STATE AND PROSPECTS OF DRY BEAN BREEDING AND PRODUCTION IN BULGARIA

Dimiter Genchev, Ivan Kiryakov
Dobroudja Agricultural Institute, 952-General Toshevo
E-mail: genchev@dai-gt.dobrich.net

Bean is the most simple and the most preferred food of Bulgarians. This fruit of the Bulgarian land has grown into the mind of the common Bulgarian in such a way that he considers that its cultivation began in ancient times. Therefore many people are surprised at hearing that this symbol of the Bulgarian every day life became known to our ancestors a little more than three centuries ago. Bean originated in America and was introduced in Europe only after America was discovered, i.e. at the beginning of 16th century. It was introduced into the boundaries of the Ottoman empire a century and a half later, i.e. in the middle of the 17th century, simultaneously with maize.

Due to the favorable climatic conditions, and due to the fact, that bean is preferred by the population in the country, a large number of botanical forms and landraces have been differentiated; they differ by the type of plant, by flower, form and size of seeds, as well as by economic qualities. By its variability of forms and types, bean is a crop unmatched by any other in our country. Gradinarov (1939) established 91 landraces of common bean and two of runner bean. Vishnevsky (1940) described 124 landraces. Rachinsky (1968) collected and investigated 496 landraces, and Ganeva (1983) - 4323 forms. In IPGR-Sadovo there are 1710 accessions (Stoilova, T., 1998). At Dobroudja Agricultural Institute (DAI) - General Toshevo 400 accessions have been collected and are being investigated. Undoubtedly, there is even greater variability in Bulgaria, especially concerning the biological and physiological differences which are still insufficiently studied.

Bean reached its peak of distribution during 1941-1946 - up to 160 000 ha annually. Since then, however, the area sown with bean has been decreasing and now it is about 20 000 ha.

The climatic conditions in Bulgaria are very variable. According to the soil and climatic regions (Hristoforov et al., 1969), the areas, favorable for growing of bean encompass the greater part of the Danubian plane and the Dobroudja plateau, which also includes Dobroudja Agricultural Institute - General Toshevo. The sum of mean twenty-four hour air temperature from spring (10° C) to autumn (15° C) is 2800 - 3200° C, while the temperature sum necessary for normal vegetation is 1900° C. During the period of seed development, the mean air temperature is 21-22° G. The years with high maximum temperatures exceeding 34° C are 20-40 %. The hydro-thermal coefficient of the bean vegetation period varies from 1.10 to 1.51. In these regions 7-40 % of the obtained yield is over 2000 kg/ha, 20-47 % - from 1500 to 2000 kg/ha, 20-47 % - from 1000 to 1500 kg/ha, and 7-27 % - under 1000 kg/ha.

The biological potential of dry bean under the conditions of Bulgaria based on trials in 15 stations for State varietal testing with the most widespread varieties Dobroudjansky 2 (IIIb growth type), Dobroudjansky 7 (IIIb) and Abritus (Iia) for 10 years has been 1760 kg/ha. In these stations yields varied from 1200 to 2400 kg/ha. The traditions and experience accumulated in cultivation of dry bean under non-irrigation conditions are in north-east Bulgaria, where about 80 % of the areas and 90 % of the production were concentrated, the realization of the production potential being only 50 %. The reason for this low realization of the productivity potential is the lack of varieties and technology for direct harvesting. Variety Abritus has disposition of pods on the growth habit suitable for direct sowing, which remains stable by years and regions. The only disadvantage according to Bulgarian consumer is that its seeds are small (seed weight of 200-220 mg). DAI will soon be able to supply varieties with Ila growth type with large white seeds and the problem with this variety will be solved. The varieties with Ila growth type are also suitable for growing with irrigation and direct harvesting.

In the mountain regions, where mechanized harvesting is not possible, varieties with IVa and IVb growth type dominate. They provide more produce per unit area (3000-4000 kg/ha). They are grown on poles of Corylus sp. 3-4 m long. These regions with altitude from 600 to 1000 m are characterized with more abundant and more evenly distributed rainfalls. Besides, there are
possibilities for irrigation. All this is a prerequisite for high and stable yields during the years, and of better cooking properties. The most prominent peculiarity of bean growing in such places are the considerably greater labor expenses.

The diseases are a major problem for production of common bean in Bulgaria. Among the more than 20 bacterial, fungal and viral diseases, the following have economic importance: common bacterial blight (Xanthomonas axanopodis pv. phaseoli), halo blight (Pseudomonas savastanoi pv. phaseolicola), anthracnose (Colletotrichum lindemuthianum), bacterial wilt (Curtobacterium flaccumfaciens pv. flaccumfaciens), white mold (Sclerotinia sclerotiorum), bean common mosaic (BCMV and BCMNV). Among the pests, bean weevil (Acanthoscelides obtectus) has economic importance.

The breeding efforts of DAI are directed toward breeding of varieties which can meet the various demands of the consumer. These demands are related mainly to: 1) the way of growing; 2) climatic peculiarities and 3) demand on the market. Therefore we are working for the development of varieties suitable for all types of growing that have proved their suitability in practice. The new varieties possess: 1) variable form, size and color of seeds and 2) different biology allowing production of maximum amounts and quality under certain environmental conditions. However, the main direction of breeding in DAI is developing varieties with simultaneous flowering and maturation, with erect habit (Ia, IIA, IIIb, IVa and IVb), with high disposition of the pods on the habit, suitable for growing as monoculture and direct harvesting.

REFERENCES


