PRODUCTION OF LAYERED WOOD CHIP/STRAW BEDDING COMPOST IN A MILLEFEUILLE (LAYERED) METHOD

1. Layer of wood chips being spread in the barn, 2. Compost spread in windrows on the pasture, 3. Corinne Bloch in front of her riparian forests, 4. Hedge trimmings drying. ((1, 2, 3, 4) ©Ver de Terre Production)

THE WHAT AND WHY

Using hedge wood for bedding and compost offers several advantages. Wood chips provide a cost-effective alternative to straw and help make use of local resources. As bedding, they effectively absorb moisture, reduce nuisances such as respiratory diseases, calf diarrhea, parasites, and lameness, and significantly improve animal comfort. They also produce high-quality compost, rich in organic matter, which structures and sustainably fertilizes the soil by nourishing the soil mycelium.

We can take the example of the Hoeffel-Walbourg farm in Alsace, which raises 100 breeding Charolais cows and their offspring, totaling 260 cattle. The farm operates a mixed crop-livestock system with grazing on 170 hectares of contiguous land, featuring 12 km of hedgerows. The branches used mainly come from the pruning of bocage hedges and riparian forests on the farm. The preferred tree species include shrubby and bushy willows, alders, ashes, and poplars. An additional portion of the wood is sourced from municipalities and the SDEA, which carry out pruning in public spaces.

HOW THE CHALLENGE IS ADDRESSED

Forage

At their farm, branch collection begins after August 15 to respect the bird nesting period from March 15 to August 15. The branches are cut and brought to the livestock for feeding. By late August, grass stops growing and becomes increasingly poor in nutrients. This woody forage is remineralizing, anti-inflammatory, and acts as a natural dewormer. It consists mainly of shrubby willows. The work is done manually using chainsaws, and the branches are then handled and transported with a telehandler. The cattle eat the leaves and very thin branches, leaving behind the thicker ones.

Winter Wood Pruning

During fence maintenance and replacement work (rotten posts, rusty barbed wire), hedgerows and riparian forests—including many pollarded willows—are coppiced and regenerated.

The cut branches are stacked outdoors and left to dry for several months, sometimes up to a year. This drying process reduces residual moisture, making later chipping easier. Additionally, it ensures better-quality wood chips, which become much more absorbent in bedding. The branches are then chipped by a company equipped with a mobile machine. It is crucial that the wood used is clean and free of contaminants (metal, plastic, etc.) to protect animal health. Once chipped, the wood chips are stored in piles in a sheltered area or under a waterproof yet breathable tarp to protect them from moisture.

Woodchips, Bedding, Compost, Animal health, Forage feeding, Cattle, Hedge pruning.

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ADVANTAGES

In the Barns, a thick layer of approximately 15 cm of wood chips is spread over the cows' resting areas when they are clean and empty. These chips play a crucial role in absorbing moisture, ensuring a surface that remains both dry and comfortable for the animals. Thanks to their absorbent capacity and airy structure, they significantly reduce the development of pathogens and parasites in the bedding. Additionally, they improve hoof health and prevent moisture-related issues, such as hoof infections. The essential oils (terpenes) released from the wood purify the air, which helps prevent respiratory diseases, particularly in calves. Since the cows' udders remain very clean, calf diarrhea is also avoided.

The cows stay on this bedding for a day or two, and then straw is added over the next three days. After testing different methods, they prefer the "layered straw/wood system" over single-material bedding. More wood is then added, followed by successive layers of straw and wood (straw-straw-straw-wood). Animal waste accumulates naturally, and a thin layer of wood chips is applied on top of every three layers of straw. This cycle lasts a total of 6 to 8 weeks. This method maintains an airy structure, limits unpleasant odors, and ensures good hygiene in the barn.

Once the layered wood chip/straw bedding reaches its maximum height (about 80 cm), the barn is cleaned out, and the already pre-composted manure is piled into windrows in the field. At Corinne and Ernest's farm, renewal occurs when the manure reaches the feeding barrier where the cows eat. The saturation timeline depends on several factors:

Number of animals and barn density: The more animals there are, the faster the bedding becomes saturated.
Initial bedding thickness: A thicker wood chip layer takes longer to absorb waste and moisture.
Type of wood used for the chips: Some species absorb better than others. They prioritize softwoods like willows, alders, bark, sawdust, wood shavings, and some conifers.
Environmental conditions: Temperature and humidity affect the saturation rate.
For this organic breeding and selection farm (where all animals are registered in the Herd Book Charolais), daily straw bedding is essential. The layered wood-straw system ensures a barn free of ammonia odors, with high absorbency and good load-bearing capacity.

Note: In general, well-dried wood chips used as bedding can remain effective for several weeks to a few months. Saturation can be identified when:
The bedding becomes damp and compact, losing its absorption capacity.
Odors increase, indicating advanced organic matter breakdown.
The mixture of manure and wood is then formed into windrows in a field. At the end of winter, a windrow turner is used to facilitate composting.

HIGHLIGHTS:

The Use of Wood Chips Offers Several Significant Benefits:

- **Economic: Reduces dependence on straw, which is often more expensive and less beneficial for the soil. Avoids one barn cleaning cycle each winter. Facilitates the transition to organic farming.**
- **Ecological: Enhances the value of local woody resources and reduces green waste by utilizing pruned branches. It is resilient to both water shortages and excess moisture.**
- **Agronomic: The compost produced from this bedding is of higher quality, rich in durable organic matter, and contributes to long-term soil improvement.**
- **Herd Health: Fewer respiratory diseases, less diarrhea, cleaner animals, and healthier bedding.**
- **Not to mention: Mid-August – feeding with willow branches, which are remineralizing, anti-inflammatory, and a natural dewormer.**

Bedding wood compost ©Ver de Terre Production

Composting and Soil Enrichment
Wood chips provide an optimal structure for compost, improving aeration and ensuring even decomposition. The five natural fermentation processes occurring during composting eliminate pests and unwanted seeds.

The resulting rich and well-balanced compost is used to enhance cultivated fields and both temporary and permanent pastures. It is spread two to three weeks after composting, improving soil fertility and structure. This supports better crop growth while increasing water retention capacity. The compost also nourishes the soil's mycelium network, which helps store and distribute water. (One additional point of humus can store 220 m^3 of water per hectare.) These microscopic fungi release phosphorus and trace elements, making them bioavailable for plants.

Adding wood to the soil also contributes to carbon sequestration, helping store significant amounts of CO_2 in the soil.

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