

# Carrots and Parsnips

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## Culture

Best production is obtained from deep, porous soils. Raised beds tend to increase the depth of tilled soil and can help provide good root shape. Do not destroy soil structure by overworking soils or working them while they are wet. Some growers roto-till to obtain a deep, friable soil. Hilling soil over the shoulders of the roots at the last cultivation can help reduce greening.

## Varieties

### Fresh market carrots (wholesale and roadside stand)

- Enterprise
- Hybrid Nantes strains
- Scarlet Nantes

### Processing carrots

- Nantes Type
- Danvers 126 (for juice)
- Royal Chantenay

### Parsnips

- Harris Model
- All America

## Lime and Fertilizer

Maintain soil pH between 6.0-6.8.

For soils of average fertility, apply per acre: 50-75 lb nitrogen, 50-150 lb P<sub>2</sub>O<sub>5</sub>, 50-200 lb K<sub>2</sub>O before planting. Phosphorus and potassium rates should be according to soil test. Topdress or sidedress an additional 30-50 lb nitrogen/A, 4-6 weeks after seeding. If heavy, leaching rainfall occurs, apply one extra topdressing. Application of high amounts of nitrogen on parsnips causes excessive top growth and increases their susceptibility to diseases. The use of fresh manure should be avoided because this can result in branched roots.

## Seeding and Spacing

### Carrots

Rows: 16-18 inches.

Carrots should be planted to a stand of 16 plants/ft of row, which requires 2-3 lb of seed/A.

Precision seeders (such as Stanhay) allow growers to plant coated seed in bands of three rows, 1.5 inches apart. Growers generally put three or four rows on a bed. These crops are slow to germinate; an adequate supply of moisture is necessary during this period. In addition, parsnips are a long-season crop and should be seeded as early in the spring as is practical.

### Parsnips

Rows: 12-18 inches.

In-row: 8-10 plants/ft of row.

Seed required: 3-4 lb seed/A.

Sow 0.5-0.75 inch deep.

## Storage

Carrot and parsnips must be topped before storage. Mature roots can be kept in good condition for 4-5 months at temperatures near 32°F. Avoid freezing and relative humidities above 95% to avoid condensation and dripping. Carrots that are not fully mature can be stored only 4-6 weeks.

Parsnips should not be harvested until fully mature for good quality. Parsnips can be left in the ground over winter but should be harvested before growth starts in the spring.

Do not store these crops in buildings with apples, pears or other ethylene-producing fruits, because bitterness can result.

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## Disease Control

### Damping off

Use seed commercially treated with Apron and Maxim or Thiram.

For Pythium damping off, apply **Ridomil Gold** EC at 1-2 pt/A or preplant incorporated or on the surface.

### Nematodes

**Telone II** (mineral soil, 9-15 gal/A, muck soil, 24-36 gal/ A). Fall treatment is best.

**Vydate L** 2-4 gal/A broadcast, or 1-2 gal/A in furrow at planting. (See label instructions)

### Cercospora and Alternaria leaf spots

A 2- or 3-year rotation will help reduce fungus carryover. Make 3-5 applications at 7- to 10-day intervals with one of the following fungicides:

**Bravo Weather Stik** 1.5-2.0 pt/A (0 days-PHI), **Equus 720** 1.3-2 pt/A (14 days-PHI), or other chlorothalanyl formulation or product.

**Bumper 41.8 EC** or **PropiMax** 4 fl oz/A (14 days-PHI). Alternaria leaf spot suppression only.

**Quilt** 14 fl oz/A (14 days-PHI). Alternaria leaf spot suppression only.

\***Rovral 4F** 1-2 pt/A (0 days-PHI)—Alternaria only.

If cavity spot (Pythium) has been a problem, apply **Ridomil Gold** EC at planting or preplant (see above), followed by **Ridomil Gold/Bravo** at 1.5-2.0 lb/A 40-50 days later and again at 14 day intervals (2-4 applications; 7 days-PHI).

\***Quadris** 9.2-15.4 fl oz/A (0 days-PHI).

\***Cabrio EG** 8-12 oz/A (0 days-PHI).

\***Gem 500 SC** 1.9-2.9 fl oz/A (7 days-PHI).

\***Pristine** 8.0-10.5 fl oz/A (0 days-PHI).

\***Endura** 4.5 fl oz/A (0 days-PHI). Alternaria leaf spot only.

\***Switch** 11-14 oz/A (7 days-PHI). Alternaria leaf blight only.

### Aster yellows

Control leafhoppers with recommended insecticide. Control weeds adjacent to production areas.

\*Follow guidelines for fungicide resistance management on the product label (see pages 58-59).

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## Insect Control

See the table on the next page for overview of insecticides used to control carrot and parsnip pests.

### • Preplant broadcast soil treatment

**Diazinon (carrots only)**

For cutworms and wireworms. Incorporate 4-8 inches.

Diazinon 50WP: 4-8 lb/A.

Diazinon AG500 (4EC): 2-4 qt/A.

Diazinon AG600: 51-102 oz/A.

Diazinon 5G: 14-28 oz/1000 sq ft.

Diazinon 14G: 14-28 lb/A.

<b>Insecticides for Control of Carrot and Parsnip Pests</b> ( ✓ = labeled; - = not labeled)					
	<b>Pre-harvest interval (days)</b>	<b>Carrot rust fly</b>	<b>Leafhoppers</b>	<b>Aphids</b>	<b>Carrot weevil</b>
carbaryl (Sevin)	7	-	✓	-	-
cyfluthrin (Baythroid)	0	-	✓	-	✓
deltamethrin (Delta Gold)	3	-	✓	-	-
diazinon	14	✓	-	✓	-
endosulfan (Thionex)	7	-	✓	✓	-
esfenvalerate (Asana)	7	-	✓	-	✓
imidacloprid (Admire)	21	-	✓	✓	-
imidacloprid (Provado)	7	-	✓	✓	-
malathion	7	-	✓	✓	-
methomyl (Lannate)	1	-	✓	-	-
methoxyfenozide (Intrepid)	14	-	✓	-	-
oxamyl (Vydate)	14	-	-	-	✓
spinetoram (Radiant)	3	-	-	-	-
spinosad (SpinTor)	3	-	-	-	-
thiamethoxam (Actara)	7	-	✓	✓	-
thiamethoxam (Platinum)	-	-	✓	✓	-
zeta-cypermethrin (Mustang)	1	-	✓	-	-

## • At-planting treatment

### **Diazinon**

For carrot rust fly (maggots) on carrots.

Diazinon 50WP: 4 lb/A (1.5 oz/1,000 sq ft); drench in seed furrow.

### **Imidacloprid** (21 days-PHI)

For aphids, leafhoppers.

Admire 2F, Alias 2F: 0.7-1.7 fl oz/1,000 ft or 10-24 fl oz/A.

Admire Pro (4.6F): 4.4-10.5 fl oz/A.

### **Thiamethoxam**

For aphids, flea beetles, leafhoppers, whiteflies.

Platinum 2SC: 5-12 fl oz/A. Do not use more than 12 fl oz/A per season.

Platinum 75SG: 1.7-4.01 oz/A. Limit 4.01 oz/A per year.

## • Foliar treatment

### **Carbaryl** (7 days-PHI)

For leafhoppers.

Carbaryl 4L; Sevin 4F; Sevin XLR Plus (4EC): 1-2 qt/A for aster leafhopper; 0.5-1 qt/A for other leafhoppers.

Sevin 50WP: 2-3 lbqt/A for aster leafhopper; 1-2 lb/A for other leafhoppers.

Sevin 80S: 1.25-2.5 lb/A for aster leafhopper; 0.62-1.25 lb/A for other leafhoppers.

### **Cyfluthrin and beta-cyfluthrin** (0 days-PHI, carrots only)

For black cutworm, aster leafhopper, carrot weevil.

Baythroid 2EC: 1.6-2.8 fl oz/A. Limit 5 applications per year.

Baythroid XL 1EC: 1.6-2.8 fl oz/A.

### **Deltamethrin** (3 days-PHI)

Delta Gold 1.5EC: 1.0-2.4 fl oz/A for cutworms, loopers. 1.5-2.4 fl oz/A for armyworms, leafhoppers, tarnished plant bug.

**Diazinon** (14 days-PHI, carrots only)

For aphids.

Diazinon AG500 (4EC): 1 pt/A on carrots.

Diazinon 50WP: 1 lb/A on carrots.

**Endosulfan** (7 days-PHI, carrots only)

Apply only once per season; limit 1.3 qt/A per year.

For aphids, leafhoppers.

Thionex 3EC; Endosulfan 3EC: 0.67-1.33 qt/A.

Thionex 50WP: 1-2 lb/A.

**Esfenvalerate** (7 days-PHI, carrots only)

For leafhoppers, carrot weevil.

Asana XL 0.66EC, Adjourn 0.66EC: 5.8-9.6 fl oz/A for leafhoppers; 9.6 fl oz/A for carrot weevil. Limit 98 fl oz/A per season.

**Imidacloprid** (7 days-PHI)

For aphids, flea beetles, leafhoppers, whiteflies.

Provado 1.6F, Pasada 1.6F: 3-5 fl oz/A.

**Imidacloprid + cyfluthrin** (7 days-PHI)

For leafhoppers, aphids, cutworms.

Leverage 2.7SE: 3.5 fl oz/A. Limit 10.5 fl oz/A per year.

**Malathion** (7 days-PHI)

For aphids, leafhoppers.

Malathion 5EC; Malathion 57EC: 1-2 pt/A for aphids; 2.5 pt/A for leafhoppers.

Malathion 8EC: 0.5-1 pt/A.

Malathion 8 Aquamul: 1-2 pt/A for aphids; 1.5-2 pt/A for leafhoppers.

**Methomyl** (1 day-PHI, carrots only)

For aster leafhopper.

Limit 10 applications/crop.

Lannate 90SP: 0.5-1 lb/A.

Lannate LV (2.4WSL): 1.5-3 pt/A.

**Methoxyfenozide** (14 days-PHI)

For caterpillars: cabbageworms, loopers, armyworms.

Intrepid 2F: 6-16 fl oz/A. Limit 64 fl oz/A per season.

**Oxamyl** (14 days-PHI, carrots only)

For carrot weevil.

Vydate L (2WSL): 2-4 pt/A as a soil-directed drench. Apply up to three times at 2-3 week intervals.

**Spinetoram** (3 days-PHI)

For leafminers, caterpillars, thrips.

Radiant 1SC: 6-8 fl oz/A. Limit 3 applications per year.

**Spinosad** (3 days-PHI)

For armyworms, loopers.

SpinTor 2SC: 3-6 fl oz/A.

Entrust 80WP: 1-2 oz/A. Limit 7 oz/A per crop.

**Thiamethoxam** (7 days-PHI)

For aphids, flea beetles, leafhoppers, whiteflies.

Actara 25WDG: 1.5-4 oz/A. Limit 8 oz/A per season.

**Zeta-cypermethrin** (1 day-PHI)

For leafhoppers.

Mustang Max 0.8EC: 1.28-4 fl oz/A.

Mustang 1.5EW: 1.4-4.3 fl oz/A.

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# Weed Control

## Preplant Incorporated Carrots and Parsnips

**Trifluralin:** Carrots only.

**Albaugh Trifluralin 4EC, Gowan Trifluralin 4EC, Riverside Trifluralin 4EC, Treflan HFP, Trilin 4EC:** Use 1-2 pt/A.

**Gowan Trifluralin 5EC, Trilin 5EC:** Use 0.8-1.6 pt/A.

**Trific 60DF:** Use 0.875-1.66 lb/A.

**Gowan Trifluralin 10G, Trilin 10G, Wilbur-Ellis Trifluralin 10G:** Use 5-10 lb/A.

## Preemergence Carrots

**Lorox DF:** Apply at 1-3 lb/A after seeding (at least 0.5 inch deep) but before carrots emerge. Use low rate on light soils, and increase rate on soil containing more clay or organic matter.

**Prowl H2O:** Controls most germinating annual grasses and some broadleaf weeds. Prowl H2O should be applied at 2 pt/A post-plant treatment prior to emergence of the crop and before weed emergence. Emerged weeds will not be controlled. Apply within 2 days of planting. A number of other herbicides containing the same active ingredient (pendimethalin) are available, some of which are registered for use on carrots.

## Parsnips

**Lorox DF:** Apply at 1.5-3.0 lb/A immediately after seeding for annual weed control. Use lower rate on sandy and light-textured soils. Plant seed at least 0.5 inch deep.

## Postemergence Carrots and parsnips

**SelectMax:** Controls annual and perennial grasses. Apply 9-16 fl oz/A plus non-ionic surfactant at 0.25% of final volume. Repeat applications can be made at 14-day intervals for a maximum allowed use per season of 64 fl oz/A. Pre-harvest interval is 1 day. **Select 2 EC** (30 day PHI) may also be used. Apply 6-8 fl oz/A plus crop oil concentrate at 1% of final volume. Do not apply more than 8 fl oz/A in a single application.

## Carrots only

**Lorox DF:** Apply 1.5-3.0 lb/A when carrot plants are at least 3 inches tall. Controls small emerged annual weeds. Do not exceed 4 lb/A/season. Do not ally in tank mixture with Stoddard Solvent or other pesticides. PHI 14 days.

**Fusilade DX:** Carrots only. Controls emerged annual and perennial grasses. Apply 0.4-0.75 pt/A Fusilade DX (45 days-PHI). Do not exceed 3 pt/A/season. Add 1 qt/A nonphytotoxic oil concentrate or 0.5-1.0 pt/A of a non-ionic surfactant. Rate is dependent on grass species and stage of development.

**Metribuzin:** Products containing metribuzin control annual broadleaf weeds and grasses.

**Dimetric DF, Metri DF Herbicide, Metribuzin 75, Metribuzin 75 DF, Tricor DF:** Apply 1/3 lb/A broadcast after carrots have at least 5 to 6 true leaves. Earlier applications will result in excessive crop damage. If needed, a second application may be made after an interval of at least 3 weeks. The total amount applied in one season must not exceed 2/3 lb/A. Do not apply on very hot days or within 3 days after periods of cool, wet or cloudy weather or crop injury will occur (60 days-PHI).

**Poast:** Carrots only. Controls emerged annual and perennial grasses. Apply 0.75-1.5 pt/A Poast. Do not exceed 5 pt/A/season. Add 1 qt/A nonphytotoxic oil concentrate. Allow 14 days between applications. Rate is dependent on grass species and time of application. See label for precise timing (30 days-PHI).

## Directed/shielded application

**Gramoxone:** Controls emerged annual weeds and top growth of perennials. Apply 1.5 pt/A between rows after crop establishment. Prevent contact with crop otherwise crop injury will result. See the label for specific precautions.

**Aim EC:** Controls emerged broadleaf weeds. Apply as a directed spray, using a shielded sprayer, to actively growing weeds up to 4 inches in height. Add non-ionic surfactant at 0.25% or crop oil concentrate at 1-2%. Formulations available include: **Aim EC:** Use 1-2 fl oz/A, and **Aim EW HERBICIDE:** Use 0.5 to 1.6 fl oz/A.