

USE OF WILD CHERRY AS A SITE-IMPROVING AND STABILIZING TREE SPECIES*

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Ameliorative and stabilizing tree species (ASTP) established in the forest through stand regeneration represent one of few legal demands on the forestry sector. The introduction and silvicultural care for these species is an economical load increasing silvicultural expenses and lowering the economical effectiveness of forest management. Plantation of ASTP is subsidized by the state administration. Among the ameliorative and stabilizing tree species there are some, which are able to supply a timber, being more valuable comparing to the climax, or main commercial species. One of these species is the Wild cherry (*Cerasus avium* (L.) Moench), which could be – however – planted only on specific sites. The article proposes the optimum ratio of wild cherry in the forest stands and generalizes the results for some others noble hardwoods and light demanding admixed species, belonging by the law to the list of ameliorative and stabilizing tree species. Our results suggest the optimum proportion of wild cherry in forest stands at 25–30% of total stand basal area in the condition of even-aged forest stands when wild cherry is kept in the main canopy layer (dominant and/or co-dominant trees). Other light demanding trees with a valuable timber are assumed to have similar proportion optimum.

wild cherry; ameliorative and stabilizing tree species; production; noble hardwoods; share of wild cherry

INTRODUCTION

There is a legal demand for newly established forest stands to have certain proportion of the so-called site improving (ameliorative) and stabilizing tree species [ASTP] in the Czech Republic (Regulation No. 83/1996 Coll.). For forestry practice this legislative obligation means in many cases lower stand production. However, there are some tree species, which fulfill the role of ASTP and at the same time they could increase the production not only in terms of stand volume but also in value production. In addition, they fulfill not only production function of forests but also non-production functions – namely aesthetic and recreational values.

One of the species with this potential is the Wild cherry (*Cerasus avium* (L.) Moench), proposed as site improving species for instance in the site units (CHS) 25, 31, 35, and 45 (Podrázský, 2003, 2005). On these relatively rich sites, Wild cherry produces the timber of high quality, demanded by the wood industry (Bluďovský, 2001; Podrázský et al., 2002), at the same time influencing positively the site (Podrázský, Liao, 2001, Podrázský, Remeš, 2007). The main silvicultural problems are represented by its low occurrence in the forest stands and by bad management practices failed to keep the species in good conditions (Podrázský et al., 2002). Wild cherry has poor competition capacity and therefore their crown should be kept in the

main crown layer assuming by thinning from above enough space for its crown development (Kupka, 2002, Stojecová, Kupka 2009). A large crown is one of the most important prerequisites for good growth of wild cherry trees but it makes large knots on the stem (Kupka, 2007). Also it is crucial to secure high quality standard for Wild cherry plants used for reforestation to get good field performance of the plantations (Kupka, 2003). The target of the presented article is to analyze stands with more frequent Wild cherry occurrence and to formulate the way of its convenient silviculture.

MATERIAL AND METHODS

The main problem was to find stands homogeneous enough with variable proportion of Wild cherry trees. There were two stands on the School Training Forest Territory in Kostelec nad Černými lesy, of medium age (Penčice locality, stands 39A5, 38D4), where 9 circle plots of 100 m² were established. The stand 39A5 was of age 62 (2001), site quality was determined as site type 3S1, management unit No 446. The stand 38D4 was of age 52 (2001), the site conditions are characterized by the forest type 4S1 and 4P1, other characteristics were similar. Soils could be characterized as Luvisols. Majority of plots were in the forest site 4S1, which is considered as convenient

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for this species, being declared as site improving and stabilizing species there.

The 9 circle plots covered the main occurrence of the wild cherry in the studied stands, the character of distribution was very random and cherry was admixed species at different proportion. On each plot, the inventory of tree compartment was provided, measuring position of the tree (azimuth and distance from the plot center), DBH, height of each tree. Basal area was calculated using two diameters as well as the volume, using volume tables for beech, which has similar stem form.

RESULTS AND DISCUSSION

Results from the year 2001 show the importance and variable role of the Wild cherry in the stand structure. In this stage of knowledge– it could be summarized as silvicultural rules for Wild cherry management:

Individual trees reach the height of 20–27 m and diameter at breast height 20–42.1 cm (volume up to 1.91 m³), high quality stems should be pruned to solve the problem of large crown needed for good increment and at the same time knotless stem, wild cherry should keep dominant position in the stand structure (the condition, which is different to the other hardwoods – e.g. lime tree, oak, alder, ash, hornbeam, maple, wild cherry growth is comparable to our domestic conifers (pine, spruce and larch), in terms of diameter, height, basal area as well as volume, maximum basal area as a proportion of total stand basal area for wild cherry is between 30–40% (competition capacity of wild cherry was evaluated on research plots where its representation varies between 8–55% on particular plots), our

data suggests that the presence of the Wild cherry in the stands could increase the total stand volume between 10–30%, giving the optimum of the wild cherry presence between 25–30% (Table 1), these species composition enables to form high quality stems as higher wild cherry presence create higher competition in crown layer even from the same species.

Wild cherry requires dominant position in the stand structure, the minimal contact between individual tree crown is desirable, the accompanying species are also of decisive influence on the cherry tree growth and quality. These species should be adequate to the site, the cherry is becoming the main production species and the 'basic' species is complementary, the mutual relation between species is of high interest in the future.

Due to high quality timber of wild cherry trees (Table 2) can improve the value production of a stand (Podrázský et al., 2002; Podrázský, 2003). Moreover, there is an evidence of its favorable effects on the forest soils (Podrázský, Remeš, 2007). This species has a unique position among other broad-leaved species. It supplies timber of a very high quality but it is very sensitive to inappropriate silvicultural treatments. In general, for the so-called site improving and stabilizing tree species can be on the basis of results obtained to summarize and suppose: for majority of forest management units, the species can be found with more valuable timber comparing to main commercial species managed at this site – beech, pine, even oak, these species are light demanding in many cases and need the position in the main stand level even above it, the optimum admixture is 25–30%. In this case the maximum volume production can be expected as well as the maximum mean stem dimensions, the good

Table 1. Proportion, basal area and volume of the standing stock on particular research plots

| | | | | | | | | | |
|-----------------------------------|------|------|------|------|------|------|------|------|------|
| Wild cherry stand proportion (%) | 8.3 | 22 | 28.5 | 37.5 | 40 | 43 | 45.5 | 50 | 55.5 |
| Basal area (m ² /plot) | 0.26 | 0.50 | 0.57 | 0.49 | 0.42 | 0.35 | 0.36 | 0.23 | 0.38 |
| Volume (m ³ /plot) | 2.08 | 6.10 | 7.18 | 5.79 | 5.10 | 4.34 | 4.05 | 2.46 | 4.37 |

Table 2. Assortment prices (CZK/m³) of selected tree species

| Tree species | Assortments (quality class) | | | | |
|--------------------------|-----------------------------|-----------|--------------|----------|----------|
| | I. class | II. class | III A. class | V. class | Firewood |
| Norway spruce | 3611 | 3041 | 1875 | 649 | 336 |
| Scots pine | 3450 | 2631 | 1497 | 642 | 336 |
| Oak | 9737 | 4730 | 2718 | 545 | 476 |
| European beech | 6004 | 3005 | 1915 | 616 | 476 |
| Wild cherry | 12000 | 8000 | 3000 | 600 | 350 |
| Wild pear | 12000 | 8000 | 3000 | 600 | 350 |
| Wild apple | 11000 | 8000 | 3000 | 600 | 350 |
| Rowan trees | 15000 | 10000 | 5000 | 600 | 350 |
| Share of wild cherry (%) | 0.8 | 7.2 | 25 | 55 | 12 |

After Blud'ovský (2001)

timber trade is missing for many assortments, and therefore the demands do not meet real production, these silvicultural approaches increase the biodiversity of forest stands, meet the society demands for mutual forest functions, without decreasing productivity and production value, there is a need of more qualified silvicultural approach.

CONCLUSIONS

Our data proved high production potential of wild cherry trees belonging to the so-called 'ameliorative and stabilizing tree species (ASTP)' and at the same time belonging to noble hardwood species. These species could increase considerably the value production of the stand provided that proper silvicultural measures will be used. The optimum proportion for the wild cherry in forest stands is between 20 to 30%. As light demanding species the silvicultural regime should secure open space for their crown development keeping them in dominant or co-dominant position in the stand structure. The others species could become filling species keeping them in sub-dominant position, which could create problems for those species, which are light demanding. The common uses of wild cherry in our forest on appropriate sites need to have more discussion in forest professional community to take into account all important aspects.

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Využití třešně ptačí jako meliorační a zpevňující dřeviny

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Nutnost zajištění odpovídajícího zastoupení melioračních a zpevňujících dřevin (MZD) při obnově lesních porostů představuje jeden z mála zákonných požadavků kladených na lesního hospodáře. Obvykle je považována za ekonomickou zátěž hospodaření, zvyšující náklady a snižující efektivitu lesního hospodářství. Proto je výsadba MZD finančně dotována. Mezi druhy, které jsou na odpovídajících stanovištích považovány za odpovídající zákonným požadavkům, patří i třešeň ptačí (*Cerasus avium* (L.) Moench). Příspěvek dokumentuje stanovení optimálního zastoupení této dřeviny, kterou na některých hospodářských souborech lze považovat současně i za MZD. Zároveň tato dřevina patří mezi cenné listnáče schopné produkovat kvalitní výřezy vysoké jakosti. Tyto dřeviny jsou většinou náročné na světlo a vyskytují se v lesních porostech v příměsí. Optimální zastoupení třešně bylo stanoveno na 25–30 % jedinců ve stejnověkových porostech a v hlavní úrovni. Problémem zůstává volba vhodné výplňové dřeviny a rovněž vhodně prováděné vyvětvování, které musí zabezpečit hladkou bezsukatou spodní část kmene. U ostatních na světlo náročných dřevin s vysokou hodnotovou produkcí lze předpokládat podobné optimum zastoupení. K lepšímu využívání této dřeviny v našich lesích by bylo žádoucí rozvinout širší odbornou diskusi, týkající se všech aspektů jejího pěstování.

třešeň ptačí; zpevňující dřeviny; produkce; cenné listnáče; zastoupení třešně v porostu

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