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THE VALUE OF GROWING OAK IN RUSSIA

Bogdan Ershov[1], Pavel Fedorov[2]

[1]Doctor of Historical Sciences, Professor, Voronezh State Technical University, 20 years of October street, 84, Voronezh, Russia, E-mail: bogdan.ershov@yandex.ru

[2]Voronezh State Technical University, 20 years of October street, 84, Voronezh, Russia, E-mail: pavelov2013@gmail.com

Abstract

Due to the constant expansion of industrial production, irrational use of forest and agricultural lands, every year the forest area on our planet is decreasing, the area of desertified territories is increasing, the level of carbon dioxide in the atmosphere is increasing. Forests cleanse the air of pollution and restore its optimal composition, produce phytoncides that can destroy pathogenic viruses and bacteria.

A special burden falls on oak forests, which are located in areas with a high population density and intensive human activity. In sparsely wooded regions, man-made protective forest plantations play an extremely important role in agricultural production, which protect fields from strong winds, dust storms and soil erosion. With the participation of oak plantations, a more efficient type of landscape is formed - agroforestry landscape. Therefore, in these regions, the importance of the growth of oak grows even more.

Keywords: oak, land, forest, water, city.

I. INTRODUCTION

The urgency of creating protective afforestation in Russia is undeniable. Long-term forest cultivation experience on ordinary chernozems of the steppe zone indicates the success of oak crops. But the features of growth and stability of this breed, especially in massive plantations in dry steppe conditions, have not been studied enough.

This article will analyze the features of growth, condition and renewal of massive oak plantations growing on various soils of Russia; the relationship between the growth of oak forests and the forest vegetation properties of soils was revealed; the possible durability of oak has been determined; scientifically grounded regulations of forestry management, as well as reproduction of plantations and preservation of their genetic fund have been developed.

II. METHODOLOGY AND RESULTS

The obtained growth models, data on the longevity of oak and the relationship in the "soil-forest" system can serve as programming elements for such plantings. The results of the study can be used in forestry management and in the creation of regulations governing forestry and reforestation activities in oak forests in other areas of the dry steppe zone. They can also be used in the educational process at universities and in refresher courses.

The validity of conclusions and proposals, analysis and generalization of experimental data using modern methods of statistical analysis, extensive analysis of literary sources, a systematic approach to research determine the validity of conclusions and proposals.

An analysis of natural regeneration under the canopy of massive oak forests suggests that there is no reason to expect the predominant role of oak to be preserved due to natural seed regeneration; in the next generation of stands, if active measures are not taken to promote regeneration, the main species will change and the composition of the stands will change.

The forest litter has a thickness of 2 to 5 m; two well-defined subhorizons stand out in it - the upper, weakly decomposed, and the lower, almost 90% mineralized. With the deterioration of the forest suitability of the soil, the litter displaces the living ground cover.

Forest litter is a definite indicator of the conditions of forest growth, and affects the humus content in the upper soil layers. Under the influence of perennial plantations, noticeable changes occurred in the upper layers of the humus horizon. Under better conditions (first and second groups of soils), the humus content in soil layers up to 40 cm deep increased. In the worst conditions (the third group), there was a slight increase in humus in the very surface layer of the soil, and already at a depth of 20-40 cm, the humus content decreased.

Foto 1. The pedunculate oak (Noble mansion)

In 1950-52. of the last century, on the territory of several forestry enterprises in the dry steppe of Russia, massive plantations of pedunculate oak, both pure and mixed, with various accompanying species, mainly lanceolate ash, were created.

In connection with the signs of the beginning of the process of drying out of oak in massive oak forests of various regions of the USSR, which appeared in the mid-1960s, the Ministry of Forestry decided to study in detail the state of oak forests in various forest growing conditions and develop recommendations for further farming in these plantations.

In similar climatic conditions, on a dry steppe upland, with a deep level of groundwater, the absence of a pronounced relief, the main indicator of forest suitability is soil conditions.

In order to differentiate soil conditions, we distinguished three groups of soils - from medium-thick southern chernozems to alkaline chestnut soils.

Under the best growing conditions, on the first group of soils, at the age of 54-55 years, the oak reached an average height of 14 m, with an average annual growth of 25-26 cm, on soils of the second group, respectively 12-13 m, with an average growth of 23-24 cm Oak plantations on alkaline chestnut soils (the third group) are already at the stage of decay at the age of over 40, and the average increase in height is only 16-17 cm.

The analysis of the dynamics of growth in height showed that under the considered forest conditions, the quality of the oak decreases with age. The less favorable the soil conditions, the more pronounced this process. The difference in growth between an oak under the studied conditions and an oak in its natural range of growth increases with the age of the planting.

Foto 2. The common oak

Due to timely silvicultural care in mixed plantations - thinning of ash rows - oak by the end of the second decade of life and subsequently significantly prevails over ash in composition and height. And only in those cases where the thinning of the ash was carried out with a great delay, the ash, on the contrary, overtook the oak, and the latter was under the canopy of ash, yielding to him in participation in the composition.

With timely thinning of the ash, its shoots formed, as it were, a second tier and performed well the function of shading the soil and fitting the oak. In general, lanceolate ash, with proper silvicultural care, is a good companion of oak in the considered forest conditions.

Comparison of the growth and state of mixed and pure oak cultures allows us to conclude that there is no significant difference between oak plantations mixed with ash (with timely care for it) and pure oak plantations, where agrotechnical care was periodically carried out.

An objective indicator of the stability and longevity of plantings is its condition. To characterize the state of oak plantations, a set of factors was used: canopy closeness, crown drying rate, proportion of healthy trees, and growth rate.

The possibility of restoration in the next generation of the leading role of oak due to natural seed renewal was studied. Studies have shown that seed regeneration of oak is completely insufficient and uneven in area. The renewal of ash is incomparably more successful, both in terms of quantity and growth rate. The final data of the assessment of natural regeneration allow predicting the inevitable change of oak, as the main species, in the next generation of the plantation, if a set of measures to promote regeneration is not implemented.

Foto 3. House of oak

The lower the crown density, the lower the litter weight in both clean and mixed stands. The large weight of litter in clean oak forests is explained by more powerful development and weight of crowns.

Under the influence of perennial plantations of oak in better conditions (1 and 2 groups of soils), the humus content in the upper soil layer up to 40 cm deep increased. In the least favorable conditions (group 3 of soils) in the uppermost layer of 0-20 cm, the humus content slightly increased, and deeper, on the contrary, decreased.

III. CONCLUSION

Summarizing the results of the studies, it can be argued that on the plakor of the treeless dry steppe on the southern chernozems and dark chestnut soils of the Middle Salsk plain, excluding the chestnut solonetzic soils, it is possible to grow long-lived massive plantations of pedunculate oak, both pure and mixed.

The massive oak forests created are forest oases in the dry steppe that are of great ecological and landscape-forming importance. In addition, in the order of thinning and sanitary felling, you can get marketable timber from them, which will be used for various economic needs. Reproduction of oak plantations on the first and second groups of soils, while maintaining its leading position, is still possible up to 60-70 years of age by means of reforestation felling.

When the longevity indicators determined by us are reached in the appropriate forest conditions, the plantation will begin to decay, and even coppice renewal will be ineffective. In such plantings, it is necessary to carry out a radical reconstruction, that is, a complete replacement of plantings through uprooting, followed by the creation of new crops.

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ЦЕННОСТЬ ВЫРАЩИВАНИЯ ДУБА В РОССИИ

Богдан Ершов[1], Павел Федоров[2]

[1]Доктор исторических наук, профессор, Воронежский государственный технический университет, улица 20 лет Октября, 84, Воронеж, Россия, E-mail: bogdan.ershov@yandex.ru

[2]Воронежский государственный технический университет, улица 20 лет Октября, 84, Воронеж, Россия, E-mail: pavelov2013@gmail.com

Аннотация

В связи с постоянным расширением промышленного производства, нерациональным использованием лесных и сельскохозяйственных угодий, с каждым годом площадь лесов на нашей планете сокращается, увеличивается площадь опустыненных территорий, увеличивается уровень углекислого газа в атмосфере. Леса очищают воздух от загрязнений и восстанавливают его оптимальный состав, производят фитонциды, способные уничтожить болезнетворные вирусы и бактерии. Особая нагрузка ложится на дубовые леса, которые расположены в районах с высокой плотностью населения и интенсивной антропогенной деятельностью.

В малолесных регионах чрезвычайно важную роль в сельскохозяйственном производстве играют искусственные защитные лесные насаждения, защищающие поля от сильных ветров, пыльных бурь и эрозии почвы. С участием дубовых насаждений формируется более эффективный тип ландшафта - агролесомелиоративный ландшафт. Поэтому в этих регионах важность выращивания дуба возрастает еще больше.

Ключевые слова: дуб, земля, лес, вода, город.