

CHICKPEA PRODUCTIVITY DEPENDING ON TIME AND SCHEME OF SOWING DIFFERENT VARIETIES IN THE CONDITIONS OF UZBEKISTAN

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Abstract

The article presents data on the impact of different timescales and sowing schemes on the productivity of chickpea varieties in the conditions of Uzbekistan. When chickpeas of various varieties are sown early (in February), plant growth, bean formation, the number of seeds in beans, and yield are significantly higher than when they are sown late (in April). It is established that the efficiency of the chickpea sowing scheme is 60x9 cm.

Keywords: Chickpeas, chickpea varieties, sowing dates and schemes, plant growth, number of seeds, yield.

INTRODUCTION

Further increase in the production of vegetable protein is one of the world's most important problems. Protein deficiency leads to an increase in bread consumption and in animal husbandry-to an overconsumption of feed in the diet. In solving the protein problem, the most important role belongs to increasing the production of high-protein leguminous crops by expanding the sown areas, developing and implementing scientifically based, zonal technologies for their cultivation, taking into account the biological characteristics of zoned varieties [3, 4, 5, 4, and 5].

Academician D. N. Pryanishnikov wrote, "... in solving the problem of vegetable protein, the main role belongs to high-protein leguminous crops." Among the leguminous in this regard, special attention should be paid to the traditional, drought – resistant, high-protein crop-chickpeas (*Cicerarietinum*L.)[6, 8,9].

The prospects of this important food crop in the conditions of the republic are determined by very valuable biological and agro technical features, high adaptability and drought resistance, resistance to diseases, low demands on the soil, the use of atmospheric biological nitrogen and are a good precursor for grain crops [7, 10, and 11].

The tasks of ensuring food security in the republic require studying and improving chickpea cultivation techniques that provide a significant increase in productivity and increase in production. From this point of view, the development of varietal agricultural equipment for promising chickpea varieties in Uzbekistan is of great scientific and practical importance.

MATERIALS AND METHODS

Research on the study of sowing dates were carried out in the farms of MMTP named after Alisher Navoi of the Urgut district, Samarkand region on gray-brown soil conditions. The experiments used varieties of chickpeas Yulduz, Milyutin 6, Uzbekistan 32, Umid, the planting dates were tested-20, 28 February; 10, 20, 30 March; 10 April; the area of tally plots was 52 square meters, repetition was 4-fold [1,2]. Planting patterns of 60x6 and 60x9 cm were studied. The predecessor crop was winter wheat.

Picture1: General view of the experimental field for studying the timing of chickpea sowing on 2021.

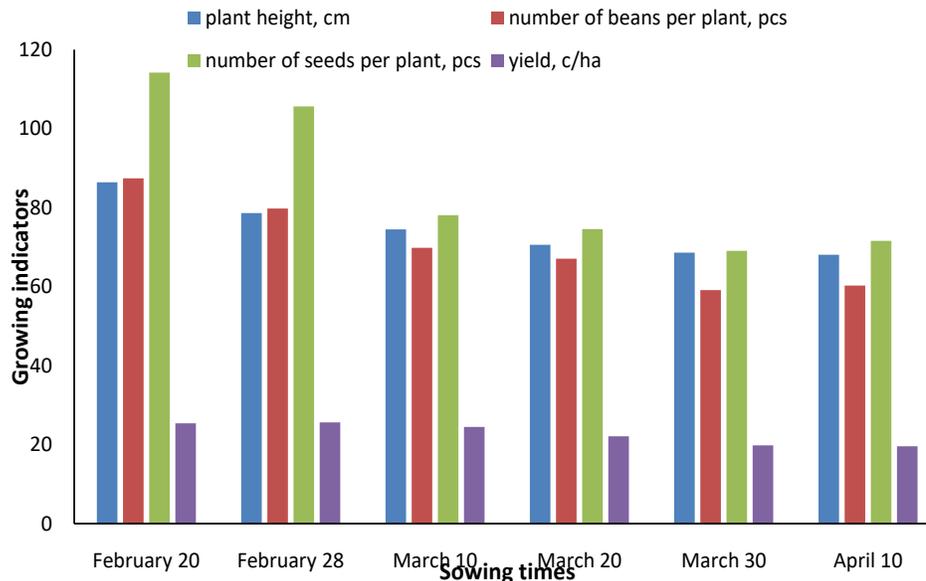


Calculation and observations were carried out according to the generally accepted method for legumes. Field experiments and statistical data processing were carried out according to Dospekhov [1].

RESULTS AND DISCUSSION

Figure1 shows data on the effect of sowing time on the productivity of chickpeas variety Yulduz. It was found that as the sowing dates are delayed; there is a tendency for decreasing plant height, number of beans and seeds per plant, and the yield of chickpeas.

Figure 1: Influence of sowing time on biometric indicators of plants and yield of chickpea variety 'Yulduz' 2020-2021



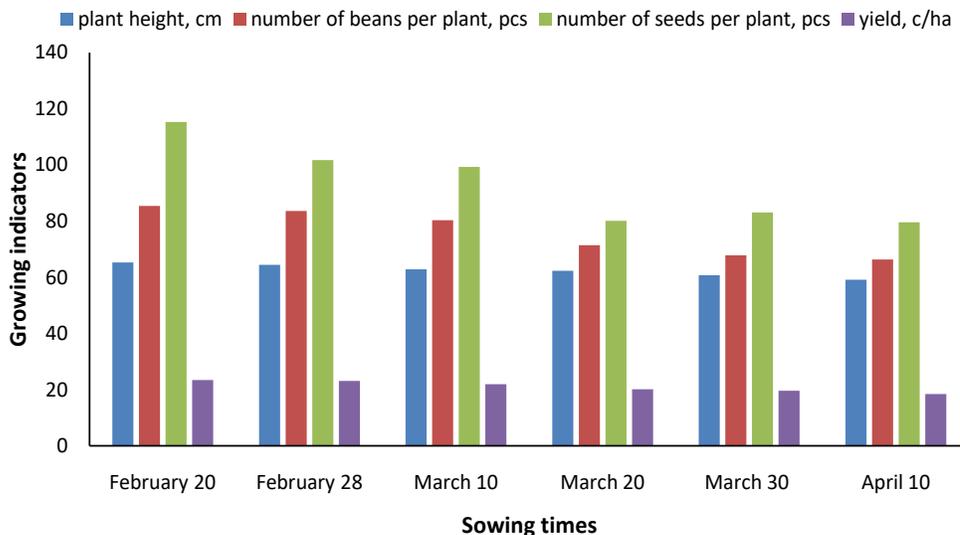
It was revealed that at late sowing dates (April 10), the plant height was 18.3 cm lower than at early sowing dates (February 20). The same tendency is maintained for the formation of lower beans from the soil surface, depending on the time of sowing the number of beans and seeds per plant. The highest number of beans and seeds per plant was recorded at early sowing dates (February 20), where 86.4 pieces of beans and 114.2 pieces of seeds were formed per plant, while at late dates (April 10) these figures were 60.3 and 71.6 pieces, respectively.

At early sowing dates, the number of single-seed beans is significantly less than at late sowing dates. With late sowing dates, the number of empty and damaged beans increases, but the number of two - and three-grain beans decreases. So, for example, if when sowing on February 20, the number of two-seeded beans was equal to 43.9 pieces, three-seed 1.6 pieces, then when sowing on April 10, these indicators were 39.1 pieces and 1.2 pieces, respectively or for 5,5 pieces less than in the early stages of sowing. With a late sowing time, the weight of 1000 seeds and the yield of plants are slightly reduced. So, for example, when sowing on February 20, the weight of 1000 seeds was 333.8 g, on April 10-330.0 g, that is, when sowing in April, the weight of 1000 seeds turned out to be 3.8 g less than when it was shown on February 20. Consequently, better quality and more viable chickpea seeds are formed at an early stage of sowing. As for the yield, the same pattern is observed here, that is, when sowing on February 20, the yield of chickpeas of the Yulduz variety was 25.4

centner/ha, and when sowing on April 10, 19.6 centner/ha. At early sowing dates (February 20, 28), chickpea grains were obtained by 6 centner/ha more than at late sowing dates (March 30 and April 10).

Figure 2 shows data on the influence of sowing time on the elements of variety productivity 'Milyutin – 6'. Plant height of the variety Milyutin 6 is influenced by the sowing time. Here, just as in the Yulduz variety, the highest growth of plants is observed at early (February 20) sowing dates, where it reaches 65.3 cm, with a delay in sowing terms, there is a lag in growth. Chickpea yield of the variety Milyutin 6 also fluctuates within the sowing time. The highest yield was obtained at early sowing dates (February 20, 23.4 centner/ha); with late sowing dates, there is a noticeable decrease in yield. So, for example, at late sowing dates (April 10), the chickpea yield was 18.4 centners / ha, that is 5 centners/ha of grain was obtained less than when it was shown on February 20.

Figure 2: Biometric indicators and yield of chickpea variety 'Milyutin 6' depending on sowing dates on 2020-2021

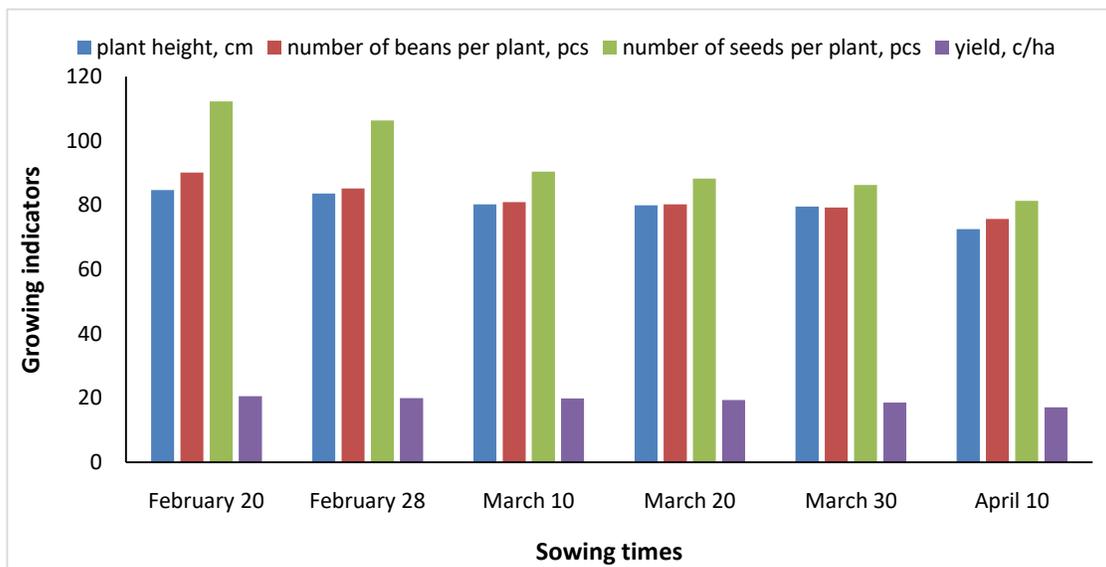


The high yield of chickpeas at early sowing dates is probably explained by the fact that chickpeas develop intensively due to the maximum formation of the root system and, consequently, a more rational use of nutrients, soil moisture, and solar energy.

The results of chickpea productivity of the Uzbekistan 32 variety at different sowing stages are shown in figure3. The height of the plant, the number of seeds and beans per plant are directly dependent on the time of sowing. The highest growth of plants is observed at early sowing dates (February 20), and as the sowing dates are late, there is also a lag in plant growth. So, for example, the height of plants at sowing on February

20 was 84.7 cm, while in April it was 72.6 cm, that is in the first case, the height of plants was 12.1 cm higher than when sown on April 10. The same pattern is observed in other biometric indicators. The largest number of beans and seeds was recorded at the February (February 20) sowing period, where the number of beans and seeds, respectively, is 14.4 and 31.4 pieces more than at the late April sowing dates. At early terms of sowing, higher yields were obtained than at late terms. So, for example, when sowing on February 28, 20.0 centner/ha was obtained, when sown on April 10. In the latter case, the yield of chickpeas of the Uzbekistan 32 variety was 3.5 centner/ha less than when sown on February 20.

Figure 3: Biometric indicators and yield of chickpeas of Uzbekistan 32 variety at different sowing dates on 2020-2021

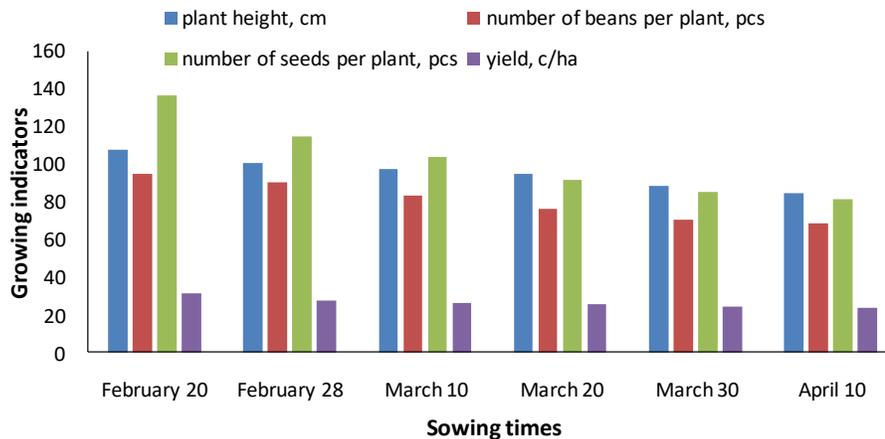


As can be seen from the data in figure4, the highest growth of chickpeas of the variety Umid is achieved in the early sowing dates. As the sowing time is delayed, the height of the plants also decreases. When sowing on February 20, the plant height was 107.3 cm, when sowing on February 28, it was 104.4 cm, on March 10-97.6 cm, on March 20-94.5 cm, on March 30-88.3 cm and the smallest growth was recorded when sowing on April 10, it reached 84.5 cm, that is the April sowing date, the height of plants of the variety Umid was 22.8 cm smaller than when it was shown on February 20. The same pattern is observed in the attachment of the lower bean from the soil surface, in the number of beans and seeds on one plant.

The yield also varies according to the time of sowing. The highest yield was obtained in the early stages of sowing. So, for example, when sowing on February 20, 31.3 centner/ha were obtained, when on February 28-27.3 centner/ha, on March 10-26.4

centner/ha, on March 20-25.3 centner/ha, on March 30-24.7 center/ha, and on April 10-23.8 centner/ha. In the latter case, the yield of the variety Umid turned out to be 7.5 centner/ha less than when sowing on February 20.

Figure 5: Planting dates, biometric indicators and chickpea yield of the variety ‘Umid’ on 2020



It is known that in the chickpea plant, productivity indicators are the formation of buds, flowers, and beans on plant bushes [1,2,2].

The highest indicators of generative organs in different planting schemes- the number of buds, flowers, total beans and preserved beans, were observed in the planting scheme of 60 x 9 cm. At the same time, the average number of buds in the variety of Umid over 3 years was 76.8 buds and the average number of flowers was 73.2 pieces. Total beans and preserved beans- 63.9 pieces. Observations of the above indicators of generative organs on the main, lateral, lower and upper tiers of the chickpea plant showed that mainly on the shoots the number of buds was 32.6 pieces, on the side shoots-44.2 pieces, respectively, the number of flowers was 31.3 and 71.7 pieces, the number of beans-29.9 and 38.2 pieces. At the same time, the number of beans preserved before harvesting was 26.6 and 37.3 pieces, respectively. So, in comparison with the total number of flowers on the main shoots, preserved beans, less by 6.0 pieces. and side shoots by 6.9 pieces, a total decrease of 12.9 pieces. Analysis of the lower and upper tiers showed that the maximum number of buds, flowers and beans is formed on the lower tiers of plants. For example, the number of buds in the lower tiers was 47.6 pieces, in the upper tiers 44.2 pieces, flowers, respectively, were 46.2 and 27.0 pieces, the number of preserved beans was 42.6 and 21.3 pieces. Analysis of the obtained data showed that the number of buds in the upper tiers, compared with the lower tier, is 18.4

pieces more, the number of flowers, total beans and preserved beans, respectively, is 19.2 pieces, 20, 1 piece. And 21.3 pieces.

When the spacing between plants is reduced, there is a decrease in the number of buds, flowers, total beans and preserved beans. At a sowing pattern of 60x9 cm per plant the number of total buds was 76.8 pieces, flowers 73.2 pieces, total beans 68.1 pieces, and preserved beans 63.9, these figures at sowing scheme 60x6 cm respectively, were 73.1; 68.7; 64.2 and 60.0 pieces. At the same time, in the sowing scheme of 60 x 9 cm, the formed buds are 3.7 pieces more than in the planting scheme of 60 x 6 cm, the number of flowers is 4.5 pieces, and the number of total beans is 4.5 pieces and the number of preserved beans by 7.2 pieces. A similar pattern persists in the sown plots of Yulduz and Uzbekistan - 32 varieties.

Analysis of the data of the formed generative organs for chickpea varieties showed that the variety Umid obtained the maximum values for the number of buds, flowers and beans. For example, in the experiment of this variety with a planting scheme of 60 x 6 cm, the number of buds was 73.1 pieces, flowers-68.7 pcs., total beans 64.2 pcs., preserved beans 60 pcs., these indicators for the variety Uzbekistan 32, respectively, were 70.5; 65.4; 61.4; and 58.5 pcs. Comparative analysis of the obtained data showed that the variety Umid recorded the number of buds by 2.6 pieces, the number of flowers by 3.3 pieces, total beans by 2.8 pieces and preserved beans by 1.5 pieces more compared to the Uzbekistan - 32 variety, compared to the Yulduz variety, respectively, more by 9.2; 9.6; 10.0 and 8.6 pieces.

CONCLUSION

Under the conditions of Uzbekistan, with early sowing of chickpeas of various varieties (in February), plant growth, formation of pods, the number of seeds in pods and yields are significantly higher than with late sowing (April).

- The height of the plants of the February sowing period in chickpea varieties exceeds the late dates within 12.3 – 18.3 cm, the number of formed beans and seeds, respectively, by 26.1 pieces – 42.6 pieces.
- Among the studied chickpea varieties, the highest-yielding one was the variety Umid, where its yield when sown on February 20 reached 31.3 centner/ha, which is 7.9 – 10.3 centner/ha more than other varieties with the same period.
- In experiments, the influence of the planting scheme on the formation of generative organs of various chickpea varieties in Uzbekistan was studied. The highest indicators of chickpea generative organs in different planting schemes - the number of buds, flowers, total beans and preserved beans, were observed in the planting scheme of 60 x 9 cm. At the same time, the maximum indicators are noted for the variety Umid.

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