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The Effect of Planting Time and Scheme on the Yield of False Stem of Leek

Vokhidov Sarvarbek Tolanboy o'g'li, Nosirov Iqboljon Kabiljon o'g'li
Andijan Institute of Agriculture and Agrotechnologies

Abstract: *In the article, the control of leek varieties "Vesta" and "Elefant MS" suitable for the soil and climate conditions of the Fergana Valley was 53.6 and 51.3 t/ha (respectively) during the February 20 planting period, compared to 10- in February 4.0-5.4 tons of high false stem yield and the highest false stem yield compared to the 70×15 cm (control) scheme (19.8 and 20.0 t/ha) 50+20/2×5 cm (72 ,1 and 70.4 t/ha) and 50+20/2×15 cm (51.5 and 52.6 t/ha) planting schemes showed 29.8-34.5% less false stem yield 70 It is highlighted that in the ×20 cm planting scheme (5.9 and 6.9 t/ha, respectively).*

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Introduction. Expanding the range of vegetable crops in the world is an urgent task of modern vegetable farming. As a solution to this problem, it is important to introduce the type of leek (Allium porrum L.) with high productivity, resistance to cold, diseases and pests to production in Uzbekistan. Leek (Allium porrum L.) occupies a special place among onion crops, and 2,239,800 tons of leek products are grown in the world. Indonesia (638.7 thousand t.), Turkey for the production of leeks

(225.5 thousand t), France (168.4 thousand t), Southern Belgium (147.1 thousand t), Korea (148.1 thousand t), China (119.0 thousand t) are the leading countries [1] ; [2].

Wild and cultivated forms of leek have different local names in the places of growth, for example, in Greece and Turkey, leek is called "prason", "pras", Arabs call it "kurrat", Romani people call it "poru, porr, pir", in Azerbaijan "chever", a leek that came to Georgia from Greece, was called "prasa" in Greek. In Georgia and Armenia, there are 3 forms of leek, called Tiamula, Gveso and Prasa domashnyaya. The German name of leek is "roggeye", the English name is "leek" [3]; [13].

Leeks are slightly different in chemical composition from onions and perennial onions, and in terms of dry matter they are close to garlic onions. Leek is called "Mendeleev's living periodic table" due to its rich chemical composition. It contains 88% water and is low in calories - 33-40 kcal per 100 g of dry weight, 8-12% carbohydrates, including: 5-6% sugar, 2-3% proteins, 0.1% organic acids are found [19].

In addition, starch 0.3%, cellulose 1.5%, fats 0.2%, ash 1.2%, as well as vitamins (mg %): A carotene - 0.03, V1 thiamine - 0.06 01, V2 riboflavin - 0.04-0.06, V3 - 0.1, B6 - 000.3, V9 folacin - 0.03, C (ascorbic acid) - 35-80, UE - 1.5-3, N – 0.14, RR (niacin) – 0.5, carotene – 0.7 [11]; [14]; [15], minerals (mg/100 g): sodium – 50; potassium - 225; calcium - 87; magnesium - 10; phosphorus - 58; iron - 1.0-2.4; along with zinc, manganese, copper and silicon, as well as the main macro and microelements, it includes nickel, cobalt, chromium, vanadium, molybdenum, titanium [12]; [13]; [25].

It contains up to 37 mg% of essential oil with sulfur, fatty acids, enzymes: maltase, dextrinase, invertase [7]. The presence of 17 volatile substances in leeks was determined: disulfo-dimethyl; 2,4-dimethylthiophene; 3,5-dimethylthiophene; disulfo-methylpropyl; 1,3-dithial; 1,4-dithial; trisulfo-dimethyl; disulfo-diallin; disulfo-allypropyl; trisulfo-allylmethyl; trisulfo-dipropyl; trisulfo-methylpropyl; 3,5-methylethyl-1,2,4-trithiol; 3,5-methylethyl-1,2,4-trithiol (isomer); 3,5-diethyl-1,2,4-trithiolane; 3,5-diethyl-1,2,4-trithiolane (isomer) [6].

But the calorie content of leek is lower than that of onion and garlic, 334-490 – 52-65 kcal per 1 kg of false stem. The energy value of the false stem is 138.27 - 150 kJ per 100 g, which determines its high nutritional value [11]; [13]; [24]. The white part of the pseudostem has higher dry matter and sugar content than the green part, but lower vitamin C and nitrate content [8].

Green leaves of leek contain carotene, glucose, fructose, kestose/nystose, sucrose, vitamins C, V1, V2, YE [16]. It also contains essential oil, a large amount of mineral substances - salts Ca, P, S, Cu, Fe, K, Na [18.]. The plant secretes a steroid saponin with hemolytic activity [17]. The plant is rich in phytoncides.

V.A. Kokoreva, V. Suzan [10] distinguished three main groups of varieties according to the morphological and biological characteristics of leeks: 1) early - intended for harvesting in August-early September, they are flat, high (from 25 cm more) false stem, characterized by light green leaves with a weak waxy coating, leaves are loosely located, plants are not resistant to cold; 2) medium-sized - they are characterized by thick, cylindrical and slightly thickened false stems in the lower part, on average 15-22 cm, strong, green or gray-green in color, mass collection is carried out in early October increased, many varieties successfully winter; 3) late ripening - the varieties are characterized by slow growth and high frost resistance, the false stem is short, often thickened at the bottom, the leaves are pencil-green, covered with a strong waxy coating, the weight of the plants is for medium-ripening varieties relatively low.

A.F. Agafonov, I.V. Medvedev said [1]; [2], during the economic and biological evaluation of leek varieties in the northwestern regions of Russia, the highest yield of leeks was obtained from the Alita variety (51.2 t/ha), Columbus (49.7 t/ha) and Kilima (38.9 t/ha) and the control Osenniy giant variety - 36.5 t/ha yielded the lowest yield.

O.V. According to Sinkevich [21]; [20]; [22]; [23], the average yield in the 2001-2003 studies was 4.38 kg/m2. Varieties Merlin and Profina, which have high adaptability, showed 13% to 80% more productivity than the control variety Karantansky, and the average yield for 3 years was 3.47-3.55 kg/m2.

Leeks are grown in two ways - from seeds and seedlings. 40-50% higher yield can be obtained from planting with seedlings than planting from seeds. In addition, it was noted that cultivation through seedlings allows obtaining the same product [3]; [4].

However, leek is not widespread in Uzbekistan, especially in the soil and climate conditions of the Fergana Valley, due to the lack of regionalized varieties and the lack of scientific basis for cultivation technology. For this reason, scientific and research work was carried out in the republic in order to study and introduce foreign selection sources of leek plant into production.

Research method. In the research work, the leek plant of the foreign selection "Vesta" and "Elephant MS" was used as a plant, leaf and false stem yield. In the study of the optimal planting period and schemes of leek varieties, 4 rows, 2 rows, rows 5.15 m long, and a calculated area of 5.6 m2 were carried out on 20 plants per sample. In growing leek from 45-day-old seedlings, important morpho-biological and valuable economic characteristics of varieties are evaluated.

Field experiments "Methodology of conducting experiments in vegetable growing, vegetable growing and potato growing" (Azimov B.J., Azimov B.B., 2002), "Metodika polevogo opita v

ovoshevodstve i bakchevodstve" (Belik V.F., 1992) and "Metodicheskiye ukazaniya po izucheniyu kolleksii luka i chesnoka" (Kazakova A.A., Borisenkova L.S., 1986) was carried out on the basis of methodological manuals, statistical analysis of research results was carried out in Excel 2010 and Statistica 7.0 for Windows computer program, with a confidence interval of 0.95% "Metodika polevogo opita" (Dospekhov B.A., 1985) was calculated by the dispersion method.

Research result. According to the parameters of 2021 in the cultivation of leek in the soil-climatic conditions of the Fergana Valley, the control of varieties "Vesta" and "Elephant MS" on February 20 (54.6-54.2, respectively) t/ha) compared to the planting period on February 10, according to varieties - 3.3-1.7 t/ha formed a high false stem yield, while on the dates of March 1 and March 10, per unit of area in the "Vesta" variety - 5.9 - 12.0 tons, and "Elephant MS" variety - 9.9-14.5 tons low false stem productivity was determined.

From leek varieties "Vesta" and "Elephant MS" in 2022, the highest false stem yield was formed in the February 10 planting period (respectively: 55.9 and 56.9 t/ha), compared to the control February 20 planting period, it was 3, 2-9.8 t/ha showed high false stem yield. Also, compared to the February 20 planting period, the "Vesta" variety had 1.6-8.4 tons of false stem yield on March 1 and 10 (respectively) and the "Elephant MS" variety had 9.8 tons of false stem yield per unit area. was determined.

When determining the optimal planting dates for the cultivation of leek varieties, the highest false stem yield in 2023 was formed in the planting period of "Vesta" and "Elephant MS" varieties on February 10 (respectively: 59.1 and 57.4 t/ha), control planting on February 20 It was found that it was 5.6-4.7 tons more per unit of area compared to the period (53.5-52.7 t/ha). Also, compared to the February 20 planting period, the false stem yield was lower in the "Vesta" variety - 6.9-10.8 t/ha and in the "Elephant MS" variety - 7.7-12.5 t/ha in the March 1 and 10 planting periods. it turned out to have.

The average false stem yield of leek leek varieties "Vesta" and "Elephant MS" at different planting dates for 2021-2023 was 53.6 and 51.3 t/ha (respectively) in the February 20 planting period. , compared to it, on February 10, 4.0-5.4 tons of false stems showed higher productivity per unit area. On the contrary, in "Vesta" and "Elephant MS" cultivars, the lowest false stem productivity was observed on March 1 and 10 (48.8-43.2 and 45.5-39.1 t/ha), compared to February 20. it was found that 4.8-10.4 and 5.8-12.2 tons were formed less than the area unit (respectively) (Table 1).

Table 1. False stem yield of leek onion cultivars at different planting dates

Planting periods	False stem yield, t/ha				
	2021-y	2022-y	2023-y	average	with respect to control %
“Vesta” variety					
10 february	57,9±0,85	55,9±0,82	59,1±0,87	57,6±0,68	107,5
20 february (control)	54,6±1,0	52,7±0,78	53,5±0,79	53,6±0,69	100,0
1 march	48,7±0,72	51,1±0,75	46,6±0,69	48,8±0,55	91,0
10 march	42,6±0,55	44,3±0,65	42,7±0,63	43,2±0,43	80,6
$EKMF_{05}$	1,7	1,4	1,5	0,7	
$Sx_{\%}$	3,3	2,7	2,9	1,3	
“Elefant MS” variety					
10 february	55,9±0,82	56,9±0,84	57,4±0,84	56,7±0,67	110,5
20 february (control)	54,2±0,80	47,1±0,69	52,7±0,78	51,3±0,60	100,0

1 march	44,3±0,65	47,3±0,70	45,0±0,66	45,5±0,50	88,8
10 march	39,7±0,58	37,3±0,55	40,2±0,59	39,1±0,43	76,1
$EKMF_{05}$	1,6	1,3	1,4	0,6	
$Sx_{\%}$	3,3	2,8	2,9	1,3	

In different planting schemes, leek varieties "Vesta" and "Elephant MS" from a unit of area in 2021, compared to the 70x15 cm (control) scheme, the highest false stem yield (18.8 and 17.5 t/ha) 50+20/2 ×5 cm (71.8 and 69.5 t/ha) and 50+20/2×15 cm (52.6 and 54.2 t/ha) planting schemes show 34.0-30.3% low false stem productivity was determined in the 70×20 cm planting scheme (respectively

12.4 and 12.2 t/ha). In 2022, the highest yield of stalks per unit of area was 50+20/2×5 cm compared to the scheme of 70×15 cm (control) in leek varieties "Vesta" and "Elephant MS" (20.2 and 21.4 t/ha). (74.6 and 71.5 t/ha) and 50+20/2×15 cm (50.6 and 51.0 t/ha) planting schemes show 30.2-38.3% less false stems productivity was determined in the 70×20 cm planting scheme (6.1 and 8.2 t/ha, respectively)/

In different planting schemes, leek varieties "Vesta" and "Elephant MS" from a unit area in 2023 compared to the 70x15 cm (control) scheme (20.5 and 21.1 t/ha) the highest false stem yield 50+20/2 ×5 cm (69.8 and 70.1 t/ha) and 50+20/2×15 cm (51.1 and 52.7 t/ha) planting schemes showed 25.4-34.1% low false stem productivity was determined in the 70×20 cm planting scheme (5.2 and 6.2 t/ha, respectively).

When the average false stem yield was analyzed for the years 2021-2023, the highest false stem yield in leek varieties "Vesta" and "Elephant MS" in different planting schemes compared to the 70x15 cm (control) scheme (19.8 and 20.0 t/ha) 50+20/2×5 cm (72.1 and 70.4 t/ha) and 50+20/2×15 cm (51.5 and 52.6 t/ha) planting schemes showing, 29.8-34.5% lower false stem yield was determined in the 70×20 cm planting scheme (5.9 and 6.9 t/ha, respectively) (Table 2).

Table 2. False stem yield of leek varieties in different planting schemes

Planting periods	False stem yield, t/ha				
	2021-y	2022-y	2023-y	average	with respect to control %
Vesta variety					
70×5 cm	39,7±0,72	45,2±0,83	50,2±0,74	45,0±0,71	227,4
70×10 cm	21,1±0,39	24,7±0,45	25,8±0,38	23,9±0,37	120,5
70×15 cm (control)	18,8±0,38	20,2±0,41	20,5±0,30	19,8±0,33	100,0
70×20 cm	12,4±0,25	14,1±0,29	15,3±0,28	13,9±0,20	70,3
50+20/2×5 cm	71,8±1,71	74,6±1,10	69,8±1,27	72,1±1,11	363,9
50+20/2×10 cm	46,4±1,10	50,3±0,74	47,5±0,97	48,1±0,79	242,7
50+20/2×15 cm	52,6±1,25	50,6±0,74	51,1±1,04	51,5±0,85	259,9
50+20/2×20 cm	30,3±0,72	30,7±0,45	29,5±0,70	30,2±0,33	152,4
$EKMF_{05}$	1,3	1,4	1,8	1,4	
$Sx_{\%}$	3,4	3,5	4,7	3,6	
Elefant MS variety					
70×5 cm	49,0±0,89	51,6±0,76	52,9±0,78	51,2±0,81	255,8
70×10 cm	22,6±0,41	28,0±0,51	30,1±0,44	26,9±0,37	134,4
70×15 cm (control)	17,5±0,36	21,4±0,31	21,1±0,39	20,0±0,26	100,0
70×20 cm	12,2±0,25	13,2±0,17	13,9±0,20	13,1±0,16	65,6
50+20/2×5 cm	69,5±1,65	71,5±1,14	70,1±0,90	70,4±0,94	351,9
50+20/2×10 cm	43,7±1,04	51,0±0,93	47,7±0,76	47,4±0,64	237,2

50+20/2×15 cm	54,2±1,29	51,0±1,04	52,7±0,96	52,6±0,69	263,1
50+20/2×20 cm	32,0±0,76	30,1±0,72	30,4±0,72	30,8±0,73	154,1
$EKMF_{05}$	1,8	1,7	1,5	1,0	
$Sx_{\%}$	4,7	4,3	3,7	2,6	

Summary.

1. Control of leek varieties "Vesta" and "Elephant MS" during the planting period of February 20 (respectively) was 53.6 and 51.3 t/ha, compared to 4.0-5.4 per unit area on February 10 tons showed high false stem productivity.

2. In different planting schemes, the highest false stem yield in leek varieties "Vesta" and "Elephant MS" compared to 70×15 cm (control) scheme (19.8 and 20.0 t/ha) 50+20/2×5 cm (72.1 and 70.4 t/ha) and 50+20/2×15 cm (51.5 and 52.6 t/ha) planting schemes showed 29.8-34.5% less false stems productivity was determined in the 70x20 cm planting scheme (5.9 and 6.9 t/ha, respectively)

3. When growing 45-day-old leek seedlings in early spring, it is recommended to plant them in the 50+20/2×15 cm planting scheme in the 1st and 2nd decades of February.

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