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Domestic rare forest tree species – help to the processing industry?

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ABSTRACT: Rare forest tree species that are necessary for the domestic processing industry, especially for the furniture industry, currently occur as scattered trees in many forest stands in the Czech Republic. For their harvest and supply to the processing industry it is necessary to measure their dimensions and growing stock. Logging technologies are proposed that will enable to harvest and transport this scattered wood mass to buyers. These technologies and used conveyances must not cause any damage either to forest soil or to adjacent stands and they should be economic, i.e. increased costs of processing must be covered by selling price.

Keywords: rare tree species; wild cherry; logging system; sorting

Sources of rare tree species

Currently, there is a great demand for many exotic or rare tree species in the wood market; due to their shortage they are bought in other countries by the wood processing industry, and especially by the furniture industry. From the aspect of customers' interest, these are trendy, sought after and asked for tree species. Besides the purchase of assortments of these tree species, some products such as veneers or semi-finished products are bought. Demands on these tree species are relatively variable according to vogue waves as for the tree species, colour and type of finish (veneer, "solid wood", polish) but the vogue waves relatively frequently recur. Consumers demand domestic tree species such as wild cherry (*Cerasus avium* L.), black alder (*Alnus glutinosa* L.), wild service tree (*Sorbus torminalis* L.), common yew (*Taxus baccata*), wild pear (*Pyrus pyraster*), etc. These tree species occur in Czech forests very frequently as an admixture that is not a part of management complexes, so they are not usually planted and they are not entered in management records (Kobliha 2002). Many times they are sizeable trees up to 30 m in height, with relatively large diameters at mean diameter, that can be used for the production of veneers by slicing or rotary cutting and so called solid wood. The wood of these tree species has a marked texture, often of darker colour, very impressive after its working.

Besides the above-mentioned examples of tree species it is possible to cite other tree species permanently demanded especially by the furniture industry (Zeidler 2001). These tree species are generally represented in this country's forests, and they are harvested in the framework of cuttings planned by forest management plans (FMP). They involve mainly English oak and durmast oak (*Quercus robur* and *Q. petraea* L.), wych elm (*Ulmus glabra*), sycamore maple and Norway maple (*Acer pseudoplatanus* and *A. platanoides*), European ash (*Fraxinus excelsior* L.) and many others.

It is very difficult to determine percentages of these tree species in forest stands. Because they are admixed tree species, often as a small number of single interspersed trees, they are recorded as species representation in total growing stocks. Only if management books are examined with the intent to seek out these tree species, in forest stand descriptions it is possible to find notes about the occurrence of these tree species, recorded as a part of "other species". If they are recorded in the species repre-

sentation, by an excerpt from FMP or from central records kept by the Institute for Forest Management (IFM) in Brandýs nad Labem it is possible to acquire necessary data on the size (height, diameter at breast height $d_{1.3}$) and volume according to forest stands. For further processing of FMP it is therefore necessary to claim a detailed description of the tree species composition of particular stands aimed at interspersed tree species of larger size with the minimum limit e.g. $d_{1.3}$ from 20 cm and more and height from 15 m and more; so it will be possible to monitor these tree species centrally, in terms of their spatial distribution and volumes that are or will be at disposal.

Logging system

For scattered cuttings of these tree species a technology very similar to logging methods of tending measures – thinnings should be used. Contrary to tending measures cut trees are of larger mean stem volume, so it is required to develop the technological procedure more carefully and precisely, to prepare detailed access to cutting areas, to propose higher-performance conveyances for their transport to roadside landing and to meet a requirement to reduce soil damage caused by the used conveyances.

Cuttings are carried out with motor-manual implements (power saws), by standard technological procedures with a greater emphasis on labour safety and protection while hang-ups of cut trees may be more frequent posing a greater risk from the aspect of labour safety. Logging technology must satisfy these requirements and also transport routes. But it may cause subsequent damage to other trees in the stand if they are not harvested during such cutting and processing of rare tree species. Hence the other loggers' tools should be used to a larger extent: ancillary winches for bringing down hung-up trees, log chains to prevent the breakage of stems and the loss of wood in the most precious part of the stem – butt, etc. Logging mechanisation, harvesters, can be used only if whole stands are cut or for complex thinnings because their use for the selection of single trees is costly.

Mechanisation used for *skidding* in cuttings of this type must ensure performance corresponding to the mean stem volume of cut trees, which may often be large (1.5–2 m^3/stem). Practically it applies to adapted general-purpose wheeled tractors (GWT) with forest attachments. The use of special wheeled skidders (SWS) is recommendable from the aspect of their performance. If these machines are used, greater hazard of soil erosion restricts their use for concentrated loggings when the removal of consequences at soil damage is easier. Cableways can be used on steep slopes, but greater concentration of wood is required, so their use for this type of skidding is very limited. Ca. 50 m^3 of wood per cableway line is considered as minimum skidding. Draft animals seem to be the most suitable means as they can work also on steeper slopes even though in a downslope direction. They cause minimum damage to soils and adjacent trees.

Hauling conveyances are standard like those used in ordinary cuttings. Sets of conveyances for the transport of logs or shortwood are used.

Job engineering poses considerably greater demands on the preparation of working sites. It is necessary to identify whether the tree species occur as single trees

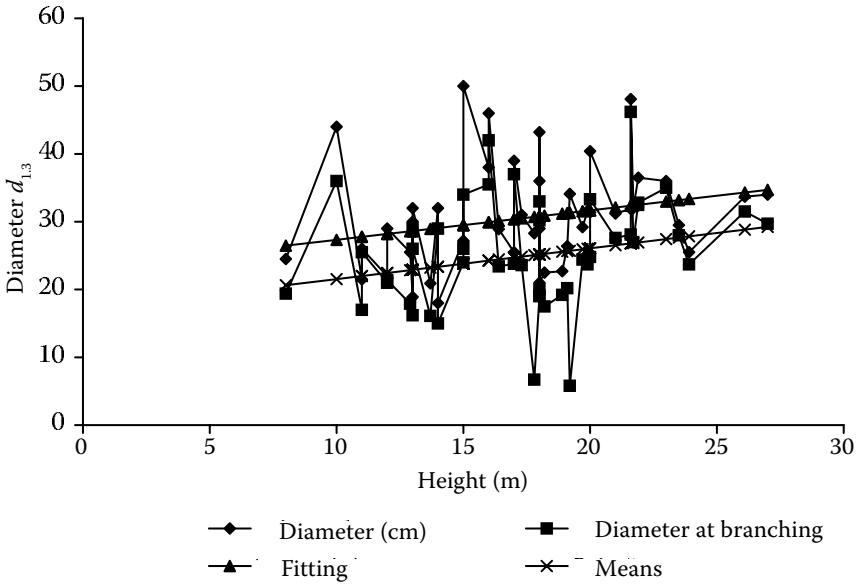

Fig. 1. All measured cherry trees

Table 1. Assortment tables – Cherry – Service tree According to the standard CSN P ENV 1927-1

Dimensions	Unit	Cherry	Service tree	Cherry	Service tree
		veneers		rotary cutting – plywood	
Min. top end	cm	45	45	28	28
Max. butt end	cm			70	70
Min. length	m	3	3	5	5
Max. length	m	10.5	10.5	10.5	10.5
Gradation of lengths	cm	10	10	50	50
Overlength	cm	10	10	2%	2%

or in groups and whether cuttings will be carried out as selection of required species or as a part of overall shelterwood or compartment cuttings. Shelterwood or compartment cuttings do not imply any deviations from standard requirements except the need of sorting according to the tree species on the roadside landing or later at the conversion depot. The marking of a suitable log dump in the locality roadside landing (RL) is easy, especially if there is space enough. From the aspect of job engineering the situation is more complicated if the tree species occur in groups or as single trees while cuttings corresponding to shelterwood cuttings are carried out (identified – selected – trees of rare species are cut). It is necessary to lay out and to mark the skidding line appropriately for a skidding means to prevent soil damage by erosion and damage to adjacent trees. Shortwood technology is the best of all (tree-length logs are shortened or shortwood is produced in order to reduce damage to adjacent trees to a minimum). It is not recommended to use harvester technologies for selection cuttings. Harvester technologies are suitable for softwood cuttings. Neither automated nor semi-automated shortwood production allows to ensure maximum accuracy, especially length accuracy, and defects of processed trees are difficult to detect. It may lead to inaccuracies that will decrease the resultant price of the supplied tree species. Manual or semi-mechanical handling of this shortwood is advisable while the permitted limits of requirements for shortwood are maximally utilised.

The requirements for dimensions or defects of these tree species have not been set down for particular tree species but they can be deduced from standards. For these purposes we should use assortment requirements for quality classes I, II or III. Assortments of lower classes are not suitable for the

Table 2. Assortment tables – Cherry – Service tree According to the standard CSN 48 0056

Dimensions	Unit	Cherry	Service tree	Cherry	Service tree
		veneers		rotary cutting – plywood	
Min. top end	cm	30.0	30.0	20.0	20.0
Max. butt end	cm				
Min. length	m	1.6	1.8	1.3	1.3
Max. length	m			10.5	10.5
Gradation of lengths	cm				
Overlength	cm				

Table 3. Recommended rules effective since 1. 1. 2003

Dimensions	Unit	Cherry	Service tree	Cherry	Service tree
		veneers		rotary cutting – plywood	
Min. top end	cm	45	45	28	28
Max. butt end	cm			70	70
Min. length	m	2.7–3.0	2.7–3.0	5.0	5.0
Max. length	m	5.0–6.0	5.0–6.0	10.5	10.5
Gradation of lengths	cm	10	10	50	50
Overlength	cm				

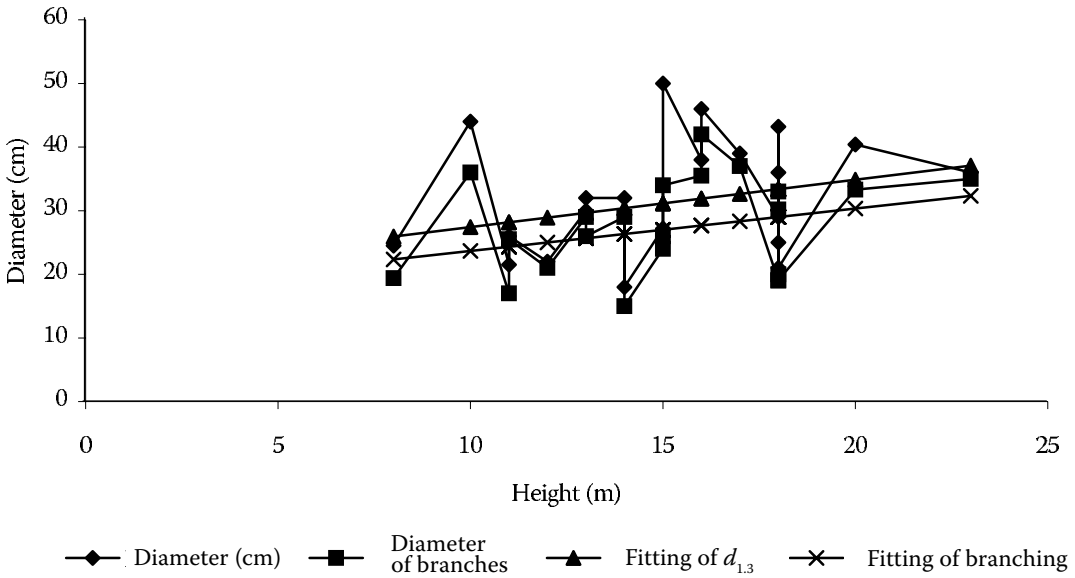

Fig. 2. Cherry – trees from the area of Sokolov spoil banks

purposes and requirements of the furniture industry any more. The following tables show a comparison of these requirements.

Different requirements for dimensions of supplied assortments are in Table 1.

To compare what dimensions exist in the tree species *wild cherry* its occurrence was measured on four plots: Bílina, reclaimed plots Sokolov and Kostelec nad Černými lesy-Pěnčice and Šarovec pond. Results of measurements of cherry-trees of diameter at $d_{1.3}$ larger than 20 cm (46 trees in total) are represented in the following graph. It is the relationship between tree height, its diameter at $d_{1.3}$ and diameter at the place of branching (i.e. logs of the quality class saw logs and higher). Trees smaller than 15 m and of diameter $d_{1.3}$ below 20 cm were discarded from the set during measurements (their dimensions are given in complete material – Gross 2001).

Measurements were done with telerelascope, and diameters were measured at $d_{1.3}$ and at the place of branching. Total height and height at the place of branching were also measured. Diameter at $d_{1.3}$ was measured with calliper for control. Graphs represent only the relations for total height and diameter at the place of branching and at $d_{1.3}$.

Table 4. Numbers of measured trees that were included in the calculation

	Volume of log	Total	Percentage	Number
Šarovec	3.615	6.221	58.110	10
Pěnčice	6.799	11.305	60.142	14
Bílina	3.828	6.847	55.908	8
Sokolov	5.104	6.885	74.132	14
SUM	19.346	31.258	61.891	46

Very interesting results were obtained in cherry-trees planted on reclaimed spoil banks at Sokolov in 1962. Their dimensions, i.e. those of stems of very high quality and relatively large volume of suitable logs, indicate that intentional planting of good-quality plants may result in the provision of necessary good-quality raw material for the furniture industry from our own sources in future. As it is also an interspersed tree species and the number of its trees may be substantially higher, its harvesting need not be carried out at the time prescribed by FMP, but it is possible to wait with its cut until there arises a great demand for it in the market and it is evaluated by a very good selling price, which will be more interesting for the buyer than imports from abroad.

DISCUSSION

New requirements of the processing industry that were agreed and published in the document "Recommended Rules", especially for the top end diameter and overlengths, imply a decrease in the suitable volume of logs processed for this industry. It is a price issue for the future whether a suitable domestic tree species (from the diameter aspect) will make the industry diminish these requirements or it will be more interesting for the industry not to adapt to domestic conditions and to import the necessary raw material. At the same time foreign manufacturers will have an opportunity to enter in this trendy market with their trendy and high-quality products that are however markedly more expensive.

CONCLUSION

The proposed method for a comparison of possibilities of using rare tree species is described in the first part of this paper. As suitable single trees and mainly admixed tree species in forest stands are relatively scarce, it is necessary to continue seeking out these tree species and to enlarge the base of measured trees also in other areas. It does not mean that in operational conditions we should not claim from forest owners and especially from large proprietors (LČR – Forests of the CR, VLS – Military Forests and Farms) to include the wild cherry and service tree as an admixed stabilisation and improvement tree species in suitable management complexes. With regard to the long production period it will be desirable to present this claim to owners. By its implementation the owners will solve the problem of improvement and stabilisation tree species that is laid down by Forest Act, and in future they will get a chance to sell the valuable raw material at a good price. It is also necessary to recommend to Ministry of Agriculture to establish in cooperation with Ministry of Industry a suitable subsidy title of support to the admixture of rare tree species to the species composition of regenerated forest stands.

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Vzácné lesní dřeviny – pomoc zpracovatelskému průmyslu?

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ABSTRAKT: Vzácné lesní dřeviny, které jsou potřebné pro domácí zpracovatelský průmysl, zejména nábytkářský, se v současnosti vyskytují rozptýleně v řadě porostů v České republice. Pro jejich vytěžení a dodání těmto zájemcům je nutné zjistit jejich rozměry a objem zásob. Zároveň se navrhují těžební technologie, kterými je možné tuto rozptýlenou hmotu vytěžit a dopravit až k odběratelům. Tyto technologie a použité prostředky musejí být bezeškodné jak pro porostní půdu a okolní porosty, tak musejí být ekonomické, tj. zvýšené náklady na zpracování musí pokrýt prodejní cena.

Klíčová slova: vzácné dřeviny; třešeň ptačí; těžební technologie; sortimentace dřevin

Nedostatek vzácných dřevin řeší nábytkářský průmysl nákupem ze zahraničí. Jde často o dřeviny z hlediska zájmu zákazníků módní a tím velmi vyhledávané, požadované i dobře placené. Požadavky na tyto dřeviny se mění relativně často s probíhajícími módními vlnami zájmu o dřevinu, barvu i druh provedení (dýha, „masiv", lesk), ale módní vlny se relativně často vracejí. Zájem je i o tuzemské dřeviny, např. třešeň ptačí (*Cerasus avium* L.), olši lepkavou (*Alnus glutinosa* L.), jeřáb břek (*Sorbus torminalis* L.), tis červený (*Taxus baccata*), hrušeň planou (*Pyrus pyraster*) apod. Tyto dřeviny se v našich lesích velmi často vyskytují jako příměs, která není součástí hospodářských souborů, takže se běžně nevysazují a často nejsou vedeny ani v hospodářské evidenci. Dřevo těchto dřevin s výraznou texturou je po opracování velmi působivé.

Zjištění podílu těchto dřevin v lesních porostech je velmi obtížné. Protože jde o příměsi, často jednotlivě roztroušené ve velmi malém objemu, v celkových

porostních zásobách jsou vedeny jako zastoupení. Teprve po podrobném pročtení hospodářských knih se záměrem vyhledat tyto dřeviny se najdou v popisu porostu poznámky o výskytu těchto dřevin – často jsou uvedeny jako součást „ostatních dřevin". Pokud jsou uvedeny v zastoupení, je možné výpisem z LHP nebo z centrální evidence v rámci Ústavu pro hospodářskou úpravu lesů v Brandýse nad Labem (ÚHÚL) získat potřebné údaje jak rozměrové (výška, průměr v $d_{1,3}$), tak objemové podle porostů.

Rozptýlené těžby těchto dřevin je nutné řešit technologickým postupem, který se nejvíce blíží těžebním postupům ve výchovných zásazích – probírkách. Na rozdíl od výchovných zásahů jsou zpracovávané stromy větší hmotnatosti a vyžadují tedy pečlivější a přesnější zpracování technologického postupu, podrobné zpřístupnění těžebních prostorů, navržení výkonnějších prostředků pro jejich dopravu na odvozní místo s požadavkem na snížené ohrožení půd použitými prostředky.

Pro potřeby porovnání rozměrů dřeviny *třešeň ptačí* bylo provedeno měření jejího výskytu na čtyřech plochách: Bílina, rekultivační plocha Sokolov, Kostelec nad Černými lesy-Pěnčice a rybník Šarovec. Měření se provádělo pomocí telerelaskopu a měřil se průměr v $d_{1,3}$ a v místě větvení kmene. Výška se měřila jak celková, tak v místě větvení kmene. Kontrolně se zjistil průměr v $d_{1,3}$ pomocí průměrky.

Velmi zajímavé výsledky jsou zjištěny u třešní vysazených v roce 1962 na rekultivovaných výsypkách v Sokolově. Jejich rozměry, velmi kvalitní kmeny s relativně velkým objemem vhodných výřezů ukazují, že záměrné vysazování kvalitních sazenic může v budoucnosti vést k zajištění potřebné kvalitní suroviny pro nábytkářský průmysl z vlastních zdrojů. Protože jde i v tomto případě o vtroušenou dřevinu, jejíž počet jedinců může být podstatně vyšší, není nutné provádět těžbu v době stanovené LHP, ale je možné s její těžbou vyčkat až do doby, kdy se objeví výrazná poptávka na trhu a bude ohodnocena i velmi dobrou prodejní cenou, jež bude pro odběratele zároveň zajímavější než import ze zahraničí.

Nové požadavky zpracovatelského průmyslu, dohodnuté a uveřejněné v materiálu *Doporučená pravidla* zejména na čepový průměr i nadměrky, znamenají snížení vhodného objemu zpracovávaných stromů pro tento průmysl. Do budoucnosti je cenovou otázkou, zda vhodná domácí dřevina (z hlediska průměru, případně délek sortimentů) bude nutit průmysl ke snížení těchto požadavků, nebo zda pro něj bude zajímavější nepřizpůsobovat se domácím možnostem, ale importovat potřebnou surovinu. Zároveň je zde ponechána možnost zahraničním výrobcům tento módní trh obsadit svými módními a kvalitními, ale výrazně dražšími výrobky.

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