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Screening sugar beet samples for the presence of bolting gene

Abekova A.M.*, Yerzhebayeva R.S., Konysbekov K.T., Bersimbaeva G.Kh.
Kazakh Research Institute of Agriculture and Plant Growing, Almalybak, Kazakhstan
** e-mail: aabekova@mail.ru*

Sugar beet (*Beta vulgaris*) is biennial plant used in sugar industry. It is an actual problem to increase the yield of sugar beet and reduce the cost of harvesting and sowing in the spring, and it's resistance to frost. However, overwintering sugar beets in the soil dramatically reduces the yield of plants and another important point – bolting. It was found that bolting depends on the effect of both environmental and genetic factors. Bolting dramatically reduces the yield of sugar beet and it's sugar content, and complicates the processes of harvesting. Thus, bolting is completely undesirable for agriculture (in the first year), although it is necessary for the production of seeds (the second year). Bolting is highly dependent on many factors. For this, the use of molecular markers closely related to the genes of bolting. A study was conducted on the collection of hybrids and sugar beet lines of the Kazakh Research Institute of Agriculture and Plant Growing with the use of CAU3903b marker, which is specific for the BR1 locus for the presence of bolting gene. As a result of the study, it was established that 39 out of 40 samples of sugar beet have resistant genes to bolting, and these samples are recommended for further breeding processes. An environmental test of 40 hybrids and sugar beet lines for adaptability, productivity, cold resistance and bolting in 3 climatic zones (Almaty, Pavlodar regions of Kazakhstan; Voronezh region of the Russian Federation) was conducted. The test showed that under the conditions of 2018, bolting of sugar beet in the first year was low in all three zones (0–0.7 %). 7 samples according to high adaptability and productivity and 10 samples according to high sugar content were identified in the Pavlodar region. Based on the preliminary testing results, 6 samples with high yield and 12 samples with high sugar content were selected in the Voronezh region. 3 samples by high yields, exceeding the standard Aisholpan hybrid in the Almaty region, were selected. Hybridization of sugar beet was carried out – 3 combinations of crossings. Hybrid seeds are obtained.