Vegetables: Growing Potatoes in Home Gardens

WASHINGTON STATE UNIVERSITY EXTENSION FACT SHEET • FS165E

Crop at a Glance

Growing season: Spring, summer, and early fall.

Time of planting: Depending on the cultivar, potatoes may be planted from early spring through early summer.

Spacing: Plant seed potatoes 10–12 inches apart in rows spaced 24–36 inches apart. Cultivars with white, red, or yellow round tubers and smaller vines (producing fewer tubers per plant) are spaced 6–8 inches apart.

Days to harvest: 70–120 days depending on the cultivar.

Yield: 20 lb per 10-foot row.

Common starting method: Seed potatoes (cut pieces of potato or small whole potatoes) are planted in the soil.

Introduction

Potatoes are grown worldwide and are a staple of the human diet. They are a good source of complex carbohydrates, potassium, vitamin C, folic acid, trace minerals, and iron. The ancestor of today's cultivated potatoes, often called Irish potatoes or white potatoes, is native to the Andes region of South America. In addition to white-fleshed potatoes, there are cultivars that produce tubers with yellow, purple, pink, red, and even orange flesh.

Botanically, potatoes are not roots. They are tubers. Tubers are short, fleshy underground stems. The "eyes" on a potato tuber are nodes with buds capable of producing new plants.

Selecting Types to Plant

There are hundreds of named potato cultivars (cultivated varieties). Select cultivars based on your tastes, intended use, and storability. Gardeners may want to consider growing heirloom and gourmet cultivars that cannot be found in most grocery stores. Washington State University has compiled a list of cultivars that researchers have grown in the Pacific Northwest to evaluate for commercial production. This list, *Potato Varieties from the Northwest (Tri-Sate) Potato Variety Development Program*, provides links to information on growing and best uses for a number of the cultivars.

Potatoes may be grouped into classes based on shape, color, flesh color, and the texture or appearance of their skin. Russet-type potatoes are generally oblong and have a thicker, rougher skin than the smooth-skinned type. Flesh flavor, texture, culinary uses, and storability vary with cultivar; selection of cultivars should be based on the gardener's preferences and intended uses.

Potatoes may also be grouped by the average length of their growing season, with early cultivars maturing in 60–80 days, mid-season cultivars in 80–100 days, and late season cultivars maturing in 100 days or more. In areas with long growing seasons, potato harvesting can be spread out by planting all three types of cultivars or by staggering planting times of one type.

There are also numerous heirloom and specialty potato cultivars that vary widely in flavor, shape, and color. Fingerling potatoes are a popular group of specialty potatoes. These cultivars have small, elongated, finger-shaped tubers. Some types of specialty potatoes, like fingerlings, are starting to become available on grocery store shelves, but most are not readily available. However, home gardeners can find seed for specialty potatoes through mail-order companies.

Choosing a Planting Site

Because tubers develop in the soil, potatoes grow best in loamy or sandy soils that are well-drained and free of rocks, but they can be grown in almost any type of soil. Potatoes prefer slightly acidic soil with a pH of 6, but will tolerate slightly alkaline soils with a pH of 8. A soil test will provide the pH and nutrient levels in the soil. Potatoes growing in alkaline soil or soil that has been amended with fresh manure or wood ashes are more prone to developing scab, a disease that affects the tubers.

Some home garden soils in Washington State may contain high levels of heavy metals like lead and arsenic. These heavy metals can pose a human health risk when gardening or eating vegetables (especially tuber and root vegetables) grown in these soils. WSU Extension recommends having soil tested for heavy metals if this is a concern in your area. For more information, see *Gardening on Lead- and Arsenic-Contaminated Soils*. If the soil is contaminated, potatoes can be grown without soil in containers consisting of uncontaminated media.

Planting Guidelines

Potatoes are typically planted from seed potatoes. These are potato tubers that were produced the previous season. Small whole potatoes or potatoes cut into pieces with at least one "eye" are used as seed pieces. Seed potatoes can be purchased from farm and garden stores or through mail-order companies.

Purchase only certified potato seed. Certified seed is tested and verified to be relatively disease free and not treated with sprout inhibitors. Experts advise against using market potatoes for seed potatoes because many have been treated with sprout inhibitors and may be infected with viruses, which will significantly reduce yield and quality.

Many gardeners plant potatoes as soon as they can get out in the garden in the spring, when the soil is dry enough to be tilled. However, waiting to plant later in the spring helps avoid rot due to cold, wet soils and damage from frost after shoots develop. Wait to plant for approximately 4–6 weeks before the last date of frost in your area and when the soil temperature is at least 50°F.

To prepare the soil for planting, till to a depth of 6–8 inches. Avoid excessive tilling, which destroys soil structure. Work well-rotted compost or manure into the soil, but do not use fresh manure as it may contain pathogens that are a human health risk. It could also introduce scab disease into the soil, especially on smooth-skinned potatoes. Apply fertilizer as recommended by a soil test. For guidelines on fertilizing your vegetable garden, consult *Home Gardener's Guide to Soils and Fertilizers*.

To plant, use a hoe to create furrows (shallow trenches) about 4 inches deep. Place the seed in the bottom of the furrow approximately 10 to 12 inches apart and then cover with 4 inches of soil. Furrows should be spaced 2 to 3 feet apart. When planted at the 2-foot spacing, the plant will provide better shade coverage, which is an advantage in areas where high soil temperatures deter tuber growth. Depending on the weather and the soil temperature, sprouts will start to emerge from the soil in about 3 to 4 weeks.

Growing potatoes under straw is an alternative to hilling them with soil. Plant seed pieces on top of the soil or only about an inch deep in the soil using the recommended spacing. Cover the seed with a 6-inch layer of clean straw. It is likely that growing potatoes under a layer of straw will not be successful for gardeners living in regions of the state with extremely hot, dry summer conditions.

Plant Maintenance

Hilling is a technique used when growing potatoes that involves covering the tubers with more soil as they grow. When hilling, wait for potato plants to reach a height of 6 inches or more, then use a hoe to gently pull soil from between the rows and gently mound it around the base of the plant, creating a new 2-inch layer of soil. Repeat this process every couple of weeks until the "hill" is 6–8 inches high. If preferred, a low 2-inch hill can be created at the time of planting and then increased periodically after plant emergence.

Hilling potato plants helps control weeds, loosen the soil, and prevent tubers from turning green. Greening occurs when tubers are exposed to sunlight. While this green plant pigment (chlorophyll) is harmless, the tubers also develop a poisonous alkaloid (solanine) when exposed to light. Eating large amounts of this alkaloid can cause illness; although, it is unlikely that individuals will eat enough to make them sick because it has a very bitter taste. However, it is best to hill the potatoes to avoid producing potatoes with green skin and flesh.

When growing potatoes under straw, wait for potato sprouts to appear above the straw, then add another 6-inch layer of straw. Repeat when the sprouts appear again. The tubers develop in the straw, instead of in the soil. Plus, the straw helps in controlling weeds and maintaining soil moisture.

While growing potatoes is relatively easy, maintaining an even soil moisture is crucial to producing a good crop of well-shaped potatoes. After the plants emerge, potatoes need about 2 inches of water per week, depending on the weather and the type of soil. Regular irrigation will be needed if natural precipitation is not adequate.

Unless the soil is very dry, do not water your potato planting before plants emerge because it can lead to seed rot and crop failure. When irrigating, moisten the top 18 inches of soil. Additional water is not needed because potato roots only grow to a depth of 18 inches in good soil. To avoid leaf diseases, it is advisable to irrigate in late afternoon or early evening so the leaves do not stay wet for long periods of time.

Wide fluctuations in soil moisture will cause uneven tuber development leading to potatoes with knobby growth, pointed ends, or a dumbbell shape, depending on when the water-stress occurs.

Mulching between rows will help maintain more even soil moisture, reduce weed growth, and keep the soil cooler during hot weather.

Pest Management

Potatoes are susceptible to a long list of diseases and insect pests in Washington gardens. Common diseases include late blight, scab, black scurf, Verticillium wilt, and numerous viruses. Common insect problems include Colorado potato beetle, aphids, flea beetles, and wireworms. For management information on using chemicals for pest control, see the WSU Hortsense website.

Common Problems

Green Skin

Photo: Scott Bauer, USDA

Symptoms: Potato skin and flesh beneath skin is green.

Corrective Action: Keep tubers covered or "hilled" with soil or straw to prevent exposure to sun.

Knobby Potatoes

Photo: Howard F. Schwartz, Colorado State University, Bugwood.org

Symptoms: Instead of being round or oblong, tubers have malformed, knobby growth.

Corrective Action: Uneven tuber growth is caused by fluctuating soil moisture. Try to maintain a moderately moist soil.

Hollow Heart

Photo: Gerald Holmes, California Polytechnic State University at San Luis Obispo, via Bugwood.org

Symptoms: A hollow space in the flesh of the potato, often near the center.

Corrective Action: Hollow heart is associated with rapid tuber growth that occurs after experiencing the stress of cool temperatures, drought, or saturated soil. The potato is safe to eat, just cut the darkened area out.

Late Blight
(*Phytophthora infestans*)

Photo: D.A. Inglis and J. Gigot, Washington State University

Symptoms: First appears as gray-green spots on leaves and stems that enlarge into blotches with a pale green margin. This fungus is favored by cool, wet conditions and is spread by wind.

Corrective Action: Plant only certified potato seed. Rotate garden crops, and avoid planting potatoes and tomatoes in the same area for 2–3 years. If irrigation is needed, avoid wetting foliage. Plant potatoes at the recommended spacing. This facilitates good air circulation between plants. As soon as the disease is noticed, remove infected plant parts or entire plants to reduce the spread of the disease. Do not compost diseased plant material.

Scab
(*Streptomyces scabies*)

Photo: Clemson University-USDA Cooperative Extension Slide Series, Bugwood.org

Symptoms: Appears as raised brown corky spot on tuber surfaces or as corky pitted areas, especially on smooth-skinned cultivars. Scabby areas primarily affect tuber appearance and not edibility. The disease is favored by alkaline soils.

Corrective Action: Do not add lime, wood ashes, or fresh manure when preparing garden soil. Maintain an evenly moist soil, especially during early tuber development. Rotate crops, and avoid planting potatoes and beets in the same area for 2–3 years. Plant only certified potato seed, and select scab-resistant cultivars, such as Nooksack, Norgold, or Russet Burbank.

Viruses
(Calico, Corky Ringspot, Potato Mop Top, Potato Virus Y, Latent, Potato Leafroll, and Rugose Viruses)

Photo: Babette Gunderson, Washington State University

Symptoms: Symptoms caused by various viruses include malformed growth, including cupped leaves; yellow rings, spots, or blotches on leaves; stunted growth; rolled or curled leaves; and yellowing of leaves.

Corrective Action: Plant only certified seed potatoes. Control weeds in and around the garden. As soon as they appear, control insects, like aphids and leafhoppers, which spread viruses. Remove any infected plants as soon as they appear.

Verticillium Wilt
(*Verticillium dahliae*)

Photo: Gary Pelter, Washington State University

Symptoms: Disease may first appear as yellowing and dieback of the plant starting at the base of the plant and moving upward. Entire plants or only part of a plant may wilt and die. Vascular tissues in the stems of infected plants will appear brown.

Corrective Action: Plant only certified seed of Verticillium-resistant cultivars. Rotate crops, and avoid planting potatoes or tomatoes in the same area for 2–3 years. Remove and dispose of infected plants.

Black Scurf
(*Rhizoctonia solani*)

Photo: D.A. Inglis, Washington State University

Symptoms: This soil fungus causes tubers to develop patches of scurf, black fungal structures that resemble dirt. They are only on the surface of the tuber, but do not come off when washed. The disease is common in soils high in organic matter.

Corrective Action: Plant only certified seed potatoes. Rotate crops, and avoid planting potatoes in the same area for 2¬–3 years. Plant in warm, well-drained soil and avoid excessive soil moisture.

Aphids
Green Peach Aphid (*Myzus persicae*) and Potato Aphid (*Macrosiphum euphorbiae*)

Photo: Mike Bush, Washington State University

Symptoms: Heavy aphid infestations can cause distorted and stunted growth, but the major damage they cause to potatoes is by infecting the plants with various viruses.

Corrective Action: Knock aphids off the plant with a strong stream of water. Control weeds in and around the garden as they may serve as host plants for aphids before they move to potato plants. Remove virus-infected plants immediately.

Colorado Potato Beetle

Photo: Mike Bush, Washington State University

Symptoms: Look for the yellow- and black-striped adult beetles and reddish-orange humpbacked larva that chew on leaves, leaving chewed edges and holes in leaves.

Corrective Action: In the spring, look for and destroy egg clusters and adults on the undersides of leaves. Control weeds in and around the garden, especially nightshade. Rotate crops.

Potato Flea Beetles
Western Potato Flea Beetle (*Epitrix subcrinita*) and Tuber Flea Beetle (*Epitirix tuberis*)

Photo: Mike Bush, Washington State University

Symptoms: Flea beetles feed on leaves, creating scallop-like scoops, pits, or small round holes early in the season. The larvae feed on tubers, leaving winding grooves on the surface or boring small pinholes into the tuber.

Corrective Action: Control weeds in and around the garden, which may harbor beetles.

Wireworms
(*Limonius* spp., *Agriotes* spp., and *Ctenicera* spp.)

Photo: Mike Bush, Washington State University

Symptoms: Creates holes 1/8- to 1/4-inch wide leading to tunnels beneath the potato skin. Larvae first appear white and later turn yellow to brown when mature.

Corrective Action: Crop rotation may help reduce wireworm damage.

Harvest and Storage

Early maturing cultivars can be harvested as "new" or baby potatoes in mid-summer, whenever they reach a desirable size. Planting in straw makes it easy to harvest a few new potatoes without killing the plant. Lift up the straw layer, remove a few potatoes directly under the straw, and then replace the layer. "New" potatoes are immature and do not store well. They can be stored in the refrigerator for about a week.

Potatoes that will be stored through the fall and winter should be harvested when mature. Depending on the cultivar, this will be approximately 70 to 120 days after planting. The vines will start to die back in late summer or early fall, when the tubers are mature. Stop irrigating after the tops die back naturally or you cut them off. This promotes wound healing and tuber maturation. In regions where wet fall weather may hamper harvest, potato plants may be cut off at the soil surface using pruning shears.

Dig your potatoes approximately 2 weeks after the vines have died back or been cut back. Waiting allows the skin to thicken, so they will not injure as easily when dug. Use a lifting fork to "dig" the potatoes; push the fork into soil just outside the row and then "lift" up under potato plant.

Do not try to store tubers that are bruised or injured from digging. Use these potatoes soon after digging. If you plan to store your potatoes for a month or more, you will need a cold (40–50°F), dark location with good ventilation and high humidity. When stored under lower temperatures, the starches will turn to sugars, which produce sweet-tasting potatoes. Do not store tubers in plastic or with ethylene-producing fruit like apples that cause sprouting. Periodically inspect stored potatoes and discard any that show signs of rot or shriveling.

End Uses

Potatoes are typically harvested or stored and then cooked in some way before eating. Raw potatoes are not considered palatable. There are many recipes available for baked, broiled, sautéed, roasted, grilled, or fried potatoes. Avoid using and eating potatoes with green skin or flesh.

Further Reading

Cogger, C. 2005. Home Gardener's Guide to Soils and Fertilizers. *Washington State University Extension Publication* EM063E. http://cru.cahe.wsu.edu/CEPublications/EM063E/EM063E.pdf.

Peryea, F.J. 1999. Gardening on Lead- and Arsenic-Contaminated Soil. http://soils.tfrec.wsu.edu/mg/lead.htm.

WSU Extension. 2013. Hortsense: Home Gardener Fact Sheets for Managing Plant Problems with IPM or Integrated Pest Management. Washington State University. http://hortsense.cahnrs.wsu.edu/Home/HortsenseHome.aspx.

References

Craigmill, A., and A. Harivandi. 2010. Home Gardens and Lead: What You Should Know about Growing Plants in Lead-Contaminated Soil. *University of California Agriculture and Natural Resouces Publication* 8424. http://anrcatalog.ucdavis.edu/pdf/8424.pdf.

Drost, D. 2010. Potatoes in the Garden. *Utah State University Extension Publication*. https://extension.usu.edu/files/publications/publication/HG_Garden_2005-13.pdf.

Miles, C., G. Sterrett, L. Hesnault, C. Benedict, C. Daniels. 2013. Home Vegetable Gardening in Washington. *Washington State University Extension Publication* EM057E. http://cru.cahe.wsu.edu/CEPublications/EM057E/EM057E.pdf.

Mosley, A., O. Gutbrod, S. James, K. Locke, J. McMorran, L. Jensen, and P. Hamm. 1995. Grow Your Own Potatoes. *Oregon State University Extension Publication* EC 1004. http://extension.oregonstate.edu/deschutes/sites/default/files/ec1004.pdf.

Pacific Northwest Vegetable Extension Group. 2012. Photo Gallery of Vegetable Problems. http://mtvernon.wsu.edu/path_team/diseasegallery.htm.

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