

### 3 Commercial Potato Production Management

#### 3.1 Varieties (D. Lynch, A. Sullivan, R. Curle)

##### 3.1.1 Variety Selection

###### Processing

Processors contract specific varieties for French fry and chip production. Russet Burbank, Shepody and Ranger Russet are the major varieties used by French fry companies in Prairie Canada. Shepody and Ranger Russet are used for early, direct (out-of-field) production, while Russet Burbank and Shepody are used for processing out-of-storage. Atlantic, Conestoga (Manitoba only), Snowden, Niska and NorValley are the major varieties used for chip production in Prairie Canada. Atlantic and Conestoga are used for early to midseason direct processing, while Snowden, Niska and NorValley are suited for long-term storage. The Frito Lay Company contracts proprietary chip varieties developed by the Company's breeding program located in Wisconsin. New varieties are routinely evaluated by the processing industry.

###### Fresh Market

Varieties with red or russet skin, as well as varieties with yellow flesh, make up the major acreage of fresh market varieties in Prairie Canada. Consumer/packer/wholesaler demand determines the varieties grown. Norland, Sangre and Red Pontiac are the major red-skinned varieties; Russet Norkotah is the major russet-skinned variety and Yukon Gold and Bintje are the major yellow-fleshed varieties. New varieties are constantly being evaluated.

###### Seed Production

The demand for seed potatoes of a specific variety is directly related to the needs of the commercial potato industry in North America. Seed growers should base production on these established markets.

##### 3.1.2 Protected Varieties

Plant Breeders' Rights legislation was enacted in Canada in 1990 and the Plant Variety Protection Act in the USA was amended to include potatoes in 1994. This legislation provides the opportunity for public and private breeders to control production of a variety and collect royalties on the sale of seed. In the future, most new varieties will be protected under this legislation.

##### 3.1.3 Registration of Varieties

All varieties produced in Canada must be registered with the Variety Registration Office of the Canadian Food Inspection Agency and be represented by a Canadian agent. Russet Burbank, Red Pontiac and Bintje do not have a Canadian agent since these varieties were registered prior to the introduction of the requirement. The Variety Registration Committee of the Western Potato Council facilitates registration for Western Canada.

##### 3.1.4 Variety Descriptions

Table 3.1-1 includes descriptions of the leading varieties grown across the Prairie Provinces. Figure 3.1-1 shows the shapes used to describe potato varieties.

Figure 3.1-1 Shapes used to describe potato varieties (Courtesy of Agriculture and Agri-Food Canada)

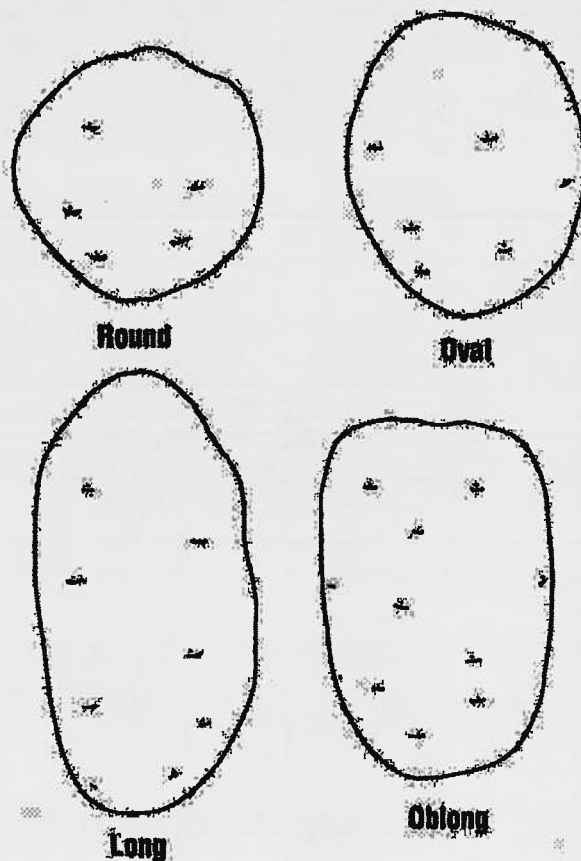


Table 3.1-1 Variety descriptions

Variety	Representative in Canada	Primary Use	Secondary Use	Maturity	Tuber				Characteristics	
					Shape	Eyes	Skin	Flesh	Yield Potential	Specific Gravity
Russet Burbank	None	French fry	Table market (baking)	Late	Long	Moderately shallow	Brown, strongly russeted	White	High	High
Shepody	Agriculture and Agri-Food Canada Potato Research Centre, NB	French fry		Mid-season	Long	Shallow	Smooth, buff	White	Medium-high	Medium
Ranger Russet (Amisk)	Agriculture and Agri-Food Canada Research Centre, Lethbridge, AB	French fry	Table market, count pack	Late	Long	Moderately shallow	Brown, strongly russeted	White	High	High
Atlantic	Agriculture and Agri-Food Canada Research Centre, Lethbridge, AB	Chipping	Early table market	Mid-season	Oval	Moderately shallow	Buff, rough (flaky)	White	High	High
Snowden	Potatoes New Brunswick, Grand Falls, NB	Chipping		Late	Round-oval	Moderately deep	Buff	White	High	High
Niska	Agriculture and Agri-Food Canada Research Centre, Lethbridge, AB	Chipping	Table market	Mid-season	Oval	Moderately deep	Buff	White	High	High
Conestoga	University of Guelph, Guelph, ON	Chipping		Early	Oval-oblong	Shallow, occasionally pink	White, rough (flaky)	White	High	Medium
NorValley	Alberta Seed Potatoes Inc., Taber, AB	Chipping	Table market	Mid-season	Round-oval	Moderately shallow	White	White	High	Medium

Characteristics			Disease		Agronomic Management
Quality	Tuber Defects	Storability	Resistance	Susceptibility	
Excellent French fry and baking quality, moderately resistant to after cooking discoloration.	Susceptible to second growth and hollow heart.	Good, medium to long dormancy.	Common scab, black leg and Fusarium dry rot.	Verticillium wilt, early and late blight, PVY.	Responds to high levels of nitrogen, particularly in terms of the yield of tubers >10 oz (280 g).
Excellent French fry quality.	Resistant to second growth and hollow heart.	French fry quality out of long term storage is variable.	Moderately to Rhizoctonia, Fusarium dry rot and net necrosis.	Common scab, Verticillium wilt, late blight, PVY (symptomless expression) PLRV, and greening due to high position in the hill.	Under certain conditions, post-emergent applications of metribuzin may cause crop injury. Responds to high levels of nitrogen, particularly in terms of the >10 oz (280 g) tuber yield fraction.
Excellent French fry and baking quality.	Resistant to second growth and hollow heart, susceptible to blackspot bruise.	Good potential, but specific gravity must be managed to minimize blackspot bruise.	Moderately to Verticillium wilt, PVX, PVY, and Fusarium dry rot.	Highly susceptible to tuber late blight infection, moderately to common scab.	The Amlak clone produces higher >10 oz (280 g) yield, is more resistant to tuber necrosis associated with infection by <i>Verticillium</i> wilt and is less susceptible to second growth.
Excellent chip quality.	Susceptible to hollow heart and heat necrosis.	Not recommended for storage, susceptible to pressure bruise.	Highly resistant to PVX and tuber net necrosis, moderately to common scab, Verticillium wilt and wart. Highly resistant to race 0 of the golden nematode.		Closer spacing reduces incidence of hollow heart.
Excellent chip quality.	Moderately resistant to second growth and hollow heart, moderately susceptible to bruising.	Excellent, short dormancy.	Moderately to common scab.		
Excellent chip quality.	Moderately resistant to second growth and hollow heart.	Excellent capacity for maintaining fry colour in long-term storage, skin set prior to harvest essential to prevent storage losses due to Fusarium dry rot.	Common scab, moderately resistant to PLRV and early blight.	PVY (symptomless expression), Fusarium dry rot and late blight.	Low set, close row spacing reduces tuber size.
Excellent chip quality.	Moderately resistant to second growth and hollow heart.		Moderately to common scab, early blight, PLRV and net necrosis.	PVY	In the early season, glycoalkaloid values may be unacceptably high. Measure glycoalkaloid levels prior to early harvests.
Excellent chip quality.	Moderately susceptible to second growth, resistant to hollow heart.	Excellent capacity for maintaining fry colour in long-term storage.	Moderately to common scab, early blight and Verticillium wilt.		Low set and close row spacing reduces tuber size.

Variety	Representative in Canada	Primary Use	Secondary Use	Maturity	Tuber				Characteristics	
					Shape	Eyes	Skin	Flesh	Yield Potential	Specific Gravity
Nerland	Cereal Research Centre, Winnipeg, MB	Table market		Early	Oval-oblong	Moderately shallow	Red, smooth	White	High	Medium-low
Sangre	Agriculture and Agri-Food Canada Research Centre, Lethbridge, AB	Table market		Mid-late season	Oval-oblong	Moderately shallow	Red, rough (scaly)	White	High	Medium-high
Red Pontiac	None	Table market		Late	Oval-oblong	Deep	Red, smooth	White	High, drought-tolerant	Medium-low
Russet Norcotah	Agriculture and Agri-Food Canada Research Centre, Lethbridge, AB	Table market		Early-mid season	Oblong-long	Very shallow	Brown, russet	White	High	Medium
Yukon Gold	University of Guelph, Guelph, ON	Table market		Mid-season	Oval	Shallow, pink	Light yellow, smooth	Light yellow	Medium	Medium
Binje	None	Table market		Late	Oblong	Shallow	Light yellow, smooth	Light yellow	High	Medium

Characteristics			Disease		Agronomic Management
Quality	Tuber Defects	Storability	Resistance	Susceptibility	
Excellent boiling quality, wet texture, moderately resistant to sloughing and moderately susceptible to after-cooking darkening.	Moderately susceptible to second growth, moderately resistant to hollow heart.	Poor retention of red skin colour in storage, short dormancy.	Wart, moderately to common scab, Verticillium wilt, PVY and PLRV.	Highly susceptible to silver scurf.	Under certain conditions, post-emergent applications of metribuzin may cause crop injury.
Excellent boiling quality, moderately mealy texture, resistant to sloughing and after-cooking darkening.	Moderately susceptible to second growth and moderately resistant to hollow heart.	Good retention of red skin colour in storage.	Net necrosis, moderately to Rhizoctonia and silver scurf.	Early and late blight, Verticillium wilt, moderately to bacterial soft rot and Fusarium dry rot.	Under certain conditions, post-emergent applications of metribuzin may cause crop injury.
Good boiling and baking quality, wet texture, resistant to after-cooking darkening.	Susceptible to second growth, particularly on oversize tubers, blackspot bruise and shatter bruise.	Good storage potential, medium dormancy.	Moderately to blackleg and net necrosis.	Common scab, Fusarium dry rot, late blight (foliage and tubers), Verticillium wilt, PLRV and PVY.	Under certain conditions, post-emergent applications of metribuzin may cause crop injury. Close row spacing is recommended to limit oversize tubers.
Moderately mealy texture, moderately susceptible to after-cooking darkening.	Very attractive tubers with low defect levels.	Stores well, medium dormancy.	Common scab and silver scurf.	early and late blight, PLRV, and PVY (symptomless expression). Late maturing clonal	
Moderately mealy texture, resistant to after-cooking darkening.	Very attractive tubers with low defect levels, hollow heart occurs in larger tubers.	Excellent with long dormancy.	Moderately to PLRV and net necrosis.	Common scab, early blight, late blight, Rhizoctonia and PVY.	Poor eye distribution can result in blind basal seed pieces. Tuber set is low, close in-row spacing is recommended.
Excellent for boiling, baking and French fries; resistant to after-cooking darkening.	Attractive tubers with low defect levels.	Fair, medium dormancy.	Moderately to PLRV.	Common scab, Fusarium dry rot, wart and PVY.	High tuber set can be managed by increasing in-row spacing.