

INFLUENCE OF WAYS OF CROPS AND NORMS OF SEEDING OF SEEDS OF BIRD'S-FOOT TREFOIL (LOTUS CORNICULATUS L.) ON EFFICIENCY IN CONDITIONS IRRIGATION OF THE FOOTHILL ZONE OF THE SOUTHEAST OF KAZAKHSTAN

Annotation

In the article bringing results about influence of the means sowing and norm sowing seed bird's-foot trefoil (*Lotus corniculatus* L.) on the production in the irrigation conditions of the foothills zone of the South-East Past of Kazakhstan. Established that behind years research the greatest yield pasture mass bird's-foot trefoil (*Lotus corniculatus* L.) to sum 662,1 center /hectare to be receive by ordinary means sowing and norm sowing 6 million pieces /hectare.

Keywords: bird's-foot trefoil, norm of seeding, ways of crops, viability, crop of pasturable weight

Important reserve of increase in vegetable protein is expansion of crops of long-term bean herbs and increase of their productivity. One of such high-proteinaceous plants is the long-term bean grass bird's-foot trefoil. This grass is entered into culture rather recently and proved as one of perspective bean herbs possessing valuable and useful qualities [1; 2].

Ways of crops and norm of seeding have essential impact on productivity of hay crop mass of bird's-foot trefoil. Ways of crops and norm of seeding of seeds has a great impact not only on a crop, but also on its quality. It depends on many factors: security of the soil with nutrients and water, qualities of a sowing material, appointment and character herbage use, etc. [3].

Bird's-foot trefoil as the new bean grass is still a little studied. In Kazakhstan this grass is studied in mixgrass on natural haymakings. Therefore studying of technology of use of bird's-foot trefoil on a hay crop and a pasturable forage is for today actual and perspective.

This field experiment was put in the spring of 2010. Depending on ways and norms of seeding of seeds field viability of bird's-foot trefoil was within 38,9-53,5%. High viability of seeds was noted on ordinary crops with norm of 3 million / piece of hectare (53,5%). The lowest viability (38,9%) is noted on wide-row (45 cm) crops with the increased norm of seeding (table 1).

Table 1 – Influence of ways of crops and norms of seeding of seeds of bird's-foot trefoil on field viability and safety of plants to fall (2010)

Experience option		Viability		Number of the remained plants	
Way of crops	Norm of seeding, one million pieces/hectare	pieces /m ²	%	pieces /m ²	%
Private (15 cm)	12	528,0	44,0	456,0	86,4
	9	398,5	44,3	347,0	87,1
	6	291,5	48,6	270,5	92,8
	3	160,5	53,5	150,0	93,5
Widely the line (30 cm)	12	489,5	40,8	417,5	85,3
	9	354,5	39,4	330,0	93,1
	6	258,5	43,1	224,0	86,6
	3	147,5	49,2	135,0	91,5
Widely the line (45 cm)	9,0	349,7	38,9	310,5	88,8
	6,0	256,7	42,8	227,0	88,4
	4,5	194,8	43,3	176,5	90,6
	3,0	151,0	50,3	138,0	91,4

In the first year of life bird's-foot trefoil mowed two times on hay. After harvesting the kidneys which have started in growth of a zone of a tillering were in a type of the truncated escapes or wintering kidneys. In such state bird's-foot trefoil left on rewintering.

Data on a crop of pasturable green material in 2010 showed that on an irrigated site when ensuring crops with moisture bird's-foot trefoil forms a quite good crop in the first year of crops. In the first hay

crop the crop of pasturable green material was within 48,4-57,6 c/hectare. The highest productivity is noted on option of ordinary crops with norm of 6 million / piece of seeds on hectare (57,6 c/hectare). Rather poor harvest is received on options of wide-row crops with high norm of crops of seeds (12 million / piece of hectare) (table 2).

In the second hay crop the same tendencies also remained. The crop of pasturable green material of the second hay crop was within 40,3-44,1 c/hectare. In the sum for two hay crops productivity of bird's-foot trefoil was within 87,0-101,7 c/hectare. Above control on +3,2 c/hectare I gave option of ordinary crops with norm of 6 million / to piece of hectare. Other options of experiment on a crop of pasturable weight conceded to control on 2,6-10,6 c/hectare. On options of wide-row crops with high norm of seeding of seeds productivity of pasturable weight was 5,8-10,6 c/hectare lower than control.

Table 2 – Crop of pasturable weight in experiment on studying of ways of crops and norms of seeding of seeds of bird's-foot trefoil (2010)

Experience option		Green material, c/hectare						deviations from control ±
Way of crops	Norm of seeding, one million pieces/hectare	1st hay crop		2nd hay crop		in the sum		
		green material	fodder units	green material	fodder units	green material	fodder units	
Private (15 cm)	12	53,5	16,4	40,5	12,6	94,0	29,0	-4,5
	9 (κ)	55,7	17,1	42,7	13,2	98,5	30,3	± 0,0
	6	57,6	17,7	44,1	13,7	101,7	31,4	+3,2
	3	55,4	17,0	40,5	12,6	95,9	29,6	-2,6
Widely the line (30 cm)	12	47,6	14,6	40,3	12,5	87,9	27,1	-10,6
	9	49,2	15,1	41,4	12,8	91,6	27,9	-6,9
	6	49,5	15,2	42,7	13,2	92,2	28,4	-6,3
	3	48,4	14,9	41,6	12,9	90,0	27,8	-8,5
Widely the line (45 cm)	12	47,8	14,7	39,2	12,2	87,0	26,9	-11,5
	9	50,1	15,4	41,6	12,9	91,7	28,3	-6,8
	6	49,4	15,2	43,0	13,3	92,4	28,5	-6,1
	3	48,5	14,9	40,8	12,6	89,3	27,5	-9,2

Productivity of pasturable weight in the second 2011 on hay crops was various. On options of ordinary crops productivity in the first hay crop was 165,7-195,5 c/hectare, in the second hay crop – 172,0-201,5 c/hectare, in the third hay crop – 98,5-145,0 c/hectare, and in the fourth hay crop – 65,5-95,4 c/hectare. The highest productivity is received in the second hay crop on option with norm of seeding of 6 million / piece on hectare (201,5 c/hectare). On wide-row crops productivity by all options of experience appeared below ordinary crops. As a whole on options of ordinary crops in the sum 501,8-637,4 c/hectare of pasturable weight are received for four hay crops from each hectare or 152,2-192,8 c/hectare fodder units and on wide-row crops this indicator was at the level of 419,2-492,3 c/hectare or 127,1-149,3 c/hectare fodder units (table 3).

Productivity of pasturable weight on hay crops was various. On options of ordinary crops productivity in the first hay crop was 147,0-205,4 c/hectare, in the second hay crop – 140,0-174,7 c/hectare, in the third hay crop – 126,5-162,6 c/hectare, and in the fourth hay crop – 111,2-126,5 c/hectare. The highest productivity is received in the second hay crop on option with norm of seeding of 6 million / piece on hectare (205,4 c/hectare).

Table 3 – Crop of pasturable weight in experiment on studying of ways of crops and norms of seeding of seeds of bird's-foot trefoil (2011)

Experience option		Pasturable (green) weight, c/hectare									
Way of crops	Norm of seeding, one million pieces/hectare	1st hay crop		2nd hay crop		3rd hay crop		4th hay crop		In the sum	
		green material	fodder units	green material	fodder units	green material	fodder units	green material	fodder units	green material	fodder units
Private (15 cm)	12,0	165,7	50,9	172,0	53,3	98,6	29,0	65,5	19,0	501,8	152,2
	9,0	182,4	55,9	194,2	60,8	117,3	34,5	84,7	24,6	578,6	175,2
	6,0	195,5	60,0	201,5	62,5	145,0	42,6	95,4	27,7	637,4	192,8
	3,0	170,4	52,3	174,0	53,9	101,4	29,8	74,0	21,5	519,8	157,5

Widely the line (30 cm)	12,0	152,2	46,7	160,4	50,8	87,4	25,7	67,2	19,5	467,2	142,7
	9,0	155,5	47,8	162,5	50,4	86,7	25,5	66,4	19,3	471,1	143,0
	6,0	160,1	49,1	164,0	51,0	96,2	28,3	72,0	20,9	492,3	149,3
	3,0	154,4	47,4	156,0	48,4	90,5	26,6	70,5	20,4	471,4	142,8
Widely the line (45 cm)	12,0	147,0	45,1	150,5	46,7	81,7	24,0	63,5	18,4	442,7	134,2
	9,0	150,2	46,1	151,5	47,0	83,4	24,5	61,0	17,7	446,1	135,3
	6,0	141,5	43,4	144,2	44,7	79,6	23,4	60,4	17,5	425,7	129,0
	3,0	139,4	42,8	141,4	43,8	79,2	23,3	59,2	17,2	419,2	127,1

On wide-row crops productivity by all options of experience appeared below ordinary crops. As a whole on options of ordinary crops in the sum for four hay crops from each hectare it is received 508,-662,1 c/hectare of pasturable weight, and on wide-row crops this indicator was up to standard 525,3-591,2 c/hectare (table 4).

Table 4 – Crop of pasturable weight in experiment on studying of ways of crops and norms of seeding of seeds of bird's-foot trefoil (2012)

Experience option		Pasturable (green) weight, c/hectare									
Way of crops	Norm of seeding, one million pieces/hectare	1st hay crop		2nd hay crop		3rd hay crop		4th hay crop		In the sum	
		green material	fodder units	green material	fodder units	green material	green material	fodder units	green material	fodder units	green material
Private (15 cm)	12,0	174,2	53,47	156,0	48,36	146,9	43,19	131,8	38,22	608,9	183,2
	9,0	196,4	60,3	170,0	52,7	150,9	44,4	134,7	39,1	652,0	196,5
	6,0	205,4	63,1	174,7	54,2	155,4	45,7	126,5	36,7	662,1	199,7
	3,0	187,0	57,41	172,0	53,32	162,6	47,8	126,2	36,6	647,6	195,1
Widely the line (30 cm)	12,0	155,0	47,58	152,5	47,27	143,4	42,16	120,2	34,86	568,0	171,9
	9,0	160,8	49,4	154,7	48,0	144,0	42,3	119,3	34,6	578,8	174,3
	6,0	168,4	51,7	158,4	49,1	148,0	43,5	116,2	33,7	591,2	178,0
	3,0	158,1	48,54	150,6	46,69	145,5	42,78	115,1	33,38	569,2	171,4
Widely the line (45 cm)	12,0	150,1	46,08	149,0	46,19	133,1	39,13	117,2	34,0	549,6	165,4
	9,0	157,6	48,4	149,5	46,3	133,5	39,2	114,5	33,2	555,2	167,1
	6,0	161,4	49,5	141,2	43,8	127,0	37,3	111,2	32,2	540,8	162,8
	3,0	147,0	45,13	140,0	43,4	126,5	37,19	111,7	32,39	525,3	158,1

Thus, for years of researches the greatest productivity of pasturable mass of bird's-foot trefoil in the sum of 662,1 c/hectare was received at an ordinary way of crops and norm of seeding 6 one million pieces/hectare.

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ВЛИЯНИЕ СПОСОБОВ ПОСЕВА И НОРМ ВЫСЕВА СЕМЯН ЛЯДВЕНЦА РОГАТОГО (LOTUS CORNICULATUS L.) НА ПРОДУКТИВНОСТЬ В УСЛОВИЯХ ОРОШЕНИЯ ПРЕДГОРНОЙ ЗОНЫ ЮГО-ВОСТОКА КАЗАХСТАНА

Резюме

В статье приводятся данные о влиянии способов посева и норм высева семян лядвенца рогатого (Lotus corniculatus L.) на продуктивность в условиях орошения предгорной зоны юго-востока Казахстана. Установлено, что за годы исследований наибольшая урожайность пастбищной массы лядвенца рогатого в сумме 662,1 ц/га была получена при рядовом способе посева и норме высева 6 млн. шт./га.

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ҚАЗАҚСТАННЫҢ ОҢТҮСТІК-ШЫҒЫС ТАУБӨКТЕРІ СУАРМАЛЫ АЙМАҒЫНДА МҮЙІЗДІ ЛОТУСТЫҢ
(*LOTUS CORNICULATUS L*) ӨНІМДІЛІГІНЕ СЕБУ ӘДІСТЕРІ МЕН МӨЛШЕРЛЕРІНІҢ ӘСЕРІ

Резюме

Мақалада Қазақстанның оңтүстік-шығыс тауөтегі аймағының суармалы жағдайында мүйізді лотустың өнімділігіне себу әдісі және мөлшері әсерлерінің зерттеу мәліметтері келтірілген. Зерттеу жағдайында мүйізді лотустың жайылымдық массасының ең жоғарғы өнімі (662,1 ц/га) жай қатарлап және себу мөлшері 6,0 млн. дана/га себілген кезде алынды.

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