Asparagus – Horticulture

root. Most daikon radishes reach their useable size in 60 to 70 days.

Ginger (Zingiber officinale) and Turmeric (Curcuma longa): These perennial crops are grown in tropical environments for their rhizomes, which creep laterally under the soil surface like irises. In the Midwest, they can be grown from 1-inch rhizome cuttings as a long-season annual planted in hothouses that maintain minimum 50°F soil temps and 70°F air temps. Trench, hill, and irrigate like potatoes. Harvest and sell as “new” or “baby” ginger in mid-late fall. Our season is not long enough (5 to 7 months) to produce large mature and cured rhizomes, which require 8 to 10 months.

Sweet potato (Ipomoea batatas): Sweet potato varieties of Asian origin are starchier than more commonly grown varieties, and often are white or purple fleshed, instead of orange. Varieties include Murasaki, Okinawa Purple, Molokai Purple, Red Japanese, and Stokes Purple. Murasaki has been adopted in the Mid-Atlantic region of the United States and is easier to get than the others. However, most of these varieties take 120 to 140 days to mature, unlike orange-fleshed varieties which take 90 to 110 days; Red Japanese is an exception at 110 days. The longer-maturing varieties can be grown in a hoophouse.

Marketing

Growers who want to diversify their farming operations by including Asian vegetables need to be very cautious before beginning production. Marketing information for Asian crops is not widely published. Since many Asian crops are niche items, only specialized produce companies deal in them. Most of these buyers deal with restaurants, some chain stores, and specialty food stores. Growers who market directly to consumers or restaurants often have more opportunity to educate customers about how to use the crops. It is more and more common to see Asian crops included in salad mixes at farmers markets.

Do your homework. Establish markets and buyers before buying any seed. Calculate budgets and collect economic data on any crop to determine its profit potential. And remember that all of these crops are very labor intensive, so you will need a strong and dependable labor force for timely harvest and proper cultural management.

Resources


Specialty and Minor Crops Handbook, second edition, University of California Agriculture and Natural Resources publication 3346, available from ANRCatalog, https://anrcatalog.ucanr.edu/

Minor Vegetables Fact Sheets, University of Florida IFAS, available from AskIFAS https://edis.ifas.ufl.edu/entity/topic/minor_vegetables


Asparagus – Horticulture

Major update by Ben Phillips, Liz Maynard – Oct 2020
Reviewed by Liz Maynard – Aug 2021

Crop Description

Hybrid varieties of asparagus (Asparagus officinalis) have improved vigor, disease tolerance, and higher yields, and are grown from seeds or crowns. All-male hybrids have higher yields and do not produce seed. Absence of seed production is desirable because seeds develop into volunteer asparagus seedlings that are a weed problem. Order hybrids well in advance.

All-male hybrids: Greenox, Guelph Eclipse, Guelph Equinox, Guelph Millennium, Porthos, Sequoia, Walker Deluxe, Jersey General, Jersey Giant (56X22-8), Jersey Knight, Jersey King, Jersey Supreme.

Other hybrids: Atlas.

Non-hybrids: Viking KB3, Mary Washington.

Specialty: Purple Passion.

Planting and Spacing

Crowns: Use only 1-year old crowns. Transplant April 15 to May 15. Use 4- to 5-foot rows with crowns 12 to 16 inches apart. Set the crowns in 8-inch furrows in light soils and 5- to 6-inch furrows in heavy soils. Cover with 2 to 3 inches of soil. Select deep, well-drained sandy loam soils. Hybrids should be planted slightly deeper. Start cultivating when spears begin to emerge and continue periodically until furrows are level at end of first season.

Seeding transplant: 10- to 14-week old seedling transplants can be mechanically transplanted. Transplant in either the spring or fall.

“Ethnic Vegetables: Asian,” University of Kentucky Extension, https://uky.edu/ccd/content/ethnic-vegetables-asian

**Fertilizing**

**pH:** Maintain a soil pH of 6.7 to 7.0. If possible, apply lime the year before planting.

**New plantings:** Before planting new crowns, apply 50 pounds N per acre, 0 to 160 pounds P₂O₅ per acre, and 0 to 150 pounds K₂O per acre based on soil test results and recommendations from your state. Broadcast the fertilizer and plow it under when preparing the land for the planting furrows. In addition, apply 30 pounds P₂O₅ per acre in the bottom of the trench and cover with 1 inch of soil before setting crowns. For transplanted seedlings, apply 4 ounces of transplant solution (e.g., 2-3 lbs. of 10-52-17 or 9-45-15 in 50 gallons of water) to each transplant.

**Established plantings:** Each year before emergence, apply 20 to 40 pounds N per acre by broadcasting and incorporate by lightly tilling. After harvests conclude, apply 40 to 60 pounds N per acre. The total amount of N from fertilizer should be 80 pounds N per acre. No P₂O₅ is necessary if adequate fertilization was achieved prior to planting. Every second year, apply up to 60 pounds K₂O per acre if a soil test recommends it.

**Harvesting**

Harvest only 2 or 3 times in spring 1 year after transplanting. Thereafter, harvest for about 2 months in the spring. Harvest asparagus early in the morning for best quality. Allow the ferns to grow vigorously after this period to accumulate food reserves for the next season. As much care should be put into maintaining a healthy fern as into harvest.

**Asparagus – Diseases**

Reviewed by Dan Egel, Mary Hausbeck – Sept 2021

**Recommended Controls**

**Crown and Root Rot of Asparagus - Fusarium Fungus**

The Fusarium pathogen can be seed borne. Try to source material for new plantings from fields fumigated with chloropicrin.

**Non-Pesticide**

The disease is promoted by acidic (low pH) and poorly drained soil. Establish production fields with blemish-free crowns produced in virgin soil. Avoid fields with a history of crown and root rot. Use tolerant, vigorous varieties if available, and avoid long harvest periods to maintain vigor in the plant over years.

**Pesticide**

**Cannonball (50WP) (fludioxonil)** | 0.5 oz. per 100 gals. of water. *Michigan only (MI 24c exp. 12/31/22).* Submerge and soak crowns for 10 minutes and allow to drain before planting. REI: 12-hour. PHI: 365-day. FRAC 12.

**Crown and Spear Rot of Asparagus - Phytophthora Oomycete**

**Non-Pesticide**

Avoid excessive irrigation. Choose well-drained planting sites. Establish production fields with blemish-free crowns obtained from virgin soil. Avoid long harvest periods to maintain vigor in the plant over years.

**Pesticide**

**metalaxyl 2E (metalaxyl) Celery** | 2 pts. per acre. Use as broadcast spray in a minimum of 10 gals. of water over the beds. Cutting beds: Apply 30-60 days before the first cutting. For additional control, make another application just before the beginning of harvest. New Plantings: Apply after planting seedlings or after covering one-year-old crowns. Formulations are labeled. REI: 48-hour. PHI: 1-day. FRAC 04.

**Orondis Gold 200 SC (oxathiapiprolin)** | 4.8-9.6 fl. oz. per acre. Use 10 Gals of water, or the volume required to fully submerge 100 crowns. Use as a crown soak prior to planting. REI: 4-hour. PHI: 0-day. FRAC 49.

**phosphite and phosphorous acid products (phosphorous acid, potassium phosphite, mono-dipotassium salts of phosphorous acid, mono- and dibasic sodium, potassium, and ammonium phosphites, fosetyl-aluminum)** | Rates vary depending on formulation and product. Apply the product to fully expanded ferns. Do not apply to ferns that are beginning to senesce. Thorough coverage is required. REI: 4 to 12-hour. PHI: See label. FRAC 33.

**Ridomil Gold SL (4SC) (mefenoxam)** | 1 pt. per acre. Apply 30 to 60 days before the first cutting. Apply again just before the beginning of harvest. Other formulations include MetaStar, Subdue Maxx, Ultra Flourish, and Xyler. Rates vary by formulation. REI: 48-hour. PHI: 1-day. FRAC 04.

**Purple Spot of Asparagus - Stemphylium Fungus**

Weather forecasting tools, such as TOM-CAST, can help asparagus farmers schedule their fungicide applications for...
Asparagus – Insects

control of purple spot. NOTE: Products labeled for rust may be helpful for purple spot control.

Non-Pesticide

Reduce crop residues by removing or mowing senescent and dried fern in the fall/winter.

Pesticide

azoxystrobin products (azoxystrobin) | Use 2 lb. a.i. per gallon formulations (Quadris) at 6.0-15.5 fl. oz. per acre. Use 3.3 lb. per gallon formulations (Azteroid) at 3.9-9.7 fl. oz. per acre. REI: 4-hour. PHI: 100-day. FRAC M05.

Dexter Max (DG) (mancozeb, azoxystrobin) | 2-2.2 lbs. per acre. REI: 24-hour. PHI: 180-day. FRAC M03, FRAC 11.

mancozeb products (mancozeb) | Several formulations of mancozeb products (Dithane, Manzate, Penncozeb) are labeled at various rates. See label for directions. REI: 12-hour. PHI: 180-day. FRAC M03.

chlorothalonil products (chlorothalonil) | Several formulations of chlorothalonil (Bravo, Echo, Equus) are labeled at various rates. See label for directions. REI: 12-hour. PHI: 190-day. FRAC M05.

Dexter Max (DG) (mancozeb, azoxystrobin) | 2-2.2 lbs. per acre. REI: 24-hour. PHI: 180-day. FRAC M03, FRAC 11.

Sonoma 40WSP (myclobutanil) | 5 oz. per acre. REI: 24-hour. PHI: 180-day. FRAC 03.

Rally 40WSP (myclobutanil) | 5 oz. per acre. REI: 24-hour. PHI: 180-day. FRAC 03.

tebuconazole products (tebuconazole) | 4-6 fl. oz. per acre. There are many brand names (Monsoon, Onset, Vibe) with 3.6 lbs. a.i. per gallon that use the same rate. REI: 12-hour to 18-day. PHI: 180-day. FRAC 03.

Unicorn DF (WDG) (tebuconazole, sulfur) | 2-3.75 lbs. per acre. REI: 12 to 24-hour. PHI: 180-day. FRAC 03, FRAC M02, IRAC UN.

Asparagus – Insects

Reviewed by Laura Ingwell, Zsofia Szendrei – Sept 2021

Recommended Controls

Aphids

Treat when less than 5% of ferns have aphids present.

Pesticide

Assail 30SG (acetamiprid) | Use 30SG formulations at 2.5-5.3 oz. per acre and do not exceed 10.7 oz. per acre per season. Use 70WP formulations at 1.1-2.3 oz. per acre and do not exceed 4.6 oz. per acre per season. For control on spears during harvest, to prevent egg laying and feeding injury. Allow 10 days between applications. REI: 12-hour. PHI: 1-day. IRAC 04A.

Fulfill (50WDG) (pymetrozine) | 2.75 oz. per acre. Apply to fern only after harvest has been completed. Allow a minimum of 30 days between applications. Do not exceed 16.5 oz. per acre per season. REI: 12-hour. PHI: 170-day. IRAC 09B.
Asparagus Beetles

At Harvest: Treat when 5-10% of plants are infested, or 2% of spears have eggs.

At Fern: Treat when 10% of plants are defoliated, or 50% of plants have larvae.

Pesticide

Assail 30SG (acetamiprid) | Use 30SG formulations at 2.5-5.3 oz. per acre and do not exceed 10.7 oz. per acre per season. Use 70WP formulations at 1.1-2.3 oz. per acre and do not exceed 4.6 oz. per acre per season. For control on spears during harvest, to prevent egg laying and feeding injury. Allow 10 days between applications. REI: 12-hour. PHI: 1-day. IRAC 04A.

Dimethoate 4EC (dimethoate) | 1 pt. per acre. Use 4EC, LV-4 and 400 EC formulations at 1 pt. per acre and do not exceed 2 pts. per acre per season. REI: 48-hour. PHI: 180-day. IRAC 01B.

Entrust SC (2) (spinosad) | Use 2SC formulations at 4-6 fl. oz. per acre and do not exceed 18 fl. oz. per acre per season. Use 80WP formulations at 1.25-2.0 oz. per acre and do not exceed 5.6 oz. per acre per season. REI: 4-hour. PHI: 60-day. IRAC 05. OMRI-listed.

Lannate LV (2.4L) (methomyl) | 1.5 - 3.0 pts. per acre. Do not exceed 15 pts. per acre per season. REI: 48-hour. PHI: 1-day. IRAC 01A.

Perm-Up 25DF (permethrin) | Use 25W, 25WP or 25DF formulations at 3.2-6.4 oz. per acre and do not exceed 25.6 oz. per acre per season. Use 3.2EC formulations at 2-4 fl. oz. per acre and do not exceed 16 fl. oz. per acre per season. Allow 7 days between applications. REI: 12-hour. PHI: 1-day. IRAC 03A. RUP.

Sevin 5B (carbaryl) | 20 lbs. per acre. For cutworm control on spears during harvest, to prevent egg laying and feeding injury. Do not exceed more than 3 applications to spears. Do not exceed 2 applications to ferns. Do not exceed 60 lbs. per acre per season on spears, and 80 lbs. per acre per season on ferns (100 lbs per acre per season total). Minimum days between treatment is 3 days. REI: 12-hour. PHI: 1-day. IRAC 01A.

Sevin XLR Plus (4SC) (carbaryl) | For cutworms. Use low rate for control on seedlings and or spears during harvest, to prevent egg laying and feeding injury. Use high rate for control on fern growth after harvest is over. Do not exceed more than 5 applications to spears and ferns combined. Do not exceed 5 qts. per acre per year. Do not treat more than once every 3 days. REI: 12-hour. PHI: 1-day. IRAC 01A.

Japanese Beetle

Pesticide

Assail 30SG (acetamiprid) | Use 30SG formulations at 5.3 oz. per acre and do not exceed 10.7 oz. per acre per season. Use 70WP formulations at 2.3 oz. per acre and do not exceed 4.6 oz. per acre per season. Apply to fern only after harvest has been completed. Allow 10 days between applications. REI: 12-hour. PHI: 1-day. IRAC 04A.

Perm-Up 25DF (permethrin) | Use 25W, 25WP or 25DF formulations at 3.2-6.4 oz. per acre and do not exceed 25.6 oz. per acre per season. Use 3.2EC formulations at 2-4 fl. oz. per acre and do not exceed 16 fl. oz. per acre per season. Allow 7 days between applications. REI: 12-hour. PHI: 1-day. IRAC 03A. RUP.

Sevin XLR Plus (4SC) (carbaryl) | For cutworms. Use low rate for control on seedlings and or spears during harvest, to prevent egg laying and feeding injury. Use high rate for control on fern growth after harvest is over. Do not exceed more than 5 applications to spears and ferns combined. Do not exceed 5 qts. per acre per year. Do not treat more than once every 3 days. REI: 12-hour. PHI: 1-day. IRAC 01A.

Caterpillars

For cutworm caterpillars: Treat when 5% of crowns are infested at harvest. Treat in the fall when there is 1 larvae per 20 plants.
Tarnished Plant Bug

Pesticide

**Assail 30SG (acetamiprid)** | Use 30SG formulations at 5.3 oz. per acre and do not exceed 10.7 oz. per acre per season. Use 70WP formulations at 2.3 oz. per acre and do not exceed 4.6 oz. per acre per season. Apply to fern only after harvest has been completed. Allow 10 days between applications. REI: 12-hour. PHI: 1-day. IRAC 04A.

**Perm-Up 25DF (permethrin)** | Use 25W, 25WP or 25DF formulations at 3.2-6.4 oz. per acre and do not exceed 25.6 oz. per acre per season. Use 3.2EC formulations at 2-4 fl. oz. per acre and do not exceed 16 fl. oz. per acre per season. Allow 7 days between applications. REI: 12-hour. PHI: 1-day. IRAC 03A. RUP.

Asparagus – Weeds

Reviewed by Stephen Meyers, Ben Phillips – Sept 2021

**Recommended Controls**

**All Weeds**

Before establishing an asparagus planting, reduce perennial weeds in the area to be planted with systemic broad-spectrum herbicides. Herbicide options are limited in the planting year.

After the first year of establishment, a typical weed control program in asparagus includes a preemergence herbicide with a long residual applied before asparagus emerges. If needed, a preemergence herbicide may be applied again after harvest is finished and a clean mowing.

Postemergence herbicides may be applied before asparagus emergence or during or after the harvest season. Some require directed or shielded spray applications to avoid spraying asparagus.

It is important use herbicides with different modes of action from year to year with this perennial crop to avoid buildup of weed species not controlled by a particular mode of action.

For specific weeds controlled by each herbicide, check the Relative Effectiveness of Herbicides for Vegetable Crops table.

Rates provided in the recommendations below are given for overall coverage. For a banded treatment, reduce amounts according to the portion of acre treated.

Non-Pesticide

Good weed control in the planting year is especially important. Multivators, tines, rolling cultivators, and flame weeder work well before emergence of asparagus, but it is important to avoid damaging crowns when cultivating. Cultivate row middles and hand-hoe after emergence. Flame weeder can also be used after clean harvest or mowing. Once established, straw mulch can be applied any time, but is easier for picking when applied after final harvest.

**Pesticide**

**2,4-D amine products (2,4-D)** | Use 3-4 pts. per acre of liquid formulations with 3.8 lbs. per gal. acid equivalent, or 1.5-2.5 lbs. per acre of dry formulations with 78.9% acid equivalent. Apply before, during, or after the harvest season. During harvest season apply immediately after cutting. Discard deformed spears. Use drop nozzles for treatments after harvest to avoid spraying fern. Wait at least 30 days between applications. REI: 48-hour. PHI: 3-day. HRAC 04.

**Aim EC (2) (carfentrazone)** | 0.5-1.92 fl. oz. per acre. Include 0.5 pt. NIS or 0.25-0.5 gals. COC per 25 gals. of spray solution. Broadcast after spear harvest. Emerged asparagus will be injured. Do not exceed 3.8 fl. oz. per acre per season. Wait at least 20 days between applications. REI: 12-hour. PHI: 5-day. HRAC 14.

**Callisto (40SC) (mesotrione)** | 3-7.7 fl. oz. per acre. Apply in spring before spears emerge after mowing, disking, or tilling; after final harvest; or both. For postharvest applications use drop nozzles or other equipment that will minimize contact with crop. Adding COC or NIS (alone or with UAN or AMS) will improve emerged weed control and increase crop injury risk in postharvest applications. Do not exceed 2 applications per year, or 7.7 fl. oz. per acre per year. REI: 12-hour. HRAC 27.

**Chateau SW (51WDG) (flumioxazin)** | 6 oz. per acre. Established plantings only. Apply to dormant asparagus at least 2 weeks before spears emerge. Crop injury may result if asparagus is not dormant. May be tank-mixed with paraquat to control emerged weeds. Or, apply after final harvest for the season before fern emerges. Do not exceed 6 oz. per acre per growing season. REI: 12-hour. HRAC 14.

**Clarity (4WS) (dicamba)** | 0.5-1.0 pt. per acre. Apply in 40-60 gals. of water per acre immediately after cutting. Discard crooked spears at harvest. Clarity can injure
nearby broadleaf crops and garden plants. Maximum 1 pt. per acre per year. REI: 24-hour. PHI: 1-day. HRAC 04.

clefthodim products (clefthodim) **POST**  Use 2EC formulations at 6-8 fl. oz. per acre with 1 qt. of COC per 25 gals. of spray solution (1% v/v). Use Select Max at 9-16 fl. oz. per acre with 8 fl. oz. of NIS per 25 gals. of spray solution (0.25% v/v). Spray on actively growing grass. Wait at least 14 days between applications. Do not exceed 32 fl. oz. of 2EC formulations or 64 fl. oz. of Select Max per acre per season. REI: 24-hour. PHI: 1-day. HRAC 01.

diuron products (diuron) **PRE** | Established plantings only. Do not apply to young plants during the first year. Use 80DF formulations at 1-4 lbs. per acre, and do not exceed 6 lbs. per acre per season. Use 4L formulations at 0.8-3.2 qts. per acre and do not exceed 4.8 qts. per acre per season. Use lower rates on light-colored soils with less than 2% organic matter. Apply after tillage or chopping fern in the spring and again after harvest, if necessary. See product label for split application rates. 6-8 weeks of residual activity. RUP in Michigan only. REI: 12-hour. HRAC 05. RUP.

**Dual Magnum (7.62EC) (s-metolachlor)** **PRE**  1.33-2.0 pts. per acre. **Illinois, Indiana, Michigan, and Minnesota only. IL 24c exp. 03/25/24. MI 24c exp. 12/31/21. MN 24c exp. 12/31/25.** Apply before asparagus and weeds emerge in spring or after the harvest season. Needs moisture for activation. Do not exceed 1 application per crop. REI: 24-hour. PHI: 16-day. HRAC 15.

**Fusilade DX (2EC) (fluazifop-P)** **POST**  8-12 fl. oz. per acre. Include 1-2 pts. of COC or 0.5-1 pt. of NIS per 25 gals. of spray solution. Spray on actively growing grass. Rates may be doubled if asparagus will not be harvested for 12 months. Wait at least 14 days between applications. Do not exceed 48 fl. oz. per acre per season on bearing asparagus. REI: 12-hour. PHI: 1-day. HRAC 01.

glyphosate products (glyphosate) **POST**  0.75-3.75 lbs. acid equivalent (ae) per acre. Use formulations containing 3 lbs. ae per gal. (4 lbs. isopropylamine salt per gal.) at 1-5 qts. per acre, or formulations containing 4.5 lbs. ae per gal. (5 lbs. potassium salt per gal.) at 0.66-3.3 qts. per acre. Apply to emerged weeds at least 7 days before spears emerge or immediately after last harvest. Use low rate for annuals and higher rates for perennials. See label for suggested application volume and adjuvants. If spears are allowed to regrow, delay application until ferns have developed and apply as a directed or shielded spray. Contact of the spray with asparagus fern may result in crop injury. REI: 4-hour to 12-hour. PHI: 14-day. HRAC 9.

**Lorox DF (50) (diuron)** **POST** | Established crowns: Apply before spears emerge, before cutting season or immediately after cutting, or as directed in ferns. New planted crowns: To control small emerged weeds apply 1-2 lbs. per acre, up to 2 applications when ferns are 6-18 inches tall. Newly seeded crops: Apply a 1-inch band of activated charcoal over the row at planting, then apply Lorox. Use charcoal at 300 lbs. per acre of actual area sprayed, which is equivalent to 15 lbs. per acre of crop with a 20-inch row-spacing. Or, use the low rate of Lorox when ferns are 6-18 inches tall and weeds are less than 4 inches tall. Do not use on sand, loamy sand, or soils with less than 1% organic matter. Maximum 4 lbs. or 3 applications per acre per year. REI: 24-hour to 8-day. PHI: 1-day. HRAC 05.

**metribuzin products (metribuzin)** **POST**  2.4-8.2 pts. per acre. Use formulations with 3.8 lbs. active ingredient per gallon. Apply at least 14 days before first harvest and prior to spear emergence. If spears are present, remove before application. On sandy soil use no more than 2.4 pts. per acre. Do not apply to newly seeded asparagus during first year. REI: 24-hour. PHI: 14-day. HRAC 03.

**paraquat products (paraquat)** **POST**  2.5-4 pts. per acre. Include 1 qt. of COC, or 4-8 fl. oz. of NIS per 25 gallons of spray solution. Apply before crop emergence or after last harvest before fern regrows. REI: 12 to 24-hour. PHI: 6-day. HRAC 22. RUP.

**pendimethalin products (pendimethalin)** **PRE**  2.4-8.2 pts. per acre. Use formulations with 3.8 lbs. active ingredient per gallon. Use 75DF formulations at 0.6-2.6 lbs. per acre. Use 4F formulations at 2-4 pts. per acre. See product label for split application rates. Use low rate if combined with diuron. 6-8 weeks residual activity. Two sprays necessary for seasonlong sandbur control. Do not exceed 2.6 lbs. or 4 pts. per acre per year. REI: 12-hour. PHI: 14-day. HRAC 05.

**Poast (1.5EC) (sethoxydim)** **POST**  1-1.5 pts. per acre. Include 1 qt. COC per acre. Spray on actively growing grass. Use high rate on quackgrass. Do not exceed 5 pts. per acre per season. REI: 12-hour. PHI: 1-day. HRAC 01.

**QuinStar 4L (3.8) (quinlorac)** **POST**  12.6 fl. oz. per acre. Include 1 qt. of COC per 25 gallons of spray solution. Apply after final harvest for the year. Controls bindweed, Canada thistle, barnyardgrass, large crabgrass. Do not exceed 1 application per year. REI: 12-hour. HRAC 04.
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Sandea (75) (halosulfuron)  
**POST**  |  **PRE**  |  
| | | 0.5-1.5 oz. per acre. Apply before, during, or after harvest. Drop nozzles and using COC or NIS are recommended for applications after harvest. For first year transplants do not apply sooner than 6 weeks after fern emergence. Do not exceed 2 applications per crop cycle, or 2 oz. per acre per 12-month period. Has residual soil activity. Effective on nutsedge. REI: 12-hour. PHI: 1-day. HRAC 02.

Sinbar WDG (80) (terbacil)  
**POST**  |  **PRE**  |  | 0.62-1.5 lbs. per acre. Established crowns or direct-seeded crops only. Do not use on sandy soil or on soil with less than 1% organic matter. *Established crowns*: Apply in spring after cutting fern and prior to spear emergence. May also be applied after a clean cutting. *Seeded crops*: At planting spray activated charcoal at 300 lbs. per acre of actual area treated in a 1-inch band over the row (equivalent to 15 lbs. per acre of crop with 20-inch row spacing), then apply Sinbar. Do not plant other crops within 2 years of application. 8-12 weeks residual activity. REI: 12-hour. PHI: 5-day. HRAC 05.

Solicam DF (78.6) (norflurazon)  
**PRE**  |  | | 2.5-5 lbs. per acre. *Established plantings only*. Do not apply within 12 months of planting. Apply preemergence to soil free of weeds and debris. REI: 12-hour. PHI: 14-day. HRAC 12.

Spartan 4F (sulfentrazone)  
**PRE**  |  | | 4.5-12 fl. oz. per acre. *Michigan only - applicators must have a supplemental label*. Apply in spring before crop emerges. Use low rate on light soil. Do not use on soils with less than 1% organic matter. Do not exceed 1 application and 12 fl. oz. per acre per season. REI: 12-hour. PHI: 14-day. HRAC 14.

Stinger (3) (clopyralid)  
**POST**  |  | | 8-10.7 fl. oz. per acre. Apply before or during harvest. May cause some crooking of spears. Controls Canada thistle, marestail, mayweed, nightshade, plantain, smartweeds. Do not exceed 10.7 fl. oz. per acre per year. Avoid application 2 years in succession. REI: 12-hour. PHI: 2-day. HRAC 04.

trifluralin products (trifluralin)  
**PRE**  |  | | Established plantings only. Use 4EC formulations at 2-4 pts. per acre. Use 10G formulations at 10-20 lbs. per acre. Use lower rates on coarse soils. Apply and incorporate 1-2 inches early in the spring when spears are at least 4 inches below soil surface. See product label for split application instructions. 4-6 weeks of residual activity. REI: 12-hour. HRAC 03.

**Crop Description**

Commercial celery (*Apium graveolens*) production in the United States began in Michigan in the 1800s. Numbered commercial varieties are maintained by a small breeding effort supported directly by the largest growers of the commodity. Other seed sources are available for smaller-scale growers, and include bushier thin-stalked types, and taller thick-stalked types. The standard green varieties can be blanched to maintain a lighter white color of the inner stalks through soil-hilling or by dense plant spacing. There are also red varieties. Seeds are produced in the second year of production if plants are overwintered under mulch.

**Planting and Spacing**

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 6 to 8 weeks before last frost, and ends 6 to 8 weeks after last frost. Schedule planting so that a uniform quantity of celery is ready to harvest every week. Using transplants instead of direct seeding ensures uniform stands and faster maturing crops. Often, succession plantings are started every three weeks.

Harden off transplants by reducing water, not temperature. 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.

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.

Rotate celery with crops 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.

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