



The Creation Of Long-Term Pastures In The Conditions Of The Foothill Semi-Desert Used Perspective Desert Fodder Plants

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Abstract: The modern condition of the desert and semi-desert pastures of Uzbekistan is characterized by a progressive deterioration in the productivity and quality of feed. By now, over 260 species of fodder plants from the natural flora have been tested and more than 30 promising shrubs distinguished by their productivity and high adaptability to extreme desert conditions have been isolated. In this case, a comparative ecological and biological study of the most important species of forage shrubs is of particular relevance, making it possible to select the most promising species, varieties of arid fodder plants for reclamation of pasture in the foothill semi-desert of Uzbekistan. This is urgent task of our scientific work, representing the result of six years of research on the comparative study and assessment of various types of shrubs in the foothill semi-desert of Uzbekistan.

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Key words. *Pasture, semi-desert deterioration, fodder plants, promising types, c* vegetation, afforestation, deep-skeletal deposits.

Introduction

The aim of our research was the selection and study of ecological, biological and economically valuable features of the most promising types of forage shrubs suitable for creating seeded forage lands and hayfields in the foothill semi-desert of Uzbekistan. The research objectives included a comparative study of their growth and development, feed and seed productivity, water regime, chemical composition and energy value of the feed mass. The scientific novelty and the practical and practical value of the work consist in the fact that for the first time in the conditions of the piedmont semi-desert of Uzbekistan, a comparative comprehensive assessment is given on the ecological and biological features and economically valuable characteristics of various types of fodder semi-shrubs belonging to the family haze and astral halothamnus; camphorosmeae, cochia, hodgepodge, eurotia, wormwood.

The practical significance of the work lies in the fact that on the basis of ecological and biological studies of various types of subshrubs, promising species for use in phytomelioration of pastures of the foothill semi-desert of Uzbekistan are identified.

Natural conditions of the place of research

The experimental work was performed at the Nurata experimental field at UzSRIF for 6 years. The experimental field is located in the piedmont semi-desert zone at the southwestern foot of the central part of the Nurata ridge at an altitude of 660 - 670 m above sea level. The climate is characterized by sharp fluctuations in daily and annual temperatures, strong insulation, insignificant cloud cover, a small amount of atmospheric precipitation with their uneven falling out (Zakirov 1971). The greatest amount of precipitation occurs in winter springtime. The average annual rainfall over the average long-term period is 206 mm, the average long-term of air temperature is 13.4⁰ C, the absolute maximum air temperature is 43.1⁰ C, the absolute minimum is minus 29⁰ C and the average annual relative humidity of air is 55.4%. The winds are mostly northern; the wind speed increases in the afternoon.

The soil-forming breeds are fine-grained and deep-skeletal deposits, characterized by high afforestation. The plot is dominated by light gray soils with wormwood and ephemeral associations. The humus content in them is I-I, 5%, nitrogen 0.05-0.09%.

The horizon of the largest accumulation of carbonates (in terms of lime, up to 20%) is at a depth of 20-30 to 60-80 cm. The below is the gypsum horizon.

In the foothill semi-desert of Nurata, the ephemeral type of pasture is widespread. The basis of the vegetation cover is *Carex pachystylis* J. Gay, *Poa bulbosa* L., *Artenisia diffusa* Krasch ex Poljak, *Alhagi pseudalhagi* (Bleb.) Fisch., *Peganum harmala* L., as well as annual ephemerals.

Methods of Research

The object of the research was six arid cultures - halothamnus, camphorosmeae, hodgepodge, cochia, eurotia and wormwood.

Experimental crops were carried out in the autumn - winter season on pre-cultivated soils: autumn plowing to a depth of 22-25 cm. harrowing in two tracks with pardon.

The accounting areas of the plots are 30 m², the repetition of the experiments is 4-fold. The sowing method is wide-row with 60 cm row spacing. The seeding rate for cochia is 3 kg / ha, oriental hodgepodge (keireuk) and eurotia-5 kg / ha, halothamnus (chogona) and larch hodgepodge - 6 kg / ha, full -0.5 kg / ha of 100% economic viability of the seed. Phenological observations were carried out according to the method of I. N. Beydeman (1960): plant survival in the spring (May) and autumn (October), as well as by year in comparison with the number of emergence in the first year of vegetation; dynamics of plant growth by monthly measuring the height of plants in populations (per 100 plants).

The yield of fodder mass and seeds was determined according to the guidelines of the feed crop department VIR (1979) and the All-Russian Research Institute of Feed (1978).

The intensity of transpiration was determined by the rapid weighing method (Ivanov. Silina, Tselniker, 1950); daily water deficit - by taking into account weight gain - leaves when artificially saturated with water, water content in plants - by drying in a drying cabinet at a temperature of 105⁰ C to constant weight, concentration of cell juice by the refractometric method and the sucking power of cells according to N.A. Gusev (1960). Studying the growth and formation of root systems using the trench method (Taranovskaya, 1957; Shalit, 1960). The content of protein, fiber, fat, ash and carotene was determined by P.T. Lebedev, A.T. Usovich (1965); vitamin C according to the method of PWM (Shimanov and others. 1976) sugars and amino acids according to A.E. Baru, I.A. Miroshnichenko (1964), the content of exchange energy according to N.G. Grigoreva and others. (1984) in the laboratory of biochemistry of UzSRIF. Statistical processing of the results of field and laboratory experiments was carried out according

to B.A. Dospekhov (1979) by using a computer of the "Agat" class.

Ecological, biological and economic assessment of desert fodder plants. Phenology

During winter sowing, seeds of desert fodder plants germinate in early spring during the snowmelt. The first emerges (2-3 decades of February) camphorosmeae, eurotia and wormwood; after 20 days (1 decade of March) - cochia, halothamnus and hodgepodge. In subsequent years, camphorosmeae, eurotia, wormwood also grow first (2 decade of February); cochia, halothamnus and hodgepodge is in the second turn (1-2 decades of March). The "beginning of flowering" phase takes place in the following sequence: cochia (1st decade of May) halothamnus, camphorosmeae and hodgepodge (3rd decade of May) - eurotia and wormwood (1st decade of June). Seeds of haze crops ripen in the 3rd decade of October, in the sequence - eurotia - cochia - hodgepodge - halothamnus - camphorosmeae, and aster crops (wormwood) ripen only in the first decade of November and later. By the length of the growing season, the cultures are distributed as follows: hodgepodge (235 days) - eurotia (240) - cochia (243-255) - halothamnus (250) - camphorosmeae (255-265) - wormwood (255-265 days).

Specific survival. At the 6th year of life, the survival cultures were distributed according to the following order: cochia (80.1- 85.3%) - Eastern hodgepodge (75.3-78.2%) eurotia (72-73%) - wormwood (40-60%) - halothamnus (45.3% - camphorosmeae (36.4%) - larch hodgepodge (17.7%).

Root system

Numerous researchers have studied the root systems of particular arid fodder plants (in various areas) (Shalyt, 1950; Shamsutdinov, 1962). In the culture of the foothill semi-desert of Nurata, the root systems of arid fodder plants penetrate to different depths of the halothamnus by 450 cm at the 5th year of life, oriental hodgepodge - 325 cm, cochia - 275 cm, wormwood -250-300 cm, eurotia - 250 cm, larch hodgepodge - 210 cm. The horizontal distribution of roots across crops is in the range of 150 to 200 cm in diameter.

Plant height. On average, over 6 years of study, the varieties of cochia, halothamnus and wormwood had the highest height (77-89 cm) (Table 1). Eastern hodgepodge already in the first year of life reached an average 6-year level in terms of this attribute in height. The remaining species in the first year of life were 24 cm (wormwood), 21 cm (eurotia), 14 cm (halothamnus) and 5-15 cm (cochia) below the average 6-year level.

Feed and seed productivity

On average, for 6 years of study, the yield of desert fodder plants was 3.9 -23.5 c / ha of dry fodder

mass (Table 2). Cochia have the highest yields (11.2–23.5 c / ha), hodgepodge (18.9–20.3 c/ ha) and halothamnus (16.4 c / ha).

The intensity of the water regime of desert fodder plants

The elements of the water regime of 6 crops were studied, according to a unified method from May to September 2015 and crops in the conditions of the semi-desert of Nurata. The greatest differences between the samples were noted in the hottest summer months of the growing season (tab. 2). Previously, water regime was studied mainly in individual cultures (Shamsutdinov, 1975; Rakhimov, Khasanov, 1980 and others). Among the studied samples, eurotia (1007 mg

/ g / h), larch hodgepodge (1047 mg / g / h), oriental hodgepodge (1115 mg / g / h), halothamnus (1130-1231 mg) have the lowest transpiration rates in the month of July. / g / h). The highest transpiration rate (1408-1418 mg / g / h) was observed in cochia and camphorosmeae; halothamnus (75.0-78.9%), camphorosmeae (52.8%) have the highest water content in the leaves, also in the month of July, cochia (41.7%) has the lowest. The lowest water deficit in the samples at the same time amounted to 8.1% for larch hodgepodge, the highest (30.2%) for wormwood (24.7%) and the highest for cochia (43.7%). The highest osmotic pressure of cell juice of cochia (36.1 atm.) and the lowest in larch hodgepodge (17.1 atm).

Table 1. Indicators of plant height (cm) of desert fodder plants in the suburban semi-desert of Uzbekistan

№	Kind	(2010) year	(2011) year	(2012) year	(2015) year	An average in 6 years
1	Cochia	74,1+1,1	68,3+3,5	91,2+3,8	95,1+2,3	88,7
2	Halothamnus	63,4+0,8	80,5+3,2	67,7+1,8	88,3+1,7	77,3
3	Sagebrush	53,5+0,9	89,6+2,9	75,4+1,1	68,1+0,7	77,0
4	Eurotia	44,6+0,9	68,9+6,1	54,7+3,6	70,1+0,9	65,6
5	Camphorosmeae	46,5+1,2	47,8+2,1	48,3+1,3	58,1+2,1	53,6
6	Larch hodgepodge	30,2+0,7	50,5+4,1	34,9+0,7	40,7+0,7	39,5

Source: Nurata experimental field UzSRIF, 2015 June

Table 2. Harvest of dry fodder mass (c/ ha) of Desert fodder plants in the conditions of the suburban semi-desert of Uzbekistan

№	Kind	2010 year	2011 year	2012 year	2013 year	2014 year	2015 year	An average in 6 years
1	Cochia	4,8	18,3	30,5	29,1	30,1	28,1	23,5+3,8
2	Eastern hodgepodge	8,4	11,8	25,5	28,0	28,2	20,1	20,3+3,1
3	Halothamnus	7,2	13,7	17,0	17,3	22,1	21,0	16,4+2,0
4	Sagebrush	9,3	10,6	11,4	10,1	8,3	10,1	9,9+0,4
5	Eurotia	2,9	9,7	10,1	10,9	14,3	11,0	9,8+1,4
6	Camphorosmeae	0,8	10,8	9,4	10,1	8,1	12,6	8,6+1,5
7	Larch hodgepodge	1,8	3,3	4,6	4,1	4,5	5,1	3,9+0,4

Source: Nurata experimental field UzSRIF

Table 3. Intensity of the water regime of desert fodder plants in the conditions of the culture of the suburban semi-desert of Uzbekistan

№	Kind	The transpiration rate, mg /g/h	Water content, %	Water deficit, %	The concentration of cell juice, %	Osmotic pressure, atm
1	Halothamnus	1231	76,9	9,5	27,3	26,3
2	Camphorosmeae	1411	52,8	15,5	35,8	23,9
3	Cochia	1408	41,7	12,4	39,3	31,2
4	Eastern hodgepodge	1115	63,8	11,0	24,3	23,1
5	Larch hodgepodge	1047	50,0	8,2	33,5	17,1
6	Eurotia	1007	50,2	27,2	27,3	21,3
7	Sagebrush	1142	49,9	20,7	34,1	27,8

Source: Nurata experimental field UzSRIF, July 2015

Biochemical and bio-energetic characteristics of desert fodder plants.

Evaluation of samples of 6 cultures was carried out on raw samples collected during the period of mowing ripeness in June 2015. The content of protein, sugar, fat, ash, fiber, BEV, carotene, gross and metabolic energy, feed units and digestible protein in absolutely dry substance was determined (Table 4.). According to the high content of protein (17-20.1%), sugar (4.30-6.96%) and fat (3.49-5.21%), wormwood were allocated; low fiber content (22.1-23%) - oriental hodgepodge, cochia; high carotene content (7-7.3 mg per 100 g of absolutely dry substance) - halothamnus, eurotia, eastern hodgepodge; according to the high amino acid index (60.3-70.7%) - eastern hodgepodge, wormwood, eurotia, halothamnus with a high content of metabolic energy (8.3-8.9 MJ per 1 kg of absolutely dry weight) of cochia and wormwood with a high content of feed units (0.54-0.55 c.u. in 1 kg of absolutely dry weight) cochia, oriental hodgepodge, wormwood. A population-based bush analysis of the protein content in the leaves of desert fodder plants during the vegetation phase (2015) showed that plants with the highest protein content are found in amounts from 6% (eurotia) to 10.8% (cochia).

Conclusions

1. A 6-year comparative comprehensive study of the species (2011-2016) of the six most promising desert fodder plants from the haze and aster family belonging to the shrub and semi-shrub life forms was carried out under the conditions of the foothill semi-desert of Nurata of Uzbekistan,.

2. According to the length of the growing season, the cultures are distributed in the following orders: hodgepodge (235-days) –eurotia (240) — cochia (243–255) – halothamnus (250) – camphorosmeae (255–265) –wormwood (255–265 days).

3. Under the culture conditions, in the fifth year of life, the root systems of the studied species penetrate to different depths: halothamnus 450 cm, oriental hodgepodge - 325 cm, cochia -325, wormwood 250-300cm, eurotia-250, larch hodgepodge -210cm.

4. Cochia (80.1-85.3%) and eurotia (72-73%) have a high plant survival in the sixth year of life: wormwood (40-60%), halothamnus (45.3%) and camphorosmeae (36.4%) have an average survival: larch hodgepodge has a low survival (17.7%).

5. On average, for 6 years of study, the yield of desert fodder plants was 3.9-23.5 c / ha of dry fodder mass. The highest harvest is exerted by cochia prostrate (11.2-23.5 c / ha), oriental hodgepodge (18.9-20.3 c / ha) and halothamnus (16.4 c / ha). The yield of seeds per crop for an average of 6 years of study was

0.7-5.8 c / ha. The highest seed yields of eastern hodgepodge are (5.3–5.8 c/ ha), cochia (3.7–3.9 c / ha) and halothamnus (2.7–2.9 c / ha).

6. The lowest transpiration intensity in the month of July was observed for eurotia (1007 mg / g / h, larch hodgepodge (1047), oriental hodgepodge (1115), halothamnus (1130-1231). Halothamnus (75-76) had the highest water content in the leaves (75-76,9%), eastern hodgepodge (60.4-63.8%), eurotia (50.2%), camphorosmeae (52.8%). The lowest water deficit is in the larch hodgepodge (8.2%) and in halothamnus (9.5-9.9%). Cochia has the highest concentration of cell juice (39.3%). The highest osmotic pressure is also in varieties of cochia (30.0-31.2 atm).

7. They are characterized by a high content (in absolutely dry substance) of protein (17-20.1%), sugar (4.30-6.96%) and fat (3.49-5.21%) of wormwood with a low fiber content (22.1-23%) - oriental hodgepodge, cochia; high carotene content (7-7.3% mg per 100g abs. dry subs.) - halothamnus, eurotia, Eastern hodgepodge; high amino acid index (60.3-70.7%) - wormwood of oriental hodgepodge, eurotia, halothamnus with a high content of exchange energy (9.3-10.4 MJ) of cochia, oriental hodgepodge and wormwood; high content of fodder units (0.54-0.65 c.u. in 1 kg of abs. dry subs.) cochia, oriental hodgepodge, wormwood.

8. According to a set of economically valuable traits, the most promising for creating highly productive pasture agrophytocenoses of autumn-winter use in the conditions of the piedmont semi-desert of Uzbekistan are from half-shrubs-halothamnus and eurotia and half-shrubs of cochia, eastern hodgepodge and wormwood.

9. For use in the conditions of the piedmont semi-desert of Uzbekistan, species of desert fodder plants are recommended which are distinguished by the highest productivity of cochia, oriental hodgepodge; halothamnus with a high degree of survival (they are also eurotia), high drought tolerance (they are), high in protein, sugar, and fat (wormwood).

10. For the first time, a comprehensive comparative study of the main set of species of desert fodder plants will allow for the scientific selection of components for pasture agrophytocenoses.

References

1. Baru A.E., Miroshnichenko I.A. The methodology for determining the amino acid composition of feed by chromatography on paper. // Thes. doc. Conf.: New in methods of zoo technical research. - Kharkov. - 1964. - p. 10-23.
2. Beydeman I.N. The study of plant phenology // Field geobotany. M.; L., 1970.V.2. - P. 333-336.

3. Grigoriev N. G., Volkov N. N., Vorobiev E. S., Melchenko A. Methodological recommendation for determining the energetically nutritional value of animal feed. - M., 1984. P.42.
4. Dospekhov B.A. Methodology of field experience. -M.: Kolos, 1979. -416 p.
5. Zakirov P.K. Botanical geography of the lowlands of Kizylkum and the Nurata ridge. - Tashkent: FAN. 1971. -201 p.
6. Lebedev P.T., Usovich A.T. Research methods of feed, organs and tissues. - M.: Rus Agr Pub House, 1965.- 711 p.
7. Rakhimova T., Khasanov O.Kh. Water regime of some species of the genus.
8. Artemisia L. // Problems of desertification. - 1980. - No. 6. - p. 55-59.
9. Saidov D.K. Some results of experimental researches of the vegetation of deserts and epilepsies of Uzbekistan. // Uzbek. biol. journal - 1979. No. 3. -p. 46-50.
10. Toranovskaya M.G. Methods of studying root systems. - M.: Agriculgiz, 1957. - 2016 p.
11. Shamsutdinov Z.Sh. Creation of long-term pastures in the arid zone of Central Asia. - Tashkent: FAN, 1975, - 175 p.
12. Shamsutdinov Z.Sh. Introduction to the culture of desert fodder plants. - Tashkent: Labour, 1987, - 180 p.
13. Shimanov V.G., Ibadov N.A., Makarov N.V. The method for determining the content of vitamin C in biological objects. - author test. No. 549742. - M., 1976. - 2 p.

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