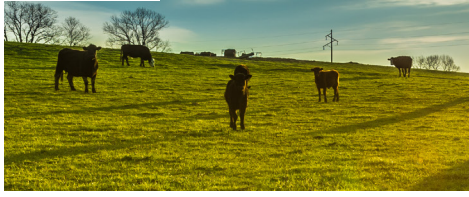


#4



Can farms of the dairy sector reduce their non-organic waste?

Analysis and recommendations in the Italian experience of REINWASTE project



Project co-financed by the European Regional Development Fund

REINWASTE project for livestock farms in the dairy sector

The objective of the REINWASTE project in general is to contribute to the reduction of non-organic waste in the agro-food sector, testing innovative solutions available in three supply chains and three countries: in Spain the horticultural sector, in France the meat sector and in Italy the dairy sector. In Italy pilot action has been focused in the Emilia Romagna region.

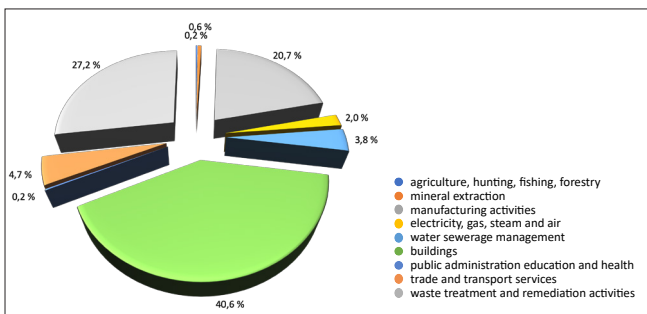


Confagricoltura as partner of the REINWASTE project had the task of researching and testing the available innovative solutions for farmers in the dairy sector. The pilot action that involved 15 farmers was carried out during 2019 by the C.R.P.A. S.p.A, an Italian Research Centre specialized on Animal Production.

AGRICULTURAL WASTE STATISTICS

The 2018 Annual Report on Special Waste, prepared by ISPRA and published on 14 June 2018, shows the waste streams and the quantities produced in 2016. The Report provides information on the agricultural sector in general but does not examine waste from the dairy sector. The total production of special waste in Italy, in 2016, is about 135.1 million tons, of which about 125.5 million tons of non-hazardous waste and 9.6 million tons of hazardous waste. 331 thousand tons refer to the agricultural sector. The impact of the agricultural sector on the total waste produced is equal to 0.2%. The same trend as in 2015 is confirmed. The distribution of agricultural waste produced is equal to 97% of non-hazardous waste and 3% of hazardous waste.

Picture. 1. % distribution of special waste by economic activity



THE PROBLEMS EMERGED FROM THE RESEARCH

The analysis showed that until 2017 the management of non-organic agricultural waste in Emilia Romagna was not considered a problem for farmers. Some waste streams are still not recyclable today, for examples the round bales nets in high density polyethylene (hpde) and plastic silage films. These types of waste, although they are highly recyclable materials, present the greatest difficulties in waste storage and in the recovery process

due to contamination of soil, vegetable residues and water for which they are sent for disposal.

NON-ORGANIC WASTE PRODUCED IN LIVESTOCK FARMS

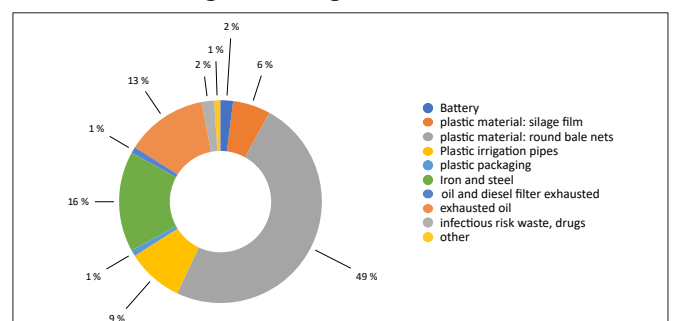
In Table 1 and Picture 2 is reporting the typology and quantity of non-organic waste produced by the 15 livestock companies in the dairy sector that participated in the pilot action of the Reinwaste project.

Table. 1. Typology of non-organic waste

NON-HAZARDOUS WASTE	HAZARDOUS WASTE
Packaging without hazardous residuals (Detergents, Disinfectants, etc.)	Packaging with hazardous residuals (Detergents, Disinfectants, etc.)
Plastic material: silage film, round bale nets	Infectious risk materials (needles, syringes, etc.) and Expired veterinary drugs
Iron and steel and demolition materials	Exhausted oils Oil and diesel filters
Plastic irrigation pipes	Waste Electrical and Electronic Equipment
Waste tyres	Asbestos

In particular, the analysis shows that 49% of the waste is made of plastic material deriving from net and wires for hay presses.

Picture 2. Percentage of non-organic waste on the total detected



The methodology

A first survey was conducted on 15 companies with the aim of making some light assessments and recommendations on how to improve the prevention of non-organic waste. In addition, an economic and environmental analysis was carried out on 5 companies focussed on the alternatives available to reduce the quantity of plastic waste produced.

RECOMMENDATIONS FOR REDUCING NON-ORGANIC WASTE

- To protect round bale nets and plastic silage films became waste; to avoid wind, rain and further contamination of soil and water, in order to keep the material dry and clean. This also decreases disposal / recovery costs;
- To use larger containers for detergents with the possibility of refill the containers;
- To adopt LED lighting systems in order to reduce the electrical consumption, the maintenance and the production of hazardous waste;
- To use plant protection products contained in biodegradable packaging;
- To use plastic silage films with reduced thickness, maintaining the same resistance index;
- To use agronomics and productives best practices to reduce drugs, antibiotics, plant protection products, etc. in order to minimize the waste packaging.

FOCUS ON ROUND BALE NETS AND PLASTIC SILAGE FILMS

- The study highlighted that the economic and environmental benefits of each alternative solution to the use of traditional plastic materials cannot be considered universally valid for all farms in the livestock sector.
- Therefore, the choice of an alternative solution should be assessed by the basis of the company characteristics (size, management, production cycle).



ALTERNATIVE SOLUTIONS

CONVENTIONAL ROUND BALE NETS (high density polyethylene)

Mesh net casing used for packing cylindrical bales

- **Alternative 1. Use of round bale net with a 5 % lower weight**

Mesh net casing with reduced thickness used for packing cylindrical bales

- **Alternative 2. Polypropylene twine**

Thin rope casing made of polypropylene used for the packaging of bales

- **Alternative 3. SISAL twine**

Thin rope Sisal wrapper used for packing bales.

Sisal (vegetable textile fiber derived from the leaves of Agave sisalana)

- **Alternative 4. Use of the Big Baler**

High density pressing for the packaging of large prismatic bales

- **Alternative 5. Use of the two-stage haymaking process of loose hay**

Haymaking technique which involves a first pre-drying phase in the field and a second phase in which the product is brought loose in the barn to complete drying.

CONVENTIONAL USE OF PLASTIC SILAGE FILM

Plastic films for covering and protecting silage in order to guarantee their shelf life.

- **Alternative 1. Use silage film of less thickness**

Plastic films for covering and protecting silage in reduced thickness trenches with the use of smaller quantities of plastic materials.

- **Alternative 2. Use of haylage round bales**

Silage technique that involves the complete wrapping of the bales by plastic films.