

ALTURAS CHARACTERISTICS

Proposed name: (Alturas)

Experimental designation: A82360-7

Botanical name: Solanum tuberosum L.

Intended Market: Dehydration/French fry processing/possibly fresh

General Description:

A82360-7 is a product of the cooperative USDA/ARS, University of Idaho breeding program in Aberdeen. It resulted from a cross made in 1982 between A77182-1 and A75188-3 (Figure 1). It has been evaluated for 10 years in public and industry trials throughout the western U.S. The release will be made jointly by the USDA/ARS and the experiment stations of Idaho, Washington, and Oregon.

A82360-7 is a late maturing, very high yielding variety with oblong, lightly russeted tubers (Figure 2). It was selected for dehydration purposes, but should also be useful for French fry processing and possibly fresh market. This variety has high specific gravity and excellent fry color from storage.

Plant Characteristics:

A82360-7 has a semi-erect vine that matures late in the season. It produces a very high number of white flowers with abundant pollen production. See Table 1. for a full description of plant characteristics and Figure 2 for photographs.

Table 1. Foliage characteristics of A82360-7 as compared to those of Russet Burbank. Comparisons were made on plants growing in Aberdeen, Idaho in 1997 and 1998.

Characteristic	A82360-7	Russet Burbank
Growth Habit	Semi-erect	Semi-erect
Maturity	Very late	Late
Leaf type (silhouette)	Medium	Medium-open
Leaflet Shape (terminal)	Lanceolate	Medium ovate
Leaflet number – primary	Ave. 5.0, Range 4-6	Ave. 4.3, Range 2-5
Leaflet number – secondary	Ave. 3.3, Range 0-5	Ave. 3.1, Range 0-5
Leaflet number – tertiary	Ave. 1.3, Range 0-5	Ave. 1.6, Range 0-5
Flower color	White	White
Pollen production	Abundant	None

Tuber Characteristics:

A82360-7 produces oblong tubers with lightly russeted skin. The skin texture is netted. The eyes are intermediate in number and not well distributed. Tuber set is medium as is the tuber size (Table 2). See Figure 2 for photographs.

Table 2. Physical tuber characteristics of A82360-7 as compared with those of Russet Burbank. Comparisons were made using tubers grown at Aberdeen, Idaho in 1997 and 1998.

Characteristic	A82360-7	Russet Burbank
Skin Color	Tan	Tan
Skin texture	Netted	Russeted
Size ¹	Medium (Ave. 6.5oz)	Medium (Ave. 6.2oz)
Shape	Oblong (L/W ratio ² = 1.37)	Long (L/W ratio = 1.68)
Thickness	Medium thick	Slightly flattened
Eye depth	Intermediate	Intermediate
Eye number	Intermediate	Intermediate – high
Eye distribution	Predominantly apical	Evenly distributed
Eyebrow prominence	Not prominent	Not prominent
Flesh color	White	White
Tuber set	Medium-high	Low-medium
Dormancy	Medium	Long

¹ Tuber size data were collected from 22 trials grown in Idaho, Oregon and Washington from 1994 through 1999.

² L/W ratio data were collected using 100 tubers from 1997 Aberdeen grown trial.

Tuber Yield:

A82360-7 has consistently shown higher total yields than Russet Burbank at all locations (Table 3). A82360-7 also had a higher percentage of U.S. No. 1's than Russet Burbank at all locations (Table 3).

Table 3. Total and U.S. No. 1 yields of A82360-7 as compared to those of Russet Burbank.

Location	Variety	Total Yield (cwt/A)	U.S. No. 1 Yield (cwt/A)
Eastern Idaho ¹	A82360-7	495	388
	Russet Burbank	353	218
Western and Central Idaho ²	A82360-7	645	517
	Russet Burbank	496	323
Oregon ³	A82360-7	768	630
	Russet Burbank	552	333
Washington ⁴	A82360-7	781	588
	Russet Burbank	584	373

¹ Data from 15 trials conducted from 1991-1999 in Aberdeen, Shelley and Rexburg.

² Data from 8 trials conducted from 1992-1998 in Parma, Kimberly and Raft River.

³ Data from 6 trials conducted from 1994-1996 in Madras, Klamath Falls and Hermiston, OR.

⁴ Data from 2 trials conducted in 1994 and 1995 in Othello, WA.

Tuber Quality Characteristics

A82360-7 produced tubers with much higher specific gravity and tuber solids than Russet Burbank. It also produced better fry color both out of 40 and 45°F storage (Table 4).

Table 4. Tuber specific gravity, dry matter, and french fry color of A82360-7 as compared with those of Russet Burbank.

Characteristic	A82360-7	Russet Burbank
Specific gravity ¹	1.090	1.081
Dry matter (%) ²	23.1	21.3
Dry matter yield (lbs/A) ²	13201	8872
Fry color (40°F storage) ³	2.7	3.6
Fry color (45°F storage) ³	1.0	1.7

¹ Specific gravity data from 31 trials grown in Idaho, Oregon and Washington.

² Dry Matter data from 23 trials grown in Aberdeen, Kimberly, Parma, Rexburg, and Shelly, ID.

³ French fry color data from 20 (40°F) and 28 (45°F) trials grown in Idaho and Oregon.

Internal and External Defects

A82360-7 is less susceptible to hollow heart than Russet Burbank (Table 5). Growth cracks can occur more frequently in A82360-7 than in Russet Burbank.

Table 5. Occurrence of internal and external defects with tubers of A82360-7 as compared with those of Russet Burbank. Data taken from trials grown at Idaho, Oregon and Washington from 1991 – 1999.

Defect	A82360-7	Russet Burbank
Growth cracks ¹	4.4	4.1
Second growth ¹	4.9	3.5
Shatter bruise ¹	3.2	3.0
Blackspot bruise ¹	3.7	3.3
Hollow heart ²	1.1%	7.2%

¹ Growth cracks, second growth, shatter bruise, and blackspot bruise rated on a scale 1-5 where 1 = severe occurrence of the defect and 5 = no occurrence of the defect.

² Hollow heart measured as percent of tubers with the defect.

Biochemical Composition:

A82360-7 tubers are lower in glycoalkaloids and higher in protein than those of Russet Burbank (Table 6). Other components were similar.

Table 6. Biochemical composition of tubers from A82360-7 in comparison with those from Russet Burbank. Data was taken from three trials grown in 1995-1997 at Aberdeen, Idaho.

Component	A82360-7	Russet Burbank
Glycoalkaloids (mg/100g)	2.8	5.2
Reducing sugars (% FWB)	0.10	0.10
Sucrose (% FWB)	0.29	0.17
Protein (%DWB)	5.8	4.5
Vitamin C (mg/100g)	20.7	19.1

Disease Reactions:

A82360-7 is more resistant to verticillium wilt, foliar early blight, PVX, foliar late blight, and tuber net necrosis than Russet Burbank (Table 7).

Table 7. Disease reactions of A82360-7 in comparison with those of Russet Burbank.

Disease ¹	A82360-7	Russet Burbank
Common Scab (Streptomyces)	2	1
Verticillium wilt (Verticillium)	2	6
Foliar Early Blight (Alternaria)	4	6
Tuber Early Blight (Alternaria)	1	3
Dry Rot (Fusarium)	5	7
Soft Rot (Erwinia)	6	6
PVX	5	8
PVY	7	7
PLRV Foliar Infection	8	9
PLRV Net Necrosis	2	7
Late Blight (Phytophthora)	6	8

¹ Data are from trials grown in Aberdeen, ID from 1992-1999. Rated using 0-9 scale with 0 = resistant to the given disease and 9 = susceptible.

A82360-7

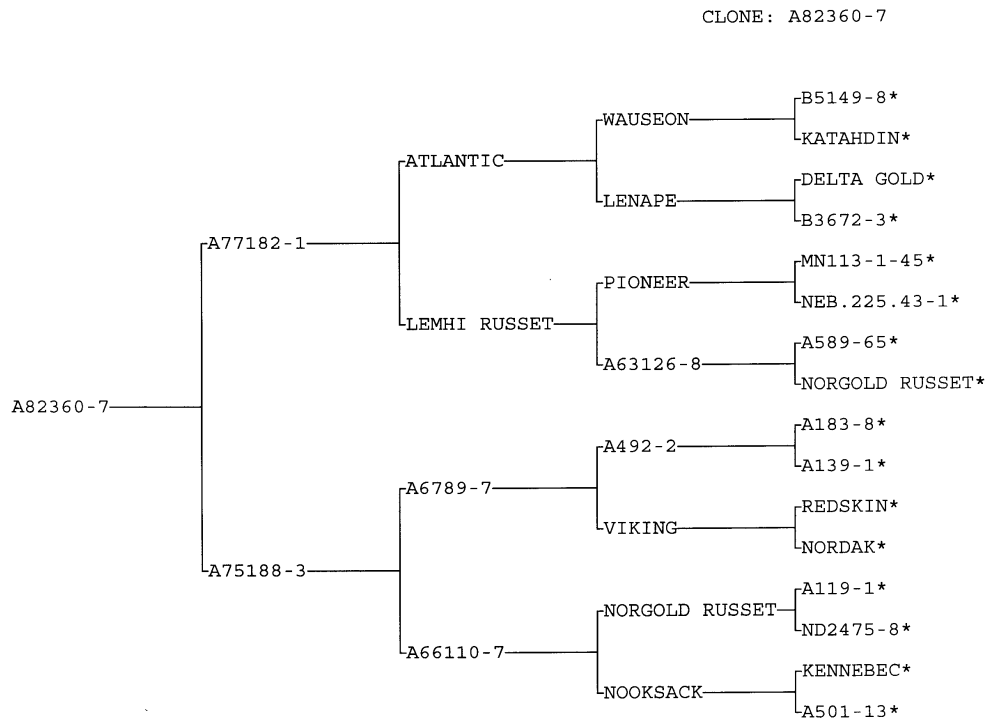


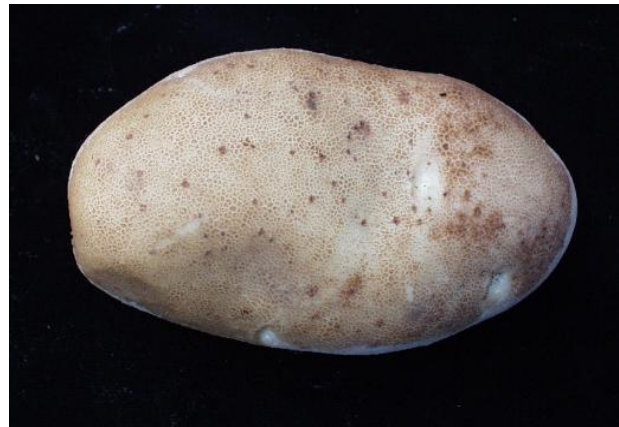
Figure 1. Pedigree of A82360-7.



a)



b)



c)



d)



e)

Photographs of Alturas (A82360-7) showing: a) tuber flesh color, b) whole plant, c) individual tuber, d) light sprout, e) compound leaf and flower.