Chaga Cultivation

Chaga cultivation brings additional income for Finnish forest owners and creates business opportunities.

Michael den Herder,
European Forest Institute, michael.denherder@efi.int
May 2022

This info card was prepared as part of the project North Karelia – China cooperation in forest bioeconomy development (KIBIO, project number A75112). KIBIO is funded by the Regional Council of North Karelia through the European Regional Development Fund.

Chaga mushroom growing on birch.
Source iStock.com/amarinchenko

Chaga *Inonotus obliquus* is a common wood-decaying fungus growing on birch. Chaga has been used in Finnish folklore medicine for centuries due to its perceived health benefits. In Finland, industrial-scale production of chaga for a tea product called “tikkatee” (woodpecker tea) began in the 1930s (Miina et al. 2021). In Chinese traditional medicine, medicinal mushrooms have been used for thousands of years as foods to maintain good health and as medicine to treat disease (Lee et al. 2012). The largest market for chaga is currently in Asia.

Chaga mushrooms are collected from forests (naturally grown chaga) as well as cultivated in China, but the country also imports significant amounts of this mushroom species as its demand in the functional health-food sector is high and still growing. The amounts of chaga produced in Finnish forests is currently low. Therefore, there would be an opportunity for Finnish forest owners and SMEs to increase chaga production through cultivation in Finnish forests which can bring additional income for forest owners. Some innovative businesses have specialized in cultivating chaga mushrooms in forests. Other Finnish companies have specialized in further processing chaga and other medicinal mushrooms into powders and extracts what can be used as a food additive or be consumed as tea. In addition, chaga mushrooms are used in wide variety of beverages, cosmetic, health and hygiene products.

How to cultivate chaga mushrooms?

Chaga mushrooms are cultivated on living birches. Birches are inoculated with 3-4 dowels (a wooden plug) containing the mushroom mycelia by inserting these into small holes which are drilled in the tree. Chaga mycelia are cultured in a laboratory and there are several Finnish companies specialized in culturing these.

Due to its rather slow growth, chaga cultivation fits best in low yielding birch forests outside commercial forest management. As chaga cultivation doesn’t need much management apart from inoculation and harvesting, it is also suitable for forest owners who live far away from their forest or for people without much time.

There are forest service providers who offer courses on chaga cultivation where the forest owner learns how to inoculate the birches him/herself. Depending on the needs of the client, there are also forest service providers who can take care of the whole process from inoculation of trees, harvest of chaga, and sales.

After inoculation, the first chaga mushrooms are harvested after 5-9 years. For each birch tree it is possible to get about 2-4 harvests.

Chaga mushrooms promoting eco-efficiency and health

Low yielding birch stands are very abundant in Finland. Chaga cultivation may be difficult to combine in intensively managed and the most productive birch *(Betula pendula)* stands but in low productive stands *(B. pubescens)* it would be an opportunity to earn some additional income (Miina et al. 2021).

Mushroom cultivation is an eco-friendly production method which can increase land use efficiency. It is an ecologically friendly way of increasing food production in forests. Instead of producing only wood as a raw material, the forest now also delivers high quality mushrooms which can be used as food supplements and in health and cosmetic products. In addition, chaga cultivation can be combined with birch sap production.

After about 15 years after 2-4 harvests the tree usually dies. Nevertheless, the tree can still be harvested and sold as fire or fibre wood or used as mulch for compost or soil improvement. In addition, the cultivation of chaga in low-yielding birch stands, or the joint production of birch sap and chaga, can contribute to the creation of dying and dead wood with beneficial effects on biodiversity.

There exists a large market for chaga in Asian countries and the current demand is higher than the supply. The demand for chaga is expected to grow even further in the future. The chaga value chain already exists, but the sales volumes are small in Finland. Most chaga sold in Finland and exported from Finland is naturally grown chaga collected from forests. As active cultivation only started recently, more research is needed to obtain reliable yield estimates (Miina et al. 2021). Nevertheless, chaga cultivation could be a profitable activity, especially in set-aside forest. The value of fresh chaga is about 20 €/kg and further processing can increase the value markedly (e.g. chaga powder or chaga tea 300 €/kg)(Piispanen 2017). The most valuable chaga products are sold as instant extract powder or liquid having a price of about 1000 €/kg (Verkasalo et al. 2017).

To develop the Finnish chaga value chain, chaga cultivation in Finland needs to be increased to guarantee a more stable supply of both raw material and processed products for the importing Asian countries. A growing demand for raw chaga could be fulfilled by systematic and organized cultivation of the species (Verkasalo et al. 2017).

Mushroom cultivation can provide a significant additional income for forest owners and can make forest management more eco-friendly and profitable.

Chaga mushroom cultivation can increase the profitability especially in low yielding birch stands outside commercial forestry use.

Chaga cultivation increases eco-efficiency by producing food, nutritional supplements, ingredients for healthcare products or medicine in addition to wood production.

Further information

Kääpä Forest – Forest service provider cooperating with forest owners running a network of chaga cultivation sites **https://www.kaapaforest.fi/**

Lee, K.-H., Morris-Natschke, S.L., Yang, X., Huang, R., Zhou, T., Wu, S.-F., Shi, Q., Itokawa, H., 2012. Recent progress of research on medicinal mushrooms, foods, and other herbal products used in traditional Chinese medicine. J Tradit Complement Med 2, 84–95.

Miina, J., Peltola, R., Veteli, P., Linnakoski, R., Escribano, M.C., Haveri-Heikkilä, J., Mattila, P., Marnila, P., Pihlava, J.-M., Hellström, J., Sarjala, T., Silvan, N., Kurttila, M., Vanhanen, H., 2021. Inoculation success of Inonotus obliquus in living birch (Betula spp.). Forest Ecology and Management 492, 119244. **https://doi.org/10.1016/j.foreco.2021.119244**

Nyyrikki Metsäpalvelut – Forest service provider based in Rääkkyla in North Karelia providing equipment and services for chaga and reishi cultivation as well as other species **https://www.nyyrikinmetsa.fi/**

Piispanen, H. 2017. ”Paljon puhetta pakurista” - Metsänomistajien näkemys. Uusia tuotteita metsästä seminaari 29.03.2017 Rovaniemi, Lapin AMK. Available online at: **https://www.lapinamk.fi/loader.aspx?id=dfe98776-b33f-48f6-803b-196953319878**

Verkasalo, E., Heräjärvi, H., Möttönen, V., Haapala, A., Brännström, H., Vanhanen, H., Miina, J. 2017. Current and future products as the basis for value chains of birch in Finland. In: Möttönen, V. and Heinonen, E. (eds.) Proceedings of the 6th International Scientific Conference on Hardwood Processing. Natural resources and bioeconomy studies 80/2017, pp 81-96.