

LukanIn A.,

academician of NAAS, doctor of technical sciences Laboratory of raw materials for winemaking firm "SERSIAL"

Zrazhva S.,

Ph.D. in Agricultural Sciences National University of Bioresources and Nature Management of Ukraine

Agafonov M.,

State Inspection of Agriculture in Kyiv

Complex pro-cessing of oak bolt for utilization in production pro- cesses of winemaking

The purpose. To increase productivity of oak bolt.

Methods. Experimental and statistical.

Results. Analysis is given of results of experiments in complex processing of oak barrel log into clapboard for production of wine and cognac casks for seasoning of vinic distillates in greater basins, micro-clapboard, and also chips and saw dust for restoring extraction properties of aged casks. Average expected exits of products are specified.

Conclusions. It is more effective to combine production of clapboard for wine and cognac casks with manufacture of by-products for winemaking, than with production of furniture and parquet workpieces.

Key words: barrel log, clapboard, micro-clapboard, chips, saw dust, lumpy waste, balance of raw material at sawing.

Given the signing by Ukraine of an association agreement with the European Union, it is urgently necessary to improve the quality of domestic wineries. An important part of this process at Ukrainian enterprises is the replacement of old barrels with new ones, since most of them after 18 to 25 years of operation can only be used as storage tanks. This is due to the fact that 5 to 7 mm of the surface layer of wood (which enters a chemical reaction with alcohols or wine materials) is exhausted. Such barrels and not to give alcohol and wine the desired flavor and aroma properties [1, 3 - 6, 10 - 12]. To save on high-value wood oak logs specially selected for wine and cognac barrels, a piece of lump and garbage can be used to create the effect of a "new barrel" by way of partial pyrolysis and fermentation of crushed wood [4]. The purpose of the research is to determine the mean values of the output of oak riveting for cognac and wine barrels, as well as riveting for distillation in large tanks, lump chips and sawdust, which can be used to withstand wine distillates and wine materials from typical domestic riveting. Materials and methods of research. The following method was used for sorting and sawing riveting ridge. Oak riveting rig lengths of 2-5 m in diameter and 24 - 54 cm in diameter with a graduation of 2 cm were selected without signs of mushroom damage, insects damage, dryness, roughness, inclination of fibers, wormhole, internal sapwood. That is, the best decks of 1st and 2nd grades were selected. The logs of the 3rd variety were not included in the experiment at low output of the billets. The gummy ridge was harvested in the forest farms of Kharkiv, Chernihiv and Transcarpathian regions. The logs were planted into lengths of 1 m in length, which were split by a hydrocolon on 3 - 6 sectors, and sprayed parallel to the scraping plane on tape-bending machines with rotary devices. Worm-rotary devices were used to establish the propeller plane radially. Further cutting of boards was performed on circular saw machines. From lump wastes cut rotten knots, remnants of sapwood, browning, and a sound core part was processed on a cod on a chipper. The output of lumber was determined according to the generally accepted method [8]. The dimensions of the logs were determined

according to DSTU 4020-2: 2001, the volumes of the logs according to GOST 2708-75, the type of logs according to GOST 9462-88, the thickness and width of the workpieces - a caliper with an accuracy of 0,1 mm and rounded to 1 mm, the length of the workpiece - roulette with an accuracy of 1 mm and rounded to the nominal value. The volume of lumber was determined with an accuracy of 0.0001 m³.

The balance of raw materials for varieties 1 and 2 was determined on the basis of data from the sawing of 50 pcs. log for each grade and each group of diameters. The klep for barrels was selected according to the SOU 20.10-37-369: 2006 [7], which has standards corresponding to the conditions of the European market. At the same time, the current GOST 247 - 58 [2] is morally obsolete, because it does not take into account the botanical type of oak, age of logs, anatomical structure and macrostructure of wood [9]. Norms for knots and other flaws are softer than for SOU 20.10-37-369: 2006, so its use in modern conditions is not feasible. The rifle, which was not suitable for the manufacture of barrels due to the irregularity of the cutting, the presence of knots, cracks, germination, inclination of fibers, sapwood, is sorted into suitable distillates suitable for endurance in large tanks and riveting from which it is possible to cut a microfiber. Zabolon, rotten knots and gutter cut or drilled. Bulk waste without sap and rot was processed on a cake to withstand wine production according to the original method [4]. Research results. Exit riveting for wine and cognac barrels, riveting staves in large tanks, flasks meeting the requirements of the JMA 20.10-37-369: 2006,

Balance of raw material during sawing of riveting ridge

Діаметр кряжа, см	Сорт	Вихід продукції, %					
		Клепка для бочок	Клепка для витримки спиртів і виноматеріалів у резервуарах	Мікроклепка	Тріска	Тирса	Кускові відходи із заболонню і гнилими сучками
<i>Клепковий кряж з лісгоспів Харківської обл.</i>							
24–38	1-й	18,6±0,9	7,2±0,5	5,1±0,4	17,0±0,7	20,3±0,6	31,8±0,9
	2-й	16,3±1,1	5,8±0,3	4,2±0,3	17,8±0,6	25,1±0,8	30,8±0,8
40–54	1-й	24,9±0,6	8,2±0,5	6,3±0,3	17,1±0,6	18,2±0,6	25,3±0,7
	2-й	21,0±0,6	7,3±0,4	5,1±0,6	16,8±0,6	20,1±0,4	29,7±0,9
<i>Клепковий кряж з лісгоспів Чернігівської обл.</i>							
24–38	1-й	17,9±0,8	7,6±0,4	5,0±0,3	16,9±0,7	22,1±0,5	30,5±0,9
	2-й	16,6±0,7	5,7±0,5	4,8±0,4	17,0±0,6	24,2±0,8	31,7±0,8
40–54	1-й	24,8±0,6	9,4±0,6	5,8±0,3	14,9±0,5	19,0±0,7	26,1±0,9
	2-й	21,1±0,7	8,2±0,5	5,0±0,3	15,9±0,6	20,2±0,9	29,6±1,1
<i>Клепковий кряж з лісгоспів Закарпатської обл.</i>							
24–38	1-й	19,3±1,1	7,5±0,5	4,8±0,7	17,2±0,6	21,5±0,7	29,7±0,8
	2-й	16,8±0,7	6,6±0,7	4,6±0,5	17,8±0,7	23,1±0,6	31,1±0,7
40–54	1-й	25,3±0,8	9,5±0,7	6,4±0,8	16,7±0,9	18,8±0,6	23,3±1,1
	2-й	21,4±1,1	7,8±0,6	6,2±0,5	16,9±0,6	20,6±0,9	27,1±1,0
<i>Середні значення</i>							
24–38	1-й	18,6±1,7	7,4±0,9	5,0±0,9	17,0±1,7	21,3±1,2	30,7±1,6
	2-й	16,6±1,5	5,9±1,3	4,5±0,9	17,5±1,1	24,1±1,4	31,2±1,5
40–54	1-й	25,0±1,7	9,0±0,7	6,2±0,9	16,2±1,7	18,7±1,1	24,9±2,1
	2-й	21,2±1,5	7,8±1,0	5,4±0,9	16,5±1,1	20,3±1,6	28,8±1,9

increases as the diameter of the ridge increases (table). For example, rivets for barrels: for the 1st grade - from 18,6 to 25%; for the 2nd grade - from 16.6 to 21.2%. At the same time, the share of cod, sawdust and lump in the total balance of products during sawing decreases with increasing the diameter of logs. For example, for cod (which can also be used to withstand wine materials): for grade 1 - from 17 to 16.2%; for the 2nd grade - from 17.5 to 16.2%.

The reasons for these features are the following factors:

- the increase in the diameter and age of the logs in the oak decreases the percentage of sapwood (which is unacceptable in the riveting) in the total volume of wood;
- In a log of a larger diameter geometrically the larger volume of circumcised sawn timber is added;
- As a rule, as the diameters of the overhead logs increase, the specific volume of defects in them decreases;
- for increasing the yield of riveting for barrels, for holding in large tanks, microlofts, it is logical that less is a healthy sound wood for technological cod, respectively, decreases the amount of lump waste, the amount of sawdust and sawdust.

So, on average, 24.18% of the second-grade logs with diameters of 24-38 cm were obtained in the experiment, and 21.3% sawdust in the premium ones; for the range 40 - 54 cm - 20.3 and 18.7% respectively. This is the total volume of sawdust from sound and sapwood wood.

Due to the high culture of the production organization, a significant proportion of sawdust from sound wood can be obtained separately from sawdust from sapwood wood, which will enable it (later, after partial pyrolysis and fermentation) to use it to withstand wine distillates. The production of riveting for keeping cognac alcohols in large tanks, microfiber and technological chips for winemaking significantly increases the yield of useful raw materials [4]. According to the SOU 20.10-37-369: 2006, in riveting machines for alcohol holding in large tanks and microtubes it is allowed to drill rotten knots, sprout, cracks under the condition of maintaining the integrity of the riveting. Such a set of accompanying products allows you to save on high-value wood from 100-year oak decks carefully selected for riveting ridge by a complex of physico-chemical indicators. Alternatives to related products may be blanks for small and industrial parquet, but they are cheaper to make from younger, less large varieties, without sorting by macrostructure, physical and chemical parameters. In addition, the size of the microfiber can be in the thickness of 4 - 10 mm, width - 20 - 50, length - 100 - 590 mm, which is more convenient for the processing of waste than the frieze or industrial parquet due to a large variation in size. The largest output of high-quality riveting for barrels is obtained from riveting ridge from the Transcarpathian region, a little less - from Kharkiv, and even lower - from Chernihiv. For example, for premium logs with diameters of 40 - 54 cm, the output of rivets for barrels from Transcarpathian assemblies was $25,3 \pm 0,8\%$, from Kharkiv - $24,9 \pm 0,6$, Chernihiv - $24,8 \pm 0,6$, respectively, that shows a smaller number of defects per unit volume of wood in a richer living conditions. Although the difference in the output of the rivet within the experiment is insignificant (5%), but with an increase in the number of experiments, this trend may be more significant.

Conclusions

For the selection of oak riveting ridge from domestic wood without rotting, mushroom lesions, wormholes, inclination of fibers it is possible to obtain an average yield of riveting for wine and cognac barrels for diameters of 24-38 cm: for the 1st grade - 17,9 - 19,3%, for the 2nd grade - 16.3 - 16.8; for diameters 40 - 54 cm: for the 1st grade - 24,8 - 25,3%; for the 2nd grade - 21 - 21.4%. The output of riveting for alcohol holding in large tanks on average will be for the 1st grade - about 7.2 - 9.5%, for the 2nd grade - 5.7 - 8.2%. The average expected yield of a microphone for 1 st grade - 5 - 6.4%; for the 2nd grade - 4.2 - 6.2%; the output of chips for the 1st variety - 18.8 - 22.1%, for the 2nd grade - 20.1 - 25.1%. There is a tendency to increase the yield of riveting for barrels as fertility improves conditions of location of oak stands. In order to increase the profitability of the production of riveting for barrels it is expedient to produce as an accompanying product riveting for alcohol holding in large tanks, microfiber and technological cork for winemaking.

Bibliography

1. Gerasimov MA Wine Technology / M.A. Gerasimov - M.: Food. Industry, 1964. - 640 p.
2. GOST 247 - 58 Specifications. Ribbon for barrels under wine, brandy alcohol, juices and berries.
3. The use of oak wood for winemaking / B. Kordier, P. Chatonne, N.G. Sarishvili, L.A. Oganesyants // Grape and wine of Russia. - 1993. - No. 5. - P. 15 - 16.
4. Lukanin O.S. The effect of the new barrel / O.S. Lukanin // Grape. Wine. - 2002. - No. 5. - P. 20 - 23.
5. Ogan'es'yants L.A. Anatomical aspects of quality oak riveting for the production of winemaking products / L.A. Ogan'es'yants, VV Korovin, Yu.A. Telegin // Grape and wine of Russia. - Special issue. - 1995. - P. 33 - 34.
6. Ogan'es'yants LA Oak and winemaking / L.A. Ogan'es'iants - M.: Food. Industry, 1998. - 256 p.
7. JUU 20.10-37-369: 2006. Rope of oak. Specifications. - K.: Ministry of Agrarian Policy of Ukraine, 2006. - 11 p.
8. Tyukina Yu.P. Technology of sawmill-woodworking production / Yu.P. Tyukina, SN Rykunin, VS Shalaev - Moscow: Forestry, 1986. - 280 p.
9. Ugolev B.N. Wood science with the basics of forest commodity science. - Moscow: Forestry, 1986. - 368 p.
10. Keller R. Journal of International Des Sciences de la vigne du vin. L'élevage des vins. Les chênes dans le monde. Les chênes de tonnellerie en France: Quercus petraea et Quercus robur / R. Keller The number of horses in 1998. - P. 7 - 30.
11. Marshe M. Etude theoritique with cognac, a composition and don viellsement naturel an tuts de cheme. Station viticola de Cognac / M. Marshe, T. Joseph // Revue Francais d'Oenologie. - 1975. - No. 57. - P. 1 - 96.
12. Vivas N. Manuel de tonnellerie à l'use des utilisateurs de futaille / N. Vivas // Editions Féret. - Bordeaux - 2002. - P. 207.

Released on 10/17/2014.