

## **A Point of View about Tolerance Evaluation Possibility of the Selection Lines and Cultivars to Environmental Stress Factors**

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The common bean (*Phaseolus vulgaris* L.) has a poor reputation both in terms of yield of potential and tolerance to physiological stresses such as drought, high and low temperatures and etc. The influence of these stress ecological factors on yield or some other selection character are associated with a lot of physiological processes in the plant. By different greenhouse, laboratory and biotechnological methods be able to evaluate only a part of the processes giving plant reaction to given stress factor. This is reason for very low correlation between given selection character ( for example - yield) and the data of these methods. The data of the artificial dry and hot fields correlate closely with ecological stress factors. The main their fault is limited number of varieties which be able to evaluate and very high cost.

We suggest the evaluation of selection characters to be done in the routine selection procedure. The nature of the idea is following. The degree of some character expression is depend from plant genome and its susceptibility of the environmental factors (relative humidity, precipitations, maximum temperatures, minimum temperatures, NPK availability in the soil, soil tillage, sowing density etc.). The cultivars with low susceptible genome to environmental factors (high tolerance) are more suitable for uncontrolled conditions and with high susceptibility for controlled conditions. The high tolerance is associated with minimum values (tend to zero) of the variation coefficient ( $V_c$ ), correlation coefficient ( $r$ ), stability parameters - plasticity coefficient ( $b$ ) and stability coefficient ( $s^2$ ), and path-coefficient.

The plant can be evaluated to each selection character on one, two, three or four of the following levels. The *first level* is on the base of variation coefficient ( $V_c$ ) and the coefficients of plasticity ( $b$ ) and stability ( $s^2$ ), which give us the general reaction of the plant genome to environmental factors. The *second level* - on base of sum of correlation coefficients ( $r$ ) between given selection character and studied environmental factors during whole vegetation period. The *third level* - on the base of concrete correlation coefficient ( $r$ ) between given selection character and given environmental factor during given vegetation subperiod. The *fourth level* - on the base of path-coefficients, which give us a clear influence of given environmental factor during given vegetation subperiod.

The all these evaluations be able to do on the base of routine competition selection trials without any additional one, by natural changing of the environmental factors in several years, at least 5 years. The data were calculated by standard methods for  $V_c$ ,  $s^2$ ,  $r$  and path-coefficient. The correlations were calculated from logarithmically transformed data.

We have been used  $V_c$  and path-coefficients with success in our practical selection of dry bean (*Phaseolus vulgaris* L.). Our selection efforts are directed towards developing common dry bean varieties with higher middle values and lower  $V_c$ ,  $b$ ,  $s^2$ ,  $r$ , and path coefficients (tend to zero) of the selection characters included in our