

AGRONOMIC PERFORMANCE OF FLAGEOLET BEANS IN SPAIN

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The flageolet is a type of common bean that was originally developed in France, in the XVIIIth century. It is known as Flageolet “vert” or Green Flageolet and it was first obtained by a French grower called Chevrier, in Brétigny-sur-Orge, a suburb of Paris, around 1878 (Porcher, 2005). Its most remarkable feature is its seed, smaller than other kidney bean seeds, and of an attractive pale green color, a rare trait within the common bean germplasm. In order to obtain fresh green colored seeds the pods have to be harvested when well filled but still immature. In northern Spain the flageolet is an heirloom variety demanded for niche markets. In these areas the flageolet bean is named as “Verdina” or “Faba do Marisco” often incorporated to local recipes cooked with seafood.

The objective of this research was to evaluate the agronomic performance of local varieties of flageolet bean as the beginning of a breeding program focused to the selection of breeding lines to be grown by farmers in northwestern Spain as new commercial varieties under the regulation of “Designation of Origin - Lourenzá” (Anonymous, 2004).

Material and Methods

Fifteen varieties (Table 1) were evaluated in field trials in two locations in Northwestern Spain, Pontevedra (40 masl, 46° 26' N, 8° 38' W) and Ponteceso (400 masl, 43° 16' N, 8° 44' W) in 2004. To obtain semi-dried seeds the whole plant was pulled up and hanged into a drying chamber at 25°C in darkness for 21 days. The dried seeds had the pale green color demanded by the market. The commercial quality of seeds was evaluated at this stage.

Table 1. Flageolet bean varieties evaluated in two environments.

VARIETY	NAME	ORIGIN
PHA-1054, PHA-1422, PHA-1423, PHA-1424, PHA-1841, PHA-1842, PHA-1843, PHA-1844, PHA-1845	Faba do Marisco	Local farmers. Lourenzá, Spain
PHA-1402	French flageolet	Washington State University, US
PHA-1405	Verdina	CRF-INIA. Madrid, Spain
PHA-1406	Verdina	CRF-INIA. Cantabria, Spain
PHA-1407	Verdina	CRF-INIA. Palencia, Spain
CO-025	Flageolet	Commercial. Sprout master, Canada
CO-032	Chevrier vert	Commercial. Thomas Etty, UK

Results and Discussion

The Table 2 shows the analysis of variance for the traits used in the evaluation of the flageolet bean varieties. The environmental effect and/or the interaction variety by environment were significant for first flower, pods/plant, yield, seed weight and water absorption. Miles (2003) evaluated the varieties French Flageolet, French Shell Flambeau and Nugge and found also environmental variation for earliness, yield and seed size. Average value for yield in the varieties evaluated was higher than those by Miles (2003) whereas the seed size was slightly lower.

Seeds/pod, seed length, water absorption and seed coat showed significant differences among varieties. Based on the results, these germplasm is being evaluated in more environments (years and/or locations) to allow a distinct identification of valuable varieties as source of genetic material for the selection of breeding lines.

Table 2. Mean squares in the analysis of variance for eight quantitative traits in the flageolet bean varieties evaluated in two environments.

Origin of variation	df	First flower (days)	Pods plant ⁻¹	Seeds pod ⁻¹	YIELD (g plant ⁻¹)
Environments - E	1	749.1 **	149.6 **	0.01	329.8 **
Replications (E)	2	3.3	2.7	0.07	6.8
Varieties - V	14	91.4	24.3	1.76 **	15.7
V × E	14	39.4 **	12.3 **	0.41	13.2 **
Error	28	2.7	2.7	0.21	2.8
Mean		44.1	9.8	4.46	77.7
SE		1.6	1.63	0.46	1.7
Minimum		42.5	6.2	3.55	4.9
Maximum		47.0	16.6	5.85	12.0
CV (%)		3.7	16.6	10.4	21.9

Table 2. Cont.

Origin of variation	df	Seed length (mm)	Seed weight (g 100 seeds ⁻¹)	Seed water absorption (%)	Seed coat (%)
Environments - E	1	0.77	2.1	411.2 *	1.34
Replications (E)	2	0.10	2.2	23.5	2.12 *
Varieties - V	14	2.40 **	18.5	426.1 *	3.02 **
V × E	14	0.38	13.2 **	117.7	0.73
Error	28	0.28	3.3	91.0	0.53
Mean		12.51	23.9	131.9	9.00
SE		0.53	1.8	9.5	0.73
Minimum		10.75	18.6	118.9	7.82
Maximum		13.52	26.7	151.2	11.39
CV (%)		4.2	7.6	7.2	8.1

*, ** Significant at P≤0.05 or 0.01, respectively; SE= standard error; CV= coefficient of variation

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