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OF THE VII INTERNATIONAL
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шие через пищеварительный тракт червей), корневищ (отгнивших крупных корней растений), дендритов(узоры мелких корешков)[2,3].

Включения

На всех трех участках были обнаружены тела органического и минерального происхождения: корни и другие части растений; обломки горны пород; кусочки кирпича, угля, стекла[2,3].

Влажность почв

Влажность почв определялась по шкале Саваренского.

Почва первого участка – влажноватая, второго – влажная, третьего – сырая.

Заключение. Данный тип почв является традиционным для всей Ярославской области как и большей части Нечерноземной зоны России.

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FEATURES OF THE VEGETATION COVER OF PASTURES DESERT STEPPES

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Abstract

The spatial and structural organization of a vegetation cover on the example of the key land representing landscapes of desert steppes of the South of Kazakhstan is studied. 5 groups of pastures are allocated, their short descriptions, phytocenotic and ecological characteristics are given. As a result of method use of landscape profiling and model of a hill the spatial structure of a vegetation cover is defined. The factors defining a phytocenotic variety of vegetation of the area of research were revealed

Key words: RK, structure, vegetation, soil, fodder land

Introduction

Study of a pasturable digression of dry steppes of the South of Kazakhstan can be considered now especially relevant because of intensive anthropogenous processes of destruction of natural landscapes resulting in extremely various forms of degradation of natural ecosystems and bioresources, first of all deterioration of a condition of pastures, decrease in their fodder potential, reduction of a biodiversity of vegetation communities, loss of soil fertility and the amplifying wind and water soil erosion and others.

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The purpose of our geobotanical researches consists in periodic control of a condition of vegetation and soils, the analysis and an assessment of their fertility, and also studying of floristic structure and dynamics of productivity of fodder lands that will allow to carry out actions for the prevention of negative impact of economic activity on the environment. The obtained data are initial (basic) information for conducting further monitoring.

Materials and methods of researches

Researches were conducted in 2011-2015. During the field period the reconnaissance inspection of a key land, of 1000 hectares, was made. The route was laid taking into account crossing of the main types of a landscape. During the reconnaissance inspection data on vegetation, soils, a relief were specified. The main types of fodder lands with determination of productivity were described, the preliminary list of plants is added, the main consistent patterns of heterogeneity of a vegetation cover and their reasons are determined [1,2].

The description of vegetation is made in special forms of geobotanical descriptions. For every allocated type of pastures the vegetation is confinedness to a relief, the soil, moistening is established.

In total about 3200 leaves of herbarium are collected. For the purpose of identification of structure, structure of vegetation communities in the list of plants, all higher plants, with the characteristic for every phenophase, height (average on several measurements), vitality, a projective covering percentage of the size of the general projective covering of community are brought. Lands of inspection belong to the dry hot agroclimatic area of desert steppes. The climate of the area differs in not cold winter, hot and dry summer.

Results and their discussion

The territory of the key land located on pasturable lands of the Abay rural district belongs to a foothill and desert and steppe zone, a subband of gray soils of the light northern. Mechanical structure of soils: sandy, sabulous, barely loamy and middling loamy. The main type of a relief – barely billowy plain, absolute height is 439-446 m. The vegetation cover is presented by the semidesertic (desert and steppe) vegetation which is characterized by a wide circulation of desert semi-suffrutescent and low-shrubby elements of flora, and steppe – firm-bunch grasses [3-5].

The floristic list on materials of field inspection makes 92 species relating to 25 families and 74 classes. The following groups of pastures of the valley of the Kuragata river in the conditions of decrease of the slightly billowy plain were allocated and characterized:

Camel's- spine group of pastures. The occupied area -200 hectares, modification – on 166 hectares. These pastures are widespread in the central and northern parts of the key land. They are presented by Camel's-thorn ephemeral type and modifications: ephemeral-Camel's-thorn, ephemeral-Camel's-thorn-Aeluropus, ephemeral-Aeluropus. They are dated to meadow gray soil light northern slightly alkalized, slightly solonchak and middling solonchak and slightly loamy soils. Mechanical structure of soils – sandy and loamy. They are met in a complex with *Climacoptera crassa* and absinthial ephemeral, saltwort-ephemeral-Camel's-thorn, absinthial ephemeral and other communities.

Dominants in type of Camel's-thorn, in modifications – ephemeral plants: meadow grass bulbous, cheat grass, desert alison, *Carex pachystylis*, *Eremopyrum triticeum*; subdominants in type of above-mentioned ephemeral plants, in modifications Camel's-thorn and Aeluropus. It is singly to meet *Lappula microcarpa*, tulips, *Diarrhiza vesiculosum*, *Ceratocarpus utriculosus* and others.

The projective covering of the soil plants made 65-85%. Height of Camel's-thorn is 25-60 cm, ephemeral plants- 3-20 cm. Structure of vegetation communities - two-story.

It is established that coefficient of shrinkage of green material is about 65-70% and quality of pastures on efficiency is average, below an average and bad at good and average nutritiveness of forage (table 1). Pastures of this group belong to lands of spring summer autumnal use for a pasture of sheep, goats and horses; Camel's- spine ephemeral Aeluropus and Camel's-thorn ephemeral – for a pasture of all types of cattle. The pasture is carried out during the warm period of year.

Table 1

Efficiency assessment of pasture quality

The recommended seasons for pasture	Quality of pastures on efficiency in c/hectare of fodder units				
	Good	Higher than average	medium	Lower than average	bad
Spring-summer-autumn	-	-	4,0-6,9	2,0-3,9	Less than 2,0
Spring					Less than 1,5
Autumn	3,0-4,0	2,0-2,9	1,0-1,9	-	Less than 1,0
Spring-autumn	2 seasons are estimated (spring autumn)				

Artemisia terrae-albae group of pastures. On the area of 141 hectare the group is presented by one type – *Artemisia terrae-albae* ephemeral, sometimes with saltworts and *Aeluropus*. They are met in the central and northern parts of the land (contours 10 and 16). Soils – mead gray soil light northern loamy slightly alkalized. Form a complex contour with Camel's-thorn ephemeral, *Artemisia terrae-albae* Camel's-thorn ephemeral and ephemeral Camel's-thorn communities.

Dominant – *Artemisia terrae-albae*; subdominant – ephemeral plants: *Carex pachystylis*, *Poa bulbosa*, *Descurainia sophia*. In contours saltworts are often met: *Petrosimonia brachiata*, *Climacoptera brachiata* and *Aeluropus pungens*.

Projective covering of the soil plants is 60-65 cm. Height of a wormwood is 25-27 cm, ephemeral plants- 3-20 cm. Structure of vegetation communities - two-story. Coefficient of shrinkage of green material is about 65-70%. Quality of pastures on efficiency is lower than average at good nutritiousness of a forage (table 2).

Taking into account palatability of fodder mass, pastures of this group belong to lands of spring summer autumnal use for a pasture of sheep, goats and horses.

Table 2

Forage of pastures assessment of nutritiousness quality

Recommended seasonality of pasture use	Quality of a forage of pastures and haymakings on nutritiousness (quantity of fodder units in 100 kg of an air dry feed)		
	good	medium	bad
Spring	More than 68	51-68	Less than 51
Spring-summer-autumn	More than 50	40-50	Less than 40
Autumn	More than 40	30-40	Less than 30
Spring-autumn	2 seasons are estimated (spring autumn)		

Note: The assessment of quality of spring and autumn pastures is given separately on spring and autumn

Autumn wormwood group of pastures. Pastures of this group are presented on the area of 99 hectares by *Artemisia* ephemeral type with *Artemisia* ephemeral Camel's-thorn with *Ceratocarpus arenarius* L. modification (6 hectares). They are widespread in eastern and western parts of the key land. They are dated to mead gray soil light northern loamy slightly alkalized soils. They are met in a complex with saltwort ephemeral Camel's-thorn and *Climacoptera* -ephemeral communities.

Dominant – autumn wormwood; in modification community – ephemeral plants: *Carex*

pachystylis, *Poa bulbosa*, *Eremopyrum orientale*, subdominants in type of above-mentioned ephemeral plants, in modification – autumn wormwood. Besides, on these pastures Camel's-thorn and *Ceratocarpus arenarius* are often met.

Projective covering of the soil plants is 65%. Height of a wormwood is 35-40 cm, ephemeral plants is 3-20 cm. Structure of vegetation communities is also two-story. On efficiency in modification quality of pastures - lower than average, in type in the spring - lower than average, in autumn – above the average at good nutritiousness of a forage. Pastures of this group are carried to lands of spring summer autumnal use.

Camphorosma songorica group of pastures. On the area of 37 hectares there is presented a group of ephemeral-Camphorosma with *Aeluropus* modification on mead gray soil light northern slightly alkalized, slightly solonchak and middling solonchak and slightly loamy soils. They are widespread in the central and east parts of the key land. They are met in a complex with *torgayot*-ephemeral and Camel's-thorn ephemeral communities.

Dominant – ephemeral plants: *Carex pachystylis*, *Poa bulbosa*, *Eremopyrum orientale*; subdominant – *Camphorosma monspeliaca*. Sometimes *Aeluropus pungens* is met. Camel's-thorn, *Climacoptera lanata*, autumn wormwood and others can be rarely met.

The projective covering of the soil plants is 55-60%. Height of ephemeral plants is 3-20 cm, *Camphorosma* – 15-20 cm. Structure of vegetation communities the single-tier.

Quality of pastures on efficiency in spring - lower than average, in autumn – average and bad at good and average nutritiousness of a forage. Pastures of this group belong to lands of spring and autumn use for a pasture of sheep, goats and horses.

Torgayot group of pastures occupies the area of 383 hectares, modification - 21 hectares. The group is presented by two types: *torgayot*-ephemeral and saltwort ephemeral Camel's-thorn and modification – *Ceratocarpus arenarius* ephemeral. They are dated to mead gray soil light northern slightly alkalized, slightly solonchak and middling solonchak and slightly loamy soils.

Dominant in types – *Climacoptera brachiata* (*torgayot*). Condominants – *Petrosimonia brachiata* and *Climacoptera lanata*. Subdominants – ephemeral plants: *Carex pachystylis*, *Poa bulbosa*, *Eremopyrum orientale*. Besides, on these pastures Camel's-thorn, a wormwood autumn, *Leptidium perfoliatum*, *Puccinella distans*, *Aeluropus* and others are met.

Projective covering of the soil plants is 70-80%. Structure of herbage - two-story. Height of saltworts and ephemeral plants is 15-25 cm, Camel's-thorn- 35-40 cm.

Quality of pastures on efficiency is average, below average and bad at good and average nutritiousness of a forage.

Taking into account palatability of fodder mass, pastures of this group belong to lands of spring and autumn and spring summer autumnal use for a pasture of sheep, goats and horses.

The pasture is carried out during autumn.

Thus, economic development of the territory has direct impact on development of a soil cover and vegetation. In the past, there were numerous channels dug. The most extended channel passes along northern and eastern borders of the territory. Numerous branches go from there. A large number of channels is dug in the southern part of the land. Earlier along channels, lands were used as the irrigated arable land for cultivation of melon cultures. Now the most part of channels is not used. Earlier, thanks to numerous channels, the level of ground waters was higher, now – decreased, there is a desertification of the territory that found reflection in a soil and vegetation cover. The vegetation content, and sometimes type of soils, quantity of fertilizer elements change.

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ADAPTATION MECHANISMS OF STABILITY OF APPLE TREE TO DROUGHT FOR CREATION OF FRUIT AGROCENOSES

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Abstract

The authors considered the problems of physiological and biochemical mechanisms of apple trees adaptation to drought conditions in the south of Russia. The studied apple trees of different eco-geographical origin were observed to have an activation of different signaling systems, which was confirmed by the change in chlorophyll content (a+b), carotenoids, phenol carbonic, organic, abscisic and indole acetic acids, as well as peroxidase, malonic dialdehyde and calcium cations. It was established that the Idared variety (American selection) is more resistant to drought and less resistant to heat. It can be used in the selection process as a source of drought tolerance trait. Varieties of Prikubansky, Fortuna, Rodnichok and Union domestic breeding and Early Mack American variety have signs of complex of drought resistance and heat resistance and can be used in the selection process as the sources of these complex traits.

Key words: apple tree adaptive resistance, drought, pigments, malonic dialdehyde, indoleacetic acid.

Аннотация

Рассмотрены вопросы физиолого-биохимических механизмов адаптации яблони к засухе в условиях юга России. У изучаемых сортов яблони различного эколого-географического происхождения наблюдалась активация различных сигнальных систем, что подтверждалось изменением содержания хлорофилла (a+b), каротиноидов, фенолкарбоновых, органических, абсцизовой, индолилуксусной кислот, пероксидазы, малоновой диальдегида, катионов кальция. Установлено, что сорт Айдаред (американской селекции) более устойчив к засухе и менее устойчив к жаре, что позволяет использовать его в селекционном процессе, как источник признака засухоустойчивости. Сорта Прикубанское, Фортуна, Родничок, Союз отечественной селекции и американский сорт Эрли Мак обладают комплексом признаков засухоустойчивости и жаростойкости и могут быть использованы в селекционном процессе, как источники комплекса этих признаков.

Ключевые слова: яблоня, адаптационная устойчивость, засуха, пигменты, малоновый диальдегид, индолилуксусная кислота.

Введение

Яблоня является основной промышленной культурой садоводства России, ей принадлежит ведущее место в увеличении производства плодов в садах. В последние годы резко возросло число климатических аномалий, что сказалось на обострении экологической обстановки в отечественном садоводстве. Неблагоприятные погодные условия, приводящие к экстремальным

* Nenko N.I., Kiseleva G.K., Ulyanovskaya E.V., Shestakova V.V., Karavayeva A.V., 2016