R2C-Ribera Circular Recovery, mechanised technological solution for biowaste valorisation and recycling plastic bags packaging

FOODRUS

PRACTICE ABSTRACT NO.12

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#mechanisedtechnologicalsolution #recycling #agrifoodindustries #wastemanager #composting #biowastevalorization

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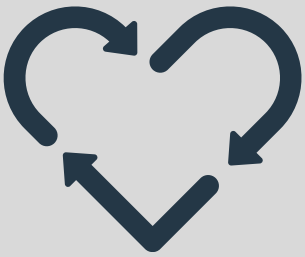

Mechanised technological solution adaptable in size and scale to agri-food industries that allows organic waste to be separated from plastic waste in order to give each type of waste its appropriate treatment: the organic matter can be used to make compost as a valuable fertiliser to enrich the soil and the plastic can be recycled for a second life.

The prototype is made up of 3 electromechanical elements: conveyor belt, bag opener and trommel (drawing 1) which together perform the task of emptying the contents of the product inside. The electromechanical equipment that makes up the machine are protected and controlled by means of an electrical panel which, in addition to containing the different protection elements, has 3 speed variators sized according to the power of each motor for regulating the operating speed of the elevator belt, bag opener and trommel. The prototype design incorporates several active safety measures to ensure operator protection and prevent accidents. The safety elements implemented are detailed below: Mechanical protection: Shells and screens have been installed on every part of the trommel to prevent access to hazardous areas. This mechanical protection acts as a physical barrier preventing direct contact with moving or hazardous parts of the machine. Inductive sensors: In critical areas, such as doors and removable parts, inductive sensors have been incorporated. These sensors can detect the position of elements such as doors and removable panels. The machine cannot operate unless all these safety elements are correctly positioned. This feature ensures that the machine only operates when all protections are in place.

Safety pictograms: Pictograms have been placed on each part of the machine to indicate potential associated hazards. These pictograms provide visual information on precautions to be taken andpotential dangers in each specific area of the machine. They contribute to a quick awareness and understanding of potential risks.

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Active safety: These active safety elements combine physical and technological measures to create a safe working environment. The combination of mechanical protection, inductive sensors and pictograms helps to minimise risks and ensures that the machine only operates under safe and controlled conditions. CONCLUSIONS : Based on the data obtained and the analysis of the same, the following conclusions are reached: The prototype has many qualities that point to it being a valid prototype for the intended purpose. The best production performance is obtained for bags with dimensions around 30×30 cm. The speed of the belt, bag opener and trommel is managed by variable speed drives, which leaves open the option of installing additional control elements.

The prototype has passive and active safety elements. Active safety can be integrated into electronic control elements. Regarding the return on investment, the investment is profitable, both economically and from the point of view of water resources. The positive return is already achieved in the second year with an internal rate of return of 22.7% and a return on investment of 34.5%, according to the baseline data. The machine helps to recover organic matter, which benefits the soil, and is a lever for saving water. To this effect, according to the Water Footprint Network (WFN), the water needed to grow the ingredients for 1 kG of salad has an approximate water consumption of 80 litres.

About

Coordinated by the University of Deusto and comprising 27 partners from 10 different European countries, the EU-funded FOODRUS project aims to limit food losses and waste, and to promote resource efficiency across all stages of the agri-food value chain. FOODRUS is working to tackle the food waste and losses by creating resilient food systems across nine European regions. To achieve this, the project will test 23 circular solutions through diverse forms of collaborative innovation.

Consortium

www.foodrus.eu

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