



## Cool Season Root Crop

### Beets

<b>Days to Germination</b>	<ul style="list-style-type: none"> <li>• 5 to 16</li> </ul>
<b>Days to Maturity</b>	<ul style="list-style-type: none"> <li>• 40 to 50</li> </ul>
<b>Soil</b>	<ul style="list-style-type: none"> <li>• pH: 6.0 to 7.5</li> <li>• Sensitive to acidic soil</li> <li>• Well-drained, loose, sandy loam soil</li> </ul>
<b>Spacing</b>	<ul style="list-style-type: none"> <li>• Between plants: 2 in. to 4 in.</li> <li>• Between rows: 12 in. to 18 in.</li> </ul>
<b>Harvest</b>	<ul style="list-style-type: none"> <li>• Beet greens are best at 4 in. to 6 in.</li> <li>• A full-grown beet is roughly the size of a tennis ball, depending on the variety.</li> </ul>
<b>Postharvest</b>	<ul style="list-style-type: none"> <li>• Hydrocool by spraying or immersing vegetables in chilled water</li> <li>• Can be stored for 4 to 6 months at 32°F and 100% relative humidity</li> </ul>
<b>Production Concerns</b>	<ul style="list-style-type: none"> <li>• Provide beets with consistent moisture, particularly during early development, but avoid overwatering.</li> </ul>
<b>Pests and Diseases</b>	<ul style="list-style-type: none"> <li>• Pests: Mexican bean beetles, leafhoppers, leaf miners, wireworms, mice, rabbits</li> <li>• Diseases: Alternaria, Cercospora, Ramularia, damping-off</li> </ul>
<b>Other Considerations</b>	<ul style="list-style-type: none"> <li>• Rotate crops to avoid Cercospora.</li> </ul>

Banse, G. *Growing Beets*. Farm and Garden. <http://www.farm-garden.com/growing-vegetables/beets>.

Source accessed November 14, 2005.





## Cool Season Root Crop

### Carrots

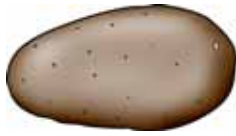
<b>Days to Germination</b>	<ul style="list-style-type: none"> <li>• 6 to 18</li> </ul>
<b>Days to Maturity</b>	<ul style="list-style-type: none"> <li>• 70 to 85</li> </ul>
<b>Soil</b>	<ul style="list-style-type: none"> <li>• pH: 6.5 to 7.0</li> <li>• Well-drained, sandy loam soils</li> </ul>
<b>Spacing</b>	<ul style="list-style-type: none"> <li>• Between plants: 3 in.</li> <li>• Between rows: 18 in. if cultivated by hand; 42 in. if field implements are used</li> </ul>
<b>Harvest</b>	<ul style="list-style-type: none"> <li>• Baby carrots: 4 in. to 5 in. long</li> <li>• Mature carrots: 3/4 in. to 1 1/2 in. in diameter</li> </ul>
<b>Postharvest</b>	<ul style="list-style-type: none"> <li>• Can be stored for 7 to 9 months at 32°F to 34°F and 98% to 100% relative humidity</li> </ul>
<b>Production Concerns</b>	<ul style="list-style-type: none"> <li>• Provide 1 in. of water per week during growing season.</li> </ul>
<b>Pests and Diseases</b>	<ul style="list-style-type: none"> <li>• Pests: carrot rust fly larvae, wireworms, leafhoppers</li> <li>• Diseases: leaf spot, soft rot, aster yellow</li> </ul>
<b>Other Considerations</b>	

Banse, G. *Growing Carrots*. Farm and Garden. <http://www.farm-garden.com/growing-vegetables/carrots>.

Jett, L. W. *Vegetable Planting and Planning Calendar*. University of Missouri Extension. <http://muextension.missouri.edu/explore/agguides/hort/g06201carrot.htm>.

Sources accessed November 9, 2005.





## Cool Season Root Crop Potatoes

<b>Days to Germination</b>	<ul style="list-style-type: none"> <li>• 10 to 14</li> </ul>
<b>Days to Maturity</b>	<ul style="list-style-type: none"> <li>• 100 to 120</li> </ul>
<b>Soil</b>	<ul style="list-style-type: none"> <li>• pH: 5.0 to 5.5</li> <li>• Good drainage</li> <li>• High phosphorus, nitrogen, and potassium content</li> </ul>
<b>Spacing</b>	<ul style="list-style-type: none"> <li>• Between plants: 6 in. to 12 in.</li> <li>• Between rows: 30 in. to 36 in.</li> </ul>
<b>Harvest</b>	<ul style="list-style-type: none"> <li>• New potatoes: Check when plants are blossoming and harvest when potatoes reach the desired size.</li> <li>• Mature potatoes: Harvest when leaves die back.</li> <li>• Lighter, well-drained soils make harvesting easier.</li> </ul>
<b>Postharvest</b>	<ul style="list-style-type: none"> <li>• Brush off the soil, but do not wash potatoes.</li> <li>• Cure potatoes in a dry, dark, cool place prior to prolonged storage.</li> <li>• Mature potatoes can be stored for 5 to 10 months at 40°F to 50°F and 90% relative humidity.</li> </ul>
<b>Production Concerns</b>	<ul style="list-style-type: none"> <li>• Provide uniform moisture throughout growing season.</li> </ul>
<b>Pests and Diseases</b>	<ul style="list-style-type: none"> <li>• Pests: Colorado potato beetles, pocket gophers</li> <li>• Diseases: speckle leaf, black leg, potato blight, early blight, late blight, ring rot</li> </ul>
<b>Other Considerations</b>	<ul style="list-style-type: none"> <li>• Potatoes can also be grown in trenches, hills, mulch, and structures such as vertical boxes and wire cages.</li> <li>• Growing potatoes in mulch works well in areas with rocky or compact soil.</li> <li>• Soil can dry out quickly when more surface area is exposed to the air, as in hills or wire cages. Monitor moisture levels closely.</li> </ul>

## Fruit and Vegetable Production

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Banse, G. *Growing Potatoes*. Farm and Garden. <http://www.farm-garden.com/growing-vegetables/potatoes>.

Jett, L. W. *Vegetable Planting and Planning Calendar*. University of Missouri Extension. <http://muextension.missouri.edu/explore/agguides/hort/g06201potato.htm>.

Vegetable Research and Information Center. "Seed Germination Temperatures."  
University of California.  
<http://vric.ucdavis.edu/veginfo/commodity/garden/veggarden/SeedGerminationTemp.pdf>.

Sources accessed November 7, 2005.



## Cool Season Root Crop

### Radishes

<b>Days to Germination</b>	<ul style="list-style-type: none"> <li>• 4 to 12</li> </ul>
<b>Days to Maturity</b>	<ul style="list-style-type: none"> <li>• 25 to 35</li> </ul>
<b>Soil</b>	<ul style="list-style-type: none"> <li>• pH: 6.5 to 7.0</li> <li>• Cool, moist soil</li> <li>• Maintain soil pH at 6.8 or higher to manage club root.</li> </ul>
<b>Spacing</b>	<ul style="list-style-type: none"> <li>• Between plants: 1 in. to 2 in. for smaller varieties; 6 in. for larger varieties</li> <li>• Between rows: 18 in.</li> </ul>
<b>Harvest</b>	<ul style="list-style-type: none"> <li>• To harvest, grasp radishes by the top and pull them from the ground.</li> <li>• Harvest radishes when they are 1/2 in. to 1 in. in diameter.</li> </ul>
<b>Postharvest</b>	<ul style="list-style-type: none"> <li>• Wash and dry radishes thoroughly.</li> <li>• Hydrocooling improves shelf life and helps maintain crispness.</li> <li>• Washing with chlorinated water helps reduce black spot.</li> <li>• Radishes can be stored for 1 to 2 weeks at 32°F and 95% to 100% relative humidity.</li> </ul>
<b>Production Concerns</b>	<ul style="list-style-type: none"> <li>• Keep soil consistently moist to prevent radishes from becoming bitter and mealy.</li> </ul>
<b>Pests and Diseases</b>	<ul style="list-style-type: none"> <li>• Pests: cabbage maggots, flea beetles, aphids</li> <li>• Diseases: generally free of disease</li> </ul>
<b>Other Considerations</b>	<ul style="list-style-type: none"> <li>• Can be grown within other crops</li> </ul>

## Fruit and Vegetable Production

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Banse, G. *Growing Radishes*. Farm and Garden. <http://www.farm-garden.com/growing-vegetables/radishes>.

Commercial Vegetable Production Guides. "Radish." Oregon State University. <http://oregonstate.edu/Dept/NWREC/radish.html>.

Jett, L. W. *Vegetable Planting and Planning Calendar*. University of Missouri Extension. <http://muextension.missouri.edu/explore/agguides/hort/g06201radish.htm>.

Schrock, D. *Vegetable Harvest and Storage*. University of Missouri Extension. <http://muextension.missouri.edu/explore/agguides/hort/g06226.htm>.

Sources accessed November 14, 2005.





## Cool Season Root Crop

### Turnips

<b>Days to Germination</b>	<ul style="list-style-type: none"> <li>• 3 to 7</li> </ul>
<b>Days to Maturity</b>	<ul style="list-style-type: none"> <li>• 35 to 70</li> </ul>
<b>Soil</b>	<ul style="list-style-type: none"> <li>• pH: 6.0 to 6.8</li> </ul>
<b>Spacing</b>	<ul style="list-style-type: none"> <li>• Between plants: Sow seeds 1 in. apart; thin plants to 2 in. to 6 in. apart</li> <li>• Between rows: 12 in.</li> </ul>
<b>Harvest</b>	<ul style="list-style-type: none"> <li>• Turnips can be harvested from the time they reach 1 in. in diameter. Once they are roughly the size of a tennis ball, they tend to become woody and tough.</li> <li>• Harvest turnip greens when they are 4 in. to 6 in.</li> </ul>
<b>Postharvest</b>	<ul style="list-style-type: none"> <li>• Can be stored for 4 to 5 months at 32°F and 90% to 95% relative humidity</li> </ul>
<b>Production Concerns</b>	<ul style="list-style-type: none"> <li>• Provide plenty of water to help prevent woody stems.</li> </ul>
<b>Pests and Diseases</b>	<ul style="list-style-type: none"> <li>• Pests: aphids, beetles, slugs, snails, cutworms, root maggots</li> <li>• Diseases: mildew, white blister disease</li> </ul>
<b>Other Considerations</b>	<ul style="list-style-type: none"> <li>• Turnips can withstand several light freezes.</li> </ul>

## Fruit and Vegetable Production

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Ed Hume Seeds. "Soil pH That Vegetables Prefer."  
<http://www.humeseeds.com/soilph.htm>.

The Gardener's Network. "How to Grow Turnips."  
<http://www.gardenersnet.com/vegetable/turnip.htm>.

Jett, L. W. *Vegetable Planting and Planning Calendar*. University of Missouri Extension.  
<http://muextension.missouri.edu/explore/agguides/hort/g06201turnip.htm>.

Organic Gardening Tips. "Turnip Gardening Tips and Advice."  
[http://www.organicgardentips.com/tips\\_on\\_how\\_to\\_grow\\_turnips.html](http://www.organicgardentips.com/tips_on_how_to_grow_turnips.html).

Perkins-Veazie, P. "Turnip." *The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks*. (draft, rev. 2004) U. S. Department of Agriculture/Agricultural Research Service. <http://www.ba.ars.usda.gov/hb66/140turnip.pdf>.

Schrock, D. *Vegetable Harvest and Storage*. University of Missouri Extension.  
<http://muextension.missouri.edu/explore/agguides/hort/g06226.htm>.

Sources accessed November 7, 2005.

## Cool Season Root Crop

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<b>Days to Germination</b>	
<b>Days to Maturity</b>	
<b>Soil</b>	
<b>Spacing</b>	
<b>Harvest</b>	
<b>Postharvest</b>	
<b>Production Concerns</b>	
<b>Pests and Diseases</b>	
<b>Other Considerations</b>	

