

B. Origin and Breeding History of the Variety

California Early Light Red Kidney (line 433) is a bulked  $F_5$  family originating from a cross of Sacramento x 2602. <sup>5</sup> The variety Sacramento is from a single plant selection from the landrace Red Kidney. Line 2602 is an  $F_4$  bulked family from the cross Red Kidney x Redkote. <sup>4</sup> The variety Sacramento is a proprietary LRK variety of early duration (80 days) and high canning quality but is of small plant type, of only moderate yields, and it is susceptible to bean common mosaic virus. The purpose of the breeding and selection that has led to the development of California Early Light Red Kidney was to obtain a public variety similar to Sacramento in earliness and canning quality but with superior yield potential and resistance to bean common mosaic virus. The early selection was at Davis where single plant selection was carried out and from where seed was initially raised for canning tests. The survivors from this work went to off-station yield tests in 1985 with subsequent canning tests of seed from these sites, beginning in 1986.

C. & D. Description and Evidence of Performance  
Characteristics of CELRK

CELRK has a determinant upright large plant type, typical of many kidneys. It matures (Table 2) in approximately 80 days near Chico and Linden, the two major kidney areas in California. Seeds are similar to those of Sacramento in size and color. Flowers are light lavender in color.

Resistance to BCMV was tested in the greenhouse in  $F_2$  by personnel from the Plant Pathology Department, UCD, and progenies of those resistant were challenged in the field in  $F_3$  and  $F_4$  generations. In  $F_4$ , all inoculated plants in the 15 foot row showed no symptoms on inoculation, in contrast to symptoms of mosaic, mottle and stunting on inoculated Sacramento. (Resistance of the dominant I gene type comes from the Redkote parent.) Resistant  $F_4$  families were screened as  $F_5$  seed for canning quality and selected for maturity <sup>5</sup> in 1985.

Beginning in 1986, 19  $F_5$  families were yield tested in the two major kidney producing areas, near Chico and Linden. Yield tests were of complete randomized blocks of 4 replications, 2 rows wide, and 32 ft. long. Cumulative yield tests over locations and years indicate that CELRK will yield about 2 1/2 cwt greater than variety Sacramento under similar conditions (Table 1). All yield tests were complete randomized blocks of four replications, two rows wide and 32 feet long.

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CELK

Canning tests have been done on seed produced at each site and year and are compared with the three other commonly grown LRK varieties (Table 3). CELRK compared very closely with variety Sacramento, and is clearly superior to both RK (Red Kidney) and to Linden.

The key points for this release proposal are to provide growers with a public variety of light red kidney that is early, is resistant to BCMV, is a very good canner, and has a good yield potential. CELRK meets all these requirements.

E. Area of Adaptation

Performs well in the two major California kidney growing areas, as revealed in tests near Chico and Linden. It may be tried elsewhere.

F. Procedure for Maintaining Stock Seed, Etc.

Breeders' seed is to be maintained by the appropriate breeding program in the Department of Agronomy and Range Science. Foundation seed will be maintained and distributed by the Foundation Seed and Plant Materials Service, University of California, Davis. Certification will be available under the supervision of the California Crop Improvement Association. Classes/Generations of seed will be Breeders, Foundation, Registered and Certified.

Approximately 114 pounds of Breeders' seed is available for 1989.

I. Sample of Seed

Presented for examination.

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Table 1. Yields in cwt/a of CELRK (433) compared with variety Sacramento at Davis, Linden, and Chico.

Entry	Davis 1985	Chico 1986	Chico* 1987	Chico 1988	Linden <sup>+</sup> 1986	Linden 1987	Linden 1988	Mean
433	26.4	28.4	29.1	25.7	27.8	27.5	23.2	26.9
Sac	25.2	29.2	23.7	22.9	24.8	26.9	17.8	24.4
C.V. %	6.55	4.95	5.79	10.52	--	4.50	11.48	
LSD @ 5%	2.48	2.11	2.80	3.66	--	1.82	3.44	

\*Three reps

<sup>+</sup>Replicate means - many other entries missing, precluding CV and LSD figures.

Table 2. Percent mature pods at 80 days. Means from notes at three locations.

	Davis 1985	Chico 1986	Chico 1987	Chico 1988	Linden 1986	Linden 1987	Linden 1988
433	100	95	100	95	100	100	90
Sac	100	95	100	100	100	100	90

Table 3. Canning data from two locations at two canneries.

	<u>S&amp;W</u>		<u>CHB</u>		<u>S&amp;W</u>		<u>CHB</u>		<u>CHB</u>		Mean of 10 tests
	1986		1986		1987		1987		1988		
CELRK	2	2	2	1	1	2	2	2	1	1	1.6
Sac	1	2	1	1	1	2.5	1	1	1	1	1.3
RK	3	3	2	3	2	2.5	1	3	2	2	2.4
Linden	3	-	-	-	2.5	3	1	3	-	-	2.5

- 1 = Excellent
- 2 = Good appearance, minor problems
- 2.5 = Borderline; will use if nothing else available
- 3 = Not acceptable, excessive problems

L = Linden location  
 C = Chico  
 S&W = S&W Fine Foods, Modesto  
 CHB = Davis, now Atwater Canning Co.