

DEFENDER CHARACTERISTICS

Proposed name: (Defender)
Experimental designation: A90586-11
Botanical name: Solanum tuberosum L.
Intended Market: French fry processing

General Description:

A90586-11 is a product of the cooperative USDA/ARS, University of Idaho breeding program in Aberdeen. It resulted from a 1990 cross between KSA195-90 and Ranger Russet (Figure 1). It has been evaluated for 11 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.

A90586-11 is a late maturing, medium to high yielding variety with white long tuber type (Figure 2). It will be useful for processing. This variety has high specific gravity high yield potential, foliar and tuber late blight resistance, and resistance to shatter bruise and corky ringspot.

Plant Characteristics:

A90586-11 has a semi-erect vine that matures late in the season, one to two weeks later than Russet Burbank. It produces white flowers with non-viable pollen. See Table 1 for a full description of plant characteristics and Figure 2 for photographs.

Table 1. Foliage characteristics of A90586-11 as compared to those of Russet Burbank. Comparisons were made on plants growing in Aberdeen, Idaho in 2001 and 2002.

Characteristic	A90586-11	Russet Burbank
Growth Habit	Semi-erect	Spreading
Maturity	Very Late	Late
Leaf type (silhouette)	Medium	Medium-open
Leaflet Shape (terminal)	Medium ovate	Medium ovate
Leaflet number – primary	Ave. 4.4, Range 3-6	Ave. 3.7, Range 3-5
Leaflet number – secondary	Ave. 3.9, Range 1-8	Ave. 3.7, Range 2-6
Leaflet number – tertiary	Ave. 5.6, Range 0-14	Ave. 5.1, Range 0-10
Flower color	White	White
Pollen production	Some, Non-viable	None

Tuber Characteristics:

A90586-11 produces long tubers with buff-tan skin. In potato marketed terminology, it would be considered a long white. The eyes are intermediate in number and evenly distributed. Tuber set is low, with average size typically medium, although large tubers are common (Table 2). See Figure 2 for photographs. Compared to Russet Burbank, A90586-11 has relatively short tuber dormancy.

Table 2. Physical tuber characteristics of A90586-11 as compared with those of Russet Burbank. Comparisons were made using tubers grown at Aberdeen, Idaho in 2001 and 2002.

Characteristic	A90586-11	Russet Burbank
Skin Color	Buff-Tan	Tan
Skin texture	Smooth-Netted	Russetted
Size ¹	Med-Large (Ave. 7.9oz)	Medium (Ave. 7.1oz)
Shape	Long (L/W ratio ² = 1.83)	Long (L/W ratio = 2.1)
Thickness	Slightly flattened	Slightly flattened
Eye depth	Shallow	Intermediate
Eye number	Intermediate	Intermediate – high
Eye distribution	Evenly distributed	Evenly distributed
Eyebrow prominence	Slight prominence	Not prominent
Flesh color	Cream-white	Cream-white
Tuber set	Low	Low
Dormancy	Medium	Long

¹ Tuber size data were collected from 13 trials grown in Idaho from 1999 through 2002.

² L/W ratio data were collected using 100 tubers from 2001 and 2002 Aberdeen trials.

Tuber Yield:

A90586-11 has high yield potential and higher total yields than Russet Burbank in Idaho, Oregon and Washington (Table 3). A90586-11 also produced higher U.S. No. 1 yield than Russet Burbank at all locations (Table 3).

Table 3. Total and U.S. No. 1 yields of A90586-11 as compared to those of Russet Burbank.

Location	Variety	Total Yield (cwt/A)	U.S. No. 1 Yield (cwt/A)
Eastern Idaho ¹	A90586-11	427	270
	Russet Burbank	374	233
Western and Central Idaho ²	A90586-11	538	332
	Russet Burbank	494	224
Oregon ³	A90586-11	946	793
	Russet Burbank	773	466
Washington ⁴	A90586-11	843	595
	Russet Burbank	740	453

¹ Data from 9 trials conducted from 1999-2002 in Aberdeen, Shelley and Rexburg.

² Data from 3 trials conducted from 2000-2002 in Kimberly.

³ Data from 4 trials conducted from 1999-2002 in Hermiston, OR.

⁴ Data from 4 trials conducted from 1999-2002 in Othello, WA.

Tuber Quality Characteristics

In 21 trials in Idaho, Oregon, and Washington, A90586-11 produced tubers with higher specific gravity than did Russet Burbank. A90586-11 also produced fry color comparable to Russet Burbank out of both 40 and 45°F storage (Table 4).

Table 4. Tuber specific gravity, dry matter, and french fry color of A90586-11 as compared with those of Russet Burbank.

Characteristic	A90586-11	Russet Burbank
Specific gravity ¹	1.087	1.080
Fry color (40°F storage) ²	3.5	3.5
Fry color (45°F storage) ²	1.3	1.2

¹ Specific gravity data from 21 trials grown in Idaho, Oregon and Washington.

² French fry color data from 16 (40°F) and 19 (45°F) trials grown in Idaho, Oregon and Washington. USDA color chart [00 – 4.0(darkest)]

Internal and External Defects

A90586-11 has demonstrated less susceptibility to growth cracks, secondary growth, and shatter bruise (Table 5). Blackspot bruise susceptibility of A90586-11 is slightly higher than that of Russet Burbank.

Table 5. Occurrence of internal and external defects with tubers of A90586-11 as compared with those of Russet Burbank. Data taken from 9 trials grown in Idaho from 1999 – 2002.

Defect	A90586-11	Russet Burbank
Growth cracks ¹	4.5	3.6
Second growth ¹	4.0	3.2
Shatter bruise ¹	4.0	2.8
Blackspot bruise ¹	2.4	3.0
Hollow heart/Brown Center ²	0%	1%

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/Brown Center measured as percent of >12 oz tubers with the defect.

Biochemical Composition:

On average, in three trials conducted at Aberdeen, A90586-11 tubers were higher in glycoalkaloids and Vitamin C, and similar in sugars and protein when compared with those of Russet Burbank (Table 6).

Table 6. Biochemical composition of tubers from A90586-11 in comparison with those from Russet Burbank. Data was taken from trials grown from 2000-2002 at Aberdeen, Idaho.

Component	A90586-11	Russet Burbank
Glycoalkaloids (mg/100g)	6.8	4.2
Reducing sugars (% FWB)	0.1	0.09
Sucrose (% FWB)	0.3	0.17
Protein (%DWB)	5.5	5.2
Vitamin C (mg/100g)	33.0	19.5

Disease Reactions:

A90586-11 is resistant to foliar and tuber late blight (Table 7). It is susceptible to common scab and shows some resistance to verticillium wilt and PVX. A90586-11 has similar susceptibility to early blight, dry rot, soft rot, PVY and PLRV foliar and net necrosis as does Russet Burbank.

Table 7. Disease reactions of A90586-11 in comparison with those of Russet Burbank.

Disease ¹	A90586-11	Russet Burbank
Common Scab (Streptomyces)	5	2
Verticillium wilt (Verticillium)	2	8
Foliar Early Blight (Alternaria)	5	6
Dry Rot (Fusarium)	5	5
Soft Rot (Erwinia)	5	5
PVX	2	8
PVY	5	7
PLRV Foliar Infection	7	9
PLRV Net Necrosis	7	7
Late Blight (Phytophthora)	4	7

¹ Data are from trials grown in Aberdeen, ID, Corvallis Hermiston, OR from 1999-2002. Rated using 0-9 scale with 0 = resistant to the given disease and 9 = susceptible.

CLONE: A90586-11

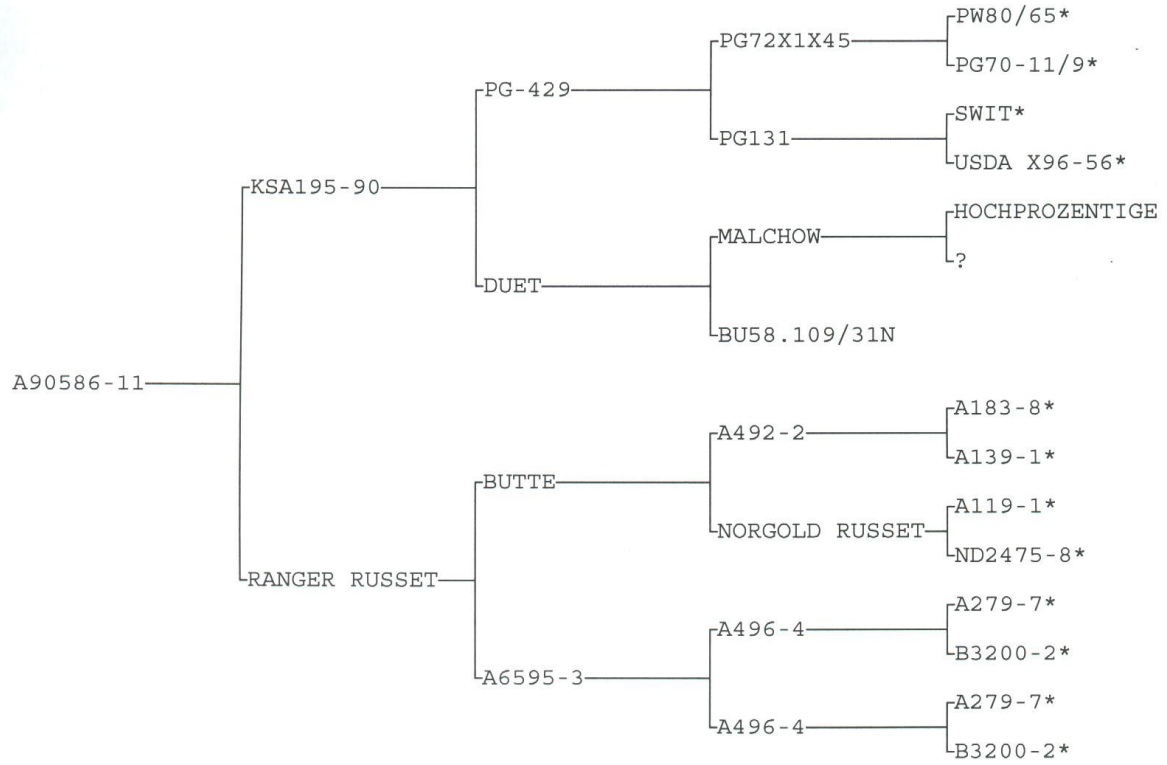


Figure 1. Pedigree of A90586-11.

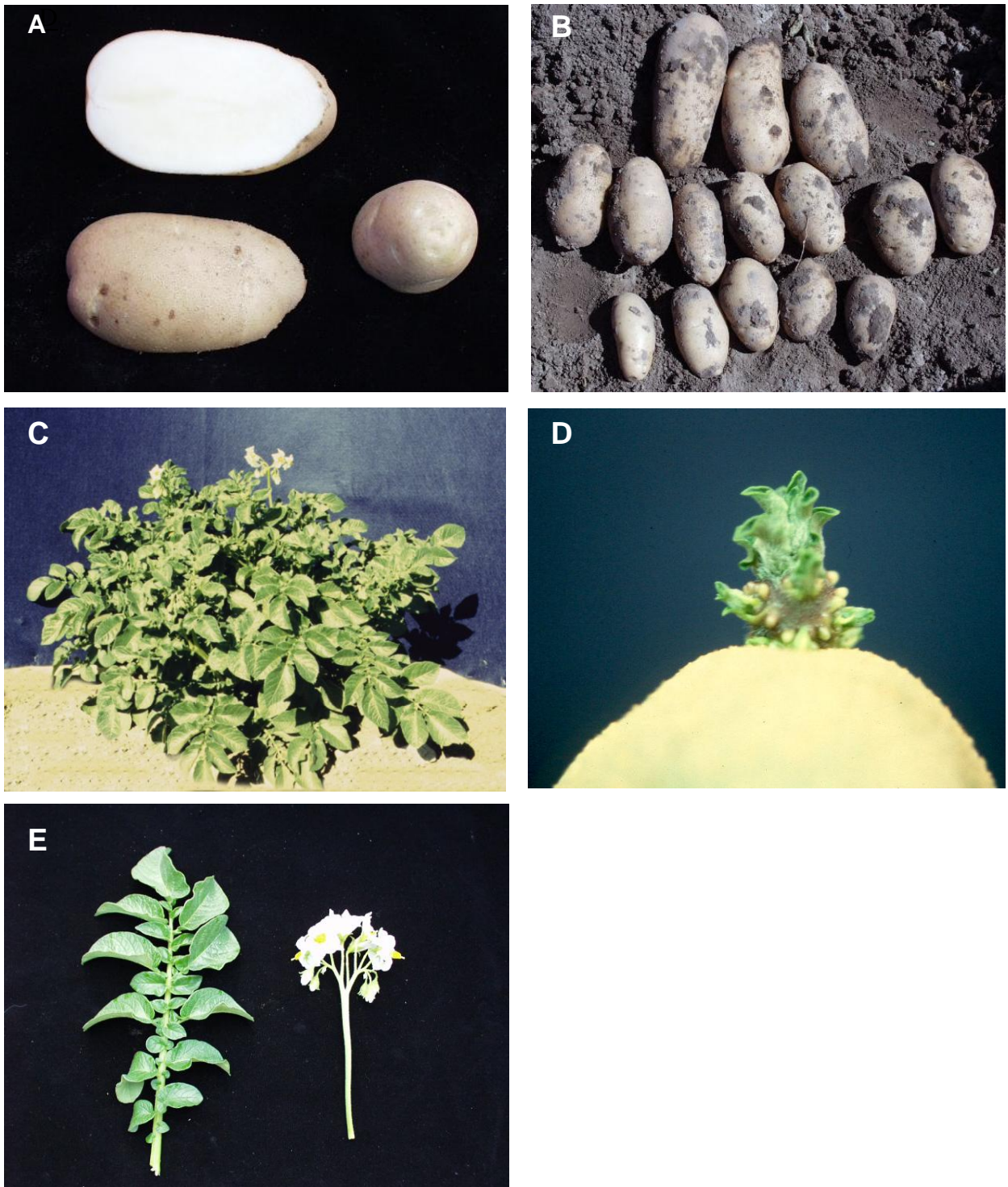


Figure 2. Photographs of A90586-11 showing: a) external tuber appearance and tuber flesh color, b) field tubers, c) whole plant, d) light sprout, e) compound leaf and flower.