



THE WAYS OF PREVENTING DEGRADATION OF SANDY DESERT SOILS

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ABSTRACT

*This article presents the results of research conducted in sandy desert soil conditions of Forish district of Jizzakh region. During the research in the variant of tilling + pulverizing before seeding the highest indications were observed on the impact of soil tillage before sowing on the growth and development of plants in preventing degradation of sandy arid soils, the growth of plant increased higher than the variant of chiselling + pulverizing by 2.3 cm, and 15.4 cm higher than harrowing and pulverizing variant. It was determined that tilling + pulverizing agrotechnical measure was effective before sowing desert feed crops, such as "Otavniy" variety of *Kochia prostrata* which grew 4 cm higher than "Jaykhun" variety of *Halothamnus subaphyllus*, and also it was observed that "Tulkin" variety of *Eurotia ceratoides* grew up to 22 cm.*

KEYWORDS: *sandy desert soils, degradation, pasture, feed crops, soil fertility.*

INTRODUCTION

Today in the world the scientific researches are conducted on prior problems of feed crops cultivation and improving ecological condition of pastures with degraded and low fertile sandy desert soils. Particularly, a greater attention is paid to determination of the changes that may occur in pastures with sandy desert soils under the degradation process, elimination of negative influence of degradation on the soils by studying phytoindicators of pasture degradation, implementation of degradation preventive technologies in pastures by sowing perspective varieties of desert feed crops considering the attributes of sandy desert soils. In order to develop agriculture of the republic it is expedient to study the main attributes and microbiological feature of sandy desert soils of pastures and to prevent pasture degradation by sowing perspective varieties of desert feed crops suitable for soil-climatic condition of the region in degraded areas and to improve pastures productivity as well.

The main reasons of low productivity of pastures are regarded as following: firstly, the climatic changes; secondly, due to increasing quantity of livestock of local people the irregularity in pasture use; thirdly, poor livestock management; fourth, extinction of feed crop varieties in pastures and their substitution with other invaluable crops for farms; fifth, improper and insufficient attention to irrigation, meliorative measures and using mineral fertilizers, organizing seed-breeding.

All these are factors that cause to degradation of pastures and they are seemed to hinder from rapid development of the sphere.

Pastures conservation and increasing yield productivity are prior tasks of today and considering their condition which is of great significance in providing rural life sustainability, the implementation of all essential factors in these cases may serve to further increase in economic power of the country and lifestyle of population as well. One of another important task which is to be solved carefully is the use of advanced technologies and effective methods in order to utilize pasture resources effectively, to improve their meliorative condition and to eliminate ecological problems.

Prevention of sandy arid soils and improving production of desert feed crops for livestock depend on cultivation and breeding of high yield feed crops in pastures. In the implementation of these measures natural soil-climatic condition of pastures and particular traits of feed crops of steppe are to be considered in order to perform agrotechnical measures in time and with quality. According to proper sowing time, seed using norms, ecological-biological farm valuable, clean and germinability traits of desert feed crops a suitable area selection, soil tillage and espacement of feed crops and seed distribution norms are noted in performance of agrotechnical measures for the prevention of sandy arid soil degradation, improving natural pastures, providing

seed germination of desert feed crops in sandy arid soils, achieving the development and high nutrients in them [8].

For increasing productivity of pastures the technology for creation of windbreaks and pasture agrophytocenosis that can conserve the nature, have been studied [1], and also noted the importance of increasing and maintaining fertility of degraded soils, improving their meliorative condition and enriching flora of pastures by scientific and practical point of view [2].

Physical-mechanical, water-physical and agro-physical traits of soils of deserts and irrigated areas of Uzbekistan have been investigated [3, 4, 5, 6, 7, 9]. However, there isn't enough information about the traits of sandy desert soils of deserts and their degradation prevention. Therefore, it is expedient to obtain high and qualitative yield in pastures, to maintain and regulate soil fertility, its conservation and to improve ecological condition of environment.

MATERIALS AND METHODS

The researches were conducted in 3 methods in Forish district of Jizzakh region: routine-expedition, static-key plots, cameral-laboratory. Field experiments were carried out according to methodological manual «Methodological manual on field experiments» and «Introduction to the culture of desert feed crops» manual worked out in research institute of Korakul farming and desert ecology, statistical analysis of obtained results were done by method of B.A.Dospekhov «Methods of field experiment».

RESULTS AND DISCUSSION

It is important to select favourable area for sowing various desert feed crops, firstly the areas with early degradation and under degradation are selected, the areas with thin plants cover are available for sowing which require timely and qualitative processing. The factors that define the drought of desert regions climate - high weather temperature, air dryness, less amount of precipitation, fast drying topsoil, rapid change of climate in spring, will require proper selection of seed sowing period. The intended amount of grass can be grown from the seeds sown in proper period. The most favourable period for sowing desert feed crops is the months December-January.

During 2012-2014, various agrotechnical measures were applied in degraded and the thinnest plants cover areas and was conducted investigation on growth and development of desert feed crops in these areas. In its

turn the lawn (coach grass) prevents the absorption of rainfall moisture in deep layers of soil, therefore it is expedient to till the land up to 22-25 cm depth, to pulverize and harrow tilled lands in order to eliminate lawn. In our researches before sowing the seeds of desert feed crops the measures such as land tilling + pulverizing then seeding, pre-sowing chiselling + pulverizing then seeding and pre-sowing harrowing + pulverizing then seeding were carried out in 3 variants, 3 repetitions, in 25 m² area, and studied the parameters of growth and development of various desert feed crops.

Selected area was cut off with lines and seedbeds before sowing desert feed crops. If plant cover of selected area is too thin with less plant species, the seedbeds were prepared with 24 m width in each 12 m. In our researches conducted in 2012 "Otavniy" variety of desert feed crop *kochia prostrata* was sown in 3-5 kgs/ha sowing norm, "Jaykhun" variety of *Halothamnus subaphyllus* in 12-14 kgs/ha, "Tulkin" variety of *Eurotia ceratoides* in 5-7 kgs/ha sowing norm by seeders in December.

In 2012-2014, phenological observations were conducted on growth and development of desert feed crops, according to the results of this observation the plant height made 47,5 cm in 15.09.2012 in the variant of "Otavniy" *Kochia prostrata* variety in which the land was tilled+pulverized before sowing, in 14.09.2013 this indication was 51.4 cm, in 16.09.2014 -56.1 cm, when the land was chiselled + pulverized before sowing the plant height was 44.6 cm in 15.09.2012, in 14.09.2013 - 48.4 cm, in 16.09.2014 it was 51.3 cm, while in the variant where the land was harrowed + pulverized before sowing this indication was 30.7 cm in 15.09.2012, in 14.09.2013 – 34.4 cm, in 16.09.2014 - 36.2 cm relatively.

In the variant of "Jaykhun" variety of *Halothamnus subaphyllus* where tilling + pulverizing was used before sowing, the height of plant made 45.5 cm in 15.09.2012, and in 14.09.2013 was 49.1 cm, in 16.09.2014 it constituted 52.1 cm, when the land was chiselled + pulverized before sowing the plant height was 45.8 cm in 15.09.2012, in 14.09.2013 – 47.7 cm, in 16.09.2014 it was 47.4 cm, and in the variant of harrowing + pulverizing before sowing these indications were relatively 20.6 cm in 15.09.2012, in 14.09.2013 - 23.4 cm, in 16.09.2014 - 27.3 cm.

Table
The influence of various pre-sowing tilling types on the growth and development of desert feed crop

Plant types and varieties	Various pre-sowing soil tilling types	In 2012-2014, plant height, cm					
		18.05.2012	15.09.2012	16.05.2013	14.09.2013	13.05.2014	16.09.2014
"Otavniy" variety of <i>Kochia prostrata</i>	tilling+pulverizing	29.9±1.8	47.5±2.3	31.3±1.7	51.4±3.2	36.4±1.4	56.1±2.2
	chiselling + pulverizing	26.4±2.1	44.6±1.9	27.2±1.8	48.4±2.7	32.1±1.6	51.3±2.4
	harrowing + pulverizing	20.1±1.9	30.7±2.7	22.4±2.3	34.4±3.1	31.3±1.7	36.2±2.1
"Jaykun" variety of <i>Halothamnus subaphyllus</i>	tilling+pulverizing	22.9±1.3	45.5±1.7	25.3±1.7	49.1±2.3	29.3±2.1	52.1±1.3
	chiselling + pulverizing	23.4±2.1	45.8±2.3	24.4±1.8	47.7±1.9	27.2±2.1	47.4±1.3
	harrowing + pulverizing	13.2±2.1	20.6±3.1	16.3±1.9	23.4±2.4	21.4±1.7	27.3±1.3
"Tulkin" variety of <i>Eurotia ceratoides</i>	tilling+pulverizing	22.3±1.9	27.2±1.3	25.3±2.1	29.1±1.6	31.3±2.1	34.1±1.2
	chiselling + pulverizing	21.6±2.1	26.6±1.9	24.5±1.9	28.1±1.2	28.5±1.6	31.1±2.2
	harrowing + pulverizing	11.6±1.8	17.5±1.7	16.2±1.3	18.3±1.2	19.3±1.1	24.3±1.4

Before sowing "Tulkin" variety of *Eurotia ceratoides* in the variant of tilling+pulverizing the plant height made 27.2 cm in 15.09.2012, and in 14.09.2013 it was 29.1 cm, in 16.09.2014 - 34.1 cm, in the pre-sowing variant of chiselling + pulverizing the plant height was 26.6 cm in 15.09.2012, in 14.09.2013 it was 28.1 cm, and in 16.09.2014 it showed 31.1 cm, pre-sowing harrowing + pulverizing variant presented plant height as 17.5 cm in 15.09.2012, in 14.09.2013 -18.3 cm, and in 16.09.2014 it was 24.3 cm (Table).

CONCLUSION

In the prevention of degradation of sandy desert soils the highest indications on the influence of pre-sowing soil tilling measures upon the growth and development of plants were observed in the variant of pre-sowing tilling + pulverizing, the plant height was 2.3 cm higher than the plant sown by chiselling + pulverizing variant, and 15.4 cm higher than the variant of harrowing + pulverizing. It was determined that before sowing desert feed crops seeds the tilling + pulverizing is an effective agrotechnical measure.

And it was observed that desert feed crops grew higher due to these soil tilling measures, "Otavniy" variety of *Kochia prostrata* crop grew 4 cm higher than "Jaykhun" variety of *Halothamnus subaphyllus*, the plant height of "Tulkin" variety of *Eurotia ceratoides* reached to 22 cm.

REFERENCES

1. Bobokulov N.A., Rabbimov A., Toshmurodov A. 2013. *The problems on effective use of desert pastures and increasing productivity. Devoted to 95 anniversary of National university after Mirzo Ulugbek. Institutional problems of rational use of pastures and their conservation. Materials from scientific-practical republican conference. Tashkent, p. 40-44.*

2. Gafurova L.A., Jalilova G.T., Kadirova D.A., Shakarov I. 2012. *Present condition of hay deserts and arid pastures and some aspects for maintaining and increasing their productivity. Effective use of land resources, the ways of maintaining and increasing soil fertility. The collection of articles from republican scientific-practical conference. Tashkent, p.33-36*
3. Kimberg N.V. 1974. *Soil of desert zones of Uzbekistan, Tashkent, p. 48*
4. Makhmudov M.M. 2010. *Improving Кызылкум pasture. Samarkand, p. 236-237*
5. Mukalyans V.M., Tursunov Kh.Kh., Mukalyans M.M. 1976. *Mineralogical content of colloide-silty accretion channel of hollow steppe of Khorezm oasis Tr. TashShI, Tashkent ed.53*
6. Osmonov R.O. 1977. *Selection of feed crops for the lands of South-West Kizilkum. Karakul farming, ed. 3, Tashkent, p. 15-16*
7. Saidova M.Kh. 2007. *Hydrogeological regionalization of Kizilkum pasture. Scientific and practical basis for increasing soil fertility. Collection of articles on the basis of international scientific-practical conference lectures. Tashkent, p.389-390.*
8. Shamsutdinov Z.Sh., Ibragimov I.O., Makhmudov M.M. 1980. *Achievements and problems on phytomelioration of pastures in arid regions. Karakul farming in XI, Tashkent, -p.135-144.*
9. Fedorovich B.A. 1950. *The origin and evolution of sandy soils of Asian deserts. Materials on quaternary period. ed. 2, Moscow, p 151-152.*