

Integrating multipurpose trees in a paddock grazed by cattle: first results of the co-designed layouts

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Context

To develop agroforestry in Northern Europe ruminant husbandry, farmers need scientific and practical knowledge.

Objective

Provide knowledge on:

- ⇒ efficient methods to protect young trees from ruminants
- ⇒ spatial organisation of trees to address multiple purposes

Methods

Co-design of an agroforestry paddock with farmers, advisors, technicians and researchers.



598 trees planted in February 2015 on a 3-ha paddock rotationally grazed by 72 dairy cows.



Test of 7 types of tree protection from cattle and of 3 spatial organisations of the trees, mixing various layouts of fodder and high stem trees.

Results

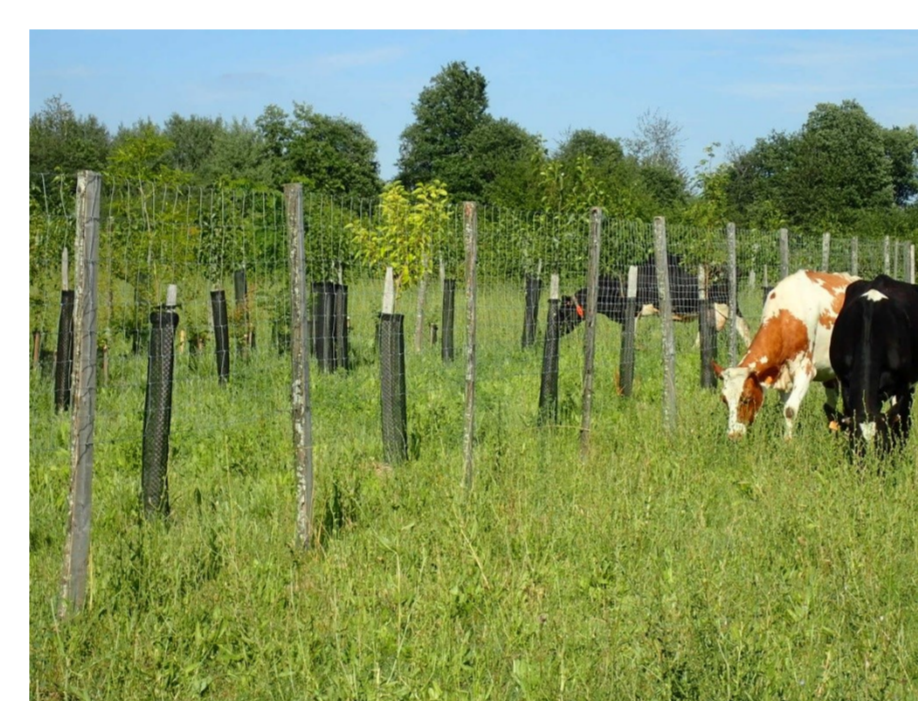
Tree protection from cattle



electric fence



electric fencing tape



metal fence



paddock excluded from grazing



plastic fence



barrier tape



olfactory repellents

garlic essence
spirit vinegar
2 deer repellents
fresh cow dung



Electric fence, electric fencing tape: quickly installed, facilitate the mechanical control of vegetation, expensive (solar charger: 300 €).

Metal fence: cheaper, can be used as trellis for climbing plants, needs more time to be installed, complicates the control of vegetation.

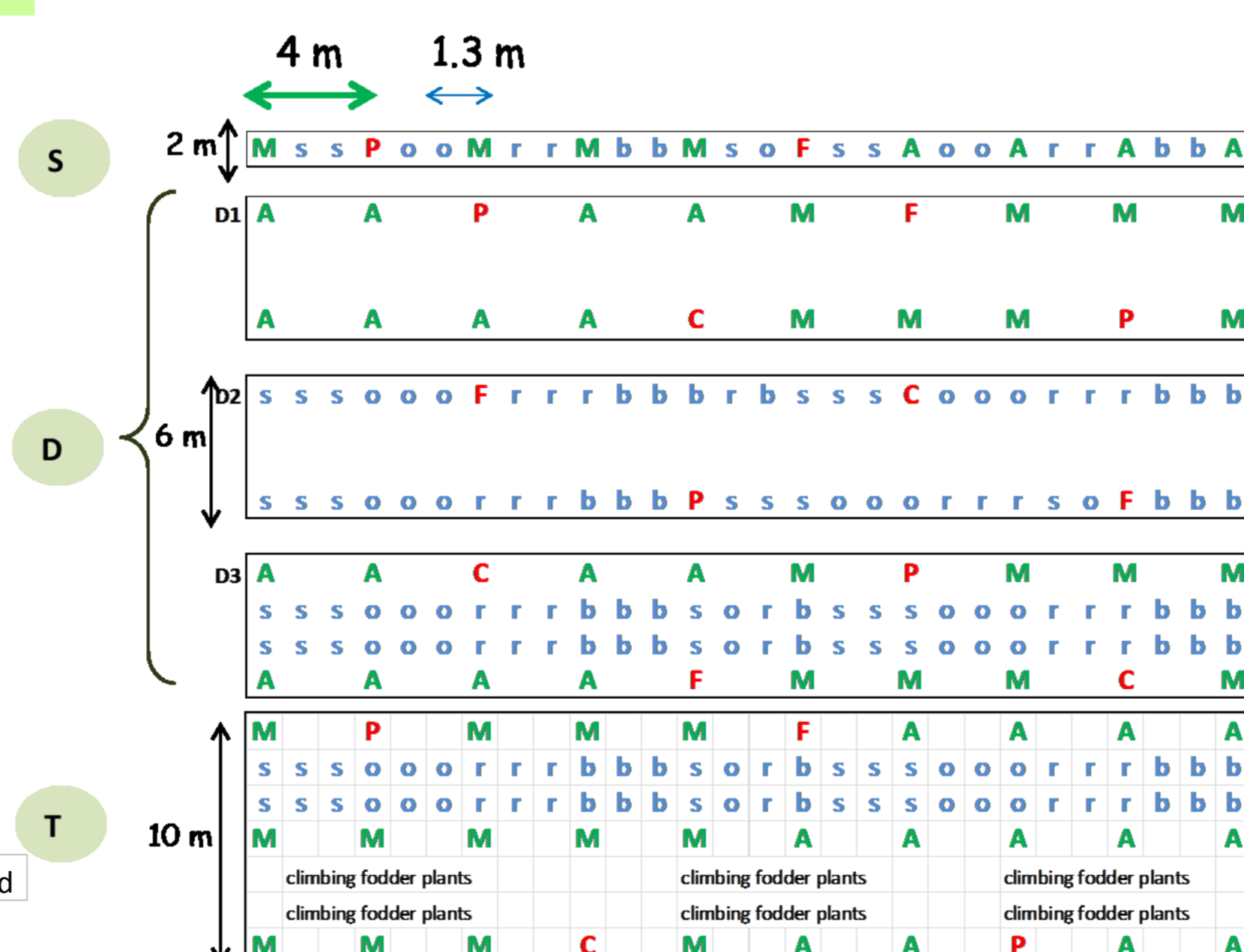
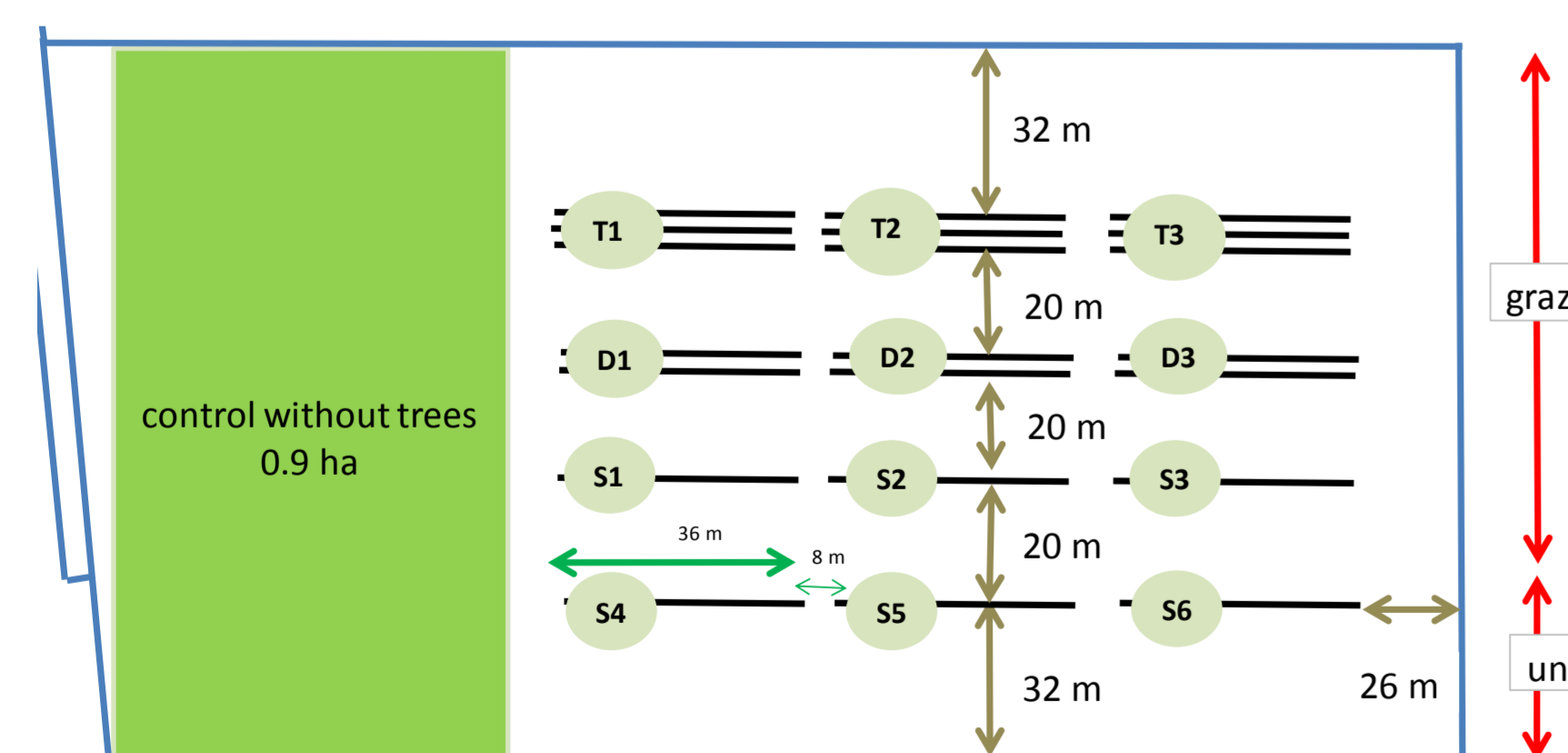
Plastic fence: quickly damaged by cows and weather.

Barrier tape: only efficient during one year.

Poles equipped with brushes can prevent cows from rubbing on trees and stakes.

The **olfactory repellents** did not work.

Spatial organisation of the trees



P *Pyrus communis*
F *Gleditsia triacanthos*
C *Sorbus domestica*

M *Morus alba*
A *Alnus cordata*

s *Salix caprea*
o *Ulmus minor*

r *Robinia pseudoacacia*
b *Alnus incana*

High stem trees provide timber, fuelwood, wood chips (litter /soil amendment), shade, fodder.

Pollards provide fodder, wood chips, timber, fuelwood.

Coppiced trees provide fodder, wood chips.

Conclusions

After 2 years, the **most efficient protections** were: electric fence, electric fencing tape and metal fence.

When considered relative to the number of tree seedlings: **double and triple row sets are more economical and time saving** for their implementation and maintenance. However they reduce the current grazing area that will only be recovered when the trees will be browsed.