

EFFECT OF NITROGEN FERTILISER FORM AND RATE ON SUGAR BEET GERMINATION

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Abstract: *Ammonium nitrate fertiliser forms N150R100K150 and N200R150K200 kg/ha of nitrogen fertiliser for sugar beet provide good plant growth in conditions of typical grey soils. When planting sugar beet seeds, pre-soaking them 100% and encapsulating them with biohumus will result in flat seedlings. As a result, the average weight of one plant is 639.7 g in the first case and 605.3 g in the second case.*

Key words: *sugar beet, root crop, growth and development, germination, seedling thickness, nitrogen fertilisers, nitrogen, phosphorus, potassium.*

Introduction: In order to meet the demand of the world's population for sugar and sugar products, one of the most urgent tasks is to increase the area of crops with high sugar content and their productivity. Sugar cane and sugar beet plants, which have a high sugar content, are cultivated in large areas all over the world. Sugar beet is planted in large areas in European and Asian countries. Its rhizome contains up to 20% sugar, 14–15% of which is isolated, and the rest can be used in industry and animal husbandry. That is why two large sugar production enterprises are operating in our republic.

In order to supply the necessary amount of raw materials for these enterprises, it is being planted as a repeat crop after winter wheat and spring vegetables on the irrigated land areas of our republic. Sugar beet seeds require high soil moisture to produce full seedlings. However, it is difficult to maintain moisture in the soil for the seed that is being replanted to meet its moisture requirements. Therefore, sugar beet seeds are 100% soaked and encapsulated with biohumus before sowing.

Literature review

According to O.A. Minakov et al. It has been established that in the steam link hybrids sugar beet of domestic selection react to improvement of nutritional conditions by a significant increase productivity and sugar content of root crops in comparison with a foreign hybrid, and in clover - their responsiveness is approximately the same. It's mathematically proven that the level of fertilization to a greater extent determined the productivity of the studied hybrids in comparison with their genotype. To obtain a crop of domestic hybrids within 43.2–45.1 t/ha in the link with fallow and 38.4–40.2 t/ha in the link with clover under the crop were applied: in the steam link under RMS 120 – N 135 P

135K135 +25 t/ha manure, N120P120K120+ 50 t/ha manure and also N190P190K190 (without manure), for hybrid PMC 127 – N135P135K135+ 25 t/ha manure and N90P90K90+25 t/ha of manure; in the clover link-N90-135P90-135K90-135 for both hybrids.

I.V. Chechetkina, M.I. Gulyaka concluded that the optimal dose of nitrogen for sugar beet on soddy-podzolic medium and light soils against the background of manure is not must exceed 120 kg/ha a.i. when it is included in one acceptance for pre-sowing tillage.

According to S.I. Tyutyunov and others The results of studies are presented, completed in 2019–2020, 2020–2021 in Belgorodskaya area in order to determine the effect of various doses of mineral fertilizers on the change in the yield value and the content of raw gluten in winter grain wheat. The material for the study was domestic varieties: Almera, Sloboda and Surava - local selection; Alekseich, Bezostaya 100 and Timiryazevka 150-selection of the Federal State Budgetary Scientific Institution "NTsZ named after P.P. Lukyanenko.

A sugar beet seed must absorb 180% of its weight in moisture to germinate. It is difficult to create this amount of moisture in the soil, which requires some degree of wetting of the seed. Since the seed also contains sugar, it melts in moisture and sticks to the walls of the seal during planting, as a result of which the seeds are crushed and the germination rate deteriorates. Therefore, in order to obtain flat seedlings, I.J. Sulaymonov and A.A. Juroevlar [2.28; pp. 69–72, 2.82; p. 32–33] found that when sugar beet seeds were moistened by 80–100% and planted using a mixture of soil (25%) and biohumus (75%) as capsules, they achieved full germination in a short period of time.

According to I. Zh. Sulaimanov et al. [8; 25-27 б.] after the winter wheat repeated sowing of beet crops will have a positive effect on the size of the soil and serve to increase its productivity. Although this crop, which has been studied in practice, yields relatively good results, it is important to select the optimal sowing standards for all repeated crops.

In our studies, we verified that mineral fertilizers, mainly nitrogen fertilizers, are of great importance for the growth and high yield of sugar beet. For sugar beets in the form of sodium nitrate (NaNO_3), N200R150K200 kg/ha normal is effective (Sulaymonov, Ergashev, [9; 122-126 б.]).

According to I.Zh.Sulaimonov and others [10; 140-144 б.] in order to increase the efficiency of irrigated land use as a second crop of succeeded suction, it is best to plant 50-75% of its seeds with seeds (respectively, 84% and 89%), so as to obtain full seedlings of seeds

Research Methodology

In the experiment, in order to study the effect of the forms and rates of nitrogen fertilisers on the germination of the plant, the thickness of the real seedling formed, and the effect on the growth and development of the plant, we set up the experimental system as shown in Table 1. All observation, analysis, and calculations were adopted at UzPITI. "Methods of conducting field experiments" [3; p. 147], "Metody agrokhimicheskikh, agrofisicheskikh, and microbiologicheskikh issledovaniy v polevykh hlopkovykh rayonakh" [5; p. 187], and "Metodika polevykh opytov s xlopchatnikom" [6; p. 233] were carried out on

the basis of methods. Experimental data of B.A. Dospekhov [4; p. 352] Mathematical analysis was performed based on the "Metodika polevogo opyta" method.

To take into account the germination of a plant, a 16.6-metre thread is taken, and according to the planting system, it is determined how many plants have sprouted within this thread. It is taken from several places in each option, and the average is found. Germination begins when 10% of the theoretical seedling thickness has germinated according to the Dospekhov method and is considered complete when 75% has germinated.

Table 1
Experience system

Options	Forms of nitrogen fertilizers	Annual rates of mineral fertilizers			Under the driver		Before planting	When it forms 2-3 true leaves	It is developing rapidly
		N	P.	K	P.	K	N	N	N
1	Without fertilizer	-	-	-	-	-	-	-	-
2	Without nitrogen fertilizer	-	100	150	100	150	-	-	-
3		-	150	200	150	200	-	-	-
4	NaNO ₃	150	100	150	100	150	40	60	50
5		200	150	200	150	200	50	80	70
6	NH ₄ NO ₃	150	100	150	100	150	40	60	50
7		200	150	200	150	200	50	80	70
8	(NH ₄) ₂ SO ₄	150	100	150	100	150	40	60	50
9		200	150	200	150	200	50	80	70
10	CO(NH ₂) ₂	150	100	150	100	150	40	60	50
11		200	150	200	150	200	50	80	70

Table 2
Plant thickness of sugar beet in the experiment, thousand bushes/ha, three-year average, 2017–2019

№	Theoretical seedling thickness	Germination rate, 2019 %				Actual seedling thickness	
		13.07	14.07	15.07	16.07	At the beginning of vegetation	At the end of the growing season
1	90X10-1		36	65	87	97,1	94,3
2	111111	16	39	76		96,3	93,8
3		18	35	72	88	97,0	94,2

4		16	29	79		95,3	93,1
5		17	38	72	93	97,2	94,1
6		15	35	63	90	96,1	93,7
7		15	38	79		96,6	94,1
8		17	38	68	91	96,2	94,0
9		17	38	65	91	96,9	94,3
10		15	38	80		97,3	94,7
11		18	40	69	87	96,5	94,0

Analysis and results

In our research, we also sowed sugar beet seeds 100% wet and encapsulated them with a mixture of biohumus and soil before planting. As a result, full germination of seeds was achieved in the early periods (Table 2). In all years of the experiment, it was observed that the germination of the seeds began on the third day after planting sugar beet seeds, and within four days they were fully germinated. The effects of mineral fertilisers, especially forms of nitrogen fertilisers, on seed germination and completion were not noticed. Germination of sugar beet seeds in the control variant can be seen starting one day later and ending in three days. Despite the fact that germination started in one day in the remaining variants of the experiment, it was observed that germination ended in 3 days in variants 2, 4, 7 and 10, and in the remaining variants (variants 3, 5, 6, 8, 9 and 11) on the fourth day.

To determine the number of seedlings produced in the field experiment, a 16.6-metre string was taken, and the number of seedlings in the reference area of all options was counted. By multiplying this identified number of seedlings by 1000, the actual number of seedlings was found. These determinations were determined at least three times from different locations of the same variant and averaged. When we determined the actual thickness of seedlings according to experimental options, the number of seedlings was in the range of 95.3–97.3 thousand pieces. The number of seedlings was the highest in the 10th option and made up 97.3 thousand pieces; the least number of seedlings was in the 4th option and made up 95.3 thousand pieces. As a result of agrotechnical measures carried out during the vegetation period, seedlings in the field may die a little. That's why we determined the number of real seedlings in late autumn, before the harvest, so that the data obtained in the experiment would be accurate. According to the findings, their decrease was significant, especially in the 5th option, where it was seen that it decreased by the most by 3.1 thousand units and the least by 2.2 thousand units in the 8th option.

Conclusion and recommendations

Based on the obtained data, it can be said that of the forms of nitrogen fertilisers for sugar beet, ammonium nitrate fertiliser (N150R100K150) and N200R150K200 kg/ha mineral fertiliser provide good plant growth. As a result, the average weight of one plant is 639.7 g in the first case and 605.3 g in the second case.

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