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DISTRIBUTION PECULIARITIES OF ASH STANDS AND THEIR TAXATION CHARACTERISTICS

The paper presents the characteristics of ash formation in Belarus. The data about its current state, distribution along the area and reserves in view of State Forestry Production Association (GPLHO) have been presented. The author shows the place of these forests in general edafic-phytocoenotic classification of forest types.

Introduction. Ash grows throughout the Republic of Belarus locating in the center of the area of natural distribution, covering approximately 0.36% of the forested area. Ecotop formation of ash trees represents extreme conditions of edafic-phytocoenotic range of both spruce and oak forests and black alder forests. Edafotop is determined by two optimums – rich soil upland, on the one hand, and fens, on the other. Thus, ash forests are represented by indigenous types of forests occupying a narrow strip between oak groves and (or) black alder and spruce forests as well as derived from reclaimed oak and black alder forests. In Belarus ash forests (*Fraxineta*) are created mainly by indigenous condominant phytocoenoses which are significantly different from oak forests (*Querceta*). Formation of oak and ash forests are interconnected, but each of them has there certain definite place in the range of ecotopes. Unlike oak forests, adapted mainly to the upland conditions with sod-podzol or brown forest soils without significant signs of inundation, phytocoenoses *Fraxineta* are mainly formed on sod-podzolic, humus-podzolic gley, well drained soils near the lowland swamps forested with black alder. Narrow edafic – hydrological amplitude determines their stability (dominant position) in habitats with potentially richer soils and specific character of the water regime.

Even a slight drop in the terrain and the accumulation of peat contribute to the overall dominance of alder, raising relief and lowering of the ground water, especially in spring, creates conditions for the development of spruce and oak. The magnitude and extent of flowage watering groundwater – the main factors determining the difference types of ash trees, their phytocoenotic structure, soil fertility and productivity of forest stands [1].

Main part. Ash forests represent one of the least studied formations of deciduous forests. Research of I. D. Jurkevich and V. S. Aderikho proved that this species grows on the whole territory of the Republic of Belarus occupying in 1973 about 0.23% of the forested area [1]. In the 70s three-quarters of ash trees (71%) were young stands, 12.5% – middle-aged, 9.3% – maturing, 7.2% – mature and over mature. Disproportion towards young growths in the age structure of ash trees testified overly intensive exploitation of these forests in the past years.

According to state registration of forests in the Republic of Belarus as of January 1, 2011 total ash forests cover 27.3 hectares, which is 0.36% of the forested area (Table 1). The territory is dominated by middle-aged stands – 17.8 hectares (65.2%), a considerable area of young stands comprises up to 6.8 hectares (24.9%), the remaining categories account for about 10% of the forested area. As described above, ash forests are condominant phytocoenoses, according to Table 2 it is clear that the mixed stands occupy 98.0% of the area. Average age of ash trees in the Republic is 60 years.

In the forests belonging to the Ministry of Forestry, the formation of ash trees occupies 22.8 thousand hectares, which is 0.33% of the forested area (Table 3). The overall picture is quite similar to the one described in Table 1. The territory is also dominated by middle-aged stands – 15.3 hectares (67.1%), young forests occupy 6.1 hectares (26.8%) of the forested area, which is somewhat higher than in the republic.

As in the whole country and in the forests belonging to the Ministry of Forestry mixed stands prevail (Table 4).

Table 1

Distribution of ash forests by age groups in Belarus

Units of measurements	Total amount	Young stands		Total amount of young stands	Middle-aged stands	Maturing	Mature	Including over mature
		1st cl.	2nd cl.					
thous. ha	27.3	2.4	4.4	6.8	17.8	1.7	1.0	0.1
%	–	8.8	16.1	24.9	65.2	6.2	3.7	0.4
mln. m ³	5.05	0.1	0.5	0.6	3.82	0.37	0.26	0.05

Table 2

Distribution of ash trees stands in composition in Belarus

Type of stands	Young stands		Middle-aged stands		Maturing		Mature		Total
	thous. ha	%	thous. ha	%	thous. ha	%	thous. ha	%	
Pure	0.1	2	0.3	2	0.1	6	–	–	0.5
Mixed	6.7	98	17.5	98	1.6	94	1.0	100	26.8
<i>Total</i>	6.8	100	17.8	100	1.7	100	1.0	100	27.3

Table 3

Distribution of ash forests by age groups in the forests of The Ministry of Forestry

Units of measurements	Total amount	Young stands		Total amount of young stands	Middle-aged stands	Maturing	Mature	Including over mature
		1st cl.	2nd cl.					
thous. ha	22.8	2.3	3.8	6.1	15.3	1.1	0.3	0.1
%	–	10.1	16.7	26.8	67.1	4.8	1.3	0.4
mln. m ³	4.08	0.44	0.54	3.27	0.21	0.06	0.01	0.04

Table 4

Distribution of ash trees stands by composition in forests of The Ministry of Forestry

Type of stands	Young stands		Middle-aged stands		Maturing		Mature		Total
	thous. ha	%	thous. ha	%	thous. ha	%	thous. ha	%	
Pure	0.1	2	0.3	2	0.1	9	–	–	0.5
Mixed	6.0	98	15.0	98	1.0	91	0.3	100	22.3
<i>Total</i>	6.1	100	15.3	100	1.1	100	0.3	100	22.8

Table 5

Distribution of ash forests in the context of forestry's

Forestry's	Young stands		Middle-aged stands	Maturing	Mature and over mature	Thous. ha / mln. m ³	Total, %
	1st cl.	2nd cl.					
Brest	0.4/0.03	0.5/0.05	1.9/0.31	0.1/0.30	–	2.9/0.41	12.7
Vitebsk	0.5/0.03	0.5/0.10	5.5/1.22	0.2/0.02	0.1/0.04	6.8/1.41	29.8
Gomel	0.6/0.04	1.4/0.15	3.4/0.78	0.4/0.10	0.1/0.04	5.9/1.11	25.9
Grodno	0.1/0.01	0.1/0.01	0.8/0.17	0.3/0.04	–	1.3/0.23	5.7
Minsk	0.7/0.03	0.7/0.06	1.9/0.39	0.1/0.02	–	3.4/0.48	14.9
Mogilev	0.3/0.02	0.5/0.06	1.4/0.31	0.1/0.02	0.2/0.03	2.5/0.44	11.0
<i>Total</i>	2.0/0.12	3.7/0.43	14/3.18	1.2/0.50	0.4/0.07	22.8/3.98	100

Table 5 shows that the highest number of ash forests is located in Vitebsk and Gomel GPLHO where they occupy 29.8 and 25.9% respectively of the total area. It is connected basically with optimal ash forest conditions.

Ash forests of Belarus are presented mostly higher (I^a–II) quality class (96.7%), which indicates their adaptability to the most fertile soils.

High potential productivity of ash trees remains largely untapped due to the low completeness of their stands: nearly half ash trees (43.2%) has the lowest density (0.3–0.6). Average density of ash forests is 0.66, along the forest areas it ranges from 0.61 to 0.70, and in some forestry's – from 0.49 to 0.80.

Average reserves of ash forests in Belarus within the age classes are generally small. Available deviation is determined by different productivity of ash trees and their unequal density. Changes

in volumes according to age classes suggests that higher classes stands must promptly enter into felling, as in over mature stands, starting with the class VIII of age and above, there is a decrease in stocks of wood through natural attrition (desiccation).

Currently, there is a massive shrinkage of ash plantations in Belarus. In ash trees there have been formed centers of root rot and stem pests with a very high degree of destruction of trees. It has been noted there are two types of tree root systems damage – white rot (peripheral part of the trunk and sapwood) and brown rot (mostly sound part). Both rot is located on the same tree, destroying its root system. The damage of ash trees by white rot reaches 100%. Brown rot is found in 80–90% of ash trees. Stem pests accelerate dieback of trees. They are large (*Hylesinus creates* F.) and bighead (*Hylesinus fraxini* Paz.)

ash beetle [2]. In 2011–2012 institution of «Bel-lesozaschita» recorded a fungus *Chalara Fraxinea*, which leads to mass death of ash young growth [3]. However, economic value of ash as a source of high-quality wood and the biodiversity object of the environment highlights the need to continue exploration of growth stands of this species and its natural regeneration under the canopy of forest stands and recovery ash forests.

Conclusion. In general, as on January 1, 2011, the formation of ash forests occupies 0.36% of forested area with a stock volume of 4.08 million m³, which indicates an increased share of the formation as compared to the last third of the last century comprising 0.23%.

Enhanced exploitation of ash forests in the past has led to disproportion in age structure: in the 70s of XX century young stands comprise more than 70%, but nowadays they comprise only 25% and their state raises serious concerns.

Middle ash forests in 2011 covered 65.2% of the area, which is five times more compared to

previous measurements, in this group there have been observed significant damage of forest stands by root rot.

To pause the process of mass drying of ash forests there is a need to develop preventive measures and protection measures for their rehabilitation.

Also, there is a need to develop regulatory technical materials for ash forests: tables of volumes of trunk height and diameter and height, tables of growth course, etc.

References

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