

AGRICULTURAL SCIENCES

THE INFLUENCE OF SOWING DENSITY AND ROW SPACING ON PLANTS HEIGHT, DIAMETER OF THE ACHENES AND QUANTITY SEEDS IN ACHENES OF SUNFLOWER HYBRIDES UNDER THE CONDITIONS OF THE RIGHT-BANK FOREST AND STEPPE REGION OF UKRAINE

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One of the effective factors regulating the use of moisture, light, the intensity of the assimilation process and the formation of the crops is the amount of plants per area unit. The relationship between productivity and plant density is manifested differently depending on the soil and climate conditions, the biological characteristics of hybrids and agricultural engineering [1, p. 8; 2, p. 41].

The results of our research indicate that the height of the plants and the diameter of the achenes depending on the sowing density and row spacing. In the testing sample with a density of 70 thousand / ha, the height of plants in the hybrid Zagrava with a row spacing of 70 cm was on average 186.4 cm, and with a row spacing of 45 cm – 185.6 cm. Ukrainian F1 hybrid within a row spacing of 70 cm shows 193.8 cm, and within a row spacing of 45 cm the result is 190.7 cm, while in the years of research there was no significant difference in the height of plants at a density of 70 and 90 thousand / ha.

The lower height of plants was observed at a density of 50 thousand / ha – in the early ripening hybrid Zagrava with an intermediate row spacing of 45 cm – 182 cm, and with an intermediate row of 70 cm – 183.5 cm, in the middle hybrid Ukrainian F1 with an intermediate row spacing of 45 cm – 185.9 cm and with an intermediate row spacing of 70 cm – 188.1 cm.

Within planting density of 90 thousand plants per 1 hectare the plants were the highest – in hybrid Zagrava with a row spacing of 45 cm – 190.4 cm, a row spacing of 70 cm – 192.5 cm, F1 hybrid Ukrainian within a row spacing of 45 cm – 196,1 cm, with a row spacing of 70 cm – 198.3 cm, 4.8 cm more than in hybrid Zagrava with a row spacing of 45 cm and 6.1 cm with a row spacing of 70 cm and a Ukrainian F1 hybrid with a row spacing of 45 cm by 5.4 cm and with a row spacing of 70 cm by 4,5 cm in comparison with the density of 70 thousand plants per hectare.

The diameter of the achenes has varied, depending on the seeding density and the width of the row spacing, in both hybrids within the range of 17.5-22.3 cm. The

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Zagrava hybrid sunflower formed larger achenes of 22.3 cm in 2016 at a density of 70 thousand plants per hectare and a width of a row spacing of 70 cm, and smaller – 17.5 cm with a width of 45 cm between rows and a density of 50 thousand plants / ha in 2017. In versions with a density of 90 thousand / ha the plants formed achenes size – respectively 18.5 and 19.9 cm, the difference was 1.4 cm and was not significant.

Under the conditions of unequal provision of life factors and depending on the density of plant standing per unit area between the height of the stem and the number of seeds can be traced backward dependence: with thickening the height of plants increases, and the number of flowers and subsequent seeds in the achenes decreases [3, p. 70; 4, p. 84].

At a low illumination during the period of differentiation of the growth cone (thickening of crops, significant weediness, cloudy weather, etc.), less flowers are laid down in the achenes and empty seeds occurs, and accordingly the amount of seeds decreases [5, p. 122].

In our research it was noted that with an increase in the density from 50 to 70 thousand plants / ha, the amount of seeds in the achenes increased significantly, reaching the maximum value in the variant of 70 thousand plants per hectare in the hybrid Zagrava with a width of row spacing of 70 cm – 1670 units, per years of research. With crops thickened to 90 thousand plants / ha, on the contrary, the amount of seeds decreased.

The minimum value of this indicator took place at a density of 90 thousand plants per hectare in the hybrid Ukrainian F1 with a width of rows of 45 cm – 1315 units.

It should also be noted the effect of weather conditions on the change in the amount of seed in the achenes. In more favorable year of 2016 in hybrid Zagrava this figure, depending on stand density was higher by 2,6-9,9 %, and Ukrainian F1 hybrid at 1-5,3% than in the years of 2017 and 2018. The reason was in a lack of moisture in the soil during the pouring and maturation of the seeds.

The total amount of seeds and the number of defective seeds are the markers on which empty grains depend; with an increase in the number of defective and a decrease of the normal seeds, empty grains are increasing [6, p. 86].

Blank seeds depended on the density of plants, and on climate conditions. Thus, in 2017 due to a number of bad conditions, seeds of hybrid Zagrava were on 0,5-2,9 % higher than in 2016 and 2018, and the Ukrainian F1 hybrid to 0,3-2,2% in accordance.

Within a density of 50 thousand plants / ha, the empty seeds in the hybrid Zagrava at the width of a rowing space of 45 cm were 15,6 %, and in the Ukrainian F1 hybrid – 15,2 %. With the thickening of crops to 90 thousand plants per hectare, the number of defective seeds increased and the index of empty seeds in the Zagrava hybrid was 24,5 %, while in the Ukrainian F1 hybrid – 22,9 %.

Thus, in order to grow both hybrids, early ripening Zagrava and middle ripening Ukrainian F1, under the conditions of the Right-Bank Forest Steppe of Ukraine, the optimum placement of plants in agrocenosis is the density of 70 thousand plants per hectare and the width of a row spacing of 70 cm, at which the highest seed quantity and larger diameter of the sunflower of achenes were obtained.

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