

## Influence of Different Planting Schemes and Nitrogen Fertilizer Rates on the Growth and Development of Rice

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**Annotation:** In this article, the influence of feeding rates and planting schemes on the growth and development processes of the "Billur" rice variety was studied. During the study, various agrotechnical variants were compared and their influence on plant height was assessed. Under these conditions, due to the density of plant density, the need for light increases, which contributes to the growth of plant height. The research results have practical significance for this variety.

Plant Height – is a genetic trait, which in grain crops is closely associated with the number of internodes and internode length. In rice, plant height is classified into four categories: dwarf (15–50 cm), short (51–70 cm), medium (71–100 cm), and tall (above 101 cm).

According to the results of the conducted studies, no significant differences were observed among the variants of the main stem height during the tillering phase of rice development. The differences between variants ranged from 0.5–0.8 cm. In the Billur variety, the lowest main stem height was recorded at 39.7 cm in the variant sown with the 25×25 cm planting scheme and fertilized at  $N_{60}P_{60}K_{90}$  kg/ha, while the highest height of 40.7 cm was observed in the 15×15 cm planting scheme with  $N_{120}P_{60}K_{90}$  kg/ha fertilization.

For the Guliston (St) variety, no significant differences in the main stem height among variants were observed during the tillering phase. The main stem height in the tillering phase under  $N_{60}P_{60}K_{90}$  kg/ha fertilization ranged from 36.4–37.4 cm depending on planting schemes, under  $N_{90}P_{60}K_{90}$  kg/ha fertilization from 36.9–37.5 cm, and under  $N_{120}P_{60}K_{90}$  kg/ha fertilization from 37.4–37.8 cm. The lowest main stem height (36.4 cm) was recorded in the 25×25 cm planting scheme under  $N_{60}P_{60}K_{90}$  kg/ha fertilization, while the highest (37.8 cm) was observed in the 15×15 cm planting scheme with  $N_{120}P_{60}K_{90}$  kg/ha.

During the elongation phase, differences in the main stem height among rice variants increased. The relatively lowest height (60.3 cm) was observed in the control variety under the 25×25 cm scheme and N<sub>60</sub>P<sub>60</sub>K<sub>90</sub> kg/ha fertilization, while the relatively highest (64.2 cm) was recorded in the 15×15 cm scheme with N<sub>120</sub>P<sub>60</sub>K<sub>90</sub> kg/ha fertilization.

In the elongation phase, the main stem height in the Standard variety ranged from 57.6 cm under N<sub>60</sub>P<sub>60</sub>K<sub>90</sub> kg/ha fertilization to 61.0 cm in the 15×15 cm planting scheme with N<sub>120</sub>P<sub>60</sub>K<sub>90</sub> kg/ha.

During the panicle initiation phase, in the Billur variety, the main stem height ranged as follows: under N<sub>120</sub>P<sub>60</sub>K<sub>90</sub> kg/ha fertilization with different planting schemes – 96.5–97.0 cm, under N<sub>60</sub>P<sub>60</sub>K<sub>90</sub> kg/ha – 97.0–98.3 cm, and under N<sub>120</sub>P<sub>60</sub>K<sub>90</sub> kg/ha – 101.4–103.2 cm. The lowest stem height (96.5 cm) was recorded in the 20×20 and 25×25 cm schemes with N<sub>60</sub>P<sub>60</sub>K<sub>90</sub> kg/ha, while the highest (103.2 cm) was observed in the 15×15 cm scheme with N<sub>120</sub>P<sub>60</sub>K<sub>90</sub> kg/ha.

In the panicle phase of development, the lowest indicator of the main stem height of the "Billur" rice variety was noted in the variant with a planting scheme of 20x20 cm and 25x25 cm with a planting scheme of 96.5 cm N<sub>60</sub>P<sub>60</sub>K<sub>90</sub> kg/ha mineral fertilizers, and the highest indicator was noted in the variant with a planting scheme of 103.2 cm and a planting scheme of 15x15 cm with the application of mineral fertilizers N<sub>120</sub>P<sub>60</sub>K<sub>90</sub> kg/ha.

In the panicle phase of development, in the Gulistan (St) rice variety, the difference between variants in the height of the main stem was significant in the panicle phase of development. At the same time, the height of the main stem of the Gulistan rice variety with the feeding rate N<sub>60</sub>P<sub>60</sub>K<sub>90</sub> kg/ha under different sowing schemes was 94.8-93.7 cm, N<sub>90</sub>P<sub>60</sub>K<sub>90</sub> kg/ha under different sowing schemes 97.1-95.8 cm, with the feeding rate N<sub>120</sub>P<sub>60</sub>K<sub>90</sub> kg/ha under different sowing schemes 99.4-98.1 cm.

In the panicle phase of development, the lowest indicator of the main stem height of the Gulistan rice variety was noted in the variant with a sowing scheme of 25x25 cm and the application of mineral fertilizers at a rate of N<sub>60</sub>P<sub>60</sub>K<sub>90</sub> kg/ha, and the highest indicator was noted in the variant with a sowing scheme of 15x15 cm and the application of mineral fertilizers at a rate of N<sub>120</sub>P<sub>60</sub>K<sub>90</sub> kg/ha.

It is known that the growth and development process of a plant, the height of the main stem, also depends to a certain extent on the varietal characteristics of the plant. The influence of agrotechnical measures, including different sowing schemes and feeding rates, on varieties has not been sufficiently studied.

In the experiment, the positive influence of the feeding rate and planting scheme on stem height was also observed in the ripening phase. In the ripening phase, the highest indicator of the plant height was 103.2 cm, when sowing rice according to the 15x15 planting scheme N<sub>120</sub>P<sub>60</sub>K<sub>90</sub> under conditions of feeding norms.

#### Growth of rice plant height according to different planting schemes and rates of nitrogen mineral fertilizers, cm (2025). Table 1.

Feeding rate, kg/ha	Planting scheme	Rice by developmental phases main stem height, cm					
		Accumul ation	Tubuli zation	Flowin g	Accumu lation	Tubuli zation	Flowing
		Gulistan St			Crystal		
N <sub>60</sub> R <sub>60</sub> K <sub>90</sub>	15x15	37.4	58.5	94.8	40.2	61.4	97.0
	20x20	37.1	58.1	94.4	39.9	60.9	96.5
	25x25	36.4	57.6	93.7	39.7	60.3	96.5

N <sub>90</sub> R <sub>60</sub> K <sub>90</sub>	15x15	37.5	59.2	97.1	40.5	63.2	98.3
	20x20	37.2	58.8	96.2	40.2	62.7	97.2
	25x25	36.9	58.3	95.8	39.8	62.1	97.0
N <sub>120</sub> R <sub>60</sub> K <sub>90</sub>	15x15	37.8	61.0	99.4	40.7	64.2	103.2
	20x20	37.5	60.2	98.6	40.4	63.6	102.5
	25x25	37.4	59.5	98.1	40.3	63.1	101.4

**Conclusion and discussion.** In the experiment, in the initial stages of development, the difference in the height of the main stem was relatively low - 0.1-0.3 cm for the Billur variety and 0.1-1.4 cm for the Guliston (st) variety. In subsequent stages of development, an increase in the difference between variants was observed. The results of the experiments showed that with an increase in the thickness of rice seedlings, the plant becomes denser, as a result of which the plant strives for light and the height of the main stem is higher. At all stages of development, relatively high indicators of the main stem height of rice were noted in the variants with rice sowing 15x15. The experiment showed that the feeding rate and planting scheme of rice varieties have a positive effect on the height of the main stem.

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