



### Production of biomass from self-propagating trees and shrubs

Areas, including agricultural land, where natural succession of different species of trees and shrubs has followed the abandonment of typical production of agricultural crops have recently become one of the substantial sources of woody biomass. Such plants are referred to as 'self-sowing plants', and the species composition on a given area (e.g. pine, birch, spruce, willow, poplar, etc.) depends on the environmental conditions, including the habitat, climate, plants growing in the surroundings, etc. Harvesting biomass from such areas plays a dual function. On the one hand, it is a source of woody biomass; on the other hand, it enables the restoration of this area for agricultural use or for other purposes, e.g. development.

In the light of the above, the company Quercus has developed a technological line, a set of machines and devices which are dedicated to this type of harvest. The first stage employs a Westtech Woodcracker C450 or C350 hydraulic shear head mounted on a Volvo EC 250 or EW 160 excavator, which can cut trees with a diameter up to 500 mm. The operator simultaneously performs a few tasks – grabs a plant right above the ground, squeezes it and cuts off with a cutting module. Then, he uses a collector to support the cut plant while grabbing and cutting another one. When the shear head's collector is filled up, the operator deposits the biomass in regular rows. This set of machinery can cut plants from an area of 1 ha in an average of 20 working hours, and harvest around 100 Mg of biomass on average. However, it is worth bearing in mind that each surface area has different features, and the above values may vary widely. The outcome also depends on atmospheric conditions and the type of soil, species structure and age of plants, and the professional experience of the operator.



#### KEY WORDS

Biobaler, biomass of agricultural and forestry, bales, calorific value

#### COUNTRY/REGION

Poland

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## ADDITIONAL INFORMATION

After harvesting the whole area, biomass is usually transported to one site (heap, pile) with a forwarder or tractor with a trailer and crane, for storage and possibly air drying to increase its calorific value. During storage, depending on the season of the year, atmospheric conditions, size of the heap, and duration of the storage period, the moisture content of plants decreases from around 50-60% on harvest to around 30-40% after a few weeks, so that the calorific value of biomass increases from around 8 to 12 GJ/Mg. Biomass stored in heaps, depending on its amount and the distance from the company's logistic yard, can be shredded into wooden chips with mobile Bruks 805.2 STC chippers mounted on a forwarder or on an Albach Diamant 2000. The chips are then transported to the end consumer in vehicles fitted with containers or movable floors. The wooden chips produced with the above technology are a valuable solid biofuel, which is most often used in heating plants or in combined heat and power plants, both local and commercial ones.

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## 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

