

Celery

Spacing

Typical spacing for celery is rows 2 feet apart with plants 6 inches apart in row. One plant per square foot.

Soils

Traditionally, celery has been grown on muck soils, but it can be grown on coarse-textured mineral soils. Regardless of soil type, high fertility and moisture are necessary for tender succulent stalks.

Use overhead sprinkler or drip irrigation to apply water and fertilizer frequently to the shallow-rooted crop. If the soil gets too dry, physiological disorders such as blackheart (a calcium deficiency), will develop.

Rotate celery with such commodities such as onions or corn whenever possible to avoid building up pests in the soil. At the end of the season, consider planting a winter cover crop of barley or rye to reduce erosion and add active organic matter to the soil.

Transplants

Celery seed is small and difficult to germinate, thus all commercial celery is planted from greenhouse-grown transplants produced in plug trays using peat-based media. Allow 8 to 10 weeks for transplant production.

In early February, seeds are sown in greenhouses and are ready for transplanting to the field in about eight weeks. Transplanting begins in April and ends in late July. Schedule planting so that a uniform quantity of celery is ready to harvest every week. Using transplants as opposed to direct seeding ensures uniform stands and faster maturing crops. Often, succession plantings are started every three weeks.

Harden off transplants by reducing water, not temperatures. Celery is a cool-season crop that produces best at temperatures of 60 to 80°F. Plants can withstand light frosts, but prolonged frosts below 28°F will cause damage. Plants may form seed stalks (bolt) if exposed to temperatures below 55°F for 7 days or longer.

Harvesting

Once celery reaches marketable size, there is a narrow harvest window (about six to eight days) before a quality significantly reduces. Harvest celery by pulling the entire plant. Cut off the roots, chill quickly in cold water, and refrigerate in a plastic bag.

Store boxes in a cool place. Ideal storage conditions are near freezing and high humidity. Fresh market and processing celery are typically harvested mechanically. Fresh market celery is trimmed, sized, washed, and packed into cartons at on-farm packing sheds. Growers transport the packed celery to shippers where it is cooled and placed into cold storage for shipment.

Fertilizing

Maintain the soil pH above 5.5 in muck soils and 6.5 in mineral soils.

P₂O₅: Maintain soil phosphorus at 45 to 80 ppm on mineral soils and 120 to 140 ppm on muck soils. If soil P is in this range, applying 50 to 70 pounds of P₂O₅ per acre per year should be sufficient.

K₂O: Maintain soil potassium at 85 to 115 ppm K on mineral soils with a CEC of 4, and at 100 to 130 ppm K on mineral soils with a CEC of 10. On muck soils maintain soil K at 210 to 260 ppm. If soil K is in this range, applying 290 to 406 pounds of K₂O per acre per year should be sufficient.

N: Most celery crops will require applying 200 pounds of N per acre on mineral soils and 150 pounds of N per acre on muck soils. Since nitrogen demand for celery peaks later in the season, add most nitrogen as a side dressing. Banding fertilizer at transplanting can help when soil is cool. At transplanting, you can apply 40 pounds of N, up to 100 pounds of P₂O₅ and up to 40 pounds of K₂O per acre as a band application. You can apply the remaining N during the season. If additional P and K are needed above what is applied in band, broadcast it before transplanting.

Celery is responsive to boron (B). Apply 2 to 4 pounds of B per acre in banded or broadcast fertilizer to avoid stem cracking.

Pesticide Use in Greenhouses

Before using any pesticide, always read the product label for mention of greenhouse restrictions. See Selected Information About Recommended Fungicides (page 79), Selected Information About Recommended Herbicides (page 69), and Selected Information About Recommended Insecticides (page 54).

Disease Control

Anthracnose

Disease and symptom development are favored by periods of warm temperatures (>68°F) combined with high humidity. Symptoms include curled/cupped leaves, sporadic leaf margin discoloration, twisted petioles and small, oval lesions on petioles. Symptoms of anthracnose can be confused with those associated with aster yellows except that the affected foliage remains green.

Recommended Products

Cabrio[®] at 12-16 oz. per acre. 0-day PHI.

Merivon Xemium Brand Fungicide[®] at 4-11 fl. oz. per acre. 1-day PHI.

Pristine[®] at 10-15 oz. per acre. 0-day PHI.

Bacterial Leaf Blight

Symptoms include leaf blight and extensive leaf death that requires additional trimming at harvest, resulting in yield loss. May be seedborne.

Recommended Products

Badge SC[®] at 1-4 pts. per acre, or **Badge X2**[®] at 0.75-3.57 lbs. per acre. 0-day PHI.

 Several formulations of **copper** products (**Badge**[®], **Champ**[®], **Curpofix**[®], **Copper Count-N**[®], **Kocide**[®], **Nu-Cop**[®]) are labeled for use and may slow spread of bacterial leaf blight. See label for directions.

Crater Rot

Apply as a basal spray after each cultivation.

Recommended Products

Catamaran[®] at 4-5 pts. per acre. 0-day PHI.

chlorothalonil products (including **Bravo**[®] and **Equus**[®]) are labeled at various rates. See product labels.

Quadris Flowable[®] at 0.4-0.8 fl. oz. per 1,000 row feet. 0-day PHI.

Quadris Opti[®] at 2.4-3.7 pts. per acre. 7-day PHI.

Damping-off

Michigan State University research has found *Pythium* spp. causing damping-off of celery in greenhouses can result in poor field establishment. Conditions that favor rapid seedling germination may limit damping-off severity. Avoid excessive irrigation and poorly drained soils. Good sanitation (including cleaning plug trays and plant containers that are reused) is critical to avoid damping-off.

Recommended Products

Ridomil Gold[®] SL at 1-2 pts. per acre, or **Ridomil Gold**[®] GR at 20-40 lbs. per acre, or **Ultra Flourish**[®] at 2-4 pts. per acre. Apply preplant for greenhouse production.

Uniform[®] at 0.34 fl. oz. per 1,000 ft. of row. Make one application per crop season.

Early Blight, Late Blight

Early blight symptoms include small, yellow spots that rapidly enlarge to tan or gray lesions. All aboveground tissues of celery can become infected resulting in losses of 50% or more when blighted stalks or leaves have to be removed at harvest. Symptoms of Septoria late blight include irregularly-shaped brown spots on leaves with pycnidia similar in appearance to grains of ground black pepper. Over time, these leaf spots expand and cause the entire leaf to die.

Recommended Products

Cabrio[®] at 12-16 oz. per acre. 0-day PHI.

Catamaran[®] at 4-5 pts. per acre. 7-day PHI.

Several **chlorothalonil** formulations are labeled and may lessen the severity of crater rot. See labels for directions.

Flint[®] at 2-3 oz. per acre, or **Gem 500SC**[®] at 1.9-2.9 fl. oz. per acre. 7-day PHI.

Fontelis[®] at 14-24 fl. oz. per acre. 3-day PHI.

Merivon Xemium Brand Fungicide[®] at 4-11 fl. oz. per acre. 1-day PHI.

Pristine[®] at 10-15 oz. per acre. 0-day PHI.

Propimax EC[®], **Tilt**[®] at 4 fl. oz. per acre. 14-day PHI.

Quadris Flowable[®] at 9-15.5 fl. oz. per acre. 0-day PHI.

Quadris Opti[®] at 2.4-3.7 pts. per acre. 7-day PHI.

Quilt[®], **Quilt Xcel**[®] at 14 fl. oz. per acre. 14-day PHI.

Weed Control

Burndown or Directed/Shielded

Recommended Products

Roundup 4L[®] at 2-3 qts. per acre. Apply to emerged perennials before planting in the spring or after harvest in the fall.

 May be acceptable for use in certified organic production. Check with your certifier before use.

Preemergence Broadleaves and Grasses

Recommended Products

Caparol 4L® at 1-2 qts. per acre. Make 1 or 2 applications 2-6 weeks after transplanting but before weeds are 2 inches tall. Do not exceed 2 qts. per acre per year.

Chateau 51WDG® at 3 oz. per acre. Apply before transplanting or 3-7 days after transplanting for control of many annual broadleaf weeds and grasses. Do not tank-mix with other pesticides.

Dual Magnum® at 1-2 pts. per acre. *Michigan only* — applicators must have a 24(c) label. Apply before or immediately after transplanting. Will control annual grass and small-seeded broadleaf weeds and nut-sedge. Use high rate on muck soils. Follow with 0.25-inch water within 7 days. 62-day PHI.

Lorox 50DF® at 1.5-2 lbs. per acre. Apply after transplanting but before celery is 8 inches tall. Do not exceed 40 PSI pressure. Do not apply when temperatures exceed 85°F, and do not mix with wetting agents or other pesticides.

Postemergence Grasses

Recommended Products

Poast 1.5E® at 1-1.5 pts. per acre. Apply to actively growing grasses. Include 1 qt. COC per acre. Do not exceed 3 pts. per acre per season. 30-day PHI.

Select Max 0.97E® at 9-16 fl. oz. per acre. Apply to actively growing grasses. Do not exceed 64 fl. oz. per acre per year. Include 0.25% NIS v/v of spray solution. 30-day PHI.

Insect Control

Aphids, Leafminers, Mites

Treat at the following thresholds:

Aphids

When more than 3 percent of plants are infested.

or

There are more than six aphids per 100 sweeps.

Over-treatment with pyrethroids may cause increased aphid problems.

Leafminers

Apply as soon as visible mines appear and repeat every 7 days as needed.

Recommended Products

Actara® at 1.5-3 oz. per acre. *Aphids only*. 7-day PHI.

Admire Pro® at 4.4-10.5 fl. oz. per acre. 45-day PHI.

Agri-Mek® (0.15 EC) at 8-16 fl. oz. per acre, or **Agri-Mek**® (SC) at 1.75-3.5 fl. oz. per acre. *Leafminers and mites only*. Use with a nonionic surfactant. 7-day PHI. RUP.

Assail® (30SG) at 2-4 oz. per acre, or **Assail**® (70WP) at 0.8-1.7 oz. per acre. *Aphids only*. 7-day PHI.

Belay 50WDG® at 1.6-2.1 oz. per acre. *Aphids only*. 7-day PHI.

Beleaf 50SG® at 2-2.8 oz. per acre. *Aphids only*. 0-day PHI.

Brigade® (WSB) at 5.3-16 oz. per acre. *Aphids only*. 7-day PHI. RUP.

Coragen® at 5.0-7.5 fl. oz. per acre. *Leafminers only*. Can be applied as a soil treatment or foliar treatment. See label for application methods. 1-day PHI.

Dibrom 8 Emulsive® at 1-1.5 pts. per acre. 1-day PHI. RUP.

Dimethoate 4EC® at 1 pt. per acre. *Leafminers and mites only*. 7-day PHI.

Durivo® at 10-13 fl. oz. per acre as a soil treatment. 30-day PHI.

 **Entrust**® at 2-3 oz. per acre, or **Entrust**® (2SC) at 6-10 fl. oz. per acre. *Leafminers only*. 1-day PHI.

Exirel® at 13.5-20.5 oz. per acre.

Fulfill® at 2.75 oz. per acre. *Aphids only*. May require 5-7 days for aphid mortality. 0-day PHI.

Various **Malathion**® formulations are available. *Aphids and mites only*. See labels for rates. 7-day PHI.

Movento® at 4-5 fl. oz. per acre. *Aphids only*. Must be tank mixed with penetrating adjuvant. 3-day PHI.

Mustang Maxx® at 2.24-4 oz. per acre. *Aphids only*. 1-day PHI. RUP.

Orthene 97® at 8-16 oz. per acre. *Aphids only*. 21-day PHI.

Perm-Up® (3.2EC) at 4-8 oz. per acre. *Leafminers and aphids only*. 1-day PHI. RUP.

Platinum® at 5-11 fl. oz. per acre, or **Platinum 75SG**® at 1.66-3.67 oz. per acre. *Leafminers only*. 30-day PHI.

Radiant SC® (1SC) at 6-10 fl. oz. per acre. *Leafminers only*. 1-day PHI.

Scorpion 35SL® at 2-5.25 fl. oz. per acre. *Leafminers only*. 7-day PHI.

Sivanto® at 10.5-12.0 fl. oz. per acre. Can be applied as a soil treatment or foliar treatment. See label for application methods. *Aphids only*.

Torac® at 17-21 oz. per acre. *Aphids only*. Do not exceed 2 applications per crop per year.

Trigard® at 2.66 oz. per acre. *Leafminers only*. 7-day PHI.

Venom® at 1-3 oz. per acre. *Leafminers only*. 7-day PHI.

Verimark® at 6.75-13.5 oz. per acre as a soil treatment. See label for application methods. 0-day PHI.

Armyworm, Corn Earworm, Cutworm, Loopers

Treat at the following thresholds:

Armyworm and cutworm:

Apply preventive treatments within 4 weeks of harvest.

Loopers:

Apply if needed-protect plants within 4 weeks of harvest.

Recommended Products

Avaunt® at 3.5 oz. per acre. *Armyworm and loopers only*. 3-day PHI.

 Several *Bacillus thuringiensis* products (Agree®, Bio-bit®, Dipel®, Javelin®, Xentari®) are available. *Not for corn earworm*. Follow label directions for rates. 0-day PHI.

Baythroid XL® at the following rates:

Armyworm: 2.4-3.2 fl. oz. per acre.

Cutworm: 0.8-1.6 fl. oz. per acre.

Loopers: 1.6-2.4 fl. oz. per acre.

0-day PHI. RUP.

Brigade® (WSB) at 5.3-16.0 oz. per acre. *Not for corn earworm*. 7-day PHI. RUP.

Confirm 2F® at 6-8 fl. oz. per acre. *Armyworm and loopers only*. 7-day PHI.

Coragen® at 3.5-5.0 fl. oz. per acre. *Armyworm and loopers only*. Can be applied as a foliar spray or soil treatment. See label for application methods. Must wait at least 3 days between foliar applications. Do not exceed 15.4 fl. oz. per acre per season. 1-day PHI.

Dibrom 8 Emulsive® at 1.0-1.5 pts. per acre. *Armyworm and loopers only*. 1-day PHI. RUP.

Durivo® at 10-13 fl. oz. per acre as a soil treatment. *Armyworm and loopers only*. 30-day PHI.

 **Entrust**® at the following rates:

Armyworm: 1.25-2.5 oz. per acre.

Loopers: 1-2 oz. per acre

1-day PHI.

 **Entrust**® (2SC) at the following rates:

Armyworm: 4-8 fl. oz. per acre.

Loopers: 3-6 fl. oz. per acre.

1-day PHI.

Exirel® at 7.0-13.5 oz. per acre. *Armyworm and corn earworm only*.

Intrepid 2F® for *armyworm and loopers only* at the following rates:

Early-season applications to young, small crops: 4-8 fl. oz. per acre.

Mid- to late-season applications: 8-10 fl. oz. per acre.

1-day PHI.

Lannate SP® at the following rates:

Armyworm: 0.25-1 lb. per acre.

Cutworm: 0.5 lb. per acre.

Loopers: 1 lb. per acre.

7-day PHI. RUP.

Mustang Maxx® at the following rates:

Armyworm and loopers: 3.2-4 oz. per acre.

Cutworm: 2.24-4 oz. per acre.

1-day PHI. RUP.

Perm-Up® (3.2EC) at 4-8 oz. per acre. 1-day PHI. RUP.

Proclaim® at the following rates:

Armyworm: 2.4-4.8 oz. per acre. *only*. 7-day PHI.

Loopers: 3.2-4.8 oz. per acre. *only*.

RUP.

 May be acceptable for use in certified organic production. Check with your certifier before use.

Radiant SC[®] (1SC) at 5-10 fl. oz. per acre. *Armyworm and loopers only.* 1-day PHI.

Various **Sevin**[®] formulations are available. *Armyworm only.* See labels for rates. 14-day PHI.

Torac[®] at 21 oz. per acre. *Suppression only.* Do not exceed 2 applications per crop per year.

Verimark[®] at 6.75-13.5 oz. per acre as a soil treatment. *Loopers only.* 0-day PHI.

Carrot Weevil

Recommended Products

Vydate L[®] at 4 pts. per acre. *Larvae only.* Apply as a directed spray. Start when eggs or larvae are first seen and repeat in 2 to 3 weeks. 21-day PHI. *RUP.*

Diamondback Moth

Recommended Products

Exirel[®] at 7.0-13.5 oz. per acre.

Movento[®] at 4.0-5.0 fl. oz. per acre. Must be tank-mixed with adjuvant with spreading and penetrating properties. 1-day PHI.

Leafhoppers

Treat when there are more than 14 leafhoppers per 100 sweeps.

Repeat as needed, depending on number of leafhoppers.

Recommended Products

Actara[®] at 1.5-3.0 oz. per acre. 7-day PHI.

Admire Pro[®] at 4.4-10.5 fl. oz. per acre as a soil treatment. 45-day PHI.

Baythroid XL[®] at 2.4-3.2 fl. oz. per acre. 0-day PHI. *RUP.*

Belay[®] (50WDG) at the following rates:

Soil treatment: 4.8-6.4 oz. per acre.

Foliar treatment: 1.6-2.1 oz. per acre.

Brigade[®] (WSB) at 5.3-16 oz. 7-day PHI. *RUP.*

Durivo[®] at 10-13 fl. oz. per acre. 30-day PHI.

Lannate SP[®] at 0.5-1 lb. per acre. 7-day PHI. *RUP.*

Mustang Maxx[®] at 2.24-4 oz. per acre. 1-day PHI. *RUP.*

Nuprid 2F[®] at 10-24 fl. oz. per acre as a soil treatment. 45-day PHI.

Perm-Up[®] (3.2EC) at 2-8 oz. per acre. Over-treatment with permethrin may increase aphid problems. 1-day PHI. *RUP.*

Platinum[®] at 5-11 fl. oz. per acre as a soil treatment, or **Platinum 75SG**[®] at 1.66-3.67 oz. per acre as a soil treatment. 30-day PHI.

Scorpion 35SL[®] at 2-5.25 fl. oz. per acre. 7-day PHI.

Various **Sevin**[®] formulations are available. See labels for rates. 14-day PHI.

Sivanto[®] at 7.0-10.5 fl. oz. per acre as a soil treatment. See label for application methods.

Torac[®] at 14-21 oz. per acre. Do not exceed 2 applications per crop per year.

Venom[®] at the following rates:

Soil treatment: 5-6 oz. per acre. 21-day PHI.

Foliar treatment: 1-3 oz. per acre. 7-day PHI.

See label for application methods.

Nematodes

Plant nematode-free transplants to prevent serious losses. Root-knot, pin, needle, and root-lesion nematodes can reduce celery yields. If your fields have indeterminate root problems, test for nematodes. If the plant-parasitic nematodes are present above the economic thresholds, rotate crops or apply a nematicide. The following nematicides are suitable for control of root-knot, pin, needle, and lesion nematodes in celery production.

Recommended Products

Telone II[®] for fall soil fumigation (broadcast) at the following rates:

Muck soils: 25 gals. per acre.

Mineral soils: 9-18 gals. per acre.

Fumigate in the fall when soil temperatures at 6-inches are above 50°F. Inject the fumigant to a soil depth of 8 inches and lightly seal the soil immediately after application. Use soil fumigants only as directed on the label. In some limited situations soil fumigants can be applied in the spring.

Correct soil moisture, temperature, and soil structure are required for effective control. Take special care to seal fumigants in target zone for required time. You can do this by soil packing or by immediate tarping.

Vydate L[®] (*RUP*) at the following rates:

Preplant: 2 gals. per acre in 20 gals. of water in an 8- to 16-inch band. Incorporate to a depth of 4 inches.

At planting: 0.5-1 gal. per acre in at least 100 gals. of water immediately after transplanting seedlings.

After planting: 1 gal. per acre in at least 100 gals. of water as a foliar spray. Apply 3 weeks after transplanting. Apply again 3 weeks after first treatment.

Tarnished Plant Bug

Apply if there are 2-4 tarnished plant bugs per 20 plants.

Recommended Products

Baythroid XL[®] at 2.4-3.2 fl. oz. per acre. 0-day PHI. *RUP*.

Beleaf 50SG[®] at 2-2.8 oz. per acre. 0-day PHI.

Mustang Maxx[®] at 3.2-4 oz. per acre. 1-day PHI. *RUP*.

Various **Sevin**[®] formulations are available. See labels for rates. 14-day PHI.

Slugs

Recommended Products

Deadline M-Ps[®] (4B) at 20-40 lbs. per acre, or **Metaldehyde 3.5G**[®] at 30-40 lbs. per acre. Apply between rows. Avoid contact to edible product.

Thrips, Whiteflies

Recommended Products

Assail[®] (70WP) at 1.1-1.7 oz. per acre. *Whitefly suppression only.* 7-day PHI.

Exirel[®] at 13.5-20.5 oz. per acre. Use with an effective adjuvant.

Movento[®] at 4.0-5.0 fl. oz. per acre. *Whiteflies only.* Must be tank-mixed with an adjuvant with spreading and penetrating properties. 3-day PHI.

Sivanto[®] at 10.5-14 fl. oz. per acre. *Whiteflies only.* Can be applied as a soil treatment or foliar treatment. See label for application methods.

Torac[®] at 21 oz. per acre. Do not exceed 2 applications per crop per season.