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PRESERVATION AND HARVEST OF BEET SEEDS IN THE WINTER VEGETATION PERIOD

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Abstract:

The article highlights the benefits of growing feeding beetroots without planting seedlings method over planting seedlings method, that this method reduces handwork labor by reduction of expenditures 2,5-3,0 times, increasing yield and quality of seeds and reduces opportunities for beet growing from 2 years to 9-10 months.

Keywords: With Seedlings, without seedlings, innovational technology, region, Uzbekistan-83 breed, method, biometric, photosynthesis, transpiration, organic and mineral substances,cost-effectiveness

The urgency of the problem. It is known that the development cycle of root seeds in the autumn-winter, winter and spring vegetation period is characterized primarily by the biological, climatic and technological conditions of the irrigated zone of the Zarafshan Valley of Uzbekistan. Note that the conditions of growth and development in them during this period proceed completely differently than in the same root crops grown in the spring-summer period, and therefore the main principles of their selection should be based on winter hardiness, high rates of biomass yield formation at relatively low positive temperatures (N.G. Gisbullin et al., 1987: I.V. Massino, S.M. Akhmedova 1989; V.N. Balan et al., 2001).

It is noted that the peculiarities of the autumn-spring period of cultivation of root crops (sugar beet, fodder beet, table beet, carrot, etc.) consist in the partial preservation of the root system, which allows plants to start growing in early spring, making the most of the autumn to form high-quality crops. only seeds, but also the green mass of plants. Meanwhile, at the present time, the introduction of non-planting seed plants of root crops during the winter vegetation in farms requires further, comprehensive study of methods aimed at increasing their winter hardiness in the so uncalled autumn-winter, winter and early spring vegetation period with the aim of a sharp (in 2.0- 2.5 times) to increase the biomass yield while reducing the cost of production, which are achieved by a complex of biological processes and technological methods.

Unfortunately, in the irrigated lands of the Zarafshan Valley, the issues of increasing winter hardiness, safety, plant density of carne crops during the winter, as well as fertilizer doses, water regime, etc., are still insufficiently studied, which, in our opinion, is the relevance of this problem. In particular, the issues of preservation in winter not only of beets, but also of Markov and other vegetable root crops, the influence of temperature regimes and frosts on the safety of non-planting seed plants, the degree of accumulation of sugar and dry substances in root crops, the effect of low temperature anomalies on growth, development of root crops, crops, as well as the relationship between safety, standing density in connection with the timing, seeding rates and biomass yield of these crops.

Tasks, object and methods of research. The purpose of our research was, from a scientific point of view, to substantiate the possibility of obtaining high-quality seed crops of non-planting seed plants grown in winter on irrigated lands of the Zarafshan Valley by identifying agroecological and biological and abiotic resources and, on this basis, to identify the practical possibility of obtaining high and economically viable yields. their seeds, which included the study of the following tasks;

-give a climate assessment of the region and identify resources, and on this basis, justify the suitability of crops for non-planting seed production of root crops;

- identify wintering conditions and their impact on seed yield during autumn-winter, winter and spring-summer vegetation of the plant;

- to study the features of growth and development of non-planting seed plants of root crops in the conditions of irrigated lands;

-to study the relationship between safety and agro-climatic conditions of the winter period in experiments;

- to study the features of the formation of seeds of non-planting root crops and justify the quality of their seeds.

The objects in the research were varieties of fodder beet Uzbekistanskaya 83. In the experiments, the following dates were studied on September 1, 15, 30 at rates of 10, 20, 30 pcs. 1 running meter rare. Field experiments were carried out on the farm of vegetables, gourds and potatoes in 2018-2021 according to the method of field experiment (B.A. Dospekhov, 1985), in four repetitions with the

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arrangement of plots in 2 tiers. The total area of the plot was 75 m2 and the accounting one was 50 m2. Production experiments were carried out in the conditions of irrigated lands of Samarkand, Navai and Jizzakh regions during 2019-2020.

In all years, without exception, all agro-climatic, biological, biometric and other studies, analyzes and measurements of plants and seeds were carried out on 100 model plants isolated at 4 points of plots of odd repetitions (Methodology of the GSI of agricultural plants, Moscow, 1983) . The content of humus in soils was determined according to Tyurin, total nitrogen according to Keldal, nitrate nitrogen according to Grandval-Lage, and exchangeable potassium on a flame photometer (Methods of agrochemical analyzes of soils and plants, Tashkent, 1977). Phenological observations, records of plant density and their safety during the winter were determined according to the generally accepted method of state variety testing of agricultural crops (Moscow, 1983).

We studied the climatic resources of the region on the basis of data from the weather station in Samarkand during 2018-2021, and the safety of plants over the winter according to the method of V. M. Lichikaku (Leningrad, 1962). The economic efficiency of fodder beet during the winter growing season was determined in accordance with the methodology and recommendations of the Ministry of Agriculture of the Republic of Uzbekistan, and the statistical processing of data on harvesting beet seeds was carried out by the method of analysis of variance modified by R. Fisher (B.A. Dospekhov, 1985).

RESULTS AND ITS DISCUSSION. It should be noted that the successful cultivation of root beet seeds in the winter growing season on a non-planting basis is characterized primarily by the receipt of friendly and uniform entries from autumn and their successful overwintering, which, as a rule, are characterized by biological and agro-climatic conditions of plant vegetation. As noted by V. N. Balan et al. (2001), a characteristic biological feature of non-planting beet seed plants is the partial preservation of the root system, which allows early growth, maximizing and using autumn-winter moisture reserves and extracting water and nutrients from deep soil layers . Therefore, non-planting seeds are marked by increased energy, leaf, and stem formation compared to the planting culture, which is shown in the mail 30-35 days earlier. In addition, nutrients enter the plants 3-4 times more compared to the two-year period of plant vegetation.

But the main condition for obtaining high and guaranteed yields of beet seeds with a non-planting culture is to carry out measures aimed at increasing the resistance of the culture to low air temperatures, which is achieved in a slow increase in the woodiness of root crops, etc. Based on this, our observations in the experiments show that Root beet with non-planting culture comes through the stages of germination and the formation of 3-4 pairs of true leaves, and the main factor determining at this time is, in our opinion, the reserves of productive moisture in the soil due to precipitation at this time, irrigation and applied agrotechnical methods in the experiments.

An analysis of the meteorological data of the city of Samarkand in 2017-2019 shows that under our conditions, the average air temperature in September, with the optimal sowing time, is on average 23.3, October 12.4 0C, which is sufficient to obtain good seedling density. In addition, if in these 6 months the relative humidity of the air is on average 41 and 56%, then the amount of precipitation is scanty, i.e., in the range from to 17.7 mm. And in this regard, the duration of the growing season of the seed plants in the fall, that is, before they leave for the winter, is of particular interest, which is given in the following table (Table 1)**.**

Table 1
Agro-climatic conditions and development phases of beet plants in the autumn period in experiments (NIS NIIOBKiK, average 2018-2021)

N	Indicators	On years			
		2018	2019	2020	2021
1	Air temperature, 0C	15,9	15,2	15,3	15,5
2	Precipitation, mm	42,5	28,0	19,8	29,3
3	Relative humidity,%	56,0	55,1	52,5	51,0
4	Sowing dates, dates	1. IX	1. IX	1. IX	1. IX
5	seedlings	12. IX	13. IX	11. IX	14. IX
6	1st pair of leaves	21. IX	22. IX	23. IX	24. IX
7	2-3rd pair of leaves	05. X	04. X	07. X	06. X
8	Total days from sowing to wintering	90	90	90	90

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As Table 1 shows, depending on the agro-climatic conditions, the duration of the development phase for the formation of the number of leaves varies. So if when sowing seeds on September 1 (optimal rate), mass seedlings of testes were noted on September 11-14 by year, the first pair of true leaves was 10-12 days later on average after receiving full seedlings, and the third pair of true leaves was noted in experiments October 4-7 annually. Thus, as shown by records and observations during the growing season of plants before leaving for winter (we consider this date from December 5 annually) will average 90 days. It should be noted that the meteorological conditions during the cultivation of non-planting beet seeds in the winter period also affect the degree of growth and development of root crops during the autumn growing season, which is given in the following table (Table 2).

Table 2
The degree of development of non-planting fodder beet seedlings in experiments (NISNIIOBKiK, average 2019-2021, when sown on September 1)

N	Indicators	On years			Medium
		2019	2020	2021	
1	Weight: root, g.	60,8	55,9	64,7	60,4
2	leaves, g	121,3	119,8	124,0	121,7
3	Number of leaves, pcs	13,5	14,7	16,8	15,0
4	Leaf length, cm.	12,5	11,5	12,4	12,3
5	Leaf width, cm	8,1	7,7	8,0	7,9
6	Assimilation surface, cm2	519,6	515,4	526,7	525,6

The data in the table show that with the optimal sowing time (September 1), the average weight of one root in the experiments was from 60.8 to 64.7 grams of leaves from 119.8 (2020) to 124.0 (2021) over the years.) grams, their quality was on average from 13.5 to 16.8 pcs. on one plant, and the assimilation surface of the leaves was from 519.8 (2019) to 526.7 (2021) cm2, which averaged 525.6 cm2 per plant in experiments. Of great interest is also the analysis of agro-climatic conditions in the so-called winter period (October-March) with the preservation of quick-planting seeds of fodder beet variety Uzbekistan 83. In the experiments, our observations showed that the average daily soil temperature at the level of the root head is of great importance, which is the following table (Table 3)

Table 3
The safety of beets in experiments depending on the duration of the minimum air temperature at the level of the head of the root crop (NIS NIIOBK and K, average 2019-2021).

Year	Month	Minimum air temperature, 0C			Snow depth cm	Root conservation %
		Средне суточная	На уровне головки корня	Продолжи-тельность в днях		
2018/2019	November	0,1	-0,5	1	0,1	100
	December	0,3-0,5	-3,5	1	0,3-0,5	98
	January	0,8-1,4	-5,1	2	0,8-1,4	96
	February	0,3	-4,0	1	0,5	95
2019/2020	November	9,9	-0,1	1	1,0	100
	December	3,6	-2,9	1	1,0	98
	January	5,4	-1,8	1	-	96
	February	4,0	-1,2	1	-	95
2020/2021	November	10,5	-0,9	1	0,6	100
	December	3,9	-3,1	2	0,8	98
	January	5,8	-2,2	1	-	96
	February	3,8	-0,9	1	-	95

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As the data in Table 3 show, what if 2018/2019 the average daily air temperature in November was 0.1 0C, in December 0.3-0.5 0C, then in winter, i.e. in January and February, it was within 0.8-1.4 days and 0 ,3 0C, which at the level of the root head was observed by months ranging from 0.5 (November) to 5.1 (February) 0C, which lasted for 1-2 days, and the thickness of the snow cover, according to the data of the Samarkand regional meteorological service, if from 0.1 to 1.4 cm, in 2018/2019 within 1.0 cm, then in 2019/2020. was 0.6 in November and 0.8 cm in December, and almost no snow fell in January and February. Most importantly, the safety of root crops of fodder beet seeds without planting was in experiments in 2018/2019. on average in December 98, and in February 95% of the original. It should be noted that approximately the same regularity was noted for the death of plants during the months of January and February and. etc. Meanwhile, a number of researchers (V.N. Balan et al., 2001; Kh.F. Batirov, 1997; G.Yu. Rakhimov, 2019;) note that under our conditions, the critical freezing temperature of non-planting seed plants at the level of the root crop head is in within 6-7 0C, which corresponds to an average daily air temperature of 10-120C. However, we did not observe such frosts during the years of the experiments, and as for the insignificant death of plants in the experiments, we explain this by damage to them by pests and partly by diseases that were noted during the growing season of plants. In our opinion, it is also of particular interest to study the microclimate of the field in the root layer of non-planted fodder beet during the period of growth and development of the crop, which we present in Table 4.

Table 4.

Microclimate in the root layer of the soil in the experiments (NIS NIIOBK and K, average 2018-2021)

Months	**Heightsnow cover, cm**	**Minimum temperature, 0C**		
		On the soil (0-5cm)	**At the level of the root head**	**At the level of the tail of the root**
2018-2019 years				
December January February	0,3-0,5 0,8-1,4 0,3	11,2 7,4 11,6	-3,5 -5,1 -4,0	0,9 1,4 1,1
2019-2020 years				
December January February	1,0 - -	11,4 13,7 12,8	-2,9 -1,8 -1,2	0,7 0,4 0,2
2020-2021years				
December January February	0,8 - -	12,0 13,9 12,2	-3,1 -2,2 -0,9	1,0 0,9 0,5

The data of this table show that with a snow cover height in the winter of 2018-2019, on average for 3 months, from 0.3 to 1.4 cm on the soil surface (0-5 cm), the minimum air temperature in 2018-2019 was . from 7.4 to 11.6 0C, 2019-2020 11.4-13.7 0C and in 2020-2021. not 12.0-13.9 0C on average. As for such a temperature at the level of the root head, it was relatively severe in the winter of 2018-2019, 3.5-5.1 0C, 2019-2020. from 1.2 (February) to 2.9 (December) 0C, and in 2020-2021. it was within 0.9 0C in February and 3.1 0C in December. It must be said that the same regularity was noted by us in terms of the minimum temperature at the level of the tail part of the root of a non-planting culture. In our opinion, the next important condition for the formation of seeds of non-planting seed plants is the study of agro-climatic conditions in the second year of plant vegetation. Since the spring regrowth of fodder beet seed plants in our conditions is noted early, which comes in the first ten days of March. I must say that it was during this period that they observed an important pattern; The lower the positive temperature and the longer the daylight hours during the spring period, the sooner the plant passes from vegetative renewal to seed

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reproduction, i.e. they intensively go through phases of development, forming with these more productive testes with their high quality, etc.

In this regard, it is of considerable interest to pass through the corresponding phases of their development in the seedless testes, and, consequently, the maturation of the seeds, which is presented in Table 5..

Table 5

Development phases of non-planting fodder beet seedlings in experiments (NISNIIOBK and K, average 2019-2021).

Phases of beet development	On years		
	2019	2020	2021
Beginning of spring regrowth	5.III	7.III	6.III
sockets; Start	17. III	19. III	15. III
complete	21.III	22.III	19.III
Duration, days	16.	15.	14.
Shooting; Start	22.IV	19.IV	15.IV
complete	25.V	4.V	7.V
Duration, days	14.	15.	16.
Flowering start	14. V	16. V	15. V
complete	18.VI	19.VI	15.VI
Duration, days Ripening; Startfull	24.	23.	20.
Duration, days	7. VI	6. VI	5. VI
Period in the second year of vegetation, days	25. VI	27. VI	25. VI
	18.	21.	20.
	106.	104.	105.

As the data of Table 5 showed, that early spring regrowth of non-planting seed plants occurs literally in early March, leaf rosettes were noted in experiments in mid-March, which lasted 14-16 days, while the formation of stems was noted in our experiments in mid-April and early May, the beginning of flowering it was noted on May 14-16, and the full phase - June 5-9, and the beginning of seed ripening was on June 5-7 for the year, and the full phase was observed on June 25-27.

Thus, each phase, depending on the passage of the beginning and the full phase, lasted within 15-18 days, and the period of the second year of vegetation in non-planting seed plants in the experiments was 106 days in 2019, only 105 days in 2020-104 and 2021, which confirms that that due to the winter vegetation of plants, all phases of growth and development are faster in comparison with the planting method. In experiments, depending on the timing of sowing and seeding rates, we obtained a high yield of seeds with an optimal term of September 1 and a seeding rate of seeds at the rate of 20 pcs. per 1 p.m. row, which ensured their yield, respectively, 27.5 q / ha, and this is the most justified and profitable from an economic point of view. Thus, our studies under irrigation conditions allow us to draw the following main conclusions:

1.Analysis of agro-climatic conditions showed that the air temperature in the autumn period is 15.50C on average for 2018-2019, the relative humidity of the soil is 56.0% and the amount of precipitation is 337.5-509.7 mm, the vegetation of plants in the winter period is 45 -56% and the amount of precipitation falling in the spring is 71-82% of the annual norm. Therefore, with non-planting seed production, it is advisable to sow fodder beet seeds in the first decade of September and the seeding rate (20 pcs. per 1 running meter of row) in the fall within 9-12 days of full-fledged shoots, and by the beginning of October (5.x) the beginning of 3 pairs of leaves on one plant, which guarantees their successful overwintering.

2. The degree of development of non-planting seed plants will depend on the conditions of the autumn-winter, terrestrial and early spring vegetation period. Thus, the weight of the root over the years of research fluctuated on average 60.4 grams, leaves 121.7 grams with 15 of them. and an assimilation surface of 525.6 cm2 on one plant.

3. The safety of non-landing seed plants will directly depend on the presence of a minimum air temperature

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in the carne-inhabited layer and the thickness of the snow cover. So, if the winter period of 2018-2019, especially in December and February, was observed at the level of the root head - 0.5-5.10C, as a result of which the safety of the roots was noted within 95-98%, then in the next 2 years in winter conditions, the safety was respectively from 95 to 97% of the original.
4. Spring regrowth of a non-planting crop occurs in early March, after which almost all phases are observed within 18-20 days, and the vegetative period in the second year is 104-106 days, which had a positive effect on obtaining a seed yield of 27.5 q / ha, which is economically profitable and justified.

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