

# A Guide to Growing Potatoes In Your Home Garden

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## Have you ever grown potatoes in your garden?

Growing potatoes is fun and not that hard! Home gardeners can grow unique varieties that are not sold in local supermarkets. Potatoes come in all different shapes, sizes and colors. Did you know that there are purple, red and yellow potatoes? Potatoes make a great garden project for your children or grandchildren.



Figure 1. Children love helping in the garden and getting dirty is an added bonus.

## Potatoes are important in our world!

Potatoes are the number one non-grain food crop in the world. In the United States, over 1 million acres are planted each year for commercial production. Potatoes are important to developing nations as well. Potatoes can grow in harsh climates and many potato varieties can be produced in 90 days or less on small parcels of land.

## Are potatoes nutritious?

Yes potatoes are nutritious! They are a great source of vitamin C, potassium, fiber and protein, all with no fat! Potatoes, along with many other vegetables, can be prepared as part of a healthy diet. Luckily, potatoes are versatile and are easy to prepare. Whether baked, boiled, roasted or fried they are a delicious addition to any meal.

| <b>Nutrition Facts</b>                                   |                     |
|--|---------------------|
| Serving Size 1 potato (148g/5.3oz)                       |                     |
| Amount Per Serving                                       |                     |
| <b>Calories</b> 100                                      | Calories from Fat 0 |
| % Daily Value*   |                     |
| <b>Total Fat</b> 0g                                      | 0%                  |
| Saturated Fat 0g   | 0%                  |
| <b>Cholesterol</b> 0mg                                   | 0%                  |
| <b>Sodium</b> 0mg  | 0%                  |
| <b>Potassium</b> 720mg                                   | 21%                 |
| <b>Total Carbohydrate</b> 26g                            | 9%                  |
| Dietary Fiber 3g   | 12%                 |
| Sugars 3g  |                     |
| <b>Protein</b> 4g  |                     |
| Vitamin A 0% • Vitamin C 45%                             |                     |
| Calcium 2% • Iron 6%                                     |                     |
| Thiamin 8% • Riboflavin 2%                               |                     |
| Niacin 8% • Vitamin B <sub>6</sub> 10%                   |                     |
| Folate 6% • Phosphorous 6%                               |                     |
| Zinc 2% • Magnesium 6%                                   |                     |
| *Percent Daily Values are based on a 2,000 calorie diet. |                     |

Figure 2. Source: U.S. Food and Drug Administration

Should you eat the skin? Yes! We recommend it! The skin of the potato contains the majority of the potato's fiber, and many of the nutrients are located close to the skin. Wash the potato thoroughly, cut away green discoloration and/or sprouts, and enjoy your potato with the skin on.

## Where did potatoes come from?

Potatoes are native to the Andean region of South America. European explorers introduced the potato to Europe in 1536 but it did not arrive in the United States until 1719 when Irish immigrants brought the potato with them to the New World.



Figure 3. Peru, South America . Photo credit: Allard Schmidt



## All about potatoes

### All about potatoes

The potato is a member of the *Solanaceae* (nightshade) family, which includes tomato, pepper, eggplant, petunia and tobacco.

The enlarged, edible, underground storage portion of the potato plant is called a “tuber”. The tuber develops from underground stems called stolons. Dormant buds (eyes) develop on the tuber. Tuber formation begins when plants are 6 to 8 inches tall, or five to seven weeks after planting, and results from the production and movement of starch into the developing tubers. Many varieties develop fruits and flowers, but these parts are not edible. The fruits look like small green tomatoes and contain the true seed of the potatoes; however they are genetically different from the parent. Plants grown from this seed will not necessarily resemble the original variety. Commercial potato production and home gardeners use tuber pieces containing at least one dormant bud (eye) that will sprout and form a potato plant. These tuber pieces are sometimes referred to as “potato seed” or “seed pieces”. The potato is raised as an annual crop, however, tubers left in the garden that do not completely freeze during the winter, may emerge as volunteer potato plants when the soil warms again.

### Potato types and uses

Potato varieties vary according to shape, flesh color and skin appearance. They are classified according to the tuber types listed below (see Figure 4).

**Long Russet (A):** A thick-skinned potato with a long shape and dry texture; good for baking and frying (French fries). This is the most popular market type in the United States. Variety example: Goldrush.

**Round white/Long white (B):** A thin-light brown skinned all-purpose potato with firm, creamy texture; best for boiling and frying. Variety examples: Onaway, Kennebec, Superior (Round),

Shepody and Cal White (Long)

**Round red skin (C):** A thin, red-skinned potato with firm, creamy texture; good for boiling. Variety examples: Red Norland, Chieftain and Red Pontiac.

**Yellow (D):** There are several varieties with thin, golden skins and creamy smooth yellow flesh; good for boiling and frying, some for baking. Variety examples: Yukon Gold, Yellow Finn.

**Round Red skin yellow flesh (E):** New varieties with various color combinations are being released every year. One example is a red skinned potato with creamy yellow flesh. Good for boiling. Variety example: Red Gold

**Purple (F):** A violet-purple skinned potato with purple flesh; for baking and frying. They retain their color when cooked. Variety examples: Adirondack Blue, Purple Majesty

**Fingerlings (G):** Small varieties that are narrow almost finger shaped. Fingerlings are fully mature when harvested. Variety examples: Banana, Rose Finn Apple.

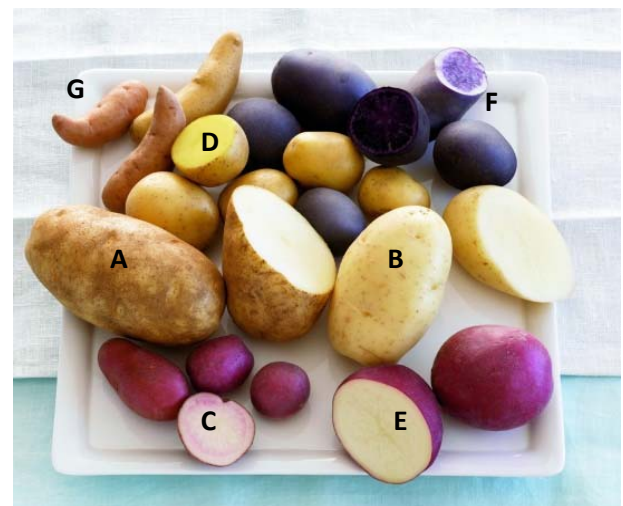


Figure 4: Potatoes come in many shapes and colors. Photo credit: U.S. Potato Board





## Variety Selection, Seed Purchasing and Soil Preparation

### Variety Selection

Choice of a potato variety for growing in a home garden depends on factors such as garden space availability, desired uses, and storage plans.

To ensure quality and maximum productivity, purchase certified seed tubers. Certified potato tuber seed is seed of a known variety produced under strict standards to maintain seed tubers that are virus and disease free. Saving tubers from your garden will eventually result in decreased yields and small tubers due to more incidences of disease. For the same reason, you do not want to plant tubers from the grocery store. Grocery store potatoes have been treated to prevent sprouting so it may be difficult to even get a plant started at planting time.

Certified potato tuber seed can be purchased at area garden nurseries or through the internet. If you are interested in trying new or unique varieties, try purchasing from reputable online vendors including:

Irish Eyes Garden Seeds

<http://www.gardencityseeds.net>

Wood Prairie Farm

<http://www.woodprairie.com>

Gardens Alive!

<http://www.gardensalive.com>

Burpee

<http://burpee.com>

Potato Garden.com

<http://www.potatogarden.com>

### Seed Preparation

Depending on the source and the quantity you buy you will receive either small tubers or large tubers. Small tubers (1 to 2 inches in diameter) can be planted whole. Cut large tubers into block-shaped, 2 to 2 1/2 ounce seed pieces (about the size of an egg) (Figure 5). The seed pieces should be firm, with at least one "eye"

per section and a maximum sprout length of 1/4 to 1/2 inch to ensure optimum germination. Seed tubers can be cut and planted on the same day, however allowing the cut surface to heal over for 4-7 days may reduce the risk of seed pieces rotting in the soil.



Figure 5: Tuber seed piece cuttings.

### Soil Preparation and Fertility

Potatoes grow on a wide range of soils, but are best suited to a sandy loam or a soil that is well drained. Very sandy soils may require extra watering to maintain adequate soil moisture. Fine-textured soils that are high in silts and clay may not be well drained, and they tend to produce poorly shaped potatoes.

If possible, a soil test can be performed before planting. Contact your local Extension office for details on soil testing. The best soil pH for potatoes is between 5.5 and 6.0. A pH above 6.0 may increase the incidence of common scab (a disease) on tubers. If a soil test is not available, follow these recommended guidelines:

- Rototill into the seedbed about 2 pounds per 50 feet of row of 12-12-12 (N-P-K) analysis fertilizer.



## Planting and Care of Potatoes in Your Garden

- Beside the row, apply 1/3 pound per 50 feet of row of 46-0-0 (urea) fertilizer one week after plant emergence and again between 4 and 6 weeks after emergence. Instead of working the fertilizer into the soil, water thoroughly so that the fertilizer moves into the root zone.

Do not amend the soil with lime or manure in the same year that potatoes are to be grown. Lime and manure increase the risk of potato scab disease.

### Planting and Care

Potatoes are a cool season crop; ideal temperatures for crop growth are 65 to 80 during the day and 55 to 65 at night. The soil should be cultivated 6 to 8 inches deep in the spring, and large soil clods should be broken up or removed before planting. Plant potatoes when soil temperatures are above 45 F. Cold, wet soil at planting time increases the risk of seed piece decay, and planting into cool, dry soils can cause delayed sprouting and emergence of the potatoes.



Figure 6: Plant seed pieces 3 to 4 inches deep and space 9 to 12 inches apart.

Plant tuber seed pieces 3 to 4 inches deep. Leaving 30 to 36 inches between rows and spacing seed pieces 9 to 12 inches apart in the row will generally produce an acceptable yield of medium-sized tubers (Figure 6). Five pounds of seed potatoes should plant 40 feet of row with 12 inches between seed pieces. You can expect to harvest 3 to 5 pounds of potatoes per potato plant. Larger tubers are produced at wider plant spacings, though some varieties, for example, Yukon Gold, develop growth defects such as hollow heart at a wider spacing.

Potato plants should be “hilled” when the plants are 8 to 12 inches tall (Figure 7).



Figure 7: When the plants are 8-12 inches tall they should be hilled to keep tubers covered and prevent greening.

Mound the soil to a height of 3 to 6 inches and approximately 12 to 15 inches from the base of the plant. Use care to prevent damage to the plant roots, which may extend 8 to 12 inches from the base of the plant. Hilling maintains suitable soil cover for tubers as they expand. Tubers that break the soil surface may have green areas that contain bitter tasting glycoalkaloids and should not be eaten. Discard or cut off the green portions.





## Planting and Care of Potatoes in Your Garden

Avoid planting potatoes in the same location year after year. To lower the risk of disease and insect problems, do not plant in areas where tomatoes, peppers, eggplants, radishes or beets were grown the previous year.

### Water Requirements

Potatoes are very sensitive to soil moisture and do best with a consistent soil moisture level. Even soil moisture levels throughout the root zone should be maintained, though over-wet and saturated conditions should be avoided. In general, 1 inch of water per week from rainfall or irrigation is adequate. As much as 2 inches per week may be required on sandy soils with low organic matter.

Dry soil alternating with periods of saturated soil can result in poor quality tubers with defects such as knobs, growth cracks, hollow heart and internal browning. Long periods of excess moisture, particularly near maturity, may lead to decreased yields and poor quality tubers.

### Pest and Disease Control

You can help alleviate pest problems by changing the location in your home garden where potatoes are planted, through regular inspection, and by removing “volunteer” potato plants, which can serve as a host for diseases that can damage the new crop.

Shallow cultivation is preferred for weed control. For late season weed control, pull weeds instead of hoeing them to prevent tuber damage. Mulches can be beneficial in weed control as well as helping to maintain soil moisture.

Scab disease may be a problem (Figure 8). Scab is caused by a common soil borne

organism that causes disease only on tubers. Some varieties are more resistant than others to scab; tolerant varieties include Onaway and Superior. Tubers with scab are fine to eat. Just peel or cut off the circular rough skin.



Figure 8: Common scab disease in potato.

Insects such as the Colorado potato beetle (Figure 9) can be controlled by destroying eggs which are laid on the underside of the leaf. This can be done by crushing the eggs or removing the leaf with the eggs and disposing of them in the trash away from the garden. Additionally, you will want to remove larva and adults by hand, disposing of them when the numbers are small.

The potato is subject to several seed, foliar and tuber disorders that may affect quality and appearance. See Table 1 (Page 6) for information on the potato disorders most common to home gardeners.



Figure 9: The Colorado potato beetle eggs, larvae and adult stages.



## Common Problems in Home Potato Gardens

**Table 1. Potato disorders, causes and remedies**

| Symptom   | Possible Cause   | Remedy   |
|---|--|--|
| <b>Seed Disorders</b>   |  |  |
| Rotted seed pieces  | Soil too wet/cold or too hot/dry at planting   | Plant whole seed when soil temp. is > 45°F   |
| <b>Foliar Disorders</b>   |  |  |
| Reddish brown decay or lesions on sprout, below-ground stem and stolons   | Rhizoctonia: develops in cold wet soils and when seed is planted too deep (> 3-4 inches) | Plant when soil temp. is above 45°F; plant seed pieces 3-4 inches deep   |
| Black, wet rot of stem, mostly at ground level  | Bacterial soft rot; referred to as "Blackleg"  | Plant whole, certified seed  |
| Reduced plant growth, pale green or yellow leaf color and inward rolling of lower leaves                                    | Leaf-roll virus  | Purchase new certified seed and control aphids to prevent spread   |
| Older leaves have small, dark brown/black lesions with concentric rings. Usually on maturing or stressed plants.            | Early blight   | Remove infected foliage from garden area<br>Avoid plant stresses by supplying adequate water and nutrients                                       |
| Dark, water-soaked areas on leaves and stems. May see a white mold growth on the underside of infected leaves.              | Late blight  | Remove infected foliage from garden area<br>Keep foliage dry by watering at the base of the plant.   |
| Yellowing of lower leaves and early leaf drop   | Normal maturing or nitrogen deficiency   | Add nitrogen to the soil and water   |
| Leaf and petiole defoliation; presence of larvae, adult beetles and/or bright orange egg masses on the underside of leaves. | Colorado potato beetle   | By hand collect insects in a container, place in freezer for 1 hour and discard.   |
| Leaf damage including: irregular holes, dry brown leaf margins, inward leaf rolling   | Insect damage from potato leafhopper or cabbage looper                                   | By hand collect insects in a container, place in freezer for 1 hour and discard.   |
| <b>Tuber Disorders</b>  |  |  |
| Green skin  | Exposure to sun or other light<br>Develops over time                                     | Hill around plants, store potatoes in the dark   |
| Raised and/or pitted corky areas  | Common scab  | Use certified seed of resistant varieties.<br>Avoid lime or manure the year potatoes are grown. Avoid carrots, beets and radishes as prior crops |
| Knobby, misshapen tubers  | Physiological from inconsistent moisture levels  | Provide uniform growing conditions   |
| Splits in the tuber that are healed over-"growth cracks"  | Physiological (for example: inconsistent moisture levels)                                | Provide uniform growing conditions   |
| Large, shallow gouges in tubers   | White grubs (large brown/cream larvae often curled into a C-shape)                       | Gardens near long grass are at greater risk  |
| Brown cavities near the heart of the tuber-"hollow heart"   | Physiological (seed pieces planted too far apart; inconsistent moisture levels)          | Plant seed closer to avoid oversized tubers; water consistently  |



## Planting and Care of Potatoes in Your Garden

### Harvesting

Time of maturity varies for each variety. Indicators of tuber maturity include complete vine death, “skin set” (tuber skin does not peel from the flesh when pressure is applied) and desired tuber size. Mature tubers store better and are less likely to bruise or decay than immature tubers.

New or small tubers can be harvested early without destroying the entire plant by careful digging and removing some of the tubers. The remaining tubers should be left to grow and reach full maturity.

Harvest potatoes before a severe frost. Use a spade or fork to loosen the soil and gently lift the tubers out of the soil (Figure 10). To prevent greening and sunburn damage, do not allow tubers to be exposed to light after harvesting.



Figure 10: Since potatoes grow underground, harvest time is always a big surprise!

### Storage

For two to three weeks after harvest, store tubers in the dark at 55 to 60°F with high relative humidity to heal bruised and damaged areas that could provide entrance for disease organisms. Store only the healthy potatoes that are reasonably free from soil.

After healing, proper storage conditions should include cool temperatures (near 40°F), darkness to prevent greening, high humidity and adequate ventilation. Storing tubers in plastic bags (or any tightly sealed container) will restrict the movement of fresh air around the tubers and can lead to rot. Store above freezing (root cellar) or garage if it does not freeze.

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Visit MSU’s Potato Breeding and Genetics Program website at <https://www.msu.edu/~douchesd/>

