Hedgerows in silvopasture: multifunctional resources for sustainable farming

SOURCE: Camille Archambaud[1], Angéline De Almeida[1], Esther Le Toquin[1] (2025).Triple Performance. https://wiki.tripleperformance.fr/wiki/Haies_en_syst%C3%A8mes_sylvopastoraux_:_des_ressources_multifonctionnelles_pour_une_agriculture_durable

[1]*Ver de terre Production*

Integration of hedgerows into grazing systems. Contribution to farm agroecological multifunctionality

The implementation of hedgerows in grazing systems, whether inter- or intra-field, offers numerous benefits at various scales. From an agronomic perspective, it im-proves yields, protects against soil erosion, provides beneficial shading during pe-riods of excessive heat, and promotes animal welfare. Additionally, it provides woody forage for livestock, a local, accessible, and sustainable resource. Many of the species in hedgerows are indeed consumable by ruminants and can serve as an addi-tional food resource alongside pastures. This helps better manage forage shortages during extreme weather events such as droughts. To be directly grazed by animals, they can be managed either as pollarded trees or coppiced stools.

FIGURE 1. Linear hedgerows bordering a pasture grazed by a herd of cattle. EARL Des Vieilles Rues © Ver de terre production

Ecologically, hedgerows help with carbon storage and increase organic matter near the planting areas. They also play a role in water regulation, acting as a buffer to manage both excess and insufficient water, while creating ecological corridors. These hedgerows enhance the diversity and complexity of systems, host biodiversity, and can even aid in the regulation of parasitism and diseases. Incorporating trees into pastures fosters the development of a diverse plant community, enhances grass growth, and consequently boosts forage productivity.

Economically, they provide additional income and can lead to savings on bedding costs. Finally, the landscape and social issues are also significant, with the preserva-tion of landscapes and the enhancement of territories.

Designing a Hedgerow for Grazing Systems

The success of a hedgerow planting project in a grazing system begins with a thorough understanding of the site. This assessment should cover the entire farm, and involve multiple layers of analysis. A topographical overview helps identify environ-mental interaction and the influence of elevation and exposure. Key factors to consider include altitude, rainfall, wind patterns, soil characteristics (texture, depth, pH, drainage, presence of stones or active lime), and existing vegetation. It is also important to identify water flow patterns such as streams, ditches, ponds, or flood-prone areas, as these influence the adaptability of tree species to wet conditions.

Before planting, the farmer should clearly define the hedgerow's objectives—such as livestock protection, biodiversity enhancement, water retention, forage production, or wind protection. The choice of species, height, and design (e.g., forage hedge, windbreak, melliferous hedge) depends on these goals, available space, terrain constraints, and livestock type. Using diverse, preferably indigenous species and incorporating multiple vertical layers maximizes ecological benefits.

- At least 20% of young trees should be maintained permanently to ensure the regeneration of the hedgerow.
- To optimize the agroecological benefits of hedgerows, a minimum width of 1.5 meters should be maintained, and topping should be avoided, as it impairs the growth of trees and shrubs and diminishes their ecological and agronomic value.
- The arrangement of structures and their orientation should take into account the characteristics of the plot: slope, erosion risk, prevailing wind, and drought. Consideration should also be given to how shade will be projected.

Integrated hedgerow management to support sustainable grazing systems

To sustainably enhance the value of tree-based capital, the implementation of a hedgerow management plan at the farm level is strongly recommended. Such a plan facilitates the scheduling of uses (timber, firewood, wood chips), the organization of cutting rotations, the identification of hedgerows requiring regeneration, and the planning of necessary formative pruning interventions.

In grazing systems, tree protection is essential. Installing fences at a distance of 1.5 meters from the tree line ensures sufficient growing space while allowing livestock access to foliage and young shoots. Fence height can be adjusted depending on the livestock species, enabling tailored management and facilitating the maintenance of margins, whether through natural pruning by animals or with mechanized tools.

The practice of browsing, requires careful regulation of grazing pressure to avoid overexploitation of the woody component. Rotational browsing of hedgerows by cattle has proven effective, as demonstrated by early observations from the OAsYs system (Novak et al., 2020), whereas continuous grazing by heifers or dry cows re-sults in more significant damage, including tree injuries and marked soil erosion at the base of trunks.

Certain woody species, such as ash, elm, maple, and willow, provide valuable supplemental forage for livestock due to their high digestibility and mineral content, with some also offering phytotherapeutic benefits. During drought, the leaves of species like chestnut, hazel, and sycamore, along with pine needles and buds, can supply up to 15 days of feed for cows, goats, and sheep.

Regarding hedgerow maintenance, annual coppicing is advised for young hedgerows (less than 10 years old), with cuts made at 10–15 cm above ground to stimulate low-branch development and new root growth, thereby increasing plant resilience and anchorage. For older hedgerows, coppicing and thinning every 10 to 12 years is re-commended. Moreover, in order to protect associated wildlife and reduce plant health risks, all maintenance operations (including trimming and mowing the base) should be conducted between November and February.

FIGURE 2. Newly planted multi-strata agroforestry grove within a grazing system for cattle. EARL Des Vieilles Rues (a) Linear fodder hedgerows offering shade and supporting water regulation. Ferme de Ligny (b), Grazing of a hedgerow by a herd of goats in Haute-Saône (c), and Protection measures for a young double-row rural hedgerow planted within a cattle pasture system. Ferme de Ligny (d). a,

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Some species should be avoided because they can be toxic to livestock. List according to animal breeds: http://vegetox.envt.fr/Menus-html/especesfinal.htm

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