

This is a section from the

**2016**

**Mid-Atlantic**

# **Commercial Vegetable Production Recommendations**

The manual, which is published annually, is NOT for home gardener use.

The full manual, containing recommendations specific to New Jersey, can be found on the Rutgers NJAES website in the Publications section  
[njaes.rutgers.edu](http://njaes.rutgers.edu)

The label is a legally-binding contract between the user and the manufacturer.

The user must follow all rates and restrictions as per label directions.

The use of any pesticide inconsistent with the label directions is a violation of Federal law.

Maintain fungicide schedule until harvest. See the “Harvesting and Storage” section. Fungicide application for black rot control will help maintain “handles” on the fruit. Harvest carefully because wounding can negate benefits from a season-long fungicide program.

### Phytophthora Crown and Fruit Rot

Multiple practices should be used to minimize the occurrence of this disease. Rotate away from susceptible crops (such as peppers, eggplants, tomatoes, lima and snap beans, and other cucurbits) for as long as possible. Preplant fumigants will also suppress disease. Fields should be adequately drained to ensure that water does not accumulate around the base of the plant. Mefenoxam (Ridomil Gold or Ultra Flourish) should be applied pre-plant for early season control. Once the canopy closes, subsoil between the rows to allow for faster drainage following rainfall. When conditions favor disease development, tank mix one of the following with fixed copper at labeled rates (for suppression only):

Rotate:

Revus--8.0 fl oz 2.08F/A

Ranman--2.75 fl oz 400 SC/A (plus a non-ionic or organosilicon surfactant; do not apply with copper; see label for additional precautions)

with:

Presidio--4.0 fl oz 4SC/A

Forum--6.0 fl oz 4.17SC/A

Tanos--8.0 to 10.0 oz 50DF/A

Materials with different modes of action (i.e. FRAC codes) should always be alternated to reduce the chances for fungicide resistance development.

### Fusarium Fruit Rot

This disease is especially destructive in fields where pumpkins are grown on an annual basis. Once the pathogen is established in a field losses can be significant. Fruit rot is caused by several *Fusarium* spp., and fungicide applications are not effective. Hard rind cultivars are less susceptible to *Fusarium* fruit rot than other cultivars. Production of pumpkin on a no-till cover crop mulch layer such as winter rye plus hairy vetch has been shown to help reduce disease incidence. Greater disease reductions will occur when the mulch layer is thicker.

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## RADISHES, RUTABAGAS, AND TURNIPS

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**Radishes.** Radishes are a quick-growing, cool-season crop developing its best quality and root shape when grown at temperatures of 50° to 65°F (10° to 18.3°C) in moderate to short day lengths. Crop must be grown rapidly (23 to 28 days) and with an adequate moisture supply. When growth is checked, the radish becomes hot, tough, and pithy. Long days (15 hours) and warm temperatures induce seedstalk formation. Under medium to short day lengths, roots are generally well shaped and tops are small.

**Rutabagas.** A cool-season crop developing best at temperatures of 60° to 65°F (15.6° to 18.3°C). Usually considered a fall crop; it can be grown in the spring.

### Varieties

#### Radish (Red globe; white interior)

Saxa  
Rover\*  
Cherriette\*  
Perfecto  
Rudolf (Crack tolerant)  
Cherry Belle  
Pink Beauty (organic)  
Champion  
Crimson Giant (large globe)

#### Daikon/Specialty Radish

Watermelon (White flesh, red interior, globe)  
Shumkyo Semi Long (Red flesh, white interior, elongated)  
White icicle (White flesh, white interior, elongated)  
Minowase (Daikon)  
Mihashige (Daikon)  
China Rose (Red flesh, white interior, elongated)  
Chinese Winter (Daikon)  
Discovery\* (Daikon)  
Round Black Spanish (Heirloom, Dark flesh, white interior, large globe)  
April Cross\* (Daikon)  
Sakurajima Mammoth (White flesh, white interior, large globe)

#### Rutabaga

American Purple Top (and Improved Strain)  
Helenor  
Laurentian

#### Turnip White

Tokyo Cross\*  
White Lady\*  
Hakeuri\*  
Shogoin  
Just Right\*  
White Ball\*

#### Turnip Purple

Purple Prince\*  
Purple Top White Globe (MR)  
Royal Crown\*

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Varieties listed earliest to latest according to vendors: radish 18 – 45 days; Daikon/Specialty 24 – 80 days; Rutabaga 90 – 100 days; Turnip 35 – 75 days.

\*Indicates F<sub>1</sub> hybrid variety. Disease resistance/tolerance (according to vendor) and/or specialty descriptors in parentheses ( ); MR = mosaic resistant.

### Recommended Nutrients Based on Soil Tests

Before using the table below, refer to important notes in the Soil and Nutrient Management chapter in Section B and your soil test report. These notes and soil test reports provide additional suggestions to adjust rate, timing, and placement of nutrients. Your state's soil test report recommendations and/or your farm's nutrient management plan supercede recommendations found below.

Pounds N per Acre	Soil Phosphorus Level				Soil Potassium Level				Nutrient Timing and Method	
	Low	Med	High	Very	Low	Med	High	Very		
			(Opt.)	High			(Opt.)	High		
	Pounds P <sub>2</sub> O <sub>5</sub> per Acre				Pounds K <sub>2</sub> O per Acre					
Radishes,	50	150	100	50	0	150	100	50	0	Total nutrient recommended.
Rutabagas, and Turnips	50	150	100	50	0	150	100	50	0	Broadcast and disk-in.

Apply 1.0 to 2.0 pounds of boron (B) per acre with broadcast fertilizer. See Table B-9 for more specific boron recommendations.

#### Seed Treatment

Check with your seed company to determine if seed is hot water-treated. Purchase hot water treated seed if possible or request hot water seed treatment. See the Disease section for more information to prevent disease.

#### Spacing and Seeding

**Radishes.** Seed as early in the spring as soil can be worked, then at 8 to 10 day intervals through September. Seed 10 to 15 pounds per acre. Space rows 8 to 15 inches apart with 12 to 15 plants per foot in the row.

**Rutabagas.** Seed in early spring for the early summer crop and at least 90 days before the early freeze date in the fall. Sow 1½ to 2 pounds of seed per acre at a depth of ¼ inch in rows 30 to 36 inches apart. Thin to 4 to 8 inches in the row when plants are 2 to 3 inches tall.

**Turnips.** Seed as early in the spring as soil can be worked or at least 70 days before the early freeze date in the fall. Seed in rows 1 to 2 pounds per acre, 1/8 to 1/4 inch deep, in rows 14 to 18 inches apart. Plants should be 2 to 3 inches apart in the row. Seed can also be broadcast at the rate of 2.5 pounds per acre.

#### Harvesting and Post Harvest Considerations

**Radishes.** Bunch or wrapped/bagged are the two ways radishes are sold. Typically, in this region they are bunched with the tops on. Plants are pulled and bunched with rubber bands or twist ties. Shelf life for bunched radishes is 10-14 days. Store at a temperature of 32°F (0°C) and at a relative humidity of 95-100%.

**Rutabagas.** Pull and trim tops in the field. Bruised, damaged, or diseased rutabagas will not store well. Wash rutabagas in clean water, spray-rinse with clean water, then dry as rapidly as possible before waxing or shipping. Rutabagas can be stored 2 to 4 months at 32°F (0°C) and at a relative humidity of 90 to 95%.

**Turnips.** The crop is dug mechanically and either bunched or topped. Turnips can be stored over winter at 32° to 35°F (0° to 1.67°C) and at a relative humidity of 90 to 95%.

#### Weed Control

Identify the weeds in each field and select recommended herbicides that control those weeds. See Tables E-3 and E-4.

Match preplant incorporated and preemergence herbicide rates to soil type and percent organic matter in each field.

Use shallow cultivation as necessary to control seedling weeds.

Determine the preharvest interval (PHI) for the crop. See Table E-4 and consult the herbicide label.

Find the herbicides you plan to use in the Herbicide Resistance Action Committee's (HRAC) **Herbicide Site of Action Table E-8** and follow the recommended good management practices to minimize the risk of herbicide resistance development by weeds in your fields.

#### Preemergence

**Turnips.** DCPA--6.0 to 10.5 lb/A. Apply 8.0 to 14.0 pints per acre Dacthal 6F immediately after seeding.

#### Postemergence

Clethodim--0.094 to 0.125 lb/A. Apply 6.0 to 8.0 fluid ounces per acre Select 2EC with oil concentrate to be 1 percent of the spray solution (1 gallon per 100 gallons of spray solution) or 12.0 to 16.0 fluid ounces of Select Max 0.97EC with nonionic surfactant to be 0.25% of the spray solution (1.0 quart per 100 gallons of spray solution) postemergence to control many annual and certain perennial grasses, including annual bluegrass. Select will not consistently control goosegrass. The use of oil concentrate with Select 2EC may increase the risk of crop injury when hot or humid conditions prevail. To reduce the risk of crop injury, omit additives or switch to nonionic surfactant when grasses are small and soil moisture is adequate. Control may be reduced if grasses are large or if hot, dry weather or drought conditions occur. For best results, treat annual grasses when they are actively growing and before tillers are present. Repeated applications may be needed to control certain perennial grasses. Yellow nutsedge, wild onion, or broadleaf weeds will not be controlled. Do not tank-mix with or apply within 2 to 3 days of any other pesticide unless labeled, as the risk of crop injury may be increased, or reduced control of grasses may result. Observe a minimum preharvest interval of 15 days for radish and 30 days for rutabagas and turnips.

Clopyralid--0.047 to 0.188 lb/A. Turnips ONLY! (roots and tops) Apply 2.0 to 8.0 fluid ounces of Stinger 3A or OLF per acre in a single application to control certain annual and perennial broadleaf weeds. Stinger or OLF controls weeds in the Composite and Legume plant families. Common annuals controlled include galinsoga, ragweed species, common cocklebur, groundsel, pineappleweed, clover, and vetch. Perennials controlled include Canada thistle, goldenrod species, aster species, and mugwort (wild chrysanthemum). Stinger or OLF is very effective on small

seedling annual and emerging perennial weeds less than 2 to 4 inches tall, but is less effective and takes longer to work when weeds are larger. Use 2.0 to 4.0 fluid ounces to control annual weeds less than 2 inches tall. Increase the rate to 4.0 to 8.0 fluid ounces to control larger annual weeds. Apply the maximum rate of 8.0 fluid ounces to suppress or control perennial weeds. Spray additives are not needed or required by the label, and are not recommended. Observe a minimum preharvest interval (PHI) of 30 days for turnip roots and 15 days for turnip tops. Stinger or OLF is a postemergence herbicide with residual soil activity. Observe follow-crop restrictions, or injury may occur from herbicide carryover.

### Postharvest

Paraquat--0.6 lb/A. **A Special Local-Needs 24(c) label has been approved for the use of Gramoxone SL 2.0 or OLF for postharvest desiccation of the crop in Delaware, New Jersey and Virginia.** Apply 2.4 pints per acre Gramoxone SL 2.0 or OLF as a broadcast spray after the last harvest. Add nonionic surfactant according to the labeled instructions. See the label for additional information and warnings.

### Insect Control

#### THE LABEL IS THE LAW. PLEASE REFER TO THE LABEL FOR UP TO DATE RATES AND RESTRICTIONS

**NOTE:** Copies of specific insecticide product labels can be downloaded by visiting websites [www.CDMS.net](http://www.CDMS.net) or [www.greenbook.net](http://www.greenbook.net). Also, specific labels can be obtained via web search engines.

### Soil Pests:

#### Cabbage Maggot

**Note.** When yellow-rocket (mustard family) first blooms, cabbage maggot adults (flies) begin laying eggs on roots or soil near roots.

chlorpyrifos--Lorsban Advanced. See specific rates on label based on method of application and crop. Preplant, at-plant, and post-plant applications only; do NOT apply as a foliar application.

diazinon--2.0 to 4.0 qts/A Diazinon AG500 (or OLF) as a preplant broadcast or 4 to 8 fl oz per 50 gallons of transplant solution.

#### Cutworms

Apply one of the following formulations:  
beta-cyfluthrin--1.6 to 2.8 fl oz/A Baythroid XL (or labeled mixtures containing beta-cyfluthrin, like Leverage 360)  
carbaryl--1.0 to 2.0 qts/A Sevin XLR Plus (or OLF)  
cyfluthrin--1.6 to 2.8 fl oz/A Tombstone

### Above-ground Pests:

#### Aphids

Apply one of the following formulations:  
cyantraniliprole **soil** 6.75-13.5 fl oz/A Verimark, **foliar** 13.5-20.5 fl oz/A Exirel (**turnip only**)  
flupyradifurone--7.0 to 10.5 fl oz/A Sivanto 200 SL  
imidacloprid--**soil** 4.4 to 10.5 fl oz/A Admire PRO, **foliar** 1.2 fl oz/A Admire PRO  
imidacloprid+beta-cyfluthrin--2.4-2.8 fl oz/A Leverage 360 (**radish and turnip only**)

malathion--1.0 to 2.0 pts/A Malathion 57EC (or OLF)  
thiamethoxam--**soil** 1.70 to 2.17 oz/ A Platinum 75SG or OLF; **foliar** 1.5 to 3.0 oz/A Actara 25WDG

#### Caterpillar “worm” Pests including: Cabbage Looper (CL), Diamondback moth (DBM), Imported Cabbageworm (ICW), Cross-striped Cabbageworm, Cabbage Webworm, and Armyworms

Not all materials are labeled for all crops, insects or application methods; be sure to read the label for use directions. Due to resistance development, pyrethroid insecticides are not recommended for control of DBM or beet armyworm (BAW). Other insecticides may no longer be effective in certain areas due to DBM resistance; consult your local county Extension office for most effective control. Rotation of insecticides with different modes of action is recommended to reduce the development of resistance. Underleaf spray coverage is essential for effective control particularly with *Bacillus thuringiensis* and contact materials. With boom-type rigs, apply spray with at least 3 nozzles per row--one directed downward and one directed toward each side. Evaluate effectiveness to consider need for further treatment.

Apply one of the following formulations:

*Bacillus thuringiensis*--0.5 to 2.0 lb/A Dipel DF (or OLF) (**OMRI listed**)  
chlorantraniliprole--3.5 to 5.0 fl oz/A Coragen 1.67SC  
cyantraniliprole--**soil** 5.0-10.0 fl oz/A Verimark, **foliar** 7.0-13.5 fl oz/A Exirel  
esfenvalerate--5.8 to 9.6 fl oz/A Asana XL (**ICW only**) (**turnips only**)  
methoxyfenozide--8.0 to 10.0 fl oz/A Intrepid  
spinetoram--6.0 to 8.0 fl oz/A Radiant SC  
spinosad--1.7 to 3.3 fl oz/A Blackhawk or 1.0 to 2.0 oz/A Entrust (**OMRI listed**)

#### Flea Beetles

Apply one of the following formulations:  
beta-cyfluthrin--1.6 to 2.8 fl oz/A Baythroid XL  
carbaryl--0.5 to 1.0 qts/A Sevin XLR (or OLF)  
cyfluthrin--1.6 to 2.8 fl oz/A Tombstone  
esfenvalerate--5.8 to 9.6 fl oz/A Asana XL  
imidacloprid--**soil** 4.4 to 10.5 fl oz/A Admire Pro, **foliar** 1.2 fl oz/A Admire PRO  
imidacloprid+beta-cyfluthrin--2.4 to 2.8 fl oz/A Leverage 360 (**radish and turnip only**)  
spinosad--1.7 to 3.3 oz/A Blackhawk or 1.0 to 2.0 oz/A Entrust (**OMRI listed**)  
thiamethoxam--**soil** 1.7 to 2.17 oz/ A Platinum 75SG or OLF; **foliar** 1.5 to 3.0 oz/A Actara 25WDG

#### Leafminers

Apply one of the following formulations:  
cyantraniliprole--**soil** 6.75-13.5 fl oz/A Verimark, **foliar** 13.5-20.5 fl oz/A Exirel  
spinetoram--6.0 to 8.0 fl oz/A Radiant SC  
spinosad--1.7 to 3.3 fl oz/A Blackhawk or 1.0 to 2.0 oz/A Entrust (**OMRI listed**)

Pesticide	Use Category <sup>1</sup>	Hours to Reentry	Days to Harvest <sup>2</sup>		
			Radish	Rutabagas	Turnip
<b>INSECTICIDE</b>					
<i>Bacillus</i>					
<i>thuringiensis</i>	G	4	0	0	0
beta-cyfluthrin	R	12	0	0	0
carbaryl	G	12	7	7	14
chlorantraniliprole	G	4	1	1	1
chlorpyrifos	R	24	30	30	30
cyantraniliprole (soil/foliar)	G	4/12	--	--	AP/1
cyfluthrin	R	12	0	0	0
diazinon	R	96	AP	AP	--
esfenvalerate	R	12	7	--	7
flupyradifurone	G	4	7	7	7
imidacloprid (soil/foliar)	G	12	21/7	21/7	21/7
imidacloprid + beta-cyfluthrin	R	12	7	--	7
malathion	G	12	7	7	7
methoxyfenozide	G	4	1	1	1
spinetoram	G	4	3	3	3
spinosad	G	4	3	3	3
thiamethoxam (soil/foliar)	G	12	21/7	21/7	21/7
<b>FUNGICIDE (FRAC code)</b>					
azoxystrobin (Group 11)	G	4	0	0	0
Cabrio (Group 11) copper, fixed (Group M1)	G	see label	0	--	0
Merivon (Groups 7 + 11)	G	12	7	7	7
Presidio (Group 43)	G	12	7	7	7
Ranman (Group 43)	G	12	--	--	0
Ridomil Gold (Group 4)	G	48	AP	AP	AP
Ridomil Gold Copper (Groups 4 + M1)	G	48	7	--	--
Ultra Flourish (Group 4)	G	48	AP	AP	AP
Uniform (Groups 4 + 11)	G	0	AP	AP	AP

See Table D-6.

Dash (--) in table indicates pesticide is **not** labeled for that crop.

<sup>1</sup> G=general, R=restricted

<sup>2</sup> AP=At planting application

### Disease Control

#### Seed treatment options

Heat treatment of seeds is a non-chemical alternative to conventional chlorine treatments that only kill pathogens on the surface of the seed coat. Heat treatment has the additional benefit of killing pathogens that may be found within the seed coat. Heat treatment is particularly useful for crops that are prone to seed-borne bacterial infections. Seed heat-treatment follows a strict time and temperature protocol, and is best done with thermostatically controlled water baths. Two baths are required; one for pre-heating, and a second for the effective (pathogen killing) temperature. The initial pre-heat cycle is for 10 minutes at 100°F (37°C) followed by the effective (pathogen killing) temperature. Soak radish seed at 122°F (50°) for 15 minutes. Immediately after removal from the second bath, seeds should be rinsed with cool water to stop the heating process. Afterward, seeds should be dried on screen or

paper. Pelleted seed is not recommended for heat treatment. Heat treat only seed that will be used during the current production season.

An alternative to hot water seed treatment is to use 1 part Alcide (sodium chlorite), 1 part lactic acid, and 18 parts water as a seed soak. Treat seed for 1 to 2 minutes with constant agitation and rinse for 5 minutes in running water.

Following either treatment above, dry the seed, then dust with Captan 50WP or Thiram 480DP at 1 level teaspoon per pound of seed (3 oz/100 lb).

#### Seed treatment prior to seeding

For Pythium and Phytophthora root rot control use a seed treatment such as Apron XL LS (mefenoxam)--0.085 to 0.64 fl oz/100 lb seed

For control of other root rots apply:

Maxim 4FS--0.08 to 0.16 fl oz/100 lb seed

Apron XL LS and Maxim 4FS can be combined.

#### Damping-off (caused by *Pythium* or *Phytophthora*, and *Rhizoctonia*) after seeding

For Pythium root rot control apply as banded spray:

Presidio--3.0 to 4.0 fl oz 4SC/A

mefenoxam--0.5 to 1.0 pt Ridomil Gold 4SL/A

metalaxyl--2.0 to 4.0 pt MetaStar 2E AG/A

For Rhizoctonia root rot control apply as in-furrow application:

azoxystrobin--0.40-0.80 fl oz 2.08F/A (see label) or OLF

For Pythium and Rhizoctonia root rot control apply as banded spray:

mefenoxam + azoxystrobin (Uniform--0.34 fl. oz 3.66SC/1000 ft. row). See label for restrictions

Uniform, Presidio, mefenoxam, or metalaxyl applied at seeding will also help control Downy mildew.

Uniform--0.34 fl. oz 3.66SE/1000 ft row. See label for restrictions. Uniform applied at seeding will also help control Rhizoctonia and Downy mildew.

#### Black Rot, Blackleg, and Alternaria

Black rot, Black leg and Alternaria can survive on infested debris and on infested seed. Purchase certified or treated seed. Use hot water seed treatment to help reduce seed-borne infections. See the proceeding "Seed treatment options" section. Thoroughly disc or plow under all plant debris after harvest. Eliminate cruciferous weeds from field which can act as hosts and rotate with non-cruciferous crops.

#### Clubroot

Radishes are susceptible to clubroot, whereas turnips are resistant. Use of irrigation water containing spores of the fungus is the principal way that the pathogen is spread to new fields. If clubroot occurs, take time to clean and disinfest any equipment to be used in other fields to its prevent spread. Adjust soil pH with hydrated lime to as close to 7.0 as possible. Improve drainage in the field as much as possible and grow using raised beds.

#### Downy Mildew

Apply the following when weather conditions favor disease development and/or disease is first noticed:

copper, fixed--at labeled rates every 7 to 10 days

Ranman--2.75 fl oz 400SC/A (for use in Turnip greens only)

Applications of Uniform, Presidio, mefenoxam, or metalaxyl applied at seeding for root rot control will also help reduce chances for downy mildew development.

### **Leaf Spots (caused by *Cercospora*, *Alternaria*, or *Powdery mildew*)**

Long periods of wet weather and driving rains which promote soil splashing are conducive for development. Thoroughly disc or plow under all plant debris after harvest. Eliminate cruciferous weeds from field which can act as hosts and rotate with non-cruciferous crops.

Apply and alternate one of the following preventatively and/or when conditions favor development:

Merivon--4.0 to 5.5 fl oz 2.09SC/A

### **Rotate with one of the following FRAC code 11 fungicides:**

azoxystrobin--6.0 to 15.5 oz 2.08SC/A or OLF) plus fixed copper at labeled rates  
Cabrio--8.0 to 12.0 oz 20WG/A plus fixed copper at labeled rates

### **Fixed coppers not for use in rutabagas**

### **Scab**

This disease is more severe under dry soil conditions, high soil pH, and low level of magnesium. Heavy irrigation in the first 2 weeks after emergence and the application of sulfur to reduce soil pH will assist in disease control.

### **White Rust**

When weather conditions favor disease development or at the first sign of disease in field:

Apply:

Ridomil Gold Copper--2.0 lb 65WP/A every 7 days (not for use in rutabagas and turnip)

### **Alternate with one of the following FRAC code 11 fungicides:**

azoxystrobin--6.0 to 15.5 fl oz 2.08F/A) or OLF  
Cabrio--8.0 to 16.0 oz 20WG/A

Presidio and Ridomil Gold Copper applications will also help control downy mildew (see labels for restrictions).

Hispanic peppers, African greens and eggplants).

As with any new enterprise, developing a marketing plan for specialty vegetables is essential. There are several important points to consider:

- Before you plant, make sure you know where you will be selling your crop when it is ready to harvest.
- Be sure you fully understand all the quality, grading and packaging requirements, and costs for various market outlets. Apparently similar ethnic groups may want very different varieties of the same crop, or use the same/similar names for different types of crops, or different names for the same crop.
- Be sure to determine if consumers will want it when you can produce it.
- Assess the costs of production, especially the time and labor required. On-farm trials will help determine varieties and production systems, and small plantings will help work out problems that can be resolved easily (Maynard, 1995 see Section R). Keep accurate records of the small scale productions to be able to estimate costs and returns for larger commercial plantings.
- Increase production as demand grows, but be constantly aware of the number of competitors entering the enterprise. Here your prospective buyers may be the most revealing source of competition, though state and federal crop reporting agencies, and your local Extension workers are good sources of information.
- Project the effects on price that various levels of competitive supply will have to determine if returns will pay for any required capital costs over a specified period of time.

Keep in mind that a specialty enterprise may not be limited to a single vegetable, but may include a group of complimentary crops that fill a diverse market niche. Each crop may be a required part of the mix in order to gain a foothold in the market that a single crop will not allow.

Understanding marketing for specialty crops is the first step toward making profitable production decisions. The following sections describe the production practices for specialty vegetables grouped by the general market outlets for the specific crops to direct the producer's attention to that critical part of the decision process.

## **Specialty Vegetable Markets Organic & Hydroponic Production**

Production practices which, in and of themselves, create niche-market 'specialty vegetables' are not the focus here. Most, if not all, of the crops described here. can be grown by 'organic' practices, i.e. those approved under the USDA National Organic Program. Likewise, using 'hydroponic' techniques to grow crops in a nutrient solution, normally in a controlled environment structure such as a greenhouse, is also suitable for many vegetable crops if there is sufficient market demand to justify the capital investment for this type of system. Both of these production systems require marketing to specific niche markets where demand is greatest for them. The combination of organically grown exotic vegetables may compound the demand.

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## **SPECIALTY VEGETABLES**

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### **Niche Marketing**

The term 'specialty vegetables' refers to the large group of crops that fit into several niche markets. They are sometimes called 'exotic' as they represent a class of vegetables unlike standard tomatoes, peppers, beans, peas and sweet corn, etc.; 'alternative' because they represent new enterprises that traditional vegetable growers might try; or 'designer veggies' that allow the consumer to be creative with their presentation. Specialty vegetables can be described as the new and unusual in the manner they are produced (organic, hydroponic); in the color, shape or flavor of the varieties grown (red and oakleaf lettuces, pear tomatoes, heirloom varieties and unusual greens like radicchio); in their size (baby, miniature, micro); or in their ethnic origins and demand (Asian crucifers and cucurbits,