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Influence of Watering and Fertilizing Norms on the Yield of White Cabbage

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Abstract: Influence of watering and fertilizing norms on the yield of white cabbage.

In three-factor experiments conducted in 2012-2015, the average weight of cabbage in all variants was in the range of 3.26-2.70 kg, the difference of which was 120.7%. The yield of the Saratoni variety is 65.6 t/ha with a control irrigation regime of 70-70% and the application of recommended (N 150 P 150 K 100 kg/ha) mineral fertilizers, an irrigation regime of 80-80%, and with nitrogen (N 250 kg/ha) /ha) norm (81.1 t/ha) was 23.6% higher than the control, and 113.0 and 126.7% higher than the control in the hybrid W61-19 F1 at 80-80% irrigation regime in both fertilization rates. With an increase in productivity, the cost of 1 ton of products decreased by 16.8% for all options. The level of profitability by options was: 37.8-51.4% for the Saratoni variety and 45.7-61.6% for the W61-19 F1 hybrid.

In increasing the yield, the importance of irrigation was stronger than that of mineral fertilizers.

President by " Uzbekistan Republic village of the farm development for 2020-2030 intended strategy population employment provide according to set given priority tasks performance provide , plant from the fields efficient use , population food products has been demand Satisfied , village economy products of prices stability supply , export size increase also in 2022 from grain and tomorrow from crops loose to the fields repeated crops own in terms of planting , agricultural engineering events transfer , demand to be done material - resources delivery to give and cultivated the harvest own in time collect get , re work , reserve accumulation and for export orientation according to separately tasks set given.

Food safety provide and is available irrigated from the fields efficient in use , repeated plant as white cabbage in cultivation efficient agricultural technologies supporting this _ plant productivity and gross product work release size increase demand is enough The world according to white Cabbage 2.82 million . per hectare more than on the field is being cultivated . Average productivity 29.4 tons per hectare and gross harvest 82.8 mln. tons organize [1] .

This about scientific based on technologies work to issue current reach through product size and productivity increase , irrigated from the fields efficient use and repeated from crops removable economic efficiency indicators high to be is provided .

Aqbosh cabbage has been demand satisfy in order to village economy work manufacturers for this crop repeated plant as Cultivation technology improvement in this the most acceptable planting duration of plants nutrition Fertilize the field and irrigation standards identify as well goods and fruitful variety and hybrids choose regarding studies current is considered

Long from years since researchers by different soil climate conditions white cabbage Cultivation technologies improvement issues by : Foreign countries A. S. Bolotskiy, M. S. Grigorov, M. V. Damkov, M. A. Lixomanova, V. M. Jidkov, A. A. Nazarenko, L. E. Solovyova, V. M. Pivovarov, N.

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N. Chernisheva, R. D. Almasker, S. V. Koroleva, S. V. Sitkinov, L. K. Gurkina, T. V. Lizgunova, V. A.Denisov, R. D. Almasker, I. D. Rajabli, N. B. Petrov, O. N. Vishnevskaya, L. I. Uralets, M. N. Shapturenko, V. N. Lukyanets, G. A. Kostenko, A. D. Jahangirov, V. P. Kuzmishchev, G. F. Monaxos; respublikachilik V. I. Zuev, O. Qodirxojaev, B.J. Asimov,, A. M. Abbosov, M. X. Aramov S. S. Lapasov, and another many scientists by scientific studies take went.

From the above come out white cabbage grain from crops free in the fields repeated in the crop Cultivation for promising variety and hybrids irrigation and feeding according to studies take we went

In 2007-20011 take went in our studies promising that found varieties , feeding and irrigation standards embodied in 2012-2015 special complicated experiences we spent This experience three factorial is, - the factor A in it variety and hybrid Factor V irrigation order , S factor fertilization standards it happened In factor A white of cabbage Cancer variety and W61-19 F_1 hybrid ; In factor V to limited field wet capacity relative to (CHDNSN) from irrigation previous soil humidity was 70-70 (control) and 80-80%; S factor fertilization norms $N_{150} P_{150} K_{100}$ kg/ha control recommendations according to and nitrogen fertilizer to control relatively addition pure $N_{250} P_{150} K_{100}$ kg/ha was applied per hectare .

B.J. Azimov during research and B.B. Azimov's "Methodology of conducting experiments in vegetable growing, vegetable growing and potato growing", V.F. Belik's “Методика опытного дела в овощеводстве и бахчеводстве”, “Методические указания по экологическому испытанию овощных культур” as well as N.I. Savvinov and V. Methodology of E. Kabaev was used. The statistical analysis of the research results was carried out using the "Metodika polevogo opyta" dispersion method of B.A. Dospehov in "Excel 2010" and "Statistica 7.0 for Windows" computer programs, with a confidence interval of 0.95%.

In the experiment, the seedling is 70 cm. It was planted between the trees, and 6 rows, 30 meters long, were planted in 4 turns. One option has an area of 126 m^2 and one return area 1008 $m^{2.}$ Summary of experiment 2 area 4032 m^2 .

In our experiments variety, hybrid, irrigation procedure and fertilization standards of cabbage to the size also (height, *cabbage width and external core)* own effect showed. From watering the cancer variety previous soil humidity 80-80% irrigation in order recommendation done fertilizer norm when applied cabbage height is 23.5 cm and background+N is 26.0 cm at $_{250\ kg/}$ ha between them the difference is 110.6% and 70-70% irrigation to the procedure when relatively 80-80% fertilization options according to suitable 106.8 and 109.2 % respectively did of cabbage watering 80-80% of the width in order two different nitrogen rates when applied cabbage width suitable 26.5 and 27.5 cm respectively , 70-70% irrigation in order fertilization standards 103.9 and 105.8 % more was.

Applied variety and hybrid, irrigation procedure and fertilization in the standards cabbage height with cabbage width of the correlation coefficient between dependence strong (r=0.84±0.22) and a plausible r of 3.8 times it happened

Watering the cancer variety previous soil control humidity ChDNSN 70-70% option recommendation done fertilization norm when applied cabbage weight between 2.82-1.99 kg shaking stood up and four yearly average the indicator was 2.30 kg .

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Table 2. Varieties, irrigation procedure and fertilization norms cabbage by weight impact (2012-2015)

Var	Watering order , %	Fertilization rate , kg/ha	Cabbage weight , kg				Average	
			2012	2013	2014	2015	$\bar{X}$	to control relative to
Cancer	70-70 control	$N_{150}P_{150}K_{100}$	2.82	2.13	2.27	1.99	2.30	100.0
		Background+ N_{250}	2.96	2.36	2.41	2.08	2.46	100.0
	80-80	$N_{150}P_{150}K_{100}$	3.34	2.43	2.50	2.15	2.60	113.0
		Background+ N_{250}	3.68	2.61	2.68	2.42	2.85	115.9
W61-19 F_1	70-70 control	$N_{150}P_{150}K_{100}$	2.99	2.40	2.64	2.12	2.54	100.0
		Background+ N_{250}	3.14	2.71	2.81	2.44	2.77	100.0
	80-80	$N_{150}P_{150}K_{100}$	3.32	2.85	2.79	2.51	2.87	113.0
		Background+ N_{250}	3.86	3.09	3.04	2.86	3.21	115.9
$\bar{X}$			*3.26*	*2.57*	*2.64*	*2.32*	*2.70*	

From irrigation previous soil humidity ChDNSN is 70-70%, increased (N_{250}) nitrogen rate when applied years according to cabbage weight in the range of 2.96-2.08 kg was 2.46 kg on average and recommendation done option compared to 7.0% larger was Cancer 80-80 % irrigation in the variety in order recommendation (N_{150}) option cabbage weight years in the range of 3.34-2.15 kg being the average was 2.60kg. This watering in order increased (N_{250}) nitrogen fertilizer when applied cabbage weight average is 2.85 kg did This indicators previous irrigation to the procedure relatively fertilization standards 13.0 and 15.9 % higher was.

W61-19 F_1 hybrid 70-70% irrigation when applied in the order ($N_{150}P_{150}K_{100}$ kg/ha) cabbage average weight is 2.54 kg did Nitrogen fertilizer was increased to 250 kg/h option average is 2.77 kg , recommendation done option relatively was high (109.1%) .

From irrigation previous soil humidity is 80-80% recommendation done fertilizer norm when applied cabbage weight average the indicator is 2.87 kg, increased nitrogen (N_{250}) rate when applied average is 3.21 kg 70-70 % irrigation to the procedure relatively options according to suitable 13.0 and 15.9% more , respectively was.

2012 year productivity Cancer in the variety from watering previous soil Control humidity ChDNSN 70-70% option recommendation ($N_{150}P_{150}K_{100}$ kg/ha) option 80.3 t per hectare , to him relatively, nitrogen rate (N_{250} kg/ha) was increased 5.2% higher in the variant (84.5 t/ha). was 80-80 % irrigation in this variety in order recommendation ($N_{150}P_{150}K_{100}$ kg/ha) option yield is 95.1 t/ha and increased fertilization (N_{250} kg/ha) in option higher 110.2% more was Cancer 70-70 % irrigation in the variety to the procedure relative to 80-80% irrigation in order fertilization standards options according to yield is 18.4 and 24.0% higher was Productivity high to be irrigation procedure effect more was.

W61-19 F_1 hybrid 70-70% irrigation in order recommendation done fertilization norm when applied productivity 85.3 tons per hectare and nitrogen fertilizer increased (N_{250} kg/ha) option (89.4 t/ha) by

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4.8% more was In this hybrid from watering previous soil humidity ChDNSN is 80-80 % fertilization norm ($N_{150} P_{150} K_{100}$ kg/ha) control option productivity 94.6 tons per hectare and 110.1 t/ha in the Fon+N_{250} kg/ha option and between them the difference is 116.4 % did 70-70% irrigation to the procedure relative to 80-80% irrigation in order fertilization options according to productivity belongs to 110.9 and 123.2% irrigation respectively in order high was.

Experience complex 3 -factor is , factor A is type and hybrid Factor V 70-70 % and 80-80% irrigation procedure and to the S factor fertilization standards service did 2012 year productivity $EKMT_{05}$ 1.2 t and S and AS, VS and AVS factors in A and V factors according to $EKMT_{05}$ was 1.2 t . Try it accuracy C is $\bar{x}$1.2% higher was.

Cancer variety ChDNSN from irrigation previous soil control humidity 70-70% option recommendation ($N_{150} P_{150} K_{100}$ kg/ha) fertilization from the standards in 2013 when used per hectare received yield is 60.7 tons and nitrogen rate 111.0% higher in the increased (N_{250} kg/ha) option (67.4 t/ha) was _ 80-80 % irrigation in this variety in order fertilization when the norm $N_{150} P_{150} K_{100}$ kg/ha is applied productivity 69.3 t per hectare and the rate of nitrogen (N_{250}) was increased 107.5% higher in the variant (74.5 t/ha). was _ 70-70% irrigation to the procedure relative to 80-80% irrigation in order fertilization standards between productivity the difference is 114.2 and 110.5 % did.

Table 3. Watering procedure and fertilization norms varieties productivity impact (2012-2015)

Watering order , % (V factor)	Fertilization rate , kg/ha (S factor)	Productivity , t/ha				Average	
		2012	2013	2014	2015	$\bar{x}$	to control relative to
type of cancer							
70-70 control	$N_{150} P_{150} K_{100}$	80.3	60.7	64.7	56.6	65.6	100.0
	Background+ N_{250}	84.5	67.4	68.8	59.4	70.0	106.7
80-80	$N_{150} P_{150} K_{100}$	95.1	69.3	71.2	61.2	74.2	113.1
	Background+ N_{250}	104.8	74.5	76.3	68.9	81.1	123.6
W61-19 F_1 hybrid							
70-70 control	$N_{150} P_{150} K_{100}$	85.3	68.4	75.2	60.3	72.3	100.0
	Background+ N_{250}	89.4	77.1	80.1	69.5	79.0	109.3
80-80	$N_{150} P_{150} K_{100}$	94.6	81.3	79.4	71.4	81.7	113.0
	Background+ N_{250}	110.1	88.1	86.6	81.4	91.6	126.7
$EKMT_{05}$ A and V factors		*1.2*	*2.5*	*2.3*	*1.9*		
$EKMT_{05}$ S and AS, VS and AVS factors		*1.2*	*2.5*	*2.3*	*1.9*		
Experience accuracy , $S_{\bar{x}}$ %		*1.2*	*2.3*	*2.9*	*2.7*		

W61-19 F_1 hybrid (control) 70-70% watering in order recommendation ($N_{150} P_{150} K_{100}$ kg/ha) fertilization 2013 in Varinatide productivity 68.4 tons per hectare and to him relatively, nitrogen rate (N_{250} kg/ha) was increased 77.1 t/ha in the variant , between them the difference was 112.7% . From irrigation previous soil when humidity ChDNSN 80-80% recommendation done fertilization option yield was 81.3 t/ha, background+N was applied at $_{250}$ kg/ha 88.1 t/ha in the variant , between them the difference was 108.4% . 70-40% irrigation to the procedure relative to 80-80% irrigation when applied fertilization options between productivity the difference is 118.9 and 114.3% higher was.

Watering procedure and fertilization standards to productivity effect $EKMT_{05}$ A and V factors in statistical calculations indicator 2.5 tons, $EKMT_{05}$ S and AS, VS and AVS factors the indicator was 2.5 tons and experience accuracy $S_{\bar{x}}$ 3.3% is plausible was.

2014 Cancer 70-70 % control in the variety irrigation procedure and recommendation ($N_{150} P_{150} K_{100}$ kg/ha) mineral fertilizers applied option per hectare received yield 64.7 t/ha, increased nitrogen (N_{250} kg) standard 6.3% higher when applied (68.8 t/ha). was In this variety from watering previous soil humidity is 80-80% recommendation mineral fertilizers applied option productivity is 71.2 t/ha and increased (N_{250} kg/ha) fertilization 76.3 t/ha in the option (N_{150} kg) compared to 107.2% in the

option high was Uniform fertilization in moderation different 70-70 % and 80-80% irrigation procedures compared to 80-80% irrigation in options yield is higher by 10.0 and 10.9% it happened.

Watering procedure and fertilization norms variety and hybrid to productivity effect according to statistical analyzes performed A and V factors in the results according to options between productivity difference EKMT $_{05}$ – 2.3 t.; S and AS, VS and AVS factors according to EKMT 05 _ 2.3 t. Try it accuracy is $\bar{x}$ 2.9% higher was.

2015 year Watering the cancer variety before ChDNSN is 70-70% , recommendation done rate of fertilizers (N $_{150}$ P $_{150}$ K $_{100}$ kg/ha) when applied productivity 56.6 tons per hectare , nitrogen fertilizer (N $_{250}$ kg/ha) was increased 104.9% higher in the variant (59.4 t/ha). was Watering Fertilization is 80-80 % standards harvest collected, previous from option and (N $_{250}$ P $_{150}$ K $_{100}$ kg/ha) in variants productivity belongs to 61.2 and 68.9 t/ha respectively , between them the difference is 12.6 % did Various watering procedure with uniform fertilization. standards in comparison The difference in yield is 8.0 and 16.0% was.

W61-19 F $_1$ hybrid 70-70% irrigation in 2015 option recommendation done fertilization (N $_{150}$ P $_{150}$ K $_{100}$ kg/ha) standards when applied productivity 60.3 tons per hectare and 69.5 t/ha when nitrogen fertilizer (N $_{250}$ kg/ha) is increased, which is 15.3% higher was 80-80 % irrigation in this hybrid fertilizer in the order of N $_{150}$ P $_{150}$ K $_{100}$ kg/ha when inserted yield is 71.4 t/ha and increased (N $_{250}$ kg/ha) variant is 81.4 t/ha , and between them the difference is 114.0 % did 70-70% irrigation to the procedure irrigated at 80-80 %, the same fertilizing standards when applied, the yield is 18.4 and 17.1% with 80-80% irrigation procedure in favor of was.

In this experiment variety and from the hybrid strictly look from watering previous soil humidity increased to go with and when the nitrogen rate is increased to $_{250}$ kg/ N productivity parallel respectively increased went Options according to average productivity is reliable from EKMT $_{05}$ respectively high are EKMT $_{05}$ A and V factors for 1.9 t. and EKMT $_{05}$ S and AS, VS and AVS factors for 1.9 t. and the experience accuracy S $\bar{x}$ 2.7% higher was.

So, the options average productivity private average from indicators believable respectively high was 4 years old average yield W61-19 F $_1$ hybrid 70-70% irrigation procedure and recommendation according to fertilizer 72.3 t/ha when applied, increased (N $_{250}$ kg/ha) nitrogen fertilizer put in option 79.0 t/ha , control 9.3% higher than the option was 80-80% irrigation when applied in the order (N $_{150}$ P $_{150}$ K $_{100}$ kg/ha) productivity is 81.7 t/ ha by 13.0% of the control , and 91.6 t/ha when increased nitrogen (N $_{250}$ kg/ha) was used , and the control 26.7% higher than the variant was 70-70 % and 80-80% different irrigation order , the same mineral fertilizer norm when applied yield 80-80% irrigated 13.0 and 15.9% higher in the variant was cabbage productivity to mineral fertilizers in increasing relatively irrigation procedure importance stronger was.

Watering procedure and fertilization standards productivity increase with together economic to efficiency too own effect showed. Cancer in the variety profitability level irrigation procedures by: 37.8 and 45.9%, W61-19 F $_1$ 45.7 and 61.6% in the hybrid so, both in the variety also 80-80% irrigation in the procedure, nitrogen fertilizer was applied at the rate of +250 kg/ha in options high was.

Conclusion.

in 2012-2015 all in options cabbage average weight in the range of 3.26-2.70 kg and their difference was 120.7% . Fertility: Cancer 70-70 % control in the variety irrigation in order and recommendation (N $_{250}$ P $_{150}$ K $_{100}$ kg/ha) mineral fertilizers between 80.3-56.6 tons when used oscillated and average was 65.6 t/ha . Watering order is 80-80% increased (N $_{250}$ kg/ha) nitrogen rate when applied yield (81.1 t/ha) is 23.6% higher than the control was _ W61-19 F $_1$ 80-80% irrigation in the hybrid in order both fertilization in moderation to control relatively productivity is 113.0 and 126.7% did.

Factors A and V in the experiment for EKMT $_{05}$ between 1.2-2.5 t ; S and AS, VS and AVS factors for EKMT $_{05}$ 1.2-2.5 t. between of experience accuracy is 1.2-3.3% higher was Productivity to mineral fertilizers in the increase relatively irrigation procedure importance stronger was.

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70-70% irrigation to the procedure relative to 80-80% irrigation in order uniform fertilization in moderation per hectare received income Cancer by 13.1% in the variety ; W61-19 F_1 26.7% higher in the hybrid was 80-80% irrigation in order net profit earned Cancer by 29.8 % in the variety; W61-19 F_1 53.4% higher in the hybrid was. Productivity increase with all options according to 1 ton of products cost up to 16.8 % decreased went Profitability level options on : Cancer 37.8-51.4 % in the variety and W61-19 F_1 in the hybrid is 45.7-61.6% did.

References:

1. Decision of the President of the Republic of Uzbekistan No. PQ-4575 dated 28.01.2020. The strategy for the development of agriculture of the Republic of Uzbekistan for 2020-2030 is about measures.
2. Mirziyoev Sh. No. PF-5388 "On additional measures for rapid development of fruit and vegetable growing in the Republic of Uzbekistan". Presidential Decree. - Tashkent, March 29, 2018.
3. Mirziyoev Sh. PQ-2460 "On measures for further development and reform of agriculture in 2016-2020". President's decision. - Tashkent, December 29, 2015.
4. Azimov B.J., Azimov B.B. Methodology of conducting experiments in vegetable growing, rice growing and potato growing // - Tashkent, UzME. 2002. – B. 9–11.
5. Belik V.F. Methodology of experimental work in agriculture and agriculture. - M.: Agropromizdat, 1992. - S. 30-45 .
6. Dospekhov B.A. Methodology polevogo opyta. - M.: Kolos, 1985. - S. 316-328.
7. Azimov B.J. The mode of cultivation of white cabbage in the spring and summer periods of planting and the conditions of underground soil in Uzbekistan.: Autoref. diss. ... candy. s/x. science - Tashkent, 1968. - S. 12-18.
8. Bolotskikh A.S. Poliv kapusty. // «Sovremennye tendentsii v selektsii i semenovodstve ovoshchnyx kultur. Traditsii i perspektiv'. I Mejdunarodnaya nauchno-prakticheskaya conference (August 4-6, 2008). - Moscow, 2008. - T. 1. – S. 138–139.
9. Grigorov M.S., Grigorov S.M., Damkov M.V., Likhomanova M.A. Razrabotan mode oroshenia kapusty. // J. The potato is the voice. - Moscow, 2001. - No. 3. - S. 31-32.
10. Zhidkov V.M., Mashtykov G.G. Optimum regime nutrition i oroshenia kapusty na burnyx pochvax Kalmykii. // The potato is a noisemaker. - Moscow, 2007. - No. 6. - S. 20.
11. Zuev V.I., Azimov B.J., Umarov Kh. Irrigation and fertilization of cabbage / vegetable crops. - T.: Uzbekistan, 1975. - B. 52–54, 94–97.
12. Nazarenko A.A. Effectiveness of irrigation and fertilization during growth and storage, perspective sorting and selection of hybrid white cabbage, domestic and foreign. Autoref. sugar diss... s.-x. science - Moscow, 2005. - S. 3-9.
13. Soloveva L.E. Vliyanie regimeov roshenie i irovnya mineralnogo pitaniya na productivity kapusty belokochannoy v usloviyax Lesostepi Krasnoyarskogo kraya. Abstract diss.. Cand. s/x nauk. - Moscow, 1986. - S. 3-12.
14. Lapasov SS, Shokirov AJ, Azimov BJ Selection of White Cabbage Variety Samples Those are Cultivated in Uzbekistan Conditions // International Journal of Science and Research (IJSR) ISSN (Online): 2319–7064. Volume 6 Issue 11, November 2017. – P. 1999–2002.
15. Pivovarov V. F. VNIISSOK: 13 let v sisteme Rosselkhozakademii // J.: Kartofel i ovoshchi. - Moscow, 2004. - No. 4. - S. 5–6.
16. Shokirov A.J. Basic scientific and practical technologies for growing white cabbage (Brassica capitata Lizg.) in repeated culture. . Abstract diss. doc . s/x nauk. - Tashkent, 2020. - S. 5 - 24.

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