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**EFFICIENCY DIFFICULT GRASS MIXTURE IN THE CONDITIONS
IRRIGATION OF THE SOUTH-EAST PART OF KAZAKHSTAN****K. Aubakirov, K. K. Zholamanov, K. M. Erzhanova**

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Key words: seeded cultural pastures, grass mixtures, birds-foot trefoil, productive.

Abstract. The article presents data on the productivity complex grass mixtures in conditions irrigation in foothill zone of south-east Kazakhstan. It is established that *Lotus corniculatus* composed grass mixtures increases the longevity of a highly positive effect on soil fertility and provides a high-protein pasture forage in conditions irrigation in foothill zone of the south-east Kazakhstan.

Kazakhstan historically is the livestock country. Therefore providing animal husbandry with high-quality stems is an actual task at the present stage of development of agrarian sector of the republic.

The most rational and perspective method of strengthening of food supply animal husbandry, especially for dairy cattle in the republic, is creation and uses of cultural pastures. From references it is known that efficiency well picked up for specific conditions the seeded grass mixture, allows to provide on the irrigated lands to 10-15 thousand fodder units from hectare, to increase protein content in a stem for 10-20%, and also to lower expenses by production of forages - 10-15%, on unit livestock production.

At pasturable use of herbs fertility soils increases, receipt to the soil of a significant amount of the easily dissolved forms organic substance promoting increase in number and strengthening activity of the microorganisms and soil fauna promoting decomposition of the died-off parts plants is the reason of it.

The value of fodder plants for fertility soil general is defined by quantity of their roots [1-3]. At the same time in the republic not enough attention is paid to cultural pastures. In our opinion, distribution is very necessary production technology of high-quality pasturable green forages restrains still because of not a perfect scientific development.

It concerns, first of all, selection of the range of herbs for creation of long agrophytocoenosis, it is also important that requirements to soil fertility and an agrobacground corresponded to the existing level of the last. For example, at creation of the irrigated cultural pastures 3-5 component grass and leguminous mixture where the sowing campaign were a bean component generally a lucerne and a sainfoin, were used. In a year crops, the share bean in a pasturable green forage made - 45-55%. At intensive pasturable use such herbage grass mixture, by 3-4th year of use in herbage, the share leguminose didn't exceed 20-25%.

In this regard it was necessary to include in grass mixture new species of bean herbs, more perspective for pasturable use. Materials of research of the countries distant (the USA, Canada) and the neighbor (Russia, Belarus) abroad, testify to prospects of inclusion of a long-term bean grass bird's-foot trefoil (*Lotus corniculatus* L.) in grass mixture at creation of the long irrigated cultural pastures.

According to foreign researches, this grass appeared very perspective bean component for creation highly productive cultural herbage [4, 6].

Fast and rather wide circulation bird's-foot trefoil in a fodder grass cultivation in many countries, occurred thanks to a complex such as economy - valuable signs, as long (till 10-12 years), high winter hardiness, indiscriminateness to soils (pH 4,5-8,2), a good aftercrop after beveling and drain that is especially important at resistance to a cattle pasture, ability to maintain flooding by thawed snow (20 days and more). In Kazakhstan bird's-foot trefoil is proved as very perspective grass for improvement water meadows [5]. This grass is proved, as a good forage, in a foothill zone of the southeast of the republic [6].

Research grass and leguminose mixture with participation bird's-foot trefoil (*Lotus corniculatus* L) were begun in the conditions of an irrigation in a foothill zone of the southeast of the republic. Special attention was paid to selection herbs for inclusion in structure of a grass mixture. At selection herbs biological and ecological features separate species of herbs that have essential impact on dynamics of a crop for the vegetative period and productive long the seeded of herbage were considered.

In the field experiments put in educational-experimental station "Agrouniversitet" of the Enbekshikazakh area, Almaty region, Republic of Kazakhstan, in spring 2009, grass mixture consisting of the following components are studied: from leguminose – a lucerne sowing campaign, sainfoin, bird's-foot trefoil; from cereals – fussian brome grass, orchard-grass, rye grass pasturable.

Crops grass mixture are made in spring, on April 18-20. Herbs are seeded under cover summer barley. In the fall under the main processing of the soil brought P₉₀-K₆₀ active ingredient on hectare, N₆₀ brought in the spring. The research methods are standard in plant growing and a forage production. Soils of a skilled site meadow-chestnut, the maintenance humus in a layer the 0-20th – 3,2-4,6%, humidity of the soil is maintained at the level of 70-75% of the smallest moisture capacity. The first hay crop on a pasturable forage is cleaned a phase of a budding leguminose herbs, the subsequent hay crops with a height escapes of 20-24 cm. The beginning emergence of shoots herbs is noted for 7-8 day and full shoots for 17-20 day, after crops.

Calculation quantity of shoots on 1 m² is carried out after cleaning of integumentary barley, on May 20-22. Field viability cereal herbs was at the level of 47-50%, leguminose 54-60%. By fall more than 70-74% plants remained (459-469 pieces/meter²). From seeded grass the rye grass one-year differed in more intensive growth.

In a year sowing grass mixture gave two hay crops. The first alienation was carried out in 67-68 days, after emergence of full shoots. The second alienation was carried out in 38 days after the first hay cutting: in the first hay cutting by options of experience 94,5-108,4 c/hectare, in the second hay cutting – 147,0-162,0 c/hectare pasturable green material were received. For two hay cutting grass mixture gave 241,5-282,5 c/hectare of a pasturable forage.

It should be noted that high productivity of the first year is provided due to intensive growth of a rye grass pasturable one-year. It is a grass due to intensive growth during the initial period and good aftergrowth after a hay cutting, considerably increased efficiency grass mixture in the first year of use. The specific mass of an annual rye grass pasturable in a crop was within 25-35%. In the second year researches, the beginning growth of the seeded grass was noted on April 13-18. With more intensive growth it was allocated bird's-foot trefoil. The first hay cutting is made in 31-32 days, after growth of grass. Duration of the second hay cutting - 30-31 days, the third – 27-29 days, the fourth – 32 days and the fifth – 33 days. The last hay cutting is made on August 15-17.

In the second year of studying, grass mixture gave 376,2-433,6 c/hectare of pasturable mass, for five hay cuttings. The first hay cutting was more yielding (82,7-92,6 c/hectare). Then on hay cutting decrease of harvest is observed. In the fifth hay cutting pasturable productivity by options of experience made 64,0-75,6 c/hectare.

Table 1 – Productivity pasturable green mass grass and leguminose mixture (2009-2013gg.)

Grass mixture	Productivity, c/hectare		Increase in the sum in 5 years	
	First 3 years average	In 5 years average	c/hectare	%
First	334,6	349,5	–	–
Second	358,6	391,3	209,0	59,8
Third	374,5	389,7	201,0	57,5
Fourth	387,7	411,0	307,5	88,0

In third and fifth researches, on experiences 5 hay cuttings were made. The beginning of spring growth and distribution productivity of grass mixture on hay cutting was approximately, as in the second year. In the third year for 5 hay cuttings grass mixture gave 386,2-447,0 c/hectare of pasturable green mass. In the fourth year for 5 hay cuttings on experiences it was received by 390,8-467,1 c/hectare of pasturable forage. In the fifth year for 5 hay cuttings it is received pasturable mass within 353,0-424,7 c/hectare. From Table 1 it is visible that for all years growth, grass mixture with participation of bird's-foot trefoil, more big harvest is yielded.

In the first year the increase is made 15,1-41,0 c/hectare, in the second – 26,3-57,4 c/hectare, in the third – 32,9-60,8 c/hectare and in the fourth year – 37,4-76,3 c/hectare. Decrease in efficiency of the 3rd bird's-foot trefoil that is connected with big loss in the 4-5th years of use of sainfoin is observed.

Analyzing productivity grass mixture, it is possible to note that in the first 3 years average productivity of pasturable mass was at the level of 334,6-387,7 c/hectare. In 5 years average productivity was within 349,5-411,0 c/hectare.

In 5 years growth grass mixture, the crop increase the sum by options of experience made - 201,0-307,5 c/hectare or 57,5-88,0% in comparison with control (the first option). On options with participation of bird's-foot trefoil increase productivity was essential. On option with participation of sainfoin, since 3-5 years of use, harvest is decreased.

The structure of productivity of leguminose herbs is given in table 2. From here it is visible that in the first years the share lucerne and sainfoin in harvest was more, than bird's-foot trefoil. Starting with the 3-4th years of use, the share of a lucerne and especially sainfoin, in a crop significantly decreased. By 4th year the lucerne share in pasturable mass on hay cutting was within 10,0-13,0%, the share sainfoin 1,5-7,0% and vice versa, the share bird's-foot trefoil increased to 18,5-24,6%, that is noted growth and increase in mass bird's-foot trefoil in pasturable weight. In general, by 4th year researches, the share leguminose in harvest was at the level of 25,5-35,0%.

Analyzing structure of harvest, it is possible to note that in the 1st year of studying, the share of cereals was more. It is connected with inclusion in structure grass mixture of an annual pasturable rye grass. It is noted by us the intensity of a shoot education cereal grass during two periods growth – in the spring and summer-autumnal. For example, in our research the intensive shoot education of an fussian brome grass was noted during the summer-autumnal periods, than in the spring. Intensity of difference of shoot education orchard-grass and rye grass on the periods didn't observe. The good summer-autumnal tillering grass a big yields next year (table 2).

Table 2 – Structure of pasturable green mass grass and leguminose mixture (on the 2nd hay cutting)

Grass mixture	Structure of a crop by years, %														
	1st year of use					4th year of use					5th year of use				
			including					including					including		
	grass	leguminose	lucerne	sainfoin	bird's-foot trefoil	grass	leguminose	lucerne	sainfoin	bird's-foot trefoil	grass	leguminose	lucerne	sainfoin	bird's-foot trefoil
First	54,6	42,2	22,0	20,2	–	60,2	27,4	20,0	7,4	–	73,1	14,4	17,0	0,4	–
Second	53,9	43,0	30,5	–	12,5	59,5	30,2	12,0	–	18,2	60,8	30,8	10,4	0,3	20,1
Third	55,8	40,9	–	27,9	13,0	61,4	25,5	–	6,0	19,5	59,7	30,2	–	0,7	29,5
Fourth	56,3	41,3	16,7	15,4	9,2	60,7	33,5	11,0	4,5	18,0		32,7	10,5	–	22,2

We established an intensive tillering and a high rowen both of cereal and leguminose herbs which is marked out at sufficient moistening and security of the soil with nutritious elements. On leguminose-cereal pastures it is periodically necessary to introduce phosphoric or phosphorus-potassium fertilizers, and nitric food is generally carried out due to nitrogen fixing by leguminose components. Sometimes in pastures it is necessary to feed up in small doses mineral nitrogen (N₁₅₋₃₀). At shortage of moisture deterioration of an rowen herbs and even a stop of this process was noted.

In summary it should be noted that inclusion in structure the seeded grass and leguminose pastures bird's-foot trefoil, quantity of the root remains and an eddish enriching the top layer of soil with nitrogen and cindery substances made 150 c/hectare. Already by third year growth, in a soil layer of 0-20 cm in the 4th grass mixture contained roots (in c with 1 hectare dry weight) – 167, in the 3rd grass mixture – 148, in the 2nd grass mixture – 155, in the 1st grass mixture – 133. In structure of a crop from 3rd year of use,

there is a decrease in a share of a lucerne and a cock's head and increase in a share of bird's-foot trefoil. Thus, this perspective perennial leguminose grass increases highly productive longevity, positively influences on soil fertility and provides a high-protein pasturable feed in the conditions of irrigation in a foothill zone of southeast of Kazakhstan.

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ПРОДУКТИВНОСТЬ СЛОЖНЫХ ТРАВΟΣМЕСЕЙ В УСЛОВИЯХ ОРОШЕНИЯ ЮГО-ВОСТОКА КАЗАХСТАНА

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Аннотация. В статье приводятся данные о продуктивности сложных травосмесей в условиях орошения предгорной зоны юго-востока Казахстана. Установлено, что люцерна рогатый в составе травосмесей увеличивает высокопродуктивное долголетие, положительно влияет на почвенное плодородие и обеспечивает получение высокобелкового пастбищного корма в условиях орошения предгорной зоны юго-востока Казахстана.

ҚАЗАҚСТАННЫҢ ОҢТҮСТІК-ШЫҒЫС Өңірінің суармалы жерінде күрделі шөп қоспаларының өнімділігі

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Аннотация. Мақалада Қазақстанның оңтүстік-шығыс өңірінің суармалы жерінде күрделі шөп қоспаларының өнімінің көрсеткіштері берілді. Қазақстанның суармалы егістігінде шөп қоспаларына мүйізбас шөпті енгізген жағдайда оның ұзақжылдық жайылымдық өнімінің және құрылымының жақсарғаны анықталған.

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