PRELIMINARY EVALUATION OF COMMON BEAN LANDRACES FROM LEÓN (SPAIN)

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Common bean (*Phaseolus vulgaris* L.) is potentially the most valuable source of plant protein in many parts of South Europe, and contributes significantly to the sustainability of traditional cropping systems, because of the predominance of small-scale farmers who cultivate bean in these areas. The socioeconomic peculiarities of the Northwest of Spain, the use of traditional varieties, grown in smallholdings and by the own supplying or sale in local markets, have made possible the maintenance of these traditional culture systems, although as a consequence of new technology and market opportunities, common bean landraces are being replaced by bean improved varieties.

European Community regulations have introduced the possibility to attribute marks of origin and quality to local typical products. These marks can be an important support to *on farm* maintenance of elite landraces of principal crops (Piergiovanni and Laghetti, 1999). In the frame of collaboration between Department of Agrarian Engineering (University of León, Spain) and an association of farmers and canners of bean, common bean landraces from province of León are being studied.

The objective is can choose common bean landraces which would be included in an European Community mark of origin and quality.

The evaluation of these landraces has been focused on agronomic performance as well as on quality traits of seed. This paper shows the best common bean landraces of each one of the principal market classes (Amurrio, et al., 2001) from the province of León.

Food quality data were measured on dried, soaked and cooked bean seeds. These included, dry and soak seed weight (determined on 100 seeds per plot after soaking for 18 h), seed length and width (determined on 10 random seeds per plot after drying for 72 h at 80 ºC), proportion of coat (defined as the relation in weight between coat and cotyledon plus coat, after removing the coat from the cotyledon and keeping them for 24 h at 105 ºC), and water absorption (measured as the amount of water dried seeds absorb during soaking). Detailed methodology concerning to the calculation of each trait has been published (Santalla et al., 1995; Escribano et al., 1997). Hardshell describes a condition in which the seed fails to imbibe water within a reasonable time after when moisture is applied (Bourne, 1967). Bean cooking time was estimated with a 25-seed Mattson cooker pin drop cooker (Jackson and Varriano-Marston, 1981). Cooking time was calculated as the elapsed time from initiation of cooking until the time when 13 of the 25 pins (52%) of the instrument had dropped and penetrated seeds in the cooker.

According with the results (Table 1 and 2) it could be point out some landraces (Canela, Favada, Small White Kidney and White Kidney) with appropriate attributes to be produced in this area, which could be included in a European Community mark of origin and quality.

References

Amurrio, M., M. Santalla, A. M. De Ron, 2001. Catalogue of bean genetic resources. Fundación Pedro Barrié de la Maza / PHASELIEU - FAIR - PL97-3463 / Misión Biológica de Galicia, CSIC. Pontevedra.

Bourne, M. C. 1967. Size, density and hardshell in dry beans. Food Technol. 21:335-338.

Escribano, M.R., Santalla, M. and Ron, A.M. de, 1997. Genetic diversity in pod and seed quality traits of common bean populations from northwestern Spain. Euphytica, 93: 71-81.

Jackson, G.M. E. Varriano-Marston. 1981. Hard-to-cook phenomenon in beans: Effect of accelerated storage of water absorption and cooking time. J. Food Sci. 46: 799-803.

Piergiovanni, A.R.; G. Laghetti, 1999. The common bean landraces from basilicata (Southern Italy): an example of integrated approach applied to genetic resources management. Genetic Resources and Crop Evolution. 46:47-52.

Santalla, M.; A. M. de Ron; P.A. Casquero. 1995. Nutritional and culinary quality of bush bean populations intercropped with maize. Euphytica 84:57-65.

Singh, S.P., 1982. A key for identification of different growth habits of *Phaseolus vulgaris* L. Annu. Rep. Bean Improv. Coop. 25: 92-95.

Table 1. Morpho-agronomical characteristics of landraces from León

Market Class	Landrace	Growth habit[a]	Seeds/pod	Pods/plant	Seed yield (kg/ha)	Seed length (mm)	Seed width (mm)
Canela	Ca 13-9	1	4.4	16.1	2695	18.1	9.0
Cramberry	Pi 5-2	3	5.1	14.5	3864	13.8	10.0
Favada	Fa-gen	3	3.8	14.6	2122	18.6	7.2
Large Great Northern	Pd 2-1	3	5.4	16.5	2713	15.7	8.4
Pinto Red	Pm 11-1	3	5.7	18.1	3161	12.8	8,4
Small White Kidney	Ri men	2	5.8	17.4	3564	14.7	7.5
White kidney	Ri 8-3	1	4.8	16.8	2687	16.2	8.0

[a] According to Singh 1982

Table 2. Seed quality characteristics of landraces from León

Market Class	Landrace	100-SW (g)	WA (%)	HS (%)	CP (%)	CT (m:s)
Canela	Ca 13-9	70.86	108.83	0.00	5.73	18:54
Cramberry	Pi 5-2	69.74	98.82	0.64	5.99	16:11
Favada	Fa-gen	78.80	111.50	1.03	6.71	17:58
Large Great Northern	Pd 2-1	56.91	93.95	13.97	7.02	16:50
Pinto Red	Pm 11-1	51.53	70.65	20.27	7.06	19:34
Small White Kidney	Ri men	51.42	105.90	0.27	6.16	15:44
White Kidney	Ri 8-3	63.23	112.87	0.30	6.27	21:58

SW (100 seeds weight); V10 (seed volume); WA (water absorption); HS (Hardshell); CP (Coat proportion); CT (Cooking Time).