

Microchip, the locally-made replacement for industrial chips: 4 step recipe

The term "Microchips" describes a very small (7 mm length) homogeneous wood chip product that can be used to feed common pellet stoves - after suitable adaptations. Microchip production matches the need for replacing industrial pellets with a new product that can be manufactured by small enterprises, using locally available raw materials and low-investment technology.

Microchips cannot match the quality of pellets in terms of high energy density, extremely low moisture content and even piece size: however, microchips are still dry, dense and homogeneous enough for feeding stoves that were originally designed for pellet fuel, and that are much cheaper to purchase compared with a classic chip boiler. Furthermore, microchips are cheaper than pellets and their origin is easier to trace, because entirely local. For this same reason, microchips contribute to local economy, which is not always true for pellets.

The Travaglini Bros. are pioneers of microchip production in Italy. The family owns a farm in Tuscany, where they harvest wood, grow agricultural crops and raise cattle. This activity is successful enough to support the families of the three brothers, their sons and grandsons. Travaglini were among the first in the area to acquire a chipper and install a chip-fed boiler, tasked with heating the whole farm building complex. They got into micro-chips in 2010, in order to supply local users with a pellet surrogate. Eventually, Travaglini starting modifying and selling the stoves, which came with a guaranteed fuel supply sold at competitive price compared with conventional pellets.

Like other forest entrepreneurs, Travaglini Bros. endeavoured into microchip production in order to find an outlet for their unutilized wood and to counter dwindling firewood demand. Among the main success factors, the most important was the ability to reach the final user, without intermediaries. Other significant success factors were: use of unutilized labour resources at marginal cost, control of the raw material supply, capture of opportunity wood and reduced investment cost. In fact, the cost for setting up the original microchip operation about a decade ago was 38 000 €, which represented less than half the cost of setting up a comparable pellet-manufacturing operation. For Travaglini bros. this was a relatively small operation, with an estimated output of slightly over 100 t per year, but it turned out to be profitable endeavour, and it was strategic for optimizing the use of internal resources and for reaching new customers. Over the last three years, the operations has been upgraded and expanded and now represents an important revenue stream for the farm.



KEY WORDS

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ADDITIONAL INFORMATION

Microchips production is organized as follows:

1) STORAGE AND AIR DRYING. Low-quality chestnut logs, sits piled for approximately one year, during which tannin is washed away and moisture is lost. Initial mean moisture content is 42%, that will drop to 27% after one year-long storage in a ventilated position.

2) CHIPPING AND SCREENING. Logs are chipped using a Farmi 260 CH (set to a cut length of 7 mm) powered by a small 85 kW tractor fed with a loader. Chips are blown into a bin trailer fitted with a self-constructed oscillating screen, (an iron wire net installed on 4 spring supports and shaken by a cam that is powered by a small hydraulic motor through the tractor's own circuit).

3) DRYING. Chips are dumped on a new solar drier consisting in a walled pad sited on a well ventilated position for air drying. In summer, moisture content is reduced to 18% within 3 days, after stirring the chips with a front-end loader twice per day.

The pad can process about twenty 30-t batches in a 2-month long hot and dry season. Now fitted with a sliding roof, the structure allows covering the drying chips in the event of wet weather, which extends the drying season well above the 2-month period available with the original uncovered pad.



4) BAGGING. The bagging system fills standard 15 kg plastic bags, with thermo-sealing, it is manual and requires that an operator attends to it. All microchip bags are stored under a roof until delivery, and can stay there for few months, for completing the drying.



ABOUT BRANCHES

BRANCHES is a H2020 “Coordinaton 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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THE PARTNERSHIP

