

## B. Origin and Breeding History

UC27 is the varietal name proposed for line 8627 of the UC Davis garbanzo breeding program. The selection is a Fusarium-wilt resistant garb line derived from a cross of wilt-susceptible UC5 x the wilt-resistant Mexican variety Sonora, made in 1981 by Dr. Ken Foster. F<sub>3</sub> families were screened in a wilt infested field (Dutra field) in Santa Barbara county in 1983. The F<sub>4</sub> was grown at Davis and selected for seed type. The F<sub>5</sub> was grown in Baja Mexico (in winter 1984-85) and subsequent generations have been grown at several wilt infested locations in the Central Coast, at Davis, and in the San Joaquin Valley at West Side Field Station. Breeders seed was established from a 1987 Davis planting of the F<sub>7</sub> generation, bulked in the F<sub>6</sub>.

Those involved in the selection in the wilt field in the F<sub>3</sub> generation were Ken Foster, Bill Isom, and Warren Bendixen.

## C. Description of the Variety

Species: Cicer arietinum; subgroup "Kabuli". During the growth period the plant type and size of the line 8627 resemble those of UC5, and the leaf morphology is compound, with pinnate leaflets. However, this line, when grown in the San Joaquin Valley, has the unique characteristic of inarching its branches at maturity, becoming upright and highly suitable for direct combining. The line is a typical Kabuli type garbanzo, with a large growth habit, white flowers and large cream-colored and wrinkled seeds. It

differs markedly from the wilt-resistant garbanzo (Surutato) now being grown in California by having compound rather than simple leaves and by having a larger, more upright plant form, and smaller seeds. (When grown in the valley, seeds of 8627 averaged 53 g./100 seeds in comparison with 54.5 g./100 seeds for Surutato.)

D. Performance

1) Suitability for direct combining

Direct combining of garbanzos in furrowed fields in the San Joaquin Valley results in considerable field loss with the existing variety Surutato. This is due to its prostrate growth habit, which may extend into the furrow, and the practice of harvesting directly with grain combines.

It is important that a new variety for the valley be more suitable for direct combining by having a more upright stature. Line 8627 has the unique characteristic of inarching on drying at maturity, becoming more upright at time of seed maturity and drying. This is the only breeding line or introduction which has been observed to have this characteristic. This expression in the mature stage is preceded by a full open growth in the stages prior to maturity, providing for good canopy cover when it is desired during the growing period.

## 2) Disease resistance

Line 8627 has proved wilt resistant over several years in coastal fields where UC5 dies of wilt before maturity. When grown in the Davis greenhouse in soils infested with the wilt pathogen from eight coastal locations, line 8627 has remained wilt free, whereas UC5 has died consistently before flowering. Although we are recommending this line to be grown in the San Joaquin valley where no wilt is currently known, it is considered important to have wilt resistance because of the possibility of wilt introduction and of the possibility that the variety may be grown in coastal areas with wilt.

In the field at Davis and at West Side Field Station, line 8627 has had average incidence of virus disease and of Sclerotinia blight, with neither disease causing noticeable field loss over two years of observation.

## 3) Quality

Line 8627 is outstanding in canning quality, regardless of where it has been grown. This stability in quality across sites, with a "1" rating from coastal sites, from Davis, and from the West Side Field Station, is unique and greatly superior to the presently grown variety, Surutato (Table 1).

**Table 1.** Canning quality evaluation of 8627 compared with Surutato, from four locations.

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	WSFS 9/86 S&W	Tonini 5/87 CHB	WSFS 8/87 S&W	WSFS -----	Davis S&W 11/87	Wineman -----	$\bar{x}$
<b>Entry</b>							
8627	1	-	1	1	1	1	1
Surutato	2	3	3	2	3	3	2.8

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Note: WSFS and Davis are valley locations; others are coastal

S&W = S&W cannery at Modesto

CHB = Davis canning Co. at Atwater

1 = Superior appearance, suitable for main label at S&W.

2 = Good appearance, but some seed coat cracking, or size and color variation.

3 = Not acceptable due to splitting and starch leakage or excessive color and size variation.

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Its seed appearance before canning is also consistently excellent, with a light golden color and good uniformity of size, shape, and surface texture.

4) Yield potential

Line 8627 has a higher yield potential than the presently grown variety Surutato. At the WSFS it has averaged about six bags/acre higher than Surutato for the last two years (Table 2).

Table 2. Yields of 8627, UC5, and Surutato at WSFS for two years (1986 and 1987).

	<u>Yield and Year</u>		
	<u>1986</u>	<u>1987</u>	$\bar{x}$
<u>Entry</u>			
8627	22.1	21.6	21.8
UC5	23.7	20.6	22.1
Surutato	13.5	16.7	15.1
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C.V. %	18.9	6.3	
LSD at 5%	5.7	2.6	
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Note: 1986 data based on plots 5'x32' with four reps.

1987 data based on plots 5'x98' with two reps.

Figures in cwt/acre.

In a winter monthly planting experiment at WSFS in 1987 it yielded well when planted from mid-November to mid-

January, and outyielded Surutato by about four bags/acre (Table 3). It should also be noted that these plot yields do not reflect the harvest losses of Surutato experienced in the farmers fields.

Table 3 Yield of 8627 compared with Surutato at West Side Field Station at different planting dates, 1987.

<u>Entry</u>	<u>Yield and planting month</u>			$\bar{x}$
	<u>Nov.</u>	<u>Dec.</u>	<u>Jan.</u>	
8627	28.4	29.6	33.8	30.6
Surutato	26.7	27.2	24.8	26.3
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C.V. % varieties		15.6		
C.V. % Dates x varieties		10.1		
LSD at 1% varieties		2.6		
LSD at 1% Dates x varieties		4.4		
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Note: Data are from a trial handled by Bill Isom at WSFS.

Plots 5'x25', four reps.

Figures are cwt/acre.

E. Area of adaptation

UC27 is recommended for growing in the Central Valley as a winter crop, to be sown from mid-November to end of December or early January. It can be considered in coastal situations for the normal spring/summer cropping period where supplemental irrigation is used.

When grown at the coast, line 8627 generally outyields Surutato but it generally has yielded less than the line 8615 which is being proposed for coastal locations. Line 8627 produces a smaller plant than 8615 under dryland coastal conditions and it matures earlier and thus is unable to take full advantage of the coastal summer season.

F. Procedure for maintaining seed stocks

The specifications for garbanzos of the California Crop Improvement Association are to be followed. Foundation seed is to be planted for registered seed, which is to be planted to produce certified seed. The Foundation seed project will maintain Foundation seed. Approximately 500 pounds of breeders seed is available for planting as Foundation seed in April of 1988. This should provide approximately 25,000 pounds of Foundation seed by September of 1988.

H. Seed Production Restrictions

It is recommended that Foundation seed be grown only on wilt-free soils.