

# **The Effect Of Sowing Date And Norms On The Growth Of Sarept Mustard (*Brassica Juncea Czern.*) Varieties**

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## **Abstract**

It was found that the planting dates and norms of mustard varieties have different effects on the height of the plant stem, and increasing the planting norms caused the plant to grow taller. The height of the mustard plant planted in the spring was 134.0-146.4 cm for the "Nika" variety, 141.3-154.2 cm for the "Gorlinka" variety, and 147.5-159.5 cm for the "Yunona" variety, while when planted in the summer, it was 132.4-143.2 cm for the "Nika" variety, 138.5-152.5 cm for the "Gorlinka" variety, and 144.0-156.3 cm for the "Yunona" variety.

**Keywords:** Mustard, Nika, Gorlinka, Yunona, seeds, sowing date, sowing norm, plant height.

**Introduction.** Today, mustard (*Sinapis alba L.*) is cultivated in the world on 0.7-1.0 million hectares, with a yield of 12.0-15.0 t/ha of seeds and 30 t/ha of green mass. The leading countries in mustard cultivation are Canada, the USA, India, Ukraine and Russia. In these countries, high and quality seed yields are achieved due to the timely and optimal sowing of mustard plants and the use of recommended agrotechnologies for care [1].

In world agricultural practice, research is currently underway to create new varieties of mustard to produce high-quality and high-yielding seed crops, develop their optimal terms and norms, establish feeding norms, use resource-saving agrotechnologies in cultivation, and treat mustard seeds with various stimulants before sowing [7, 8, 9].

**The level of the problem studied.** It is necessary to determine the sowing rate depending on the level of moisture supply of the soil of the area where mustard is planted in narrow rows and the amount of weeds. In areas with good moisture supply, the sowing rate of mustard at the rate of 2.5-3.0 million seeds per hectare is effective, and in areas with relatively low moisture supply, 1.5-2.0 million seeds per hectare is effective [5, 6].

In studies conducted in Kalmykia, the yield of Sarept mustard was 20.0 c/ha when planted at the rate of 2.5 million seeds per hectare, while the yield from the variant planted at the rate of 3.0 million seeds per hectare decreased by 2.0 c/ha compared to the variant planted at the rate of 2.5 million seeds per hectare. It was found that in the variant planted at the rate of 2.0 million viable seeds per hectare, the yield was 4.0 c/ha lower than in the variant planted at 2.5 million seeds per hectare [4, 5].

**Methods and Materials.** Our research was conducted in 2022-2024 in the conditions of typical gray soils of the Tashkent region, and the effect of planting dates and rates on the biometric indicators of mustard varieties (*Brassica juncea Czern.*) was studied. In our research, mustard planting rates of 1.0, 1.5, 2.0 million units/ha were tested in the spring and summer periods.

These field experiments included 9 variants, each variant occupied an area of 60 m<sup>2</sup>, of which the calculated area was 30 m<sup>2</sup>. They were conducted in four rotations, and the total area of each experiment was 0.216 hectares.

The research was conducted in field and laboratory conditions, with field experiments, calculations and observations

based on the “Methods of conducting field experiments”, and plant analyses based on the “Methodology of state variety testing of agricultural crops” [2, 3, 6].

In the experiment, mustard (*Brassica juncea* Czern.) varieties “Nika”, “Gorlinka” and “Yunona” were sown in the first ten days of March and as a repeated crop at a rate of 1.0, 1.5, 2.0 million germinating seeds per hectare, into a depth of 2-3 cm.

**Results and Discussion.** The effect of planting dates and norms on the stem height of mustard was studied in the stages of stem formation, budding, flowering, raceme formation and ripening of the plant. According to the data obtained from our studies of mustard varieties planted in the spring period, the average plant height of the Nika variety in the stem formation phase, 84.3-91.8 cm in the budding phase, 110.0-121.8 cm in the flowering phase, 128.5-139.4 cm in the raceme formation phase and 134.0-146.4 cm in the ripening phase, according to the planting norms, was 44.0-47.2 cm. According to the planting norms of the Gorlinka variety, the plant height in the stem formation phase reached 46.7-50.3 cm, in the budding phase 87.0-94.6 cm, in the flowering phase 115.0-126.6 cm, in the raceme formation phase 134.3-146.7 cm and in the ripening phase 141.3-154.2 cm (Table 1).

According to the planting norms of the Yunona variety, the plant height in the stem

formation phase reached 49.8-52.4 cm, in the budding phase 90.7-97.6 cm, in the flowering phase 120.3-130.3 cm, in the raceme formation phase 140.8-152.5 cm and in the ripening phase 147.5-159.3 cm. In the variants with a low planting rate, it was found that due to the relatively small number of seedlings, the plant used more nutrients in the soil and received more sunlight than in other variants, the plant body thickened and became relatively shorter. The highest indicators in terms of stem height of mustard varieties cultivated in the spring period were observed in variants with a planting rate of 2.0 million germinating seeds per hectare, and the plant height was 47.2-52.4 cm in the stem formation phase, 91.8-97.6 cm in the budding phase, 121.8-130.3 cm in the flowering phase, 139.4-152.5 cm in the raceme formation phase, and 146.4-159.3 cm in the ripening phase. The lowest indicators were observed in the variants with 1.0 million germinating seeds per hectare, with 44.0-49.8 cm in the stem formation phase, 84.3-90.7 cm in the budding phase, 110.0-120.3 cm in the flowering phase, 128.5-140.8 cm in the raceme formation phase, and 134.0-147.5 cm in the ripening phase.

**Table 1. Effect of sowing dates and norms on mustard stem height, cm, 2023 (spring period)**

| Option No | Varieties | Sowing dates, mln.pcs/ha | Stem formation phase | Budding phase | Flowering phase | raceme formation phase | Ripening phase |
|-----------|-----------|--------------------------|----------------------|---------------|-----------------|------------------------|----------------|
| 1         | Nika      | 1.0                      | 44.0                 | 84.3          | 110.0           | 128.5                  | 134.0          |
| 2         |           | 1.5                      | 46.5                 | 88.6          | 116.2           | 135.6                  | 143.8          |
| 3         |           | 2.0                      | 47.2                 | 91.8          | 121.8           | 139.4                  | 146.4          |
| 4         | Gorlinka  | 1.0                      | 46.7                 | 87.0          | 115.0           | 134.3                  | 141.3          |
| 5         |           | 1.5                      | 49.5                 | 91.2          | 121.4           | 142.6                  | 149.8          |
| 6         |           | 2.0                      | 50.3                 | 94.6          | 126.6           | 146.7                  | 154.2          |
| 7         | Yunona    | 1.0                      | 49.8                 | 90.7          | 120.3           | 140.8                  | 147.5          |
| 8         |           | 1.5                      | 51.2                 | 95.2          | 126.4           | 148.2                  | 155.2          |
| 9         |           | 2.0                      | 52.4                 | 97.6          | 130.3           | 152.5                  | 159.3          |

According to data from studies conducted in the summer period, in variants planted with the Nika variety, the average plant height in the stem formation phase was 41.4-47.3 cm, in the budding phase 81.2-89.3 cm, in the flowering phase 108.3-118.7 cm, in the raceme formation phase 125.4-137.7 cm, and in the ripening phase 132.4-143.2 cm. According to the planting norms of the

Gorlinka variety, the plant height in the stem formation phase reached 42.6-49.0 cm, in the budding phase 83.8-93.7 cm, in the flowering phase 111.1-124.5 cm, in the raceme formation phase 131.3-143.6 cm, and in the ripening phase 138.5-152.5 cm (Table 2).

**Table 2. Effect of sowing dates and norms on mustard stem height, cm, 2023 (summer period)**

| Option No | Varieties | Sowing dates, mln.pcs/ha | Stem formation phase | Budding phase | Flowering phase | raceme formation phase | Ripening phase |
|-----------|-----------|--------------------------|----------------------|---------------|-----------------|------------------------|----------------|
| 1         | Nika      | 1.0                      | 41.4                 | 81.2          | 108.3           | 125.4                  | 132.4          |
| 2         |           | 1.5                      | 44.2                 | 85.5          | 114.6           | 131.6                  | 140.8          |
| 3         |           | 2.0                      | 47.3                 | 89.3          | 118.7           | 137.7                  | 143.2          |
| 4         | Gorlinka  | 1.0                      | 42.6                 | 83.8          | 111.1           | 131.3                  | 138.5          |
| 5         |           | 1.5                      | 46.8                 | 89.6          | 118.6           | 138.4                  | 147.6          |
| 6         |           | 2.0                      | 49.0                 | 93.7          | 124.5           | 143.6                  | 152.5          |
| 7         | Yunona    | 1.0                      | 45.0                 | 86.5          | 117.0           | 137.4                  | 144.0          |
| 8         |           | 1.5                      | 47.6                 | 92.0          | 123.8           | 145.7                  | 152.2          |
| 9         |           | 2.0                      | 50.7                 | 95.4          | 128.4           | 149.3                  | 156.3          |

According to the planting norms of the Yunona variety, the plant height in the stem formation phase reached 45.0-48.7 cm, in the budding phase 86.5-95.4 cm, in the flowering phase 117.0-128.4 cm, in the raceme formation phase 137.4-149.3 cm and in the ripening phase 144.0-156.3 cm. In our studies conducted in the summer, it was observed that in the variants with a low planting norm of mustard varieties, due to the relatively smaller number of seedlings, the plant used more nutrients in the soil and, due to the greater amount of sunlight compared to other variants, the plant's body thickened and became relatively shorter. Even during this planting period, the highest indicators of mustard plant stem height were observed in variants where 2.0 million germinating seeds per hectare were planted in the summer period, with plant

height being 47.3-50.7 cm in the stem formation phase, 89.3-95.4 cm in the budding phase, 118.7-128.4 cm in the flowering phase, 137.7-149.3 cm in the raceme formation phase, and 143.2-156.3 cm in the ripening phase. The lowest indicators were observed in variants with 1.0 million germinating seeds per hectare, with 41.4-45.0 cm in the stem formation phase, 81.2-86.5 cm in the budding phase, 108.3-117.0 cm in the flowering phase, 125.4-137.4 cm in the raceme formation phase, and 132.4-144.0 cm in the ripening phase.

**Conclusion.** It was found that the planting dates and norms of mustard varieties have different effects on the height of the plant stem, and increasing the planting norms caused the plant height to be higher. The height of the mustard plant planted in the spring was 134.0-146.4 cm for the "Nika"

variety, 141.3-154.2 cm for the "Gorlinka" variety, and 147.5-159.5 cm for the "Yunona" variety, while when planted in the summer, it was 132.4-143.2 cm for the "Nika" variety, 138.5-152.5 cm for the "Gorlinka" variety, and 144.0-156.3 cm for the "Yunona" variety.

### **Adabiyotlar**

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