

1. OPTIMAL USE OF THE AVAILABLE BIOMASS RESOURCES, RECYCLING AND EFFICIENT UTILIZATION OF BY-PRODUCTS AND RESIDUES - ARID

CORRESPONDING MODULE 5

Introduction

Biomass, a renewable but limited resource, is facing a growing demand. It is therefore necessary to find a balance between technical performance and respect for the environment.

Agricultural biomass is defined as all the organic matter produced and derived from agricultural systems: meat, milk, crops, grass, crop residues, livestock effluents, etc. In a context of growing demand for agricultural products for food, energy and material purposes, and a reduction in agricultural land, the pressure on agricultural biomass is likely to give rise to conflicts of use that need to be managed as well as possible. Biomass is a renewable but limited resource for which priorities of use must be determined at the different stages of production. This growing demand must not lead to excessive intensification, which could be harmful to the environment. The challenge is to combine technical performance with respect for the environment.

New resources

France is the largest agricultural producer in the European Union. This production is mainly intended for human and animal consumption and for export, but it must above all meet the food needs of the population.

However, the production of biofuels, heat and electricity requires the use of new agricultural resources. Livestock manure, crop residues, grass and energy crops can be mobilised to produce energy through methanisation.

The production of energy from energy crops requires great vigilance. If these crops are produced in place of food crops, this requires the use of certain lands in France and abroad to be changed, which may lead to deforestation with major environmental impacts.

Intermediate crops, produced in two main crops, can be a solution but more research is needed to study their technical and economic interest.

Source : <https://expertises.ademe.fr/agriculture-foret/production-agricole/chiffres-cles-observations/biomasse-agricole>

Description

GAEC DES BUISSONS in Saint-Lambert-la-Potherie

In January 1980, Chantal and François MAIRE opened the **GAEC des Buissons**, a family dairy.

The farm covers **310 hectares**, including 160 hectares of crops, with a herd of about **80 Montbeliarde cows** for a production right of **720,000 litres of milk**.

In 2017: the couple started renovating their ageing facility on the advice of their son Yohan.

A new building :

- ✓ The pit is covered under the building with a slatted floor system, divided into three rows of cubicles - served by two corridors on concrete slats - covering a pit 2.40 metres deep and with a capacity of 1,600 cubic metres. The pit is covered in this way so that it does not receive rainwater and this clever arrangement saves space on the ground. The slurry is aerated by a mixer at the end of the building.
- ✓ By opting for a metal frame, the partners saved €15,000 compared to a wooden frame. The wooden cladding, doors, mattresses and fences were installed by the farmers themselves, everything else was done by contractors.
- ✓ A manual milking parlour, The family opted for a "high line, single equipment" milking parlour with 2 X 12 places in a 50 degree herringbone with milking from the rear made by the Technic'Elevage company
- ✓ Quai Sinus allows the milkers to position themselves as close as possible to the udder to apply the claws. Another improvement is that the weight of the claws has been halved," says François.

The Gaec's new milking parlour, which was put into service last June, has given full satisfaction to its partners, who take one to two hours - including cleaning - to milk 70 dairy cows.

"It is comfortable, bright and on the same level as the dairy," says Chantal.

This new building allowed them to build a **biomass power plant** on the estate by reprocessing the manure from their cows.

The advantages of using biomass are :

- Be used as a heat source,
- Be used for electricity generation





Advantages and challenges

The installation automatically treats the 7,000 m³ of liquid manure produced annually by the GAEC's 115 dairy cows (with the chaff and feed rejects). It produces 400,000 Kw of electricity annually, which is sold to EDF (the equivalent of the consumption of 60 families per year) and 250,000 Kw of heat, which is used to heat three houses on the farm and the water for the milking robot.

The residue of the methanisation, the digestate, is used as fertiliser on the farm. The GAEC aims to reduce its use of external inputs on its crops by 20%.

This is the first French individual project for the micro-methanisation of fresh manure installed by HoSt, the leading Dutch supplier of bioenergy systems. The rapid evacuation of the manure preserves the methanogenic potential of the manure and maximises energy production.

The innovation also lies in the automation of the slurry treatment (scraping, stirring, grinding and pumping) and in the performance of the digester, which can treat 128 m³ of slurry in a short residence time (6 to 12 days).

The unit also has the particularity of being autonomous in terms of supply (10 to 12 tonnes of slurry produced per day).

Main data

310 hectares, including 160 hectares of crops
80 Montbeliarde cattle
720,000 litres of milk.

Further Information

**GAEC du Buisson,
Les Buissons
49070 Saint Lambert
de la Potherie.**