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RESEARCH ARTICLE

INFLUENCE OF TIMING OF CROPS AND NORMS OF MINERAL FERTILIZERS FOR WINTER BARLEY YIELD

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ABSTRACT

The article presents the results of studies on the responsiveness of winter and two-handled barley varieties on the terms of sowing and mineral fertilizers in conditions of light-yellow soil of the Kashkadarya region. It is established that, as the planting time lags, efficient mineral fertilizers are reduced. The highest grain yield is formed when sowing on October 15 with the application of mineral fertilizers $N_{180}P_{90}K_{60}$ kg / ha.

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INTRODUCTION

Grain production provides the population with food, livestock - with feed, industry - with raw materials. Therefore, grain production is a key issue in the development of agriculture. Barley is the main grain crop in the Republic of Uzbekistan. Despite the great importance of barley in the republic, its yield on irrigated land remains low at 30–35 c / ha. In this regard, the problem of increasing yields must be addressed through the wide use of the achievements of breeding, the further improvement of the technology of cultivation of this crop. To realize the high potential productivity of new varieties of barley, modern cultivation technologies adapted to the hot, arid climate of the south of the republic are needed. Numerous studies have been carried out in Uzbekistan concerning the selection, seed production and technologies for the cultivation of winter barley (Khalilov *et al.*, 2006; Blokhin, 2006; Gariv *et al.*, 1998). The role of predecessors, sowing dates, sowing norms, fertilizers on the yield of winter barley varieties included in the State Register has been studied. In recent years, new varieties of winter barley "Mavlono", two-handled "Bolgali" with a potential yield of 6.0-7.5 t / ha currently occupying the main areas of sowing for irrigation have been developed. But due to the lack of cultivation technology, taking into account the biological characteristics of varieties and the soil and climatic conditions of the region, the yield of barley remains low. Therefore, the improvement of the technology elements for them, taking into account the biological characteristics and the soil and climatic conditions

of the region, is currently highly relevant. To achieve the task, the following tasks were performed:

- To justify the optimal rates of sowing and mineral fertilizers of barley varieties, ensuring maximum grain yield;
- Determine the response of winter barley varieties to doses, mineral fertilizers and the economic efficiency of growing technologies of intensive winter barley varieties are made taking into account the biological characteristics and soil and climatic conditions of the region.

The advantages of winter barley are manifested in the rotation. Ripening before winter wheat and spring barley for 8-15 days, it provides for the production of feed grains in an earlier period. In addition, freeing the fields after harvesting early, winter barley is a good precursor for repetitive crops. An important feature of winter barley is that in early spring, starting to grow and continuing to bush, it suppresses weeds before other crops, thereby eliminating the need to use expensive herbicides. Studies by many authors have shown that the factors that ensure the growth of yields and gross grain harvest of new varieties of barley include: placing them according to the best predecessors and sowing seeds in optimal agro technical periods with recommended standards (Gariv *et al.*, 1998). Determining the optimal sowing time and fertilizer rates for specific environmental conditions for barley is very important because they greatly affect the timeliness of

emergence and fullness of seedlings, the subsequent growth and development of plants and, ultimately, the yield. The aim of our research is to identify the optimal timing and rate of fertilizers, providing a high yield with good quality of winter grain and two-handles of barley varieties on irrigated lands of Kashkadarya region. The object of research was the winter barley variety Mavlon and the variety of the two bullets Bolgali included in the State Register. The experiments were carried out on the experimental fields of the Kashkadarya Scientific Research Institute for the Selection of Seed Crops.

MATERIALS AND METHODS

The experiments were conducted in 4-fold repetition, accounting area plots 50 m². Sowing was carried out with an SFK-6-10 seeder with 15 cm row spacing. The seeding depth is 5 cm. The depth of groundwater is 2.5-3.0 meters. Soils are light gray, the humus content in the topsoil (0-30 cm) of soil is 0.87%, total nitrogen is 0.03-0.07%, total phosphorus is 0.15-0.18% of total potassium 1.8-2, 0%, mobile forms of N-NO₃ 0.068, phosphorus 0.105, exchangeable potassium 190 mg / kg of soil. In the experiments, the sowing of the Mavlon winter barley variety and the Bolgali double-handled varieties were carried out on October 1; October 15; November 1 and November 15 in the following variants of the rate of fertilizers:

1. Control (without fertilizers);
2. P₉₀K₆₀-background;
3. Background + N₆₀;
4. Background + N₁₂₀;
5. Background + N₁₈₀ kg / ha.

The seeding rate is 4.0 million viable seeds / ha. Cotton predecessor. In the experiments, soil moisture during the growing season was maintained not lower than that of the soil EFC (extreme field capacity). 10–15 days before sowing, water recharge irrigation was carried out at a rate of 800 m³ / ha. Phosphate and potash fertilizers were applied for plowing. Nitrogen fertilizers were applied according to the scheme of experience, depending on the rate of nitrogen fertilizers in the early spring, in the tillering stages, going into the pipe, earing as a top dressing.

RESULTS

Barley seeds against the background of water-recharge irrigation gave amicable shoots. As the sowing time lags, field germination decreased. The highest seed germination rate was observed at the time of sowing on October 15. Mineral fertilizers did not significantly affect field germination. The highest safety of plants for harvesting was observed in optimal sowing dates. Winter resistance and varietal characteristics of barley had a significant effect on the safety of plants for harvesting. The winter hardiness of the Bulgali two-hand cultivars was lower than that of the Mavlon winter variety.

As a result of research, it was found that as the dose of nitrogen fertilizers increased from 120 to 180 kg / ha, a significant increase in yield was not observed. When sowing cultivar two-rowed barley Bolgali, on October 1, the highest yield was established on plots background + N₁₂₀ and background + N₁₈₀ kg / ha, respectively, 41.6 and 42.6 c / ha, yield increase compared with the control variant 15.2; 16.2 c / ha. These figures for the grade Mavlon respectively amounted to 45.1; 46.6 c / ha, yield increase 19.7; 21.2 c / ha.

The optimal sowing date for barley varieties in the conditions of Kashkadarya region is the second decade of October. When sowing on October 15, the yield increased in comparison with the crops on October 1, and the efficiency of mineral fertilizers increased. The yield of the Bolgali two-rowed barley on the plots of background + N₁₂₀ and background + N₁₈₀ kg / ha was 46.4 and 49.1 q / ha, in the winter variety of Mavlon 48.7; 52.7 metric centners per hectare, the yield increase from mineral fertilizers by varieties was 17.2; 15.4 and 20.8 and 24.8 c / ha. It was revealed that the winter lodging variety Mavlon has a high resistance to lodging, winter hardiness and responsiveness to mineral fertilizers in comparison with the variety of the two-rowed barley Bolgali. As the sowing time lags, the yield decreased. When sowing on November 15 compared with October 15, there was a decrease in yield. The yield of the Bolgali variety on plots using background + N₁₂₀ and background + N₁₈₀ kg / ha was 37.1 and 36.9 c/ha, according to the winter variety Mavlon, these figures were respectively 35.6; 38.2 metric centners per hectare yield increase 13.8; 13.6 and 12.2; 12.6 c / ha The decrease in yield as the lagging time from the optimal sowing period for the Mavlon variety was significantly compared with the Bolgali variety, which is explained by the higher responsiveness of the Mavlon variety to fertilizer and the sowing dates. With early and late sowing of October 15, the mass of grains from one ear, the number of grains in one ear and the mass of 1000 grains decreased. On the plots of the Bolgali variety, when applying high doses of mineral fertilizers, background + N₁₈₀ kg/ha, partial lodging of plants was observed.

Findings

Under the conditions of light gray soils of the Kashkadarya region, the highest grain yield is formed by the conditions of the winter variety Mavlon and the Bolgali two-handles when sown on October 15 with the addition of N₁₈₀P₉₀K₆₀ kg / ha. Early or late sowing of barley from October 15 leads to a decrease in the effectiveness of mineral fertilizers. Mavlon's winter variety, compared to the Bolgali two-rowed barley, is more resistant to lodging and has good winter hardiness. It was found that the variety Mavlon is more responsive to the sowing dates and mineral fertilizers.

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