TREE BARK – POTENTIAL, DISTRIBUTION AND USE IN FINLAND

Due to its diverse chemical composition, tree bark could emerge as a potential raw material for various biorefining processes. The processing degree of bark is low as it is mainly burned for energy. Hence, biorefining could offer substantial added value to this abundant biomass assortment. The total volume of bark in Finland is large, yet it is not utilized in full extent. If bark is to be considered as a potential raw material for new industrial processes, its availability and geographical distribution should be well known.

HARVESTED BARK

Currently, bark is separated as a by-product of roundwood in forest industry. Therefore the quantity of available bark depends on the current roundwood harvesting levels. The amount of harvested roundwood in Finland varied from 41 to 57 million m^3 during the years 2002-2011 with an average of 52 million m^3 (including bark). The share of bark in roundwood was estimated by using biomass models, which give estimates of all biomass components in relation to tree size. On the basis of the average roundwood harvesting levels of 2002-2011, ca. 5.6 million m^3 of bark was harvested in Finland. 35 % of that was pine bark, 41 % spruce and 24 % of broadleaved species, mainly birches. In Central Ostrobothnia, the corresponding bark volume was 86 000 m^3. Some of the bark potential is not separated from stem wood, but is utilized directly in energy production as a part of wood chips made from small diameter thinning wood. In 2011, 4.3 million m^3 of smallwood chips were used in energy production. Around 0.6 million m^3 of this chip volume consisted of bark.

FOREST RESERVES

The full harvesting potential of forest biomasses is currently not utilized. In other words, even with the maximum harvesting levels from the last decade there is a surplus of roundwood and bark left in the forests. The maximum harvesting potential was estimated from harvesting suggestions obtained from the 10th national forest inventory (NFI). If this estimated felling potential was utilized, the total harvestable roundwood quantity would be ca. 63 million m^3 in the whole country. This would mean 6.9 million m^3 of bark per year. Compared to the average harvesting level, it could be estimated that a potential surplus of 1.3 million m^3 of bark remains annually in the forests (13 000 m^3 in Central Osthrobotnia).

CURRENT UTILIZATION

In 2011, 6.6 million m3 of bark was separately used in energy production. Majority of this bark was obtained from domestic roundwood harvestings, but the total quantity also includes bark from imported wood (ca. 10 million m3 of wood is imported annually). In the light of these figures, it appears that all of the harvested bark is in full use.

GEOGRAPHICAL DISTRIBUTION

The harvestable forest reserves of bark are concentrated towards Southern and Eastern Finland due to the highest volume of growing stock in these areas. Also areas close to the western coast have high bark potential. However, roundwood fellings are most intensive in the east and south-eastern parts of the country, therefore the quantity of actual harvested bark is emphasized in those regions. Most unused bark potential can then be found from areas close to the western and southern coasts.

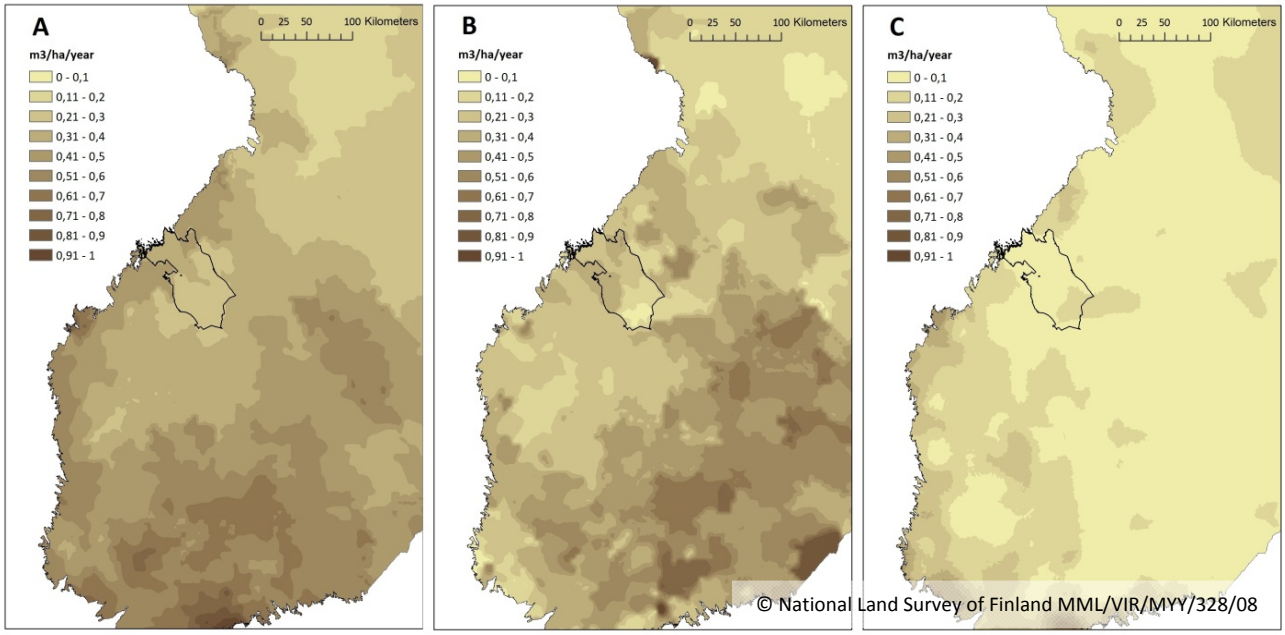

Figure 1. [A]: Harvesting potential of bark (volume per area of forest land) as estimated on the basis of 10th NFI; [B]: Volume of harvested bark on the basis of the average harvesting level for 2002-2011; [C]: Surplus of bark, i.e. harvested volume is extracted from the full potential. The province of Central Osthrobotnia is outlined in the maps. Harvesting statistics [B]: Metla/MetINFO.

LITERATURE

Repola J. 2008. Biomass equations for birch in Finland. Silva Fennica 42.
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