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The Influence of Agrotechnical Factors in the Initial Processing Of Barley Grain

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Abstract. When growing environmentally friendly and high-quality barley grain for technological processes, an important role is played by the optimization of norms and proportions of mineral fertilizers, as well as the optimization of seeding rates. In our scientific study, when preparing barley grain for technological processes, sowing rates and nutritional factors that affect a number of technological indicators, such as the weight of 1000 grains, natural weight, were widely studied.

Key words: spring barley, grain, seed fractions, mineral fertilizer, nitrogen, phosphorus, potassium, weight of 1000 grains, natural weight.

Worldwide, the quantity and variety of products made from barley grains are both drastically growing. Barley grain must first be freed from the hull before being processed into food products. Following that, it is processed to produce flour, coarse flour, leafy flour (flakes), and partly (2%) flour. In Western nations, barley groats are used to make porridge, bakery mixes, baby food, steamed and liquid foods, whole groats, and milled groats [1].

Although barley is technically a refined grain, it is much more beneficial than other refined grains because the fiber contained in the barley grain is not only in the outer bran layer but throughout the whole grain[3; 37-47 -б., 4; 310 -б., 5; 315 -б., 6; 120 -б.].

Soluble glucan (beta-glucan) contained in barley grain provides complete satiety when eaten cooked and effectively reduces the need for food. It lowers cholesterol levels, helps normalize blood pressure, and thus reduces the risk of heart disease.

Pearl barley has an extremely low fat content compared to other varieties of barley. According to several scientific research, pearl barley eating on a regular basis lowers blood sugar levels, which is especially advantageous for diabetics [2].

Therefore, one of today's most pressing issues is the investigation of technology for preparing barley grain for processing.

Field experiments were conducted in 2015-2017 at the "Saipov Shakhboz" farm in the Koson district of the Kashkadarya region. The total area of the experimental field is 6480 m2, the field experiments were conducted in four iterations, the size of the surface of the experimental fields was 180 m2, the calculation fields were 100 m2, the width was 7.2 meters, and the length was 25 meters. The mass of 1000 grains was determined according to GOST 10842-89, the bulk weight according to GOST 10840-64, and the pearl yield according to GOST 5784-60 [7; P.96-97].

Barley is graded into fractions and sifted in sieves with varying mesh sizes since the larger the grain, the higher the quality level. In our study, we used a German-made Sortimat machine with sieve meshes of 2.5 mm, 2.0 mm, and 1.7 mm to sift and fractionate seeds of the Kyzilkurgan type of barley. First, 1 kg of barley was sifted through sieves with 1.7 mm holes to separate it, and then it was divided into fractions by being sifted through sieves with holes of 2.5 mm, 2.0 mm, and 1.7 mm (Table).

The quality of the grain grew in proportion to the fractions of the seeds when different fractions of the Kyzilkurgan variety of barley were planted, as shown in the table..

According to the results of technological analysis, the weight of 1000 seeds of the Kyzilkurgan variety of barley with fractions of 1.7 mm, 2.0 mm, and 2.5 mm in the control option without mineral fertilizers was 23–46 grams, and the weight of grain was 501.4–582.3 g./l, and the perlovka output increased to 77–81%.

The same law was observed when the seeds of different fractions of barley were sown and fed with the recommended rates and proportions of mineral fertilizers ($N_{180}P_{90}K_{60}$). 34 grams, and it was observed that

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it increased to 47 grams in grains with a fraction of 2.5 mm. As the seed fractions increased, the parameters of grain weight and pearl yield increased. When seeds with a fraction of 1.7 mm were planted and fed at the same rate, the bulk weight of barley grain was 523.5 g/l, with fractions of 2.0 mm, it was 597.8 g/l, and with fractions of 2.5 mm, it was 642.4 g/l. 81% of seeds with the smallest fraction (1.7 mm), 83% of seeds with a medium fraction (2.0 mm), and 85% of seeds with a large fraction (2.5 mm) were observed.

Table

The effect of seed fractions and feeding on quality parameters of grain of the Kyzilkurgan variety of barley

(The average of the analysis obtained in 2015-2017)

№	Experiment options, mm	Quality indicators of grain of Kyzilkurgan variety of barley		
		Weight of 1000 seeds, g	Natural weight of grain, g/l	Output of pearled barley, %
Without NPK (st)				
1	2,5	46	582,3	81
2	2,0	33	561,4	79
3	1,7	23	501,4	77
When NPK is applied in the recommended rate and ratio ($N_{180}P_{90}K_{60}$)				
4	2,5	47	642,4	85
5	2,0	34	597,8	83
6	1,7	24	523,5	81
When NPK usage exceeds the authorized rate and ratio ($N_{210}P_{105}K_{70}$)				
7	2,5	48	663,2	87
8	2,0	34	602,7	85
9	1,7	25	538,3	83

In our experiments, it was found that the quality indicators of the grain grown increased proportionally to the increase in the norms of mineral fertilizers when the Kyzilkurgan variety of barley was planted in different fractions and fed with the recommended norms ($N_{180}P_{90}K_{60}$) and increased norms ($N_{210}P_{105}K_{70}$) of mineral fertilizers. For instance, it was demonstrated that the weight of 1000 grains of growing barley was 25–48 grams higher than the control option, which received no mineral fertilizers, when compared to the background of enhanced mineral fertilizers, and up to 2 grams heavier. The same pattern was seen in the grain type, where the seed fraction rose from 538.3 g/l to 663.2 g/l, whereas in the control version, which did not receive mineral fertilizers, it ranged from 36.9 to 80.9 g/l. In comparison to the control option, which did not get mineral fertilizers, it demonstrated that 83–87% of the barley grains grown on this backdrop were pearled.

Thus, in light gray soils of Kashkadarya region, the weight of 1000 grains of grain grown when seeds of the Kyzilkurgan variety of barley were sown in large (2.5 mm) fractions and fed with the recommended norms ($N_{180}P_{90}K_{60}$) and increased rates ($N_{210}P_{105}K_{70}$) of mineral fertilizers, quality indicators such as the output of the pearl will increase significantly.

References:

1. https://www.zerno-ua.com/journals/2010/dekabr-2010-god/yachmen-v-proizvodstve-produktov-pitaniya/
2. https://www.gastronom.ru/product/perlovka-jachmen-1456

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Date of Publication: 21-04-2023

3. Oripov R., Sulaymanov I., Umurzokov E. Technology of storage and processing of agricultural products. - T.: - Labor, 1991. - B 37-47.
4. Spravochnik mukomala, krupyanshchika, kombikormovshchika (V.G. Bardyshev) Zamyatin V.G. Kulak i drugie - 2nd izd. Prerab. I. Dope. - M.: Kolos, 1973. - C. 310.
5. Chernilov L.O. Oborudovanie elevatorov, skladov i zernopererabotayushchikh predpryatiy (4.1) –M. - Colossus. -1972. -C. 315.
6. Galitsky R.R., Ruday M.Z. Oborudovanie elevatorov, skladov, i zernopererabotavayushikh predpryatiy (Ch. II). - Moscow. - Colossus. -1973. -C. 120.
7. Musaev M.S. and Hayitov A.S. "Influence of seed fractions and feeding on yield and quality of barley grain." (2021). European Scholar Journal (ESJ). Vol. 2 No. 5, MAY 2021. - P.96-97.