

Bean collection of Kazakh University: enrichment and investigation on morphogenetic traits

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*Institute of Plant Biology and Biotechnology, Ministry of Education and Sciences Under mountain and steppe (plain) conditions of the Almaty Region, morphogenetic traits of 37 cultivars of common bean from different soil and climatic zones (Kazakhstan, American, Chinese, Polish, Russian, Turkish, and Czech collections) have been evaluated. This study was carried out under crop rotation in mountain and steppe (plain) zones of the Almaty Region in 2011-2012. Thirty-seven cultivars of common bean and its relatives were planted: i, generation and study on domestic cultivars of common bean; ii, setting up the collection so as to be processed by the students under the supervision of researchers; iii, development of field and seed research capability at new “Zhanga Talap” Agrobiocenter of al-Farabi Kazakh National University.

Basic morphogenetic features have been studied across the collection of common bean, *Phaseolus vulgaris* L. (Kazakhstani, American, Chinese, Czech, Polish, Russian, and Turkish), from different soil and climatic areas. The collection was grown under mountain and steppe zone conditions of the Almaty Region. A number of useful genetic stocks have been identified for agronomically desirable traits. Part of stock varieties after preliminary propagation and introduction has been registered as the State Certificate on the subject of author rights No. 612 of 14 May, 2012 entitled: “Distribution and exchange of bean specimens”.

The cv. “Luna” from Czech collection is the earliest to reach maturity, whereas other varieties are 10-12 days later than “Luna.” Using local “Aktatti” line, the effect of new domestic bioorganomineral fertilizer on morphogenetic traits were investigated, and the fertilizer was shown to increase the yield by as much as 25%.

Out of the Czech bean collection introduced in the mountain zone, the cultivar to reach maturity earliest was cv. “Luna” (80 days of maturation), whereas other cultivars reached their technical maturity 10-12 days later than “Luna”. As for germination percentages, tested by computational cluster analysis, the local line “Nazym” being closer by maturity date to cv. “Zuzka” and other local bean line “Talgat”, appears to be more promising to be grown commercially in southeast regions of Kazakhstan on the basis of this and its other desirable traits.

In addition to Czech and local cultivars and lines, six French cultivars of bush and liana common beans (“Argus”, “Coco nain blanc precoce”, “Triomphe de Farcy”, “Merveille de Venise”, “Mistica”, and “Phenomene” manufactured by Truffaut and Vilmorin companies), are currently being investigated. Five of these cultivars (except cv. “Coco nain blanc precoce”) show high or average productivity (the data are in progress). Investigations on domestic collection of cultivars and lines are also in progress with respect to biochemical, cytogenetic and other properties for use in further breeding work.