

EVALUATION OF BEETROOT BREEDING MATERIAL IN STORAGE

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In Kazakhstan beetroot is stored for fresh market for as long as 7-8 months, so the disease resistance of the crop, in particular in storage season is of great importance. It is known that the most effective method of plant protection against infectious diseases is to develop and release of disease resistant varieties for fresh market, which would greatly reduce the yield loss during storage.

Improving the postharvest storability of beetroot varieties or selection lines has been part of the breeding program. The goal of our study was to assess the storability of beetroot accessions being undergone to study in breeding nurseries. The beetroot breeding selections were exposed for the study during 2012-2013 storage seasons.

Sowing of beetroot breeding selections in nurseries was conducted manually on raised beds. On the experimental plot the recommended beetroot cultural practices were applied. To study the storing ability 20 beetroot roots with no outward signs of disease from each accession replicated two times were put into storage. The weight of beetroots varied widely from 99 g to 627 g depending on the shape and size of roots. Beetroots were stored in polypropylene bags, which were placed bulk on the lattice shelf with height of 30-35 cm. Storage temperature in the autumn and spring seasons ranged from 3-5⁰ to 6-9⁰ C, and in the winter season it was at 1-2⁰ C. Observations and surveys were done in accordance with the recommended instruction guides. In the spring after prolonged storage (October to April) the natural decline in mass, losses from disease and storability percentage of the stored mass were rated.

Some authors suggested that following harvesting storability of beet roots is associated with root rot caused by various pathogens like *Aphanomyces*, *Pythium*, *Rhizoctonia*, *Phoma*, *Fusarium*, *Rhizopus*, etc [1-6]. In other experiments, storability of beet roots mostly conditioned by the genotype of the studied varieties, by the year, the growth and storage conditions [7-9].

In our experiments, depending on the genotype beetroot breeding selections in one extent or another were infected by some of the mentioned diseases. As there were some complications in perfect identification of particular pathogens on roots of the beetroot breeding selections studied and because of the presence of pathogens of several diseases' symptoms or their mixture on the beetroot roots simultaneously, in this paper are presented the results for the total loss from the diseases.

It should be noted that in this study under the category of a storable roots were recognized only those samples that are suitable for planting for seed reproduction, i.e. all of the healthy roots were taken into account.

Despite the fact that the conditions for beetroot storage in this study significantly deviated from the accepted standard conditions, yet still there was an opportunity to assess the beetroot breeding selection material to obtain relatively

conclusive results, consequently, leading to the selection of beetroot samples for storability at prolonged storage.

The surveys showed that the magnitude of losses in stored roots varied considerably depending on the genotype of the beetroot breeding selection material studied. Due to the large scale of the data on the extent of the natural decline in mass, damages from disease and storability of beetroot breeding selection material the obtained characteristics were grouped tentatively.

As the results showed, high natural decline in mass (>10,0%) was observed in 13 breeding selections of beetroot (BR387, BR265, BR140, BR515, BR281, BR401, BR274, BR396, BR296, BR489, BR034, BR499, BR312); in 22 selection numbers it rated at a level of 5,0-10,0% (BR388, BR394, BR151, BR446, BR420, BR397, BR462, BR145, BR481, BR336, BR356, BR300, BR500, BR111, BR469, BR163, BR503, BR096, BR364, BR472, BR153, BR228); low natural decline in mass (<5,0%) was noted in 20 beetroot accessions (BR087, BR172, BR442, BR501, BR366, BR246, BR359, BR306, BR213, BR291, BR222, BR208, BR368, BR460, BR504, BR373, BR506, BR449, BR325, BR242). The lowest natural decline in mass was observed for beetroot breeding selections BR242 – 2,4%, BR325 - 3,1% and BR449 - 3,3%. The highest natural decline in mass were recorded for selection numbers BR387 - 15,7%, BR265 – 13,3% and BR140 – 12,0%.

The maximum loss from diseases were observed in beetroot breeding selections BR336 – 73,3%, BR274 – 62,4% and BR401 – 61,9%; the lowest of it was for the selection number BR153 – 10,5% and BR140 – 10,2%, the number BR460 had no losses from diseases.

The results of the studies have shown that the natural decline in mass, losses from diseases and storability of roots varied considerably depending on the genotype of the studied breeding selection material of beetroot.

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