Wood density, wood properties, microdrilling, wood drilling power, resistograph.

Presented new design mobile devices for the diagnosis of the state of drilling wood collected laboratory experimental setup. Experimental study of changes in the properties of wood round timber along the radius of the barrel. Identified mikrosverdlinnya power relationships quantities of wood and wood density using X-rays for three species: pine (Pínus sylvéstris), beech (Fágus sylvática), ash (Fráxinus excélsior).

The density of wood, wood properties, mikrosverdlinnya capacity for drilling wood, rezystohraf.

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Technological Assessment of Transcarpathia OAK FOR A PRODUCTION Wood

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The article describes a technological assessment of raw materials oak Transcarpathia in terms of suitability for the production of wine and cognac barrels. Determined the content of phenolic compounds and major aromatoutvoryuyuchyh in oak wood and rock. Presented possible volumes preparations klepkovoho Ridge.

Klepkovyy logs, riveting, barrel, oak, exit klepkovoho Ridge.

Problem. By total area of oak forest Transcarpathian yields so-steppe regions of Ukraine as Khmelnytsky, Ternopil, Poltava region but is a traditional cooperage and wine industries in Ukraine [1]. Therefore, the study of its raw materials is a prerequisite for national revival Wood production.

The purpose of research. Defining characteristics of the location and utilization of raw materials oak Transcarpathian region for the

production of high quality staves for wine and cognac barrels, as well as for aging cognac or wine in large tanks.

Research Methods. Assessment taksatsiynyh indicators oak forest Directorate performed on materials lisovporyadzhennya. Quality of round timber for plots - with current standards: GOST 9462-88 [4], quality assessment klepkovoho ridge on the requirements of a modern European market - by JMA 02.01-37-370: 2006 [3]. The number of annual layers in a 1 cm diameter and percentage of late wood investigated in accordance with GOST 16483.18-72 [2]; wide annual layer - according to EN ISO 1310: 1997 [5].

To characterize the chemical properties of wood on each sample plots were selected in 10 samples of wood logs yadrovoyi area at a distance of 3 m from the air cut. The content of phenolic compounds studied in aqueous and alcoholic extracts on the FEC. Content sweet lactones, vanillin, eugenol was determined by conventional methods for modified gas chromatograph "Crystal 2000" with flame ionization detector capillary column VYTOKAP -AL - SP 0.3, phase - VITOWAX-F (imob.) Length 50 m, internal diameter 0.32 mm.

Theoretical and experimental studies. Transcarpathian region in the foothills has favorable conditions for growing high-oak forest. Not accidentally, the average creditworthiness oak is 1.1 (Table. 1).

The vast majority of oak stands are concentrated in 5 forest enterprises: Berehovo, Vynohradiv, Mukachevo, Uzhgorod and Khust. Even in 6 households (Bushtyno, Volovetskyi, Velykoberezneanskyi, Veliko Bychkivskomu, Dovzhansky and Svalyava forest enterprises) are planting oak, rock, red at altitudes of 250 - 580 m above sea level, but at altitudes of 400 - 580 m - performance oak stands significantly reduced (2.4 average creditworthiness). By total area and supply of wood oak forests, these six mountain forestry together yield any of foothill forest enterprises.

1. Summary of the main indicators taksatsiynyh oak forest in the Transcarpathian forestry.

Lisopokryta area, ha	Stock plantations thousand. M3		Average performance taksatsiyni						Avg. RGC size on oak, yew. m3	The average annual volume klepkovoho Ridge, m3.
	In general, ny	Star least 100 years	Age, years	creditworthiness	completeness	stock, m3 / ha		composition hig-jen		
						aver age	Star least 100 years			
SE "Berehovo LH"										
4253	1106	75	52	1	0.68	260	375	9Dz 1Hz	3.7	581

SE "Vynogradiv LH"										
4346.	1143	160	63	1	0.7	263	370	9Dz 1Hz	3.7	581
SE "Mukachevo LH"										
7609	1872	77	50	1.7	0.7	246	352	8Dz1Bk 1Hz + Lp Kl.h	3.6	518
SE "Uzhgorod LH"										
7812	1937	79	53	1.8	0.7	248	365	9Dz1Hz + LpKl	3.5	504
SE "Khust LH"										
2990	759	50	54	1.7	0.7	254	360	9Dz1Bk + HzKl.h	3.3	475
SE "Bushtyno LH", "Volovetskogo LH", "Bereznyansky LH", "Velykyi LH", "Dovzhansky LH", "Svalyava LH" with										
3022	435	46	62	1.4	0.7	144	250	4Ds2Dz2 Bk2Hz + LpKl.h	1.7	241
However, in the Transcarpathian Regional Division of Forestry										
30 032	7252	629	59	1.1	0.71	241	359	-	19.5	2900
including: oak										
20 597	4844	487	55	1	0.69	235	362	9Dz1Hz	14.4	2155
sessile oak										
8107	2310	141	82	1.4	0.74	285	352	8Ds1Bk 1Hz	5.0	745
red oak										
1328	98	0.8	18	1A, 9	0.82	74	471	9Dz1Bk	0.1	-

Operating reserves oak have very little, because many of these forests on steep slopes is protective. Oak allowable cut in these forest enterprises are every 2-3 years, but because they are not of interest in terms of the possibilities of creating raw materials for the production of barrels. The biggest impact on productivity of plantations and wood properties in the region has vertical zonation, the degree of erosion of soil and moisture deficit on the rocky steep southern exposure.

Up to a height of about 300 meters above sea level in these forest enterprises in oak stands dominated by gray forest soils and above - mountain brown. Planting oak in these farms grow mainly in fresh and moist oak, oak rock - in a fresh oak and sudibrovy, red oak in fresh and moist sudibrovy. The highest productivity with red oak stands, but they are young and middle-aged plantations and industrial not matter.

Almost every forestry, which are mature oak stands in lowland and foothill conditions can be found guilty and Brandy klepkovyy logs. Destiny Ridge klepkovoho whether other purposes depends on habitat conditions, which is allowable cut.

The highest marketability are planting Vynohradivskyi, Berehiv, Hust forestry Mukachevo and Uzhgorod forestry on the plains at an altitude of 150 - 280 m above sea level. Some of these farms are allowable cut oak wood supply more than 370 m3 / ha. Trunks of trees from these plantations have a high degree of purification of knots (8-10 m), small coincidence level, but often found yadrova rot in komlevoj of the barrel.

In oak, and red rock in the Transcarpathian region there are isolated stands of oak and multiple Daleshampe who have no commercial value.

To determine the approximate output klepkovoho ridge on the requirements of the European market was laid on 6 plots the typical areas of main use cutting areas (Table. 2). The highest productivity observed in plots 3 C and 4 C in a humid oak equals areas where planting stock reached 380 m3 / ha, the yield of commercial timber (logs 1, 2, 3 varieties) - 64,9 ± 0,75%, yield of high-quality klepkovoho Ridge the requirements of the European market - 15,7 ± 1,1%. Was slightly lower output of industrial wood on plots 1 C and 2-C in fresh oak on slopes 7 - 15 0- 60,0 ± 2,7%, yield of high-quality klepkovoho Ridge - 14,4 ± 0,3% . Even less productive by planting oak rock on eroded slopes 15 - 250 in fresh oak (plots 5 C and 6-3). In such circumstances, the output logs 1-3 grades was 52,9 ± 1,3%, and klepkovoho Ridge - 11,4 ± 1,1%.

2. Description of sample plots to determine the output klepkovoho Ridge.

Number of plots	Location of sampling	Age, years	Creditworthiness	The average diameter, cm	Stock oak m3 / ha	Percentage of total stock plantings%			
						distribution logs on grades according to GOST 9462-88			klep-logs-term
						1	2	3	
1 From	SE "Khust LH" Velyatynske forestry, Apt. 43	120	1	44	380	12.3	21.4	23.8	14.7
2 On	Vyshkivskyyspetslishosp, Vyshkivs'kyi forestry, kv.102	90	2	36	343	14.1	19.7	28.6	14.1
Mean values for plots in stands of oak in fresh oak:						13,2 ± 0,9	20,6 ± 0,9	26,2 ± 2,4	14,4 ± 0,3
3 On	SE "Vynogradiv LH" Shalankivske forestry,	120	1	40	380	16.1	23.4	25.8	17.1

	Apt. 9								
4 With	SE "Mukachevo LH" Mukachevo forestry, Apt. 28	110	1	40	380	15.3	22.5	26.5	16.3
Mean values for plots in stands of oak groves in wet conditions:						15,7 ± 0,4	23,0 ± 0.5	26,2 ± 0,4	15,7 ± 1,1
5 From	SE "Mukachevo LH" Chynadiyivske forestry, Apt. 22	100	1	32	340	12.6	19.5	22.3	10.3
6-3	SE "Vynogradiv LH" Zatysnyanske forestry, Apt. 28	90	1	36	332	13.2	17.4	20.9	12.5
Mean values for plots in stands of oak rock in fresh oak:						12,9 ± 0.3	18,4 ± 1.1	21,6 ± 0.7	11,4 ± 1,1%
Mean values for plots:						13,9 ± 0.6	20,7 ± 0.9	24,7 ± 1.2	14,2 ± 1,0

To calculate the average annual volumes of possible preparations klepkovoho ridge on SE "Berehovo LH" and SE "Vynogradiv LH" was taken out results for Ridge plots 3 C and 4 C; by SE "Mukachevo LH", "Uzhgorod LH", "Khust LH" - the plots 1 C and 2 C; in other forestry - for plots 5-C and 6-3 as these plots are similar to typical oak logging areas relevant to forestry (Table. 1).

Analysis macrostructure selected by logging areas klepkovoho Ridge showed that the average width of annual layers in the core zone, which made for riveting barrels of wine klepkovoho ridge ranged from 1,6 ± 0,4 - 1,8 ± 0,3 mm and in Cognac 2,5 ± 0,3 - 2,9 ± 0,4 mm. If you are the width of the annual layer for wine klepkovoho Ridge is typical for the European market, the indicators width annual layer for brandy klepkovoho Ridge 0.1 - 0.5 mm inferior to those models that offer French firms [6, 9].

But, according to local agro-climatic conditions krupnosharovoyi It makes sense structure with a width of annual timber layer at least 2.5 mm and recommend it for production of cognac barrels. This is supported by sufficient content and phenolic substances in samples aromatoutvoryuyuchyh Carpathian oak wood. Thus, the concentration of phenolic compounds in oak ridge klepkovomu of plots 1 Of 4 From–was 72.4± 6,8 - 85.7± 8,3 mg per g dry wood (Fig. 1). A somewhat larger value content of phenolic compounds observed in plots in a humid oak (plots 3 C and 4 C). In samples of rock oak phenolic compounds was half in less than oak, but it is a characteristic feature of the species. These figures phenolic compounds correspond to the best European models [7, 8, 9].

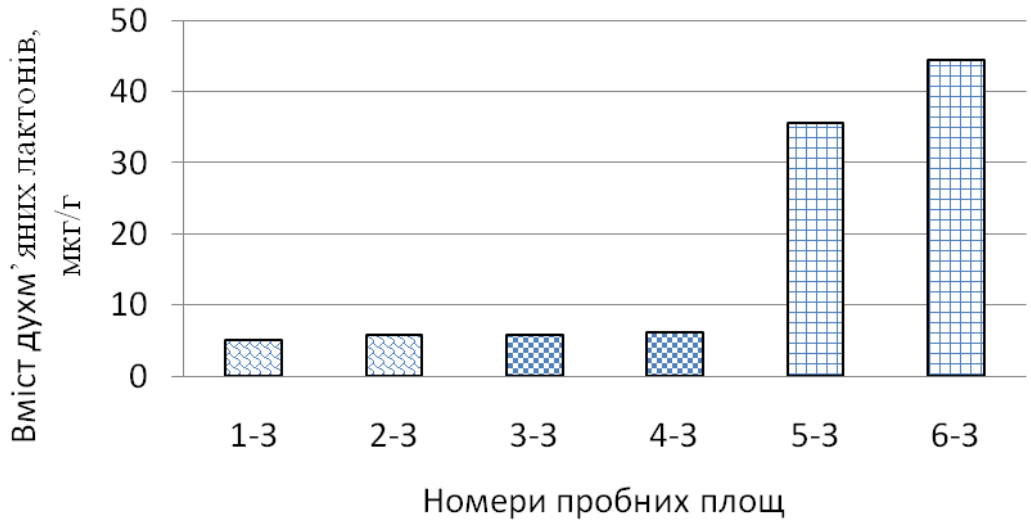

Fig. 1. The content of phenolic compounds in wood klepkovoho ridge on plots.

Content sweet lactones in oak wood in fresh and moist oak (plots 1 C - 4 C) is similar to the average values, char-Terni wood oak ridge klepkovoho of French origin (Fig. 2) [7, 9]. At the same time, their concentration in the wood of oak ridge klepkovoho rock (plots 5 and 6 With C) yields a typical French standards, but sufficient for the formation of taste in bouquets of aged wine distillates.

By concentration of eugenol klepkovoho wood with oak ridge on plots 1 C - 4 at close to the best Western designs: 0,96-1,18 mg / g, and oak French rock samples yields by 30-40% [7, 8, 9].

The content of vanillin klepkovyy logs of oak and oak rock on data plots (14.2; 11.2 mg / g) exceeds the average value for the Western samples 50 and 20%, respectively, but similar to the contents in wood ridge of klepkovoho Western Forest Steppe[7, 9].

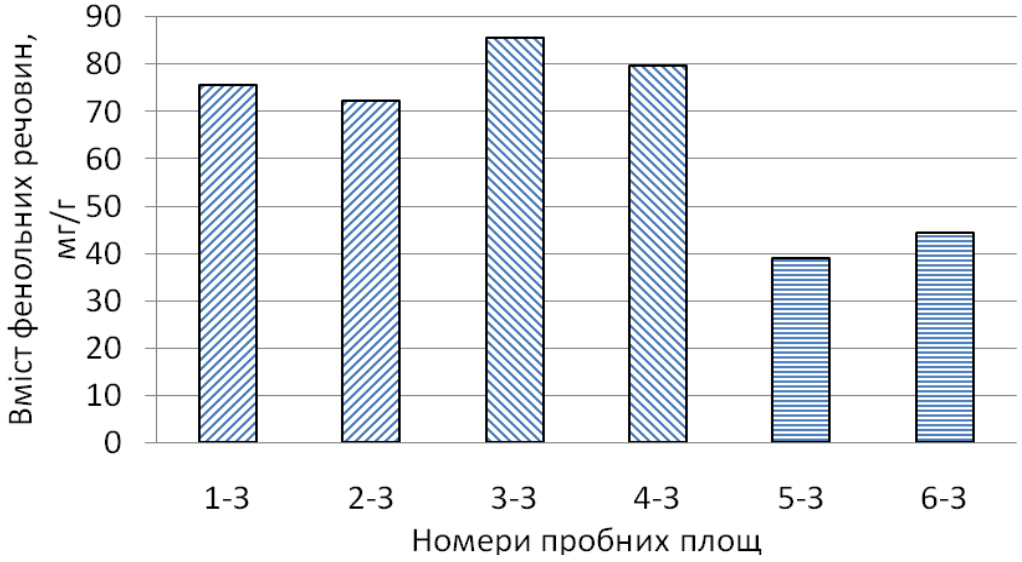

Fig. 2. The content of sweet lactones in wood klepkovoho ridge on plots.

Thus, the conditions are favorable for growing Transcarpathia high quality wine and cognac oak ridge klepkovoho that is able to compete on the Western European market.

Conclusions

- best farms for harvesting staves for the production of wine and cognac barrels are SE "Khust LH", "Vynogradiv LH", "Berehovo LH", "Mukachevo LH" and "Uzhgorod LH";
- in each of the above materials lishospivi is that the requirements to anatomical and chemical structure corresponds to a wine and cognac klepkovomu ridge;
- klepkovyy logs for cognac barrels can be found in humid oak and sudibrovy in stands of oak;
- klepkovyy logs for wine barrels advisable to select in fresh sudibrovy, in oak stands of oak and oak rock;
- in Zakarpattia Oblast possible harvesting about 2900 m3 klepkovoho ridge year, including 2155 m3 - from oak and 745 - oak rock;
- The contents of phenolic compounds, lactones and sweet oak wood eugenol in the studied plots are not inferior, and the concentration of vanillin superior designs riveting French firms;
- Sessile oak in the surveyed plots inferior standards staves from France for the content of fragrant lactones and eugenol, but has a higher concentration of vanillin.

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In this article is presented technological evaluation of sыrevыh oak timber resources in terms of Transcarpathia FITNESS FOR PRODUCTION Using a vynnыh and konyachnыh bochek. Opredeleno Contents fenolnыh a crucial aromatoobrazuyuschyh substances in hardwood oak and skalnoho. Predstavlenы vozmozhnыe obъemы pieces klepochnoho Ridge.

Timber Oak klepochnыy logs, riveting, macrostructure timber, fenolnыe substance, aromatobrazuyuschye matter.

The technological estimation of sources of oak timber of the Zakarpatja region for the using in the tonnellerie is presented. Concentration of phenolic substances, whisky-lactone, eugenol, and vanillin in English and sessile oak timber are estimated. Possible volumes of logs cutting for wine and brandy barrels are presented.

Oak timber, log, stave, macrostructure of wood, phenolic substances, aromatic substances.

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Investigation of dispersion RAZMEROV cells TROPYCHESKYH DREVESNЫH species

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The basic characteristic tropycheskoy timber - is Permanent srednyaya size diameter and density in the trachea Limit ring. Boundaries Between colic they Liboje absent, Liboje elect zametna. Multitude of species, a mortgage on the type and Location of anatomycheskyh elements razlychymы difficult, but mogut bыt razhranychenы on kolychestvennыm characteristics anatomycheskyh indicators.

This makes Studies in rassmatryvayutsya razlychyya Size anatomycheskyh elements in neskolku tropycheskyh drevesnыh species.