

United States  
Department of  
Agriculture

Cooperative State  
Research Service

Office for  
Small-Scale Agriculture

## A Small-Scale Agriculture Alternative

# Specialty Potatoes

The potato, one of the most important food crops, came under cultivation by South American "Indians" more than 2,000 years ago. Potatoes, of which there are hundreds of varieties in every shape, size, and color, were carried to Europe around 1500. From Europe they were introduced into the British Colonies in North America.

In 1992, the potato is one of several food crops featured in the Smithsonian Institution's National Museum of Natural History's exhibition "Seeds of Change," commemorating the 500th anniversary of Columbus' first voyage. For many years, the potato had its own Potato Museum, in Washington, D.C. (Also see *The Incredible Potato*, National Geographic Magazine, May 1982.)

Interest is increasing in the yellow-fleshed and other uncommon varieties -specialty potatoes. Yellow-fleshed potatoes are the rule rather than the exception in most countries. Some specialty potatoes available in the United States for many years were long considered of little commercial value. Now, however, with increased consumer demand, domestic potato breeders have begun to release some excellent yellow-fleshed varieties.

In Washington State, nearly 200 specialty potato varieties

and clones have been tested; some varieties appear with pink or purple flesh and skin colors ranging from buff to red. Many have given yields greater than 'Russet Burbank.' Erik J. Sorensen, Washington State University Cooperative Extension, Franklin County Courthouse, Pasco WA 99301, has results from test trials.

With per capita fresh potato consumption static or declining, the variety offered by specialty potatoes can add to sales. Despite hurdles, they have a bright future but will never completely replace the traditional whitefleshed, russet type.

Climate, Soils, and Water Although classified as a cool-season crop, commercial acreage can be found in all 50 States, with Idaho, Washington, Oregon, Maine, Wisconsin, California, and North Dakota leading. Soil temperatures should be between 45 and 70 degrees Fahrenheit planting time. Planting into cold soils delays emergence and increases the risk of seed piece decay.

Although rainfall often suffices, irrigation may produce highest yields. Potatoes need 18 to 30 inches of water to mature. Potatoes are shallow rooted, with most roots being in the upper foot of soil.

Potatoes are sensitive to water stress. Well-drained, light

textured soils, such as sandy foams or loamy sands, generally produce the highest quality potatoes.

### Good-Quality Seed

Potatoes are vulnerable to several diseases, including blackleg, bacterial ring rot, and viruses, which can be transmitted in infected seed. To avoid such problems, certified potato seed is recommended. Not guaranteed to be disease free, potatoes certified by State agencies have shown no more than an allowable tolerance level for disease symptoms. For certain diseases, such as ring rot, the tolerance level is zero. To be certified, seed lots must be inspected in the field during the growing season AND in storage or at shipment.

Addresses of State and Provincial certification offices which list certified growers may be obtained from the publisher of this factsheet.

A number of mail order companies also offer limited quantities of specialty potato seed. Among these are some run by innovative potato growers: Will Bonsall, Scatterseed Project, Box 1167, Farmington, ME 04938; David Ronninger, Ronninger's Seed Potatoes, Star Route 1, Moyie Springs, ID 83845 (both curators for Seed Savers).

### **Planting and Cultivation**

In much of this country, potato seed pieces are planted 3 to 4 inches deep. But where soil moisture may be limited, seed pieces are planted an inch deeper. The amount of seed required varies according to seed piece size and plant spacing. A spacing of 9 to 12 inches between plants is common. Wider spacings often result in oversized tubers.

Cut seed is widely used, but whole seed is less sensitive to tuber decay. Cut seed pieces should be 2 to 2 1/2 ounces in weight, firm, and with at least one eye.

After planting, potatoes may be cultivated to help control weeds and to reshape beds. It is common to hill potato plants when they are 8 to 12 inches tall: Soil is mounded to a height of 2 to 3 inches around the plant base. Some varieties, such as 'Yukon Gold,' set tubers high in the bed. Hilling helps maintain suitable soil cover to prevent greening or sunburning of tubers.

### **Pest Control**

The potato is vulnerable to pests. In addition to using certified seed, growers need many strategies to minimize insect and disease problems. Strategies include proper soil fertility and water management, crop rotation, sanitation, and the use of resistant varieties.

### **Harvesting and Storage**

Time of harvest varies according to variety and intended market. Potatoes may be harvested with vines still green and tubers comparatively immature. Such potatoes are generally intended for immediate use as "new potatoes." Most potatoes, however, are harvested at full maturity. Indicators of maturity are tuber size, skin set, and

death of the vine. Mature tubers store better than immature tubers and resist bruising better.

Many varieties of specialty potatoes, such as 'Michigold,' 'Donna,' and 'Yukon Gold,' produce a high percentage of A-size tubers generally the most desirable size.

'Yellow Finn,' however, is an exception. The market prefers smaller sized tubers of this particular variety. With red-skinned varieties, the small C size demands the highest price. Many restaurants also prefer small potatoes.

Potatoes store best at 40 to 50 degrees F, with adequate ventilation and relative humidity at 90 percent. It is important to exclude light to prevent greening. Only sound potatoes should be put into storage.

### **Varieties**

The dark-yellow flesh of 'Yellow Finn' has become something of a standard. By comparison, 'Yukon Gold' flesh is relatively light-yellow. Many European varieties also have light-yellow flesh.

'All Blue' is oblong with purple skin and purple flesh. Sometimes called 'Purple Marker,' its striking appearance led to its use as a marker for the ends of potato plots. It can be baked or boiled and retains the purple flesh color even after cooking. 'Purple Viking' has purple skin with red stripes.

Varieties with commercial potential: Yellow-fleshed with buff or yellow skim: 'Delta Gold,' 'Donna,' 'Michigold,' and 'Saginaw Gold.' Yellow-fleshed with red or pink skin: 'Desiree,' 'Iditared,' 'Red Gold,' and 'Rose Gold.' Yellow-fleshed with purple skin: 'Brigus.' And small-sized or fingerling potatoes: 'Banana' and 'Ruby Crescent.

Good descriptions of potato varieties are in two out-of-print books often found in university libraries: "Description of and Key to American Potato Varieties." C.F. Clark and P.M. Lombard, USDA Circular No. 741, Issued April 1946 (Revised November 1951) and "North American Potato Varieties," H.M. Darling, 1959 Potato Handbook, Potato Varieties Issue, Potato Association of America (PAA).

### **Marketing**

Marketing presents a challenge but the potato is a familiar crop and most consumers are willing to try colorful varieties. To successfully market specialty potatoes, farmers need to work with those who sell and promote vegetables.

Specialty potatoes have received national attention through articles in produce trade journals and the popular press. Supermarket chains have featured yellow-fleshed potatoes. At Larry's Supermarket in Seattle, a 4th of July promotion featured red, white, and blue potatoes. Without such efforts it is difficult to move specialty items beyond local markets and into the produce mainstream.

Quality is of paramount importance to market acceptance. For the fresh market, appearance strongly influences sales. Color, size, shape, and defects shape consumers' first impression of quality. Texture, flavor, and nutritive value are less obvious, but still important quality components, affecting first sales little but greatly influencing subsequent sales.

Many restaurants feature specialty potatoes. Often customers who first tried them in a restaurant purchased them later in supermarkets. Some

brokers and others who pack and ship fresh produce concentrate on specialty potatoes.

Marketing specialty potatoes is complicated by the fact that most potatoes are not sold by variety name. Some specialty potatoes have characteristics that lend themselves to product differentiation. 'Yellow Finn' has a characteristic flattened shape and deep eyes. 'Yukon Gold' is distinguished by the pink coloration around its eyes. Packaging can also be important to market success. Bags that display the variety name along with cooking or nutritional information are useful.

Yellow-fleshed varieties have already been bred that can be used for either fresh market or processing. 'Saginaw Gold' produces a chip with good color and taste. Purple or pink potato chips and yellow french fries are among possibilities for processed specialty potatoes. Looking beyond local markets, specialty potatoes and potato products may also have potential for export.

The market for specialty potatoes is limited and overproduction is a real danger. Growers are advised to develop a market before trying new crops--and then only on a limited acreage.

### **Cooking Quality and Nutrition**

Fresh potatoes contain about 80 percent water. Solids, or dry matter, is highly correlated with texture. A mealy texture is associated with high solids, a waxy texture with low solids. Although individual tastes vary, varieties such as 'Michigold' have a mealy texture usually considered best for baking or french-frying. Varieties such as 'Red Gold,' with a waxy texture, are more often used for boiling or in salads.

Potatoes are an excellent source of carbohydrates and contain valuable amounts of protein, minerals, and vitamins. Nutrient levels vary not only by variety but also according to the maturity of the crop and storage time. Nutritive content can be used to market specialty potatoes. It appears that the darker the yellow flesh color, the higher the level of vitamin A.

### **For More Information**

In addition to the U.S. Department of Agriculture, State Universities and County Cooperative Extension personnel can provide useful information on local production methods and marketing practices. PAA (Dr. David Curwen, Secretary, University of Wisconsin, Hancock Ag Research Station, Hancock WI 54943) publishes a Potato Extension Specialists Directory that lists University faculty members in 46 States and the District of Columbia. PAA also has an annual meeting and publishes "The American Potato Journal," a monthly. (Contact Linda Best, Membership Secretary, PAA, 8 Holmes Hall, University of Maine, Orono ME 04469-0163.)

Many potato production educational programs are sponsored by the Cooperative Extension System. In Washington, the Washington State Potato Conference and Trade Fair is held each year. Similar programs exist in Idaho, Maine, Michigan, Nebraska, and Oregon. Potatoes are included in numerous other conferences.

### **Other Information Sources**

There are many excellent publications:

- "Delta Golds ...Consumer Response to Yellow Fleshed

*Potatoes*, Applied Market Research Report #2." Agriculture and Resource Economics, 206 Winslow Hall. University of Maine, Orono, ME 04469.

- "Potato Handbook." Agricultural Communications Center, 111 Ag Sciences Building, University of Idaho, Moscow, ID 83843.

- "Potato Growers Handbook." Washington State Potato Commission, 108 East Interlake Road, Moses Lake, WA 98823:

- "Potato Varieties - An introduction to variety characteristics, management and performance in the Klamath Basin." University of California Tulelake Field Station, P.O. Box 447, Tulelake, CA 96134.

- "North American Potato Varieties." Potato Association of America, 8 Holmes Hall, University of Maine, Orono, ME 044690132.

- "Selecting Potato Varieties for Michigan." Michigan State University, Bulletin Office, P.O. Box 231, East Lansing, MI 488230231.

- "Integrated Pest Management for Potatoes in the Western United States," Publication 3316. Agricultural Sciences Publications, Division of Agricultural Sciences, University of California, Berkeley, CA 94720.

- "Compendium of Potato Diseases," American Phytopathological Society, 3340 Pilot Knob Road, St. Paul, MN 55121.

- "A Guide to Monitoring Potato Pests in New York State, 102 IPM 107." Cornell Cooperative

Extension, Research Center, 7  
Business and Technology Park,  
Ithaca, NY 14850.

• "*Potato Diseases, Agriculture  
Handbook No. 474*,"  
Superintendent of Documents,  
U.S. Government Printing  
Office, Washington, DC 20402.

A computer software program,  
Potato Crop Management, is  
available from the University of  
Wisconsin, WISPLAN

Computing, 302 Hiram Smith  
Hall, 1545 Observatory Drive,  
Madison, WI 53706.

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