

NEW VARIETIES OF PERENNIAL FORAGE GRASSES

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Abstract

The article describes the results of breeding to produce new varieties of perennial legume forage grasses. The selection process is shown by the classical scheme and for the accelerated method of creating blended hybrid synthetic populations. The description of new promising varieties of alfalfa volatile Hanshaim, Chaglinskaya 14 and Kokshetau yellow melilot 10 and Kokshetau 14 - are suitable for use in a multi-faceted northern regions of Kazakhstan and Western Siberia. Also in the article are given the results of the ecological variety testing and production of new varieties of alfalfa and melilot in the Siberian Research Institute of Agriculture (Omsk, Russia) and livestock farms of Akmola

Keywords: melilot, alfalfa, nursery, winter hardiness, drought, population, variety, hybrid.

Аннотация

В статье приведены результаты селекционной работы по выведению новых сортов многолетних бобовых кормовых трав. Показан селекционный процесс по классической схеме и по ускоренному методу создания сложногибридных синтетических популяций. Дано описание новых перспективных сортов люцерны изменчивой Ханшаим, Чагланская 14 и донника желтого Кокшетауский 10 и Кокшетауский 14, пригодных для многопланового использования в северных областях Казахстана и Западной Сибири.

Ключевые слова: донник, люцерна, селекция, популяция, сорт, урожайность, зимостойкость, засухоустойчивость.

Introduction.

In the coming years, tasked with the development of Kazakhstan's agro-industrial complex, the fact that the country has become a global and regional supplier of food, it is possible in

the production of sufficient quantities of high-quality and competitive agricultural products, including livestock.

The real solution to this problem lies in the fact that it is necessary to increase the yield of agricultural production per hectare. To do this, you need to provide a high-grade and cheap livestock feed, this is only possible with the introduction of new high-protein perennial grasses.

The further development of animal husbandry in Kazakhstan is primarily dependent on forage production of their quantity and quality. Perennial legumes in different regions of Kazakhstan are grown in the field and fodder crop rotations on perennial cultivated pastures, hayfields and other feeding grounds. In a system of measures to increase the production of feed includes the introduction of new cultivars of perennial grasses to meet the current level of agricultural development. The mound-plain zone of Northern Kazakhstan a significant place is given to alfalfa and sweet clover, as a source of protein feed.

In the structure of cropland areas of perennial grasses in plowing alfalfa takes small amounts. This is due to low crop yields, erratic seed production, and the lack of varieties of alfalfa, to fully meet the requirements of intensive farming.

The main features and properties that define the prospect of alfalfa varieties in areas of Northern Kazakhstan is the high yield crop (40/50 kg / ha without irrigation of hay and 100 kg / ha under irrigation) in combination with a high protein content (17-19%), high enough (3-4 t / ha) and sustainable level of seed production.

Varieties must also have a high winter hardiness and drought resistance, longevity of use, intensive mowing aftergrowth, resistance to major diseases and pests.

In Northern Kazakhstan special distribution received a variety of local breeding Kokshe. In addition to this variety is also cultivated: Karabalyk 18, Karaganda 1, Flora, Omsk 8893, Shortandy 2 Semirechinskaya spot and others.

However, due to the weak winter hardiness and drought resistance, pest susceptibility and these sorts of diseases did not receive a large distribution. Therefore, the new intensive varieties need to consistently high seed productivity.

Yellow and white clover is cultivated along with alfalfa in breeding farms of the northern region of Kazakhstan.

The uniqueness and universality of economic use of melilot culture caused extremely valuable and favorable combination for agriculture and plant complex properties of biological and economic signs. It is irreplaceable, high-protein forage crop, rich in protein, carotene, essential amino acids and minerals that can solve the problem of shortage of vegetable protein in the mound-plain zone of Northern Kazakhstan with complexes of salt earth.

Melilot is valuable as a good bean forecrop of white straw crops, green manure, effective and intensive crop for cultivation in fodder crop rotations, the best honey plant. The introduction of melilot in production is constrained by the lack of varieties adapted to the soil and climatic conditions of the region and its cultivation for various household uses.

In Northern Kazakhstan is mainly cultivated variety of yellow sweet melilot Alshevsky (Bashkiria, 1958), white melilot Sretensky (OS Chitinskaya, 1969), which in many respects does not meet the needs of agricultural production.

In the North-Kazakhstan Agricultural Research Institute established high-yield varieties of perennial legume forage grasses, with high productivity crop and improved quality, resistant to adverse weather conditions, especially winter hardiness, drought tolerance, resistance to diseases and pests - suitable for multifaceted use in different regions of the country. Among them alfalfa and changeable Hanshaim Chaglinskaya 14, yellow sweet melilot Kokshetau 10 and Kokshetau 14.

The results of environmental and industrial variety trials of promising varieties of perennial forage legumes alfalfa and yellow melilot Hanshaim Kokshetau 14.

Grades were ecologically tested in the Siberian Research Institute of Agriculture (Omsk, Russia) and manufacturing variety trials in the farms of Akmola region in 2013-2015.

According to tests the new varieties have confirmed their high efficiency compared to the released varieties, alfalfa – Flora 6, Kokshe (Table 1, 2) and yellow melilot Siberian 2, Alshevsky (Table 3, 4).

Table 1

The results of environmental testing of new varieties Hanshaim alfalfa (SibSRIA, Omsk - Russian Federation, south-steppe of Western Siberia, 2013-2015)

Sign	Flora 6	Hanshaim	Aberration	
			±	%
Yield of green mass, kg / ha				
1 mowing	178	208	+30	16,8
2 mowing	101	120	+19	18,8
Sum	279	328	+49	17,5
HCP ₀₅			31	
The yield of hay, q / ha				
1 mowing	43	50	+7	16,2
2 mowing	31	36	+5	16,1
Sum	74	86	+12	16,1

HCP ₀₅			9	
Yield seeds, centners / ha				
	1,5	2,1	0,6	40,0
HCP ₀₅			0,2	
Plant height, cm				
1 mowing	78	85	87	
2 mowing	61	64	+3	
Leafy, %				
1 mowing	47	49	+2	
2 mowing	54	55	+1	
Winter hardiness, score				
	4	4	0	
Drought resistance, points				
	4	4	0	
Disease resistance, points				
	3	3	0	
The vegetation period, days				
1 mowing	62	65	-3	
2 mowing	53	55	-2	
On seeds	106	109	-3	
Protein content, % on absolutely dry substance	16,9	16,7	-0,2	

At the same time showed a high productivity of green matter yield, an increase made 49 kg / ha, or 17.5% at the level of the standard 279 kg / ha. Exceeding above the standard on the yield of air-dry substance made 16%. Seed production was at the level of 2.1 t / ha, exceeding 40%.

The results of the production strain testing in animal husbandry JSC "Kolos 2014" Zerenda district of Akmola region have shown the advantage of a promising new varieties, especially on seed yield (Table 2).

Table 2

Results of the test alfalfa varieties' production (Crop of 2014, accounting 2016)

Grade	Area, ha	Productivity, kg / ha
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		Green mass	Seed
Kokshe (standard)	2,0	77	0,51
Hanshaim (new variety)	2,0	89	0,98

Increase on the green mass of the new variety yields was 12 kg / ha (in excess of 11.6%), for seed 0.47 t / ha or exceeding the standard of almost 2-fold.

Table 3

The results of environmental melilot tests varieties (SibSRIA, 2013-2015)

Sign	Siberian 2 (standard)	Kokshetau 14	Aberration	
			±	%
Yield of green mass, kg / ha				
I mowing	155	174	+19	12,3
II mowing	74	81	+7	9,4
Sum	229	255	+26	11,3
HCP ₀₅			24	
The yield of hay, q / ha				
I mowing	34	38	+4	11,8
II mowing	17	19	+2	11,7
Sum	51	57	+6	11,7
HCP ₀₅			5	
Productivity, kg / ha	2,7	3,1	+0,4	14,8
HCP ₀₅			0,3	
Plant height, cm				
I mowing	95	98	+3	
II mowing	64	66	+2	
On seeds	103	107	+4	
Leafy, %				
I mowing	44	45	+1	
II mowing	52	54	+2	
Winter hardiness, score	4	5	+1	
Drought resistance, points	4	5	+1	
Disease resistance, points	4	4	0	
The vegetation period, days				
I mowing	47	48	-1	

II mowing	34	36	-2	
Seed	86	87	-1	
Protein content,% on absolutely dry substance	14,1	14,3	+0,2	

The new variety has shown the high productivity of crop yields in excess of the standard for green mass - by 11.3% and hay - by 11.7%.

It had a higher seed production (in excess of the standard 14.8%), winter hardiness and drought resistance. Other parameters of agronomic characters were up to the standard.

The results of the production strain testing in animal husbandry JSC "Kolos 2014" Zerenda district of Akmola region have shown the advantage of a promising new varieties (Table 4).

Table 4

The results of industrial tests clover varieties (Crop of 2014, accounting 2015)

Grade	Area, ha	Productivity, kg / ha	
		Green mass	seed
Alsheevsky (standard)	1,5	81	1,1
Kokshetau 14 (a new variety)	1,5	91	1,7

An increase of the new variety yields green mass was 10 kg / ha (in excess of 12.3%) and seeds growth 0.6 kg / ha (in excess of 54.5%).

Conclusions.

New promising varieties of perennial forage legumes (alfalfa changeable Hanshaim and Chaglinskaya 14, yellow melilot Kokshetau 10 and Kokshetau 14) differ from the recognized varieties of (15-20%) by high productivity, winter hardiness, drought tolerance, resistance to pests and diseases, as well as high nutritional products obtained. In addition, these varieties are derived relatively by the new ways of selection, such as the method of polycross with the creation of complex hybrid synthetic population with high heterosis effect.

Grades were ecologically tested in the Siberian Agricultural Research Institute (Omsk, Russia) in the border area with Northern Kazakhstan in the southern forest-steppe of Western Siberia and the production strain testing in cattle farms of Northern Kazakhstan. According to the new varieties variety trials have confirmed their high productivity compared to the recognized varieties. The benefits of promising new varieties for a number of economically valuable traits were shown.

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