

It begins with trees

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A look at how Enso-Gutzeit Oy raises its raw material

"Finland is a country of forests," says Jukka Pekkarinen, "because 66% of our land area is covered with trees." About 97% of those 225,430 km² are dedicated to growing trees to be harvested.

According to Pekkarinen, director of silviculture for the company's Imatra-based forestry division, three main tree species grow in Finland: Scotch pine (*Pinus silvestris*), Norway spruce (*Picea abies*), and birch (*Betula pendula pubescens*). Of the total plantation area, 50% is dedicated to pine, 45% to spruce, and 5% to birch.

The plantation area of other species is minimal. Small amounts of oak, elm, and beech are planted on Finland's southern coast but their numbers are small.

Tree maturity depends on forest type and climatic conditions. In middle and southern Finland where Enso operates, pine trees take 75–115 years to mature, spruce average 75–90 years, and birch take 55–70 years. A tree growing in northern Finland may take decades or centuries more to mature, says Pekkarinen.

Enso's Forest Operations, headquartered in Imatra, oversee 470,000 hectares (1.16 million acres). Of that land, nearly 14,000 ha of forest are protected and 15,000 ha of peatland are also set aside for conservation.

Fifteen percent of the 11.1 million m³ of wood supplied by Enso to its mills in 1992 and 13 million m³ in 1993 came from its own forests. Privately owned forests supplied 68%, with the balance coming from imported wood, primarily from Russia and the Baltic countries. "The importation is necessary," says Pekkarinen, "because in Finland, we don't have enough pulpable birch." The wood is either pulped (67%) or used as logs (33%).

The Forest Operations Unit of 540 salaried and 800 hourly workers is managed by a general manager. Under him in the organization is the operational planning unit which plans how and from where the wood will be delivered. The silviculture department belongs under this unit; the department focuses primarily on the company's forests.

Enso's forests are divided into four areas. Each area is overseen by three to six field specialists who report to an area head. The field specialists and area heads work together to decide what forest management and silviculture methods will be used. All Forest Operations Unit personnel know the basic methods of forest



Tree seedlings are raised in nurseries. Grown in peat at a constant 25°C, they are microfertilized and automatically watered.

management and silviculture and can apply them to their own work.

"Enso has its own silviculture instructions and forest management plan, as other wood industry companies have," says Pekkarinen. "The private forest owners association and the state also have their own management plans.

"All management plans and instructions are based on the Finnish forest law. The existing plans and instructions guarantee that there are trees continuously available.

"Enso harvests wood in private forests, but the harvesting is done according to the rules and instructions of the Association of Private Forest Owners and/or the landowner. The rules and instructions are based on the law of the private forests.

"The majority of private forest owners do the silvicultural work themselves, according to the plan of the Association of Private Forest Owners, or they let the association do it for them.

"Enso has agreements with some private forest owners about wood harvesting, forest management, and silviculture."

Eighty percent of the wood cut from Enso's forests is mechanically harvested and 20% is cut manually with chain saws. The machinery used to cut timber in Enso's forests—130 harvesters, 200 forwarders, and 230 trucks—are owned by private contractors. During mechanical harvesting, the harvester fells, delimbs, and bucks trees into piles of logs. The harvester can handle any size tree. The forwarder hauls the logs to the roadside to be trucked. Areas are harvested through a combination of thinning (35%) and clear cutting (65%).

Thinning occurs in stages. The first thinning takes place when the dominant height of the tree stand is approximately 14 m, when the trees are 30–35 years old. "During the first thinning," says Pekkarinen, "small and large trunks are removed to create a good-quality growing forest. Some 1000 trees/ha are left to grow."

According to Pekkarinen, the second thinning is carried out about 15 years later. "This is mostly selective thinning from below." Some 500–600 trees/ha are left to grow. If the area is regenerated naturally, a third thinning is common to allow natural growth to occur.

"When the stand is mature and it is not possible to regenerate naturally, then clear cutting is needed." Old trees, dead, and nonvaluable tree species such as rowan, common juniper, willow, and asp are left standing.

"In the case of natural regeneration, some 70–120 seed trees/ha are left in groups when an area is regenerated with pine. For birch, 10–20 trees/ha is sufficient; these are also left in groups.

"Seed tree felling for spruce is not carried out. The border stand usually provides plenty of seeds for natural regeneration."

Challenges

In addition to the challenge of growing healthy trees under a philosophy of sustainable development, Enso must also be mindful of the public, the economy, and the environment.

"Public opinion plays quite an important role in our forestry practices," says Pekkarinen. "Our company has created harvesting and silvicultural instructions taking into account the environmental aspects, in which public opinion often plays a remarkable role."

Labor costs have increased a great deal over the past five years. "So far, the proportion of manual work is very high in all silvicultural works," says Pekkarinen. "The mechanization of planting and tending to seedling stands has met very many difficulties." Shifting the work from human to machine has reduced the number of loggers by one third in the past year.

"So far, we have solved these problems by being active in these matters," says Pekkarinen. "We have been able to meet the chal-

Eighty percent of Enso's wood is harvested mechanically.



Pulling a seedling from his satchel, an Enso forester places it in a customized tubular planter. For every tree that it harvests, Enso plants nine more.



lenges of growing trees and taking care of the environment at the same time." ■

Clites is associate editor of Tappi Journal.