УДК 630*221

K. V. Labokha, A. Ch. Borko
Belarusian State Technological University

TRANSFORMATION OF DERIVATIVES BIRCH FORESTS TENDING CUTTINGS BELARUSIAN POOZERIE AT THE ROOT OF FOREST FORMATIONS

The research features in derivative thinning birch on the territory of Begoml forestry. As a result of this species in the category of economically valuable plantations converted 70.8 hectares. Dominated by through passage thinning. As a result of their conduct in the economically valuable plantation transferred 45% of the total transferred stands, cleaning – 28%, the minimum area of derivatives birch converted into economically valuable after lightening – 7.5%. The intensity of thinning varies from mild (15%) to strong (40%).

Experience the transformation thinning birch stands of Belarusian Poozerie in indigenous forest formations on the territory of five forest districts showed that carrying out lightening in birch bilberry and sorrel types of forest facilitated the transfer of these areas in covered by spruce forest area. After the tassel in birch polytric, sorrel and fern plantations have also been translated in a wooded area by coniferous trees.

Key words: birch, Belarusian Poozerie, derivative planting, thinning.

Introduction. Birch plantations have wide spreading on territory of Belarus. Its share is 23.2% of the total forest's area of the Republic [1] and 30.1% of the forest's area of the Belarusian Poozerie [2]. Age structure of birch forest is irregular and it is dominated by middle-aged forest stands (more than 55% of the total area of birch forests), about 80% of them are high-productive plantations. However it's possible to recover native forest formations using rational activities, which are aimed at recovery of economically valuable species.

Entire and gradual fellings are dominated among main-used fellings on the territory of the Belarusian Poozerie (more than 50% of the total volume of the main-used fellings). The most favorable silvicultural effect is observed using uniformly-gradual and longly-gradual fellings among gradual fellings in fern, bilberry and oxalis birches with reliable regrowth or the undergrowth of the second layer of fir. Using these activities may lead to recovery of native forest formations and shortening of forest growing for 10–15 years [3].

Realization of thinning in derivative birches is aimed at the creation of favorable conditions for growth of the best trees of main species, the formation of high-productive, quality plantations and timely using of timber. Thinning in derivative birches promote formation of plantations with domination of native species, which have a great economic value and productivity [4].

Work objective is a determination of silvicultural efficiency of thinning in derivative birches of the Belarusian Poozerie.

Objects of researches are derivative birches of Luban's and Vileika's forestries of SEFI "Vileika experimental forestry", Dokshitsy's forestry SFI "Begoml's forestry", Slavnovskoe's and Tolochin's forestries SFI "Tolochin's forestry".

The main part. The study revealed that 80.7 ha was transferred to category of economically valuable plantations as a result of realization of thinning in derivative birches for 2011–2014 years on the territory of Begoml's forestry. Areas of derivative birches, which were transferred to economically valuable plantations by thinning, are unequal and range from 1.8 (2012) to 30.6 ha (2014).

Districts with conducted thinning are shown by mixed plantations with objective species in the compound of plantation including the second wood tier of fir or in the compound underplant forest plantations.

Passage felling are dominated among sorts of thinning, as a result of its realization 45% of plantations were transferred to economically valuable from the total volume of plantations, as a result of disengagement – 28%, as a result of increment thinning of derivative birches – 7,5%. Activity of thinning is ranged from weak (15%) to strong (40%).

Thinnings are made basically in bracken and oxalis birches, but there are districts in bilberry and fern birches. Ten test areas were laid down for analysis of cilvicultural efficiency of thinning in derivative birches of the Belarusian Poozerie.

Forestry and taxation characteristics of forest stands before realization of thinning are shown in the table.

Test area no. 1 was laid down in the 38 quarter, unit 15 of Luban's forestry of SEFI "Vileika experimental forestry". The decimation was made on this quarter in 2015. The plantation was shown by fern birch with compound, which was 6Birch(B)2Fir(F)1Aspen(Asp)1Black alder (Alb), type of soil fertility was C_4, quality class was II, entirety was 0.92. The compound of plantation after realization of the decimation is 4F4B1Asp1Alb.

Test area no. 2 was laid down in the 101 quarter, unit 36 of Vileika's forestry of SEFI "Vileika experimental forestry".

Forestry and taxation characteristics of forest stands before realization of thinning on test areas

Number	Forestry	Quarter / Unit	Area, ha	Compound of plantation before thining	Age, years	Type of forest / Soil fertility	Quality class / Entirety	Stock, m^3/ha	Sort of thinning	Year of thinning
1	Luban's (Vileika's experimental)	186 / 15	5.0	6B2F1Asp 1Alb	24	Fern Birch C_4	II 0.92	80	Decimation	2015
2	Vileika's (Vileika's experimental)	101 / 36	1.2	I 6B4 Asp II 7F3P	19 / 19	Oxalis Birch D_2	I^a/0.91 0.50	80 20	Disengagement	2014
3	Dokshitsy's (Begoml's)	34 / 1	0.7	I 10B II 10F	54 / 29	Oxalis Birch D_2	I^a/0.51 0.50	183 82	Passage felling	2014
4	Dokshitsy's (Begoml's)	209 / 1	1.9	7B3F+Asp	58	Oxalis Birch D_2	I^b 0.91	300	Passage felling	2015
5	Slavnovskoe's (Tolochin's)	110 / 3	1.2	10B+F (undergrowth 10F, 35 yeas, 4.0 m)	50	Oxalis Birch C_2	I^a 0.72	250	Passage felling	2014
6	Tolochin's	141 / 3	2.3	6B3Asp1F	16	Bilberry Birch B_3	II 0.71	20	Disengagement	2014
7	Tolochin's	115 / 9	0.7	7B2 Asp1F+P	19	Bracken Birch B_2	I 0.69	40	Disengagement	2014
8	Tolochin's	138 / 6	0.8	7B1F2 Asp+Oak	15	Fern Birch C_4	I 0.72	40	Disengagement	2014
9	Tolochin's	114 / 3	2.3	9B1F	10	Bilberry Birch C_3	I 0.93	10	Clarification	2014
10	Tolochin's	79 / 3	1.1	8B2P	10	Oxalis Birch C_2	I 0.91	10	Clarification	2014

Plantation before disengagement was shown by complicated oxalis birch: the first tier was 6B4Asp, the second was 7F3P, soil fertility was D_2, entirety of the first tier was 0.91, of the second was 0.50. Disengagement was made in 2014 and as a result of it foliar-deciduous plantation is forming with the compound, which is 3F1P4B2Asp.

Test area no. 3 was laid down in the 34 quarter, unit 1 of Dokshitsty's forestry of SFI "Begoml's forestry". Passage felling was made on this district in 2014. Complicated two-tier plantation grew before the thinning, the compound of the first tier was 10B, the second was 10F. Entirety of the first tier before the thinning was 0.51, of the second was 0.50. Class of quality of the plantation was I^a. The area was transferred to fir economy after passage felling (compound is 5F5B).

Test area no. 4 was laid down in the 209 quarter, unit 1 of Dokshitsty's forestryof SFI "Begoml's forestry", where passage felling was made in 2015.

Plantation before the thinning was shown by oxalis birch with the compound, which was 7B3F+Asp, soil fertility was D_2, class of quality was I^b, entirety was 0.91. Small-leaved-deciduous plantation is formed after the passage felling.

Test area no. 5 was laid down in the 110 quarter, unit 3 of Slavnovskoe's forestry. This district was shown by oxalis birch with the compound, which was 10B+F, fir undergrowth was under the canopy. Entirety before felling was 0.72, class of quality was I^a, soil fertility was C_2. Passage felling was made in 2014. As a result of its realization fir plantation with impurity of birch is formed with the compound, which is 7F3B.

Test area no. 6 was situated in the 141 quarter, unit 3 of Tolochin's forestryof SFI "Tolochin's forestry". Disengagement was made on this district in 2014. The compound of the plantation before the felling was 6B3Asp1F, the type of forest was bilberry birch, soil fertility was B_3, class of quality was II, entirety was 0.71. Mixed plantation with fir is formed on this district as a result of disengagement with compound, which was 3F6B1Asp.

Test area no. 7 was laid down in the 115 quarter, unit 9 of Tolochin's forestryof SFI "Tolochin's forestry". Disengagement was made on this district in 2014. The compound of the plantation before the felling was 7B2Asp1F+P, the type of forest was bracken birch, soil fertility was B_2, class of quality was I, entirety was 0.69. Mixed plantation is formed after thinning with the compound, which is 3F6B1P.

Test area no. 8 was laid down in the 138 quarter, unit 6 of Tolochin's forestry. Disengagementwas made on this district in 2014. The compound of the

plantation before the felling was 7B1F2Asp+Oak, the type of forest was fern birch, soil fertility was C_4, class of quality was I, entirety was 0.72. Small-leaved-deciduous plantation is formed after the passage felling with the compound, which is 5F1P3B1Asp. This plantation conforms to economical goals the most in this type of forest conditions.

Test area no. 9 was laid down in the 114 quarter, unit 3 of Tolochin's forestry. Mineralization of soil with sowing the seed of fir was made on this area. Clarification was made in 2014. The compound of the plantation before the felling was 9B1F, the type of forest was bilberry birch, soil fertility was C_3, class of quality was I, entirety was 0.93. Economically valuable plantation is formed as a result of felling on this district with the compound, which is 6F4B+P.

Test area no. 10 was laid down in the 79 quarter, unit 3 of Tolochin's forestryof SFI "Tolochin's forestry". The compound of the plantation before the felling was 8B2P, the type of forest was oxalis birch, soil fertility was C_2, class of quality was I, entirety was 0.91. Clarification was made in 2014 on this area. Birch and pine plantation is formed with the compound, which is 7P3B+F, Asp, on the moment.

Conclusion. As a result of researches was founded that it's possible to form economically valuable fir plantation by passage felling in middle-aged plantations (oxalis birch, no. 3 – Dokshitsy's forestry and SN no. 5 – Slavnovskoe's forestry) with the second tier of fir under the forest canopy.

As a result of clarification the district was transferred to forested area of fir economy (the number of firs is 2,800 thing/ha) in bilberry birch (no. 9), the district was transferred to pine economy (the number of pines is 3,100 thing/ha) in oxalis birch (no. 10).

Plantations were also transferred to forested area of pine economy as a result of disengagementin bilberry birches (no. 6), bracken birches (no. 7), oxalis birches (no. 2) and fern birches (no. 8).

It's possible to form native economically valuable plantation with domination of derivative of birch underwood of pine, fir or oak by realization of clarification or disengagement.

Fir plantation is formed in oxalis birches with the second tier of fir under the forest canopy by passage felling in middle-aged plantations of the Belarusian Poozerie.

References

1. *Lesnoy fond* [Forest found]. Available at: http://www.mlh.by/ru/forestry/resources.html (accessed 16.02.2016).

2. Labokha K. V., Borko A. Ch. Modern structure of forests Belarusian Poozerye. *Trudy BGTU* [Proceedings of BSTU], 2015, no. 1: Forestry, pp. 62–65 (In Russian).

3. Labokha K. V., Shiman D. V., Klysh A. S. Felling experience in derivatives birch Belarusian Poozerye. *Trudy BGTU* [Proceedings of BSTU], 2015, no. 1: Forestry, pp. 66–69 (In Russian).

4. TKP 143-2008 (02080). Rules of felling in Republic of Belarus. Minsk, Forestry Department Publ., 2013. 94 p. (In Russian).

Information about the authors

Labokha Konstantin Valentinovich – PhD (Agriculture), Assistant Professor, Head of the Department of Silviculture. Belarusian State Technological University (13a, Sverdlova str., 220006, Minsk, Republic of Belarus). E-mail: labokha@belstu.by

Borko Anastasya Cheslavovna – PhD (Agriculture), assistant lecturer, the Department of Silviculture. Belarusian State Technological University (13a, Sverdlova str., 220006, Minsk, Republic of Belarus). E-mail: borko_nastua@belstu.by

Received 16.02.2016