Maintenance

Farmstead Shelterbelts





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Introduction

Farmstead shelterbelts offer many advantages, such as reducing the costs of heating and snow removal, diminishing odors and landscape beautification. However, the maintenance of the hedge is essential to meet these objectives. This booklet outlines the main activities required in order to achieve appropriate maintenance.

1. Replacing Dead Trees

When seedlings are planted on plastic mulch, the death rate in the first years after planting is usually about 5 to 10%. Without the mulch, the death rate is generally higher. The dead trees and shrubs need to be replaced as quickly as possible in order to avoid holes in the windbreak.



2. Weeding

Weeding is a key activity in order to ensure strong plant development. It is aimed at suppressing herbaceous plants that deprive the trees and shrubs of water, light and nutrients. The activity must be undertaken at least for the first three years following planting or until the trees and shrubs dominate their competitors.

2.1 With Mulch

The use of mulch at the foot of the trees greatly facilitates weeding. Embossed black plastic mulch (.05 mm) is recommended. It is available in rolls 1.2 or 1.5 m wide and is unrolled mechanically. When terrain conditions prevent mechanical installation, a plastic 1 m square can be fixed to the ground at the foot of the tree. By using mulch, weeding is limited to mowing on each side of the plastic in order to prevent herbaceous plants from impeding the growth of the trees by depriving them of light. Certain plants, like wild vines, can also cling to the trees and thus suffocate them. Weeding must be done two or three times a year before the weeds grow higher than the trees. The use of a lawn tractor is faster than weeding with an edge trimmer. If you are planning on using a tractor, you must plan for enough space between the rows, and between rows and ditches or waterways.



2.2 Without Mulch

If mulch is not used for weed control, mechanical hoeing or herbicide application is required. Hoeing is a fairly time-consuming operation that is done two or three times during summer, preferably during hot and dry weather. Application of a systemic herbicide the year following planting is the method most frequently used because the costs are less significant than those associated with hoeing. However, one must ensure that the trees will not be affected by herbicide drift.

3. Tree Irrigation

Tree irrigation may be necessary in the event of a prolonged drought, particularly during the first year after planting of trees. A drip irrigation system can be installed under the plastic mulch when the mulch is laid. However, such a system results in additional costs and economic return is unknown.

4. Protection From Rodents

Voles can nibble the trunk and roots of certain trees, notably deciduous trees, affecting the tree growth and sometimes leading to its death.

As an initial inexpensive treatment, mow the weeds at the edge of the mulch, or in a radius of 60 cm from the trunk (if there is no mulch), in September. Mowing deprives the rodents of shelter and is a good preventative measure.

For protection of very susceptible species (such as the sugar maple), rolling plastic or metal spirals around the trunk at the beginning of the fall is a helpful approach. The spirals should be individually examined each fall to ensure they are still in place, free from debris, and that the spiral is not included in the bark. In some cases, it is advisable simply to remove the guards in spring and reinstall them in fall. The spirals are kept in place until the bark is sufficiently thick for the rodents to lose interest.

The use of repellents, with which the base of the trunks is coated in September, is an easier and more economical method than barriers, but is less effective in an epidemic situation.

5. Protection Against Deer

In certain regions in Eastern Canada, the pressure from deer is so strong that young trees must be protected from grazing of twigs and buds and rubbing against the trunks. This damage delays growth of the trees, and several years of successive grazing can lead to their death.

There are different methods to protect trees, though their effectiveness and cost vary greatly (Cusson, 2004). Putting up fencing, electrified or not, around the plantations, installing individual mechanical protection such as tree shelters, the application of repellent substances and auditory deterrents are the principal methods used to protect the trees.

For windbreaks we recommend individual ventilated tubes, held in place with the help of tutors. These protectors are installed only around the trees most susceptible to being grazed. If kept too long, tree shelter can induce a tree root deficit and some authors recommend removing them after three years (Gonin, 1999). Spruce and pine do not need such protection, and cedar should be avoided as it is much enjoyed by deer.

Planting taller trees (heights of 1.5 to 2 m) is also a way to reduce deer browsing by keeping the tree leader out of the reach of the animal.

If the hedge borders on pasture, it needs to be protected from grazing livestock by installing a fence or an electric wire.









6. Battle Against Insects and Disease

Well-maintained trees will better resist the problems of insects and disease. However, despite these precautions, harmful insects and diseases can appear. It is therefore important to inspect the windbreak very closely when weeding. If you see abnormalities such as curled, abnormally coloured or perforated leaves, damage to the branches or the trunk, or if you notice an excessive number of insects, you should contact a specialist without delay.



7. Pruning Windbreaks

Pruning windbreaks allows for the production of quality lumber, by maintaining a single dominant leader and by creating a straight, limb-free trunk. Pruning will also keep the windbreak from becoming too wide. Pruning begins in the second year following planting and continues until the tree has a sturdy trunk and a well spaced crown, which is after 10 to 30 years, depending on the species and the desired height of the trunk. It is better to prune lightly but frequently (every year or two). This reduces the size of the cuts so that wounds heal quicker and the risk of infection is lower. This operation can be done with light tools, and the cut branches are small enough to be left under the hedge. In addition, by cutting small branches, the occurrence of suckers is reduced.

When you face the tree to prune, check for the presence of a principal axis. At the level of the trunk, remove all of the branches that have a diameter that is close to that of the axis. Make sure to maintain the branch collar of the pruned branches. If you cannot make out a principal axis, check if the tree has good annual shoots and well-developed foliage. If yes, proceed to coppicing in the spring before the start of the vegetation growth. If the tree is not vigorous, identify the cause, try to remedy it, and wait for renewed vigour before coppicing.



Figure 1 - Position where branch should be cut (adapted from Michau, 1985)

The lower branches of the tree need to be cut in order to produce clear trunks, which will have fewer knots and will, therefore, have a better market value. Pruning also allows for the removal of branches that extend over farm fields and are a nuisance to farming operations. Pruning starts as soon as the tree reaches 2 to 4 m in height for deciduous trees (7 to 8 m for poplars) and 5 to 6 m for conifers. Progressively eliminate the branches, never over more than 1.5 to 2 m in height at one time. The goal is to attain a trunk without branches for a third of the height of the tree.

8. Old Shelterbelt Renovation

In Eastern Canada, many natural shelterbelts are found on farm property boundaries.

These natural hedgerows are a treasure for biodiversity, and protect crops from the wind. But over time, they can become a nuisance to farming because the branches encroach on the field. In addition, if the winter density of the shelterbelt gets too high, it can cause significant snow accumulation along the hedgerow. These shelterbelts can be renovated to reduce the disadvantages and to retain the benefits. One generally tries to reduce the width of the hedges and work on the porosity. If the purpose of the shelterbelt is to protect crops, one must aim at a winter porosity of 60 to 70% and a summer porosity of 50%. If the purpose is to protect buildings or roads, then a year round porosity of 50% must be achieved. Old natural hedges are usually heterogeneous in terms of porosity; some sections are too dense while others are not dense enough.



Several forestry operations are necessary to achieve the objectives of porosity, to reduce nuisance and to ensure a renewal of the hedge.

1 - Selecting and cutting of trees to be removed

Dead or sick trees should first be removed. If the purpose is to reduce the width of the hedge, remove the trees located in the shelterbelt area that needs to recover.

2- Pruning of the branches of trees extending into the field

The branches of trees that are detrimental to farming activities are pruned up to a maximum height of 5 m. This operation is carried out with a telescopic saw.

3- Selection and thinning of trees for the future

Where the density is too high, trees should be thinned, taking care to keep the plants that have the greatest commercial value or wildlife. A desirable tree is one that will allow us to achieve the objectives of protection and production desired (wood or fruits). It is important to maintain a diversity of plant species in the hedge. This gives an assurance of protection in case of problems from insects or diseases while promoting biodiversity. Choose healthy and vigorous trees to be kept for the future. They should be spaced about 3 m apart. Then remove any trees that interfere with the crowns of the trees to be retained (within a distance of 30 cm). If necessary, pruning for shaping can also be done on the selected trees.

4 - Refilling the hedge

In the sections where the density is too low, trees should be replanted to ensure at least one tree every 3 m. The tree must be sufficiently tall to evade competition. A minimum height of 60 cm for conifers, and 1 to 2 m for deciduous is recommended. A square meter of plastic mulch should be installed at the foot of the tree. In the case of refilling with shrubs, it is advised that they be 30 to 60 cm tall, planted at a distance of 2 m apart.





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Information and credits

Written by : André Vézina, Forest Engineer (Institut de technologie agroalimentaire, La Pocatière Campus)

Translated from French by: Jennifer Fellows

Comments :

Sabrina Ellsworth, Agrologist (Atlantic Swine Research Partnership Inc.) Guy Langlais, Professor (Institut de technologie agroalimentaire, La Pocatière Campus) Anne Loeffler, Agrologist (Grand River Conservation Authority) Cedric MacLeod, Agrologist (Canadian Pork Council) Pierre Millette, Agrologist (Institut de technologie agroalimentaire, La Pocatière Campus)

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