

BIODIVERSITY SCORE AND ITS EFFECTS ON COMMON BEAN (*Phaseolus vulgaris* L.) CROP GENETIC DIVERSITY

**Alexandre Terracciano Villela¹, Irajá Ferreira Antunes², Claiton Joel Eichholz¹,
Cristiane Tavares Feijó¹, Gilberto Antonio Peripolli Bevilaqua², Raul Celso Grehs²**

¹Universidade Federal de Pelotas, Caixa Postal 354, CEP 96010-900, Pelotas, RS, Brasil; ²Embrapa Clima Temperado, Caixa Postal 403, CEP 96001-970, Pelotas, RS, Brasil; *iraja.antunes@embrapa.br

INTRODUCTION

The concept that agriculture research systems currently under way are not suitable to attend future global food needs, under the picture of decreased land availability, population increase and climatic change, has growing lately (JORGENSEN, 2012). However technological innovation alone, it is believed, is not enough to alter in the favorable way such systems. We must also change our values, beliefs and aspirations towards sustainability (STATE OF THE PLANET DECLARATION- New Knowledge Towards Solutions, 2012). Foreseeing such of these perceptions the common bean research team of Embrapa Temperate Climate - CPACT, designed the methodology identified as Biodiversity Score- BS (Partitura de Biodiversidade; ANTUNES and BEVILAQUA, 2009). The BS comprises a group of Landraces - LR, that form the common bean germplasm bank of CPACT. The LR are variable in morphological and physiological characteristics, as well as in origin. The theoretical aim of the BS comprises the LR germplasm preservation, increase of genetic diversity, dietary improvement and greater income to the farmers. Another important point related to the BS, is the role of the farmer in the process of evaluation. Besides using its usual technological framework in the implementation of the BS, that varies from farmer to farmer, the criteria for evaluation of the LR that form the BS, are under his determination. Part of the BS system is also the presence of the extension agent, which also evaluates the LR compounding the interaction among research, extension and the farmer.

This article shows results obtained from testing of BS by farmers from 2007 to the present and their effects on the common bean genetic diversity.

MATERIALS AND METHODS

The Biodiversity Score - BS comprehends a group of Landraces - LR obtained through direct field collection or through the reception from farmers or extension agents. Usually comprises 10 LR and three cultivars released by Embrapa as checks. Experimental plots are formed by four 4m rows with 12 seeds/m with no replication. Cultural practices are the usual for each farmer in order to permit the evaluation exactly according to his traditional way. It is suggested that both the farmer and the extension agent judge the BS appointing to the three best and the three worst LR, informing the reasons for such judgment. Data is registered on disease incidence; plant architecture; adaptation; sowing, flowering and harvest dates; and seed quality. At harvest, the two central rows are collected upon which seed yield is determined.

The BS system was set in 2007/08 crop year and, up to now, about 200 have been sent for evaluation to all common bean production regions of Rio Grande do Sul State (RS). One hundred twenty LR have been distributed to farmers through the BS system, adjoining about 140 farmers

directly to the process. Mostly of the BS had the official extension service participation in the evaluation.

RESULTS AND DISCUSSION

Some of the results obtained since 2007, reveal that LR displayed differential adaptation to the environments where they have been tested. Besides, different farmers took different characteristics as of most importance in electing the best cultivars.

In such way, both the farmer and the extension agent, located in Estrela (RS) elected as the best cultivars the LRs Preto Graúdo and Milico, based on the high probability of good market performance. In Venancio Aires (RS) the reason for selection of the cultivar Chumbinho as the best, was its excellent cooking quality, whereas superior yield and disease resistance presented by the LRs BalimGrosso, Guabiju and Felipe where the characteristics for selection as the best made by the farmer located in Sertão Santana(RS).

Another important feedback from the farmers came from TenentePortela (RS), where a farmer which can be considered as a seed keeper, declared that the BS is an important instrument as source of new cultivars for use in family farming systems, in which the farmers are able to produce their own seeds.

Based in the results, the BS system mechanism resulted in improved genetic diversity since a group of new cultivars was added to the common bean cropping system

Results obtained up to now also suggest that the BS system is attending the main objectives present at the moment it was designed and point forward to its use as a model for other crops in order to accomplish with the ideas for new research systems.

REFERENCE

ANTUNES I. F.; BEVILAQUA G. A. P. Partituras de Biodiversidade – PBio – Uma nova alternativa para ampliar a base genética de espécies cultivadas e promover a segurança alimentar. SIMPOSIO DE RECURSOS GENETICOS PARA AMÉRICA LATINA Y EL CARIBE, SIRGEALC, 7, 2009. 1 CD-ROM., 2009.

JORGENSEN, R.A. A vision for 21st century agricultural research. *Frontiers in Plant Science*, Article 157, vol. 3, July 2012.

STATE OF THE PLANET DECLARATION - New Knowledge Towards Solutions. March, 26-29. 2012. London. 10 p. 2012