



Growing Potatoes in the Home Garden



The potato, *Solanum tuberosum* L., is a vegetable in the plant family Solanaceae, which also includes the fruiting crops of tomato, pepper and eggplant. It is classified as a dicotyledonous annual, although it can persist in the field vegetatively (as tubers) from one season to the next. The edible portion of the potato is a tuber, which is an enlarged portion of an underground branch of a stem called a stolon or rhizome. The potato tuber contains all the characteristics of normal stems, including dormant buds (eyes), rudimentary leaves (eyebrow scars lining the eyes) and lenticels (surface pores). Note that the buds are in a spiral pattern on the tuber and tend to be concentrated at the seed or apical end (opposite end from stem attachment) of the tuber.

Potato propagation is normally by seed piece, planting either a whole small tuber or a piece of a larger tuber containing at least one eye. Vegetative propagation is necessary to assure a very uniform crop for each variety. Although seed pieces provide genetic uniformity, they have the potential of carrying many diseases and thus it is a good practice to always use certified disease-free seed.

There are current attempts to avert this problem by planting seeds from fruits rather than pieces of seed tubers. The rationale for this approach is that very few diseases are transmitted to the next generation when "true" seeds (rather than seed tubers) are planted. The true seeds are planted indoors like tomatoes and transplanted to the garden. You may enjoy experimenting with this new technique, but there are several problems with it. First, the seeds are smaller than tomato seeds, and the seedling plants grow rather slowly at first. They are subject to frost and should not be set out any earlier than tomatoes. Plants grown from tubers may also be frosted, but this is usually less serious because the tuber seed pieces will quickly produce new sprouts. Even when plants are not frosted off, the extra food reserves available in a tuber seed piece give a boost to the early plant growth which is not possible from a tiny seed. Under the short growing seasons common in the Northeast this early growth is a prime consideration. Yields from true seed will be several weeks later and about 20% lower yielding than yields of similar varieties grown from tubers.

Because potatoes, like other vegetatively propagated crops, do not "breed true", potatoes from seeds have much more variability in plant and tuber characteristics than plants from tubers. This could lead to variable tuber size and shape, cooking quality, disease reaction, maturity, and also color. Except for novelty value, most gardeners will be well advised to plant certified seed tubers rather than true seeds.

Varieties: Seed of the recommended varieties listed below generally are available and grow well in New York State. Comments following the variety name include scab resistant (*R*) or moderately resistant (*MR*), skin color, maturity, tuber size, desirable within row spacing, and other characteristics of interest.

Chieftain: (*MR*) red, medium early, large tubers, space at 9 inches, has field resistance to late blight, excellent quality.

Katahdin: white, main season, medium-flattened spherical tubers, space at 9 to 10 inches, yields dependably, susceptible to sunburn.

Kennebec: white, main season, medium to large oblong tubers, space 9 to 10 inches, vigorous grower, excellent yields, resistant to late blight disease, susceptible to *Verticillium*.

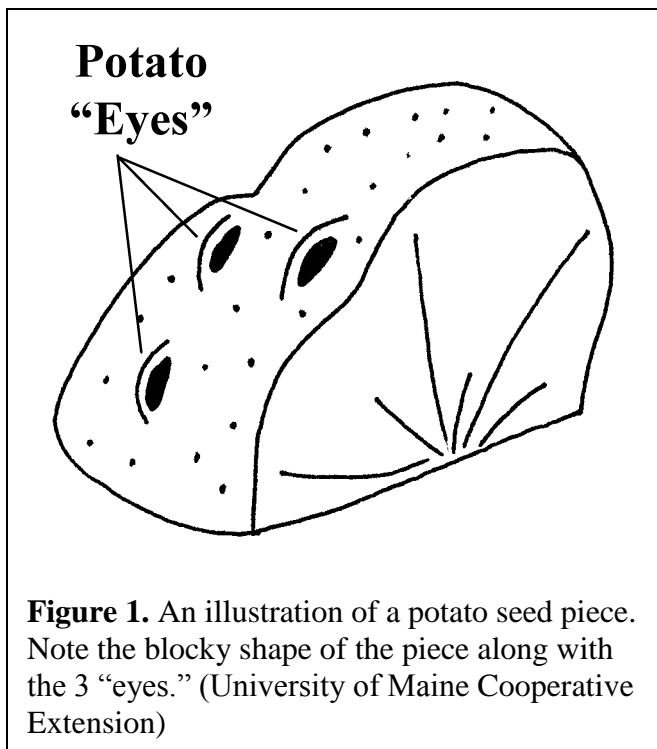
Norgold Russet: (R) medium early, medium size tubers, oblong to long tuber shape, space at 10 to 12 inches.

Norland: (R) red, early, medium size tubers, space at 10 to 11 inches, sprouts early, susceptible to air pollution injury.

Russet Norkotah: (R) new variety, early main season, medium to large long tubers, some tubers irregular in shape, space at 10 inches, moderately susceptible to *Verticillium*.

Superior: (R) white, early, medium size tubers, space at 10 to 11 inches, susceptible to *Verticillium*.

The choice of variety may be critical for the success of growing potatoes. For instance, varieties susceptible to *Verticillium* may be adversely affected by planting in the same soil where tomatoes, peppers, eggplant or strawberries had been grown a year or two before. Carefully study these characteristics to select varieties in accordance with the climate, practices and disease appearance in your garden.



Seed Piece Preparation: Small potatoes, 2 ounces and less should be planted whole. They offer advantages of reducing or eliminating: a) the cutting and suberizing step b) possible transfer of disease carried on the knife when cutting c) drying of cut surface d) poor stands in wet soils.

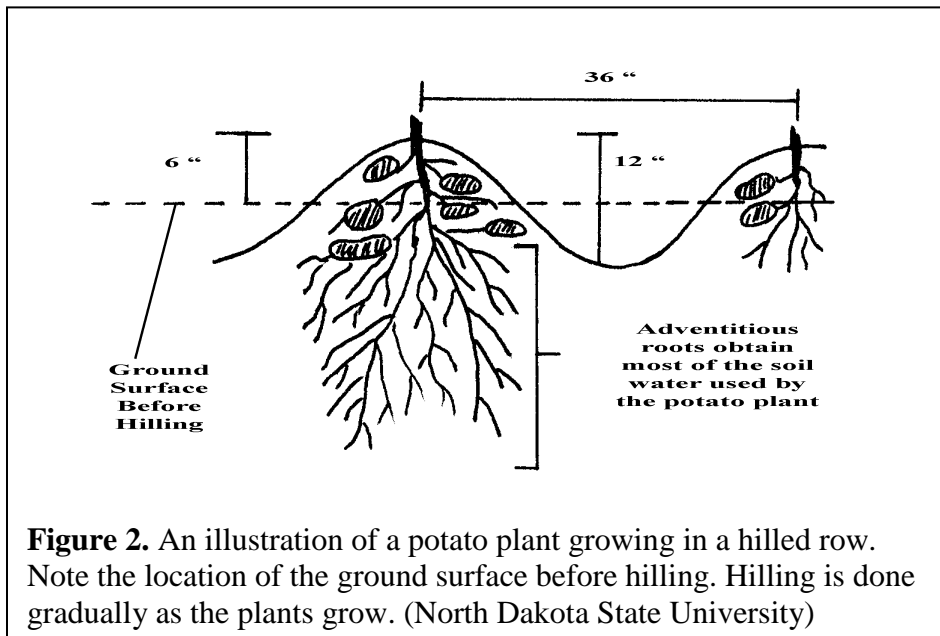
Potatoes that are 2 to 4 ounces should be cut into two pieces, 4 to 6 ounce potatoes cut into three pieces, 6 to 8 ounce potatoes cut into four pieces and 8 to 10 potatoes are cut into 6 pieces. The pieces are best if they are blocky in shape and not long or thin slices. It is important to have at least one or more eyes on each seed piece, otherwise there would be no bud to grow into a plant. Refer to the illustration in **Figure 1**.

Chemical fungicide treatment of seed pieces, while not a substitute for disease-free seed and good seed handling practices, can help reduce soil disease losses when cut seed is held for a time before planting or is planted in cold, wet soil. Home gardeners should emphasize avoiding these situations rather than relying on fungicide treatments. It can also prevent the introduction into non-infested soils of those surface-borne organisms that cause scab,

Rhizoctonia, *Verticillium* wilt and blackleg. Contact Cornell Cooperative Extension - Suffolk County for information on current fungicide recommendations.

Planting Potatoes: Seed pieces, whether whole or cut, should be held at room temperature for at least one day just prior to planting. It is best if the soil temperature is 50⁰ F. or above and is moist but crumbly. Potatoes grow best in well-drained soils, and low spots should be avoided.

Plant the seed pieces 2-3 inches deep, 9 to 12 inches apart (refer to **Varieties** for specific spacing), in rows about 3 feet apart. Wider spacing will yield larger tubers and closer spacing reduces tuber size. As the plants grow, the ridges (rows) should be built up 2 to 4 inches at a time (**Figure 2.**)



Soil is normally hoed from the aisle to the base of the plants forming a hilled row. Instead, straw or other organic material can be used to cover the ground in amounts necessary to exclude light from the emerging potato tubers. The more productive lines such as Kennebec have a greater tendency to push their tubers out of the ground and must be covered well to prevent greening. The use of organic covers offers the gardener clean tubers free of soil, but often promotes an invasion of rodents providing them with bedding material and a ready food source -- the potatoes.

Growth nutrients can be applied as

commercial fertilizer, manure or compost materials. It is recommended that the garden soil be tested before planting to determine exact nutrient requirements. Contact Cornell Cooperative Extension - Suffolk County for information on soil testing. If well rotted manure or plant compost is available, spread it at the rate of 1 bushel per 15 feet of row in a strip 3 feet wide over the area where the row will be and work it in to the top 6 inches of soil. If granular fertilizer alone is used, use the formulation of 5-10-10 at 2 lbs. (equal to 1 quart) per 25 feet of row or 10-10-10 at 1 lb. (equal to 1/2 quart) per 25 feet of row before planting. Broadcast it evenly on the surface and work it into the soil, or band in furrows 2 inches deeper and 2 inches to the side of where the seed pieces will be planted (refer to **Figure 2.**). It is recommended that a fertilizer with some of its nitrogen in a slow-release form be used. A combination of organic material and granular fertilizer can be used.

Potatoes are less likely to get scabby (a corky, pitted surface lesion caused by a fungus-like soil organism) in acid soils where the pH is between 5.0 and 5.4 since the disease-causing pathogen grows the slowest in this range. In the home garden it is usually not practical to attempt to lower the pH using acid forming fertilizer or sulfur. Other vegetable crops grown in rotation with potatoes in the home garden grow better at higher pH levels (6.0 to 6.8). If limestone is used in the garden, do not apply any in the current season to the area where potatoes will be grown to keep the pH low and thus reduce scab. Note that dry soil conditions and excessive applications of fresh manure can also increase the amount of scabby tubers. The best solution if scab is a problem is to grow resistant varieties such as Chieftain, Norgold Russet, Norland, Russet Norkotah, and Superior.

Potatoes are normally planted in April on Long Island.

Harvest and Storage: Potato yields depend on varieties used, soil moisture, weed competition, and pest damage. Irrigation increases yields substantially when applied during dry weather. Production in a 10 foot row can vary from 15 lbs. to a full bushel weighing 60 lbs. Potatoes can be harvested any time for immediate consumption once the tubers are of sufficient size. Tubers harvested before the plant tops have had a chance to die should be intended for fresh use only. They will have thin skins which can be easily bruised. These immature potatoes will lose water rapidly, causing the tubers to shrivel and become soft in storage. Also, skinned potatoes are more easily inoculated with disease organisms and will have more storage rots.

Potatoes intended for storage should be harvested one to two weeks after the vines have died down or have been prematurely cut, but before there is any danger of the ground freezing (usually December in most years on Long

Island). Store the tubers in the dark in high relative humidity at approximately 60⁰ F. for a week or two for curing of the skins. Then lower the temperature to 38⁰ - 40⁰ F. for long term storage. Low storage temperatures (but not freezing) and high moisture conditions (but no condensation on the tubers) keep the tubers from sprouting and maintains them in firm physical condition. Avoid exposure of the potatoes to light, for this causes them to turn green and to develop undesirable levels of glycoalkaloids, bitter compounds.

Storage temperatures below 38⁰ F. will cause sugar formation in some varieties of potatoes. If tubers taken from storage taste unacceptably sweet, a conversion or "reconditioning" of sugars back to starch can sometimes be accomplished by placing potatoes at room temperature for a period of a few days to a couple of weeks.

Potatoes are under-utilized in the home garden. As garden sizes decrease, the space consuming potato has been eliminated as popular crop. Because they are available in 60 or 100 lb. amounts at depressed prices in the fall, it is not necessary to home grow storage potatoes to save on the food bill.

On the other hand, it is a fascinating crop to grow, producing its edible portion secretly beneath the soil. Also, some of the best quality, most attractive varieties may not be locally available from commercial sources. And most of all, the taste and quality of fresh-dug potatoes is without equal. Even a small plot of *Solanum tuberosum* will enhance your garden and your diet.

Resource: *Home Gardening Of Potatoes*, VC Report 669, by Roger A. Kline and Donald E. Halseth, Department of Vegetable Crops, Cornell University.

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