollination. Scout every seven days for weed, insect, and disease pressure. Contact your local extension agent or consult the Midwest Vegetable Production Guide for identification and treatment options. <https://www.extension.purdue.edu/extmedia/ID/ID-56-W%202020.pdf>

HARVEST

Harvest 30 - 35 days after pollination. If shipping, pick at half slip. When picking for fresh market, pick at $\frac{3}{4}$ to full slip. Wash fruit in peroxyacetic acid (peroxide and acetic acid), as a non-chlorine sanitizing option.

STORAGE

Cool to at least 70°F and at 95% humidity. Shelf life is based on storage temperature. Do not cool below 32°F.



CANDY

ONIONS

PLANTING

Onions are mostly direct seeded in the field, although some are transplanted as seedlings or sets. Transplants are sometimes used to improve bulb size, as well as to hasten maturity, or to avoid infection by some plant diseases, but this method of crop establishment is more expensive. Planting occurs from late March through early May. Between-row spacing varies considerably depending upon weed and foliar disease management, seeder capability, and harvesting equipment. In-row spacing also varies depending upon variety, desired bulb size, between row spacing, soil type, and other management considerations.

Bunching Onions - Direct seed in spring when the soil reaches 50°F. Plant seed $\frac{1}{4}$ " deep and approximately $\frac{1}{2}$ " apart.

Bulb Onions/Short Day - Typically short day onions are direct seeded in the southern region of the United States. In order to grow short day onions in the northern region of the United States the seed has to be sown in greenhouses and then transplanted into the field. Use pelleted seed if direct seeding to help achieve better singulation.

Bulb Onions/Intermediate Day - Direct seed intermediate day onions as soon as soil allows in April or early May. Sow seed 2" apart and thin to 3 - 4" apart for larger onions. Seeding depth should be approximately $\frac{1}{4}$ " deep. If

transplanting seed in flats in late February to mid March, tops may be clipped to 5" tall. Use pelleted seed if direct seeding to help achieve better singulation.

Bulb Onions/Long Day - Direct seed long day onions as soon as soil allows in April or early May. Sow seed 2" apart and thin to 3 - 4" apart for larger onions. Seeding depth should be approximately $\frac{1}{4}$ " deep. If transplanting seed in flats in late February to mid March, tops may be clipped to 5" tall. Use pelleted seed if direct seeding to help achieve better singulation. Plant long day onions in the northern latitudes.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Keep onions well weeded with shallow cultivation. Onions are shallow rooted and grow best in moist soil; irrigation may be required. Keep direct seeded onions away from onion sets because onion sets are more prone to disease. Long day onions should be planted in northern latitudes because of daylight requirements for bulbing.

HARVEST

Onions are ready to harvest when tops approximately have 50 - 75% fallen over and the skins have dried. Pull the bulbs by hand or use equipment such as a potato digger or under-cutter to cut the roots and lift the bulbs. Wait until all the leaves are dead and dry. It is likely the outer skins will loosen. Pulling onions too green will make them difficult to cure and will affect storing them. Harvest when the weather is dry.

STORAGE

Cure onions at 65 - 85°F at 70% humidity. Curing decreases the incidence of neck rot, reduces water loss during storage, prevents microbial infection, and is desirable for development of good scale color. Curing can be done in the field, preferably when the weather is warm and dry. If it rains let them dry fully before handling. A greenhouse or hoophouse also provides good conditions for curing. Temperatures in the 80's will enhance the bronze color in the skins. Sunshine is good as long as it is not too hot. Extreme sun can produce sunscald. Store onions out of the sun; exposure to light after curing will induce greening of outer scales. Optimum temperature for long term storage of onions is 32°F with 65 - 70% humidity. It is important to cool them down slowly. Using cool late summer and fall temperatures works great to cool onions down slowly.



PEAS

PLANTING

Direct seed 1½" - 2" deep in soils that are at least 40° F. Plant in rows that are 30" - 36" apart and 1" - 2" between the plants.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Scout field for insect, weed, and disease pressure.

HARVEST

Harvest peas when ripe. In shelling peas, pods should be filled out and able to feel individual peas. Pea pods should be harvested before seed develops inside the pod.

STORAGE

After harvest store peas at 50 - 60°F with 95% humidity to ensure quality.



OUTSIDER **NEW**

PEPPERS

PLANTING

Sow in the greenhouse 7 - 9 weeks before desired planting date. Allow plants to harden 7 days before transplanting. Plant transplants halfway between rootball and bottom leaves. This will help prevent lodging.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Scout every 7 days to ensure crop development. Consult the Midwest Vegetable Production Guide:

<https://www.extension.purdue.edu/extmedia/ID/ID-56-W%202020.pdf> or your local extension agent for identification and treatments.

HARVEST

Cut or break pepper off the plant but leave at least 1" of the stem attached to the pepper.

STORAGE

Clean and wax peppers. Pre-cool at 45°F. Store at 45 - 50°F with 90 - 95% humidity; this will ensure the longest shelf life.



PUMPKINS

PLANTING

Plant pumpkins $\frac{1}{2}$ " - 1" deep. For a general rule of thumb plant seed the depth of three times the thickness of the seed. Plant spacing varies depending on fruit size. If planting a large pumpkin give plant approximately 72 sq. ft. of space. Medium sized pumpkins require 30 sq. ft. of space. Pie pumpkins require 24 - 30 sq. ft. of space. Miniature pumpkins require 10 - 24 sq. ft. of space.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Scout fields every 7 days to ensure crop health. Look for insect, weed, and disease pressure. The first three weeks focus on weeds and insect pressure. Then focus on disease pressure. For weed, insect, and disease identification and treatments consult the Midwest Vegetable Production Guide: <https://www.extension.purdue.edu/extmedia/ID/ID-56-W%202020.pdf> or your local extension. Place pollinators in field to ensure maximum fruit set.

HARVEST

Harvest when fruit has developed deep color. Handles will appear dry. Cut handles with shears to protect handles from being broken off.

STORAGE

Clean fruit of dirt and wash in 5% chlorine solution. Let air dry and cure for 10 - 12 days. Make sure air is able to circulate around fruit. It is important to keep fruit dry.

POWDERY MILDEW RATINGS

HR - High Resistance

IR - Intermediate Resistance

T - Tolerant

PLANT SPACING

Each variety or type of pumpkin has an optimum plant spacing for its best performance. If plants are too close, stress and competition can decrease fruit size and possibly even reduce the number of female flowers. Under extreme stress, tight spacing may eliminate the crop entirely.

- Optimum spacing for maximum yield, especially for jack-o-lantern pumpkins, will not necessarily be the best spacing for large fruit size. For large fruit, we would suggest reducing plant density to the next recommended plant population.

PLANT SPACING (CONTINUED)

- Accurate plant spacing will be an equal opportunity environment for every plant.
- Suggested populations are for final plant stands.
- To achieve ideal plant populations it is necessary to either over-plant and hand thin or to plant according to recommendations and hand plant later to fill skips.
- Seed corn maggots, wire worms, mice and birds, floods or lack of rain are all common problems that effect accurate stand establishment.

PLANT SPACING CHART

	Row Width	Distance Between Plants	Plants Per Acre
Category 1	12'	6'	605
Category 2	7 1/2 to 9'	4'	1,210 to 1,450
Category 3	6 to 7 1/2'	4'	1,450 to 1,815
Category 4	5 to 6'	2'	3,600 to 4,350



BLONDE BEAUTY

SQUASH SUMMER

PLANTING

Direct seed into field. Plant $\frac{1}{2}$ " - $\frac{3}{4}$ " deep. Row spacing should range from 36" - 60" apart. In row spacing ranges from 18" - 24".

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Scout fields every 7 days. Inspect for weeds, insect, and disease infestation.

HARVEST

Harvest every other day. Fruit should be 7 - 8" in length and 1 - $2\frac{1}{2}$ " in diameter. Another way to determine harvestability is to harvest when blossom has wilted.

STORAGE

Store at 40 - 50°F and at 95% humidity.

HERBICIDE CAUTION

Some pre-emergence herbicides can and will cause distortions in squash and pumpkins, especially the species with the corky stems. It also has been noticed in hardstem varieties. These distortions may show up in both color or shape.



SQUASH WINTER

PLANTING

Plant seeds $\frac{1}{2}$ " - $\frac{3}{4}$ " deep. Plant spacing varies depending on vine type. Bush type plants should be planted closer and vine types should be planted farther apart. Squash need to have approximately 25 - 30 sq. ft.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Scout every 7 days for insect, weed, and disease pressure. Fruit will tend to decrease in size the farther south a crop is planted and increase in size the farther north it is planted. Size is relative to day length.

HARVEST

Cut off the vine to keep peduncle. Wash in 5% chlorine solution and pat dry. Let cure for 10 days. Keep fruit dry to prevent spoilage. Allow air to circulate around fruit.

STORAGE

Store at 45 - 55°F and humidity level of 50 - 60%. Keep fruit dry and allow air to circulate around fruit.

PLANT SPACING

Each variety or type of squash has an optimum plant spacing for its best performance. If plants are too close, stress and competition can decrease fruit size and possibly even reduce the number of female flowers. Under extreme stress, tight spacing may eliminate the crop entirely.

- Accurate plant spacing will be an equal opportunity environment for every plant.
- Suggested populations are for final plant stands.
- To achieve ideal plant populations it is necessary to either over-plant and hand thin or to plant according to recommendations and hand plant later to fill skips.
- Seed corn maggots, wire worms, mice and birds, floods or lack of rain are all common problems that effect accurate stand establishment.

PLANT SPACING CHART

	Row Width	Distance Between Plants	Plants Per Acre
Compact Bush	5'	2'	4,356
Bush	5'	3'	2,904
Semi Bush	5'	4'	2,178
Restricted Vine	5'	4'	2,178
Vine	5'	5'	1,742



LAGUNA RED NEW

TOMATOES

PLANTING

Sow in greenhouse 4 - 6 weeks before desired planting date. Allow plants to adjust to field conditions for 48 hours before transplanting. Plant transplants up to 6 inches deep.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Staking and pruning plants are an important management practice. Staking and pruning allows the plant to concentrate on fruit development and also ensures less damage when harvesting fruit. Staking also keeps fruit from setting on the ground. Grow plants on raised beds with drip irrigation. Scout weekly to ensure crop quality. Consult Midwest Vegetable Production Guide on identification and treatment.

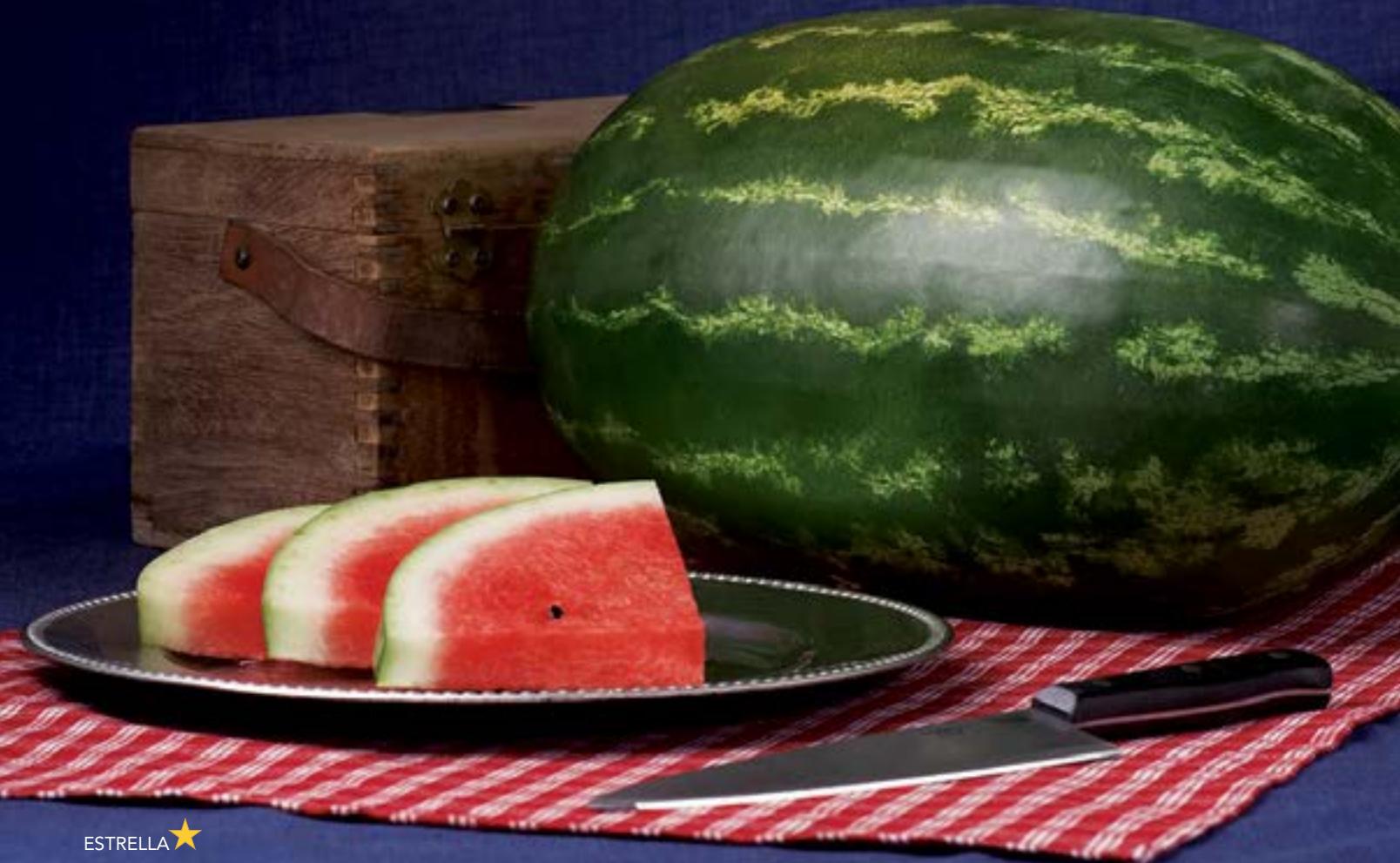
<https://www.extension.purdue.edu/extmedia/ID/ID-56-W%202020.pdf>

HARVEST

Harvest tomatoes when 60 - 90% red for fresh markets. Consult your buyers on what stage they would like their tomatoes harvested. However, please note that the more red the tomato the shorter the shelf life.

STORAGE

Store at 50 - 60°F and 85 - 95% humidity to ensure the longest shelf life.



ESTRELLA ★

WATERMELON

PLANTING

Start in the greenhouse and allow 28 - 35 days to get plants ready to transplant. Excessive water during germination must be avoided. Water transplant growing medium well and allow excess moisture to drain and moisture to stabilize for 24 - 48 hours. Bring medium temperature to 80 - 95°F before seeding. Seedcoat adherence to cotyledons may be virtually eliminated by orienting the seed in transplant trays with the pointed end up at a 45° to 90° angle. Plant transplants 6 - 12 feet apart with 36" between plants.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

Scout fields every 7 days to monitor weed, insect, and disease pressure. Place pollinating insects near the field to ensure proper pollination. Water only if necessary. Do not over-water.

HARVEST

Ripeness is indicated by a cream to slight yellowing of the white background color of the part of the melon that rests on the ground. Drying of the stem tendril nearest the attachment point of the watermelon and green color tone of the rind are also indicators of ripeness but these vary with cultivar. Melons should be cut from the vine rather than pulled, twisted, or broken off.

STORAGE

Store at 50 - 60°F and at a humidity level of 90 - 95%. This will ensure a long shelf life.



SIRIUS **NEW**

WATERMELON SEEDLESS

PLANTING

Start in the greenhouse. Allow 28 - 35 days to get plants ready to transplant. Excessive water during germination must be avoided. Water transplant growing medium well and allow excess moisture to drain and moisture to stabilize for 24 - 48 hours. Bring medium temperature to 80 - 95°F before seeding. Seedcoat adherence to cotyledons may be virtually eliminated by orienting the seed in transplant trays with the pointed end up at a 45° to 90° angle. Plant transplants 6 - 12 feet apart with 36" between plants.

As a general rule, direct field seeding of the pollinator variety should be done on the same day the triploid seed is planted in the greenhouse. Small-fruited, icebox varieties usually flower earlier than standard watermelon varieties. If icebox varieties are to be used as the pollinator, then direct seeding should be delayed a week to ten days. The diploid icebox pollinator variety will frequently set fruit and stop producing male blossoms while the triploid variety is still producing female blossoms. Growers may make a second planting of a pollinator 2 - 3 weeks after the initial planting to provide pollen for the late-developing female

blossoms on the triploid variety. No consistent differences among any standard and icebox types in effectiveness of pollination have been noted. Icebox varieties used as pollinizers result in high early yields; standard varieties used as pollinizers result in high total yields.

See "Germination Chart" on page 23 for additional information on germination rate and days to germination at various soil temperatures.

MANAGEMENT

For successful seedless watermelon production, an adequate bee population is especially important to transfer the pollen from the pollinator variety to the seedless variety (seedless watermelons do not produce pollen). The pollinator variety is normally planted in alternate, or every third row to ensure adequate pollen movement by the bees. At least eight visits to an individual flower of the seedless variety are necessary for adequate hormonal stimulation for normal fruit development. Scout fields very 7 days to monitor weed, insect, and disease pressure.

HARVEST

Ripeness is indicated by a cream to slight yellowing of the white background color of the part of the melon that rests on the ground. Drying of the stem tendril nearest the attachment point of the watermelon and green color tone of the rind are also indicators of ripeness but these vary with cultivar. Melons should be cut from the vine rather than pulled, twisted, or broken off.

STORAGE

Store at 50 - 60°F and at a humidity level of 90 - 95%. This will ensure a long shelf life.

GERMINATION CHART**PERCENTAGE OF NORMAL VEGETABLE SEEDLINGS****PRODUCED AT DIFFERENT TEMPERATURES* ****

Seeds will germinate at a wide range of temperatures. However, there is an optimal temperature that will maximize production time. This chart shows the percentage of seedlings produced at various temperatures and the number of days until seedling emergence at each temperature: shown in ().

The numbers in red = the optimal daytime soil temperature for maximum production in the shortest time.

Crops	32°F	41°F	50°F	59°F	68°F	77°F	86°F	95°F	104°F
Asparagus	0	0	61% (53 d)	80% (24 d)	88% (15 d)	95% (10 d)	79% (12 d)	37% (19 d)	0
Beans, lima	0	0	1	52% (31 d)	82% (18 d)	90% (7 d)	88% (7 d)	2	0
Beans, snap	0	0	1	97% (16 d)	90% (11 d)	97% (8 d)	47% (6 d)	39% (6 d)	0
Beets	0	53% (42 d)	72% (17 d)	88% (10 d)	90% (6 d)	97% (5 d)	89% (5 d)	35% (5 d)	0
Cabbage	0	27	78% (15 d)	93% (9 d)	97% (6 d)	99% (5 d)	70% (4 d)	0	0
Carrots	0	48% (51 d)	93% (17 d)	95% (10 d)	96% (7 d)	96% (6 d)	95% (6 d)	74% (9 d)	0
Cauliflower	0	0	58% (20 d)	60% (10 d)	62% (6 d)	63% (5 d)	45% (5 d)	0	0
Celery	0	72% (41 d)	70% (16 d)	40% (12 d)	97% (7 d)	65%	0	0	0
Cucumber	0	0	0	95% (13 d)	99% (6 d)	99% (4 d)	99% (3 d)	99% (3 d)	49
Eggplant	0	0	0	0	21% (13 d)	53% (8 d)	60% (5 d)	0	0
Lettuce	98% (49 d)	98% (15 d)	98% (7 d)	99% (4 d)	99% (3 d)	99% (2 d)	12% (3 d)	0	0
Muskmelon	0	0	0	0	38% (8 d)	94% (4 d)	90% (3 d)	0	0
Okra	0	0	0	74% (27 d)	89% (17 d)	92% (13 d)	88% (7 d)	85% (6 d)	35% (7 d)
Onions	90% (136 d)	98% (31 d)	98% (13 d)	98% (7 d)	99% (5 d)	97% (4 d)	91% (4 d)	73% (13 d)	2
Parsley	0	0	63% (29 d)	0% (17 d)	69% (14 d)	64% (13 d)	50% (12 d)	0	0
Parsnips	82% (172 d)	87% (57 d)	79% (27 d)	85% (19 d)	89% (14 d)	77% (15 d)	51% (32 d)	1	0
Peas	0	89% (36 d)	94% (14 d)	93% (9 d)	93% (8 d)	94% (6 d)	86% (6 d)	0	0
Peppers	0	0	1	70% (25 d)	96% (13 d)	98% (8 d)	95% (8 d)	70% (9 d)	0
Radish	0	42% (29 d)	76% (11 d)	97% (6 d)	95% (4 d)	97% (4 d)	95% (3 d)	0	0
Spinach	83% (63 d)	96% (23 d)	91% (12 d)	82% (7 d)	52% (6 d)	28% (5 d)	32% (6 d)	0	0
Sweet Corn	0	0	47% (22 d)	97% (12 d)	97% (7 d)	98% (4 d)	91% (4 d)	88% (3 d)	10
Tomatoes	0	0	82% (43 d)	98% (14 d)	98% (8 d)	97% (6 d)	83% (6 d)	46% (9 d)	0
Turnips	1	14	79% (5 d)	98% (3 d)	99% (2 d)	100% (1 d)	99% (1 d)	99% (1 d)	88% (3 d)
Watermelon	0	0	0	17	94% (12 d)	90% (5 d)	92% (4 d)	96% (3 d)	0

* The above data was taken from a report published in the mid-1980's. Author, affiliation, and publisher are not known.

** The above table was derived from experimental data. Certain logical inconsistencies exist due to crop failure or to bad batches of seed. They do not interfere with the overall interpretation.

PLANTING GUIDE									
	Seeds per Pound	Seeding Rate		Seed or Plant Spacing				Recommended Soil Temperature	Days to Germination
		per Acre by Weight	per Acre in 1000s	Seeds per 1000 foot of Row	In Row	Between Rows	Depth		
Asparagus	12,800 - 16,500	7.5 - 11 oz	6.1 - 11.4 M	667 - 1,000	12 - 18"	48 - 60"	.8"	60 - 85°F	10 - 20
Beans Bush Green	1,500 - 1,600	60.5 - 68 lbs	90.8 - 108.9 M	6,000	2"	30 - 36"	.5 - 1"	65 - 85°F	8 - 12
Beet	25,600 - 30,000	5.3 - 6.1 lbs	136.1 - 181.5 M	6,000	2"	18 - 24"	.5 - 1"	60 - 85°F	6 - 10
Broccoli	80,000 - 128,000	2.9 - 3 oz	15.2 - 22.7 M	1,000	12"	24 - 36"	.3 - .5"	60 - 75°F	6 - 10
Brussels Sprouts	80,000 - 128,000	1 - 1.4 oz	7.6 M	500	24"	36"	.5 - 1"	60 - 75°F	6 - 10
Cabbage	107,000 - 128,000	1.9 - 2.2 oz	15.2 M	1,000	12"	36"	.3 - .5"	50 - 60°F	6 - 10
Cantaloupe	15,000 - 20,000	4 - 4.8 oz	3.8 - 6.1 M	500 - 667	18 - 24"	60 - 72"	.5 - 1"	75 - 85°F	7 - 12
Carrots	320,000 - 410,000	2 - 2.1 lbs	653.2 - 871 M	24,000	.5"	15 - 20"	.5"	50 - 85°F	8 - 12
Cauliflower	116,000 - 128,000	1.1 - 1.3 oz	7.6 - 10.1 M	500 - 667	18 - 24"	36"	.3"	50 - 77°F	6 - 10
Celery	960,000 - 1,417,500	0.5 - 0.8 oz	45.4 M	2,000	6"	24"	.1"	65 - 70°F	21 - 25
Collards	90,700 - 144,000	1.3 - 1.8 oz	10.1 - 12.1 M	667 - 800	15 - 18"	36"	.3 - .5"	60 - 75°F	6 - 10
Cucumber	16,000 - 18,000	0.6 - 1 lbs	10.1 - 18.2 M	667 - 1,000	12 - 18"	30 - 36"	.5 - 1"	60 - 95°F	7 - 10
Eggplant	96,000 - 110,000	1 - 1 oz	5.5 - 6.9 M	600 - 750	16 - 20"	60"	.2 - .5"	85 - 90°F	10 - 14
Endive	240,000 - 260,000	1.4 - 2.2 oz	22.7 - 36.3 M	1,000 - 1,200	10 - 12"	18 - 24"	.5"	50 - 75°F	10 - 14
Kale	124,000 - 136,000	1.9 - 2.9 oz	15.2 - 24.2 M	667 - 800	15 - 18"	18 - 24"	.25 - .5"	60 - 75°F	6 - 10
Kohlrabi	123,000 - 144,000	1.9 - 2.7 oz	15.2 - 24.2 M	667 - 800	15 - 18"	18 - 24"	.25 - .5"	60 - 75°F	6 - 10
Leeks	144,000 - 151,000	1.1 - 1.4 lbs	163.3 - 204.2 M	6,000	2"	16 - 20"	.5"	65 - 95°F	10 - 14
Lettuce	364,000 - 432,000	3 - 3.4 oz	68.1 - 90.8 M	3,000	4"	18 - 24"	.3 - .5"	50 - 75°F	2 - 7
Mustard	204,000 - 272,000	4 - 5.3 oz	68.1 M	1,500	8"	12"	.3"	60 - 75°F	5 - 8
Okra	7,800 - 8,000	1.1 - 1.3 lbs	8.7 - 10.1 M	667	18"	36 - 42"	1"	65 - 95°F	7 - 18
Onion	106,000 - 144,000	1.4 - 1.5 lbs	163.3 - 204.2 M	6,000	2"	16 - 20"	.5"	32 - 85°F	10 - 14
Parsley	266,000 - 288,000	8.2 - 13.4 oz	136.1 - 242 M	3,000 - 4,000	3 - 4"	9 - 12"	.3"	50 - 86°F	21 - 25
Parsnips	87,000 - 120,000	1.4 - 1.5 lbs	121 - 181.5 M	4,000	3"	12 - 18"	.3 - .5"	32 - 75°F	18 - 25
Peas	2,200 - 2,400	41.2 - 90.7 lbs	90.8 - 217.8 M	6,000 - 12,000	1 - 2"	30 - 36"	1.5 - 2"	40 - 86°F	6 - 10
Pepper <small>Twin row on plastic</small>	64,000 - 76,000	2.2 - 2.6 oz	9.1 - 12.1 M	500 - 667	18 - 24"	12"	.3 - .5"	65 - 86°F	10 - 14
Pumpkin	3,000 - 3,200	0.6 - 1.2 lbs	1.9 - 3.8 M	333 - 500	24 - 36"	72 - 96"	.5 - 1"	70 - 80°F	7 - 10
Radish	45,000 - 48,000	12.1 - 15.1 lbs	544.4 - 725.8 M	12,000	1"	9 - 12"	.5 - .8"	60 - 85°F	5 - 8
Spinach	39,000 - 48,000	3.7 - 11.3 lbs	145.2 - 544.4 M	4,000 - 12,000	1 - 3"	12 - 15"	.5"	32 - 60°F	7 - 10
Squash Summer	2,500 - 6,000	1.7 - 1.8 lbs	4.6 - 10.1 M	500 - 667	18 - 24"	36 - 60"	.5 - .75"	70 - 80°F	7 - 10
Squash Winter	3,000 - 4,000	1 - 1.3 lbs	2.9 - 5.1 M	500 - 667	18 - 24"	72 - 96"	.5 - .75"	70 - 80°F	7 - 10
Sweet Corn	2,700 - 6,000	4.5 - 6.7 lbs	18.2 - 27.3 M	1,000 - 1,500	8 - 12"	30"	.75 - 1.5"	60 - 75°F	7 - 10
Tomato	140,000 - 165,000	0.8 - 0.8 oz	7.6 M	667	18"	48"	.25 - .5"	60 - 75°F	7 - 10
Turnip	173,000 - 192,000	1.4 - 1.6 lbs	272.2 M	6,000	2"	12"	.3"	60 - 75°F	6 - 10
Watermelon Large	4,000 - 8,000	5.1 - 5.1 oz	1.3 - 2.6 M	333	36"	72 - 144"	.5 - 1"	80 - 95°F	8 - 12
Watermelon Small	8,000 - 10,000	2.6 - 4 oz	1.3 - 2.6 M	333	36"	72 - 144"	.5 - 1"	80 - 95°F	8 - 12



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