



ManPas – farm-scale manure hygienizer

ManPas is a manure hygienizer which heat treats manure at 70 degrees Celsius by utilizing the heat generated by manure microbial decomposition. The treatment fulfils the EU manure hygienization requirement. The process removes any diseases the manure might have contained as well as germinating seeds. Hygienization with ManPas takes up to three days in total, the hygienization process itself just over an hour. The device consists of a silo and a discharge screw. It has an automated handling process where manure is pushed forward by the screw after a sufficient time at wanted temperature is reached. Temperature sensors monitor the hygienization phase and manure is not removed, unless the temperature has risen above a set value, e.g., 75°C.

The hygienized manure can be used as soil amendment or as bedding in stables and barns. In addition, ManPas reduces the need for manure storage, because traditional storage may not be needed, rather a product warehouse. It may also be that as manure becomes hygienized, it can be transported to the point of use or to the user's warehouse, as it is no longer a risk product. Hygienized horse manure from peat-bedding has been successfully tested as a growing medium for tomatoes.

Recycling horse manure in particular has been a challenge, as there have been few receivers for the manure. Gate fees are charged for horse manure to be composted or recycled in biogas plants. ManPas saves considerable costs in manure treatment. Compared to composting, the device is remarkably fast and causes less nutrient losses. In addition to horse manure, it is also suitable for separated dry cow manure. Suitability for broiler production is currently being researched as well as potential of biochar enrichment.

The first official ManPas machine was manufactured in June 2023, with a serial number 1. In practice it still is a prototype. The capacity of this ManPas 1000 is 1-1,5m³ of hygienized manure per day, in the future larger machines will be produced as well. Previous testing has been carried out on the first prototype. As development work progresses, process documentation will be recorded for self-monitoring purposes.



KEY WORDS

Manure, hygienization, agricultural technology, agricultural production, livestock production, bedding, circularity

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OTHER INFORMATION

All self-heating biomasses which require hygienization are suitable for ManPas. Fresh biomass is best, as the heat generated by the microbial activity decreases after about three weeks. The biomass particle size should be less than 2 cm. Shredded straw, wood or peat are in particular good bedding materials. The efficiency of the device is the highest when the process is continuous, and the feed heats itself to at least 60 degrees in the silo of the device.

The device is owned by IP-Innovaatiot Oy. It is sold without input and output equipment (belt conveyor). In some places, neither belt conveyors are needed if infeed is done by a loader and outfeed takes place in another room with a lower floor. In other cases, both are needed, a feeding conveyor to a height of 3 m and a discharge conveyor to lift the hygienized product higher into a storage bag or pile.

ManPas 1000 has a capacity of 1-1.5 m³ of hygienized manure per day and is priced below 20 000€. The size of the silo is 3 m³, resulting in a maximum processing time of 3 days. In the future, larger capacity units will be built, at least for 2 robot cattle farms and more. The capacity of 1-1.5 m³ is equivalent to 30-40 horses' dry manure or about 50 cows' dry manure. Due to the heat generation by microbial activity, electricity consumption and operational costs are low, as the temperature needs to be raised by only about 10°C and all other machinery operates in cycles, less than 2 minutes per hour. At its maximum, the ManPas 1000 uses electricity 10kWh/ 1 m³ of hygienized manure.



Photo: Ilpo Pölönen

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BRANCHES project

BRANCHES is a H2020 “Coordinator Support Action” project, that brings together 12 partners from 5 different countries. The overall objective of BRANCHES is to foster knowledge transfer and innovation in rural areas (agriculture and forestry), enhancing the viability and competitiveness of biomass supply chains and promoting innovative technologies, rural bioeconomy solutions and sustainable agricultural and forest management



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