

Tree pruning is the established horticultural practice of cutting and removing selected parts of a tree in order to control growth, remove dead/ diseased wood and stimulate the formation of flowers and fruit buds. Currently, thick parts of pruning wood may be used as firewood in some cases but mostly prunings are left on the field and are either burned in open fires or, less frequently, mulched in the soil.

Plantation removal is the clearing out of trees at the end of the lifetime of a plantation. The aerial part of the tree may be used as firewood, but the stump, roots and thin branches are mostly unutilized and burned in open fires.

The main permanent crops in Europe are olives, grapes and nuts, followed by pome, stone and citrus fruits. The countries in Europe that have currently the largest areas of permanent crops are Spain, Italy, Greece and France.



Olive grove

Pruning bale

Olive tree pruning hog fuel

Olive tree pruning pellets

Thin pruning branches can be harvested and stored in **bales** or they may be chipped (manually or by mechanized systems). From plantation removal **firewood** and wood chips are usually produced. The **chips** or **hog fuel** produced from prunings or plantation removal can, be further upgraded to **pellets**.

For 2018, Eurostat estimated that there are approximately **11.5 million ha of permanent crops** in the European Union (EU-28). It is estimated that the technical potential for agricultural pruning biomass in Europe is more than **12.5 million dry tonnes per annum**.

Typical annual yield for pruning is between **1-3 t per hectare (dry matter)**, depending on the crop, the pruning practice and other factors. The biomass yield for plantation removal of mature trees may be in the range of **50 t per hectare (dry matter)**.

Prunings and wood from plantation removal are **mostly underutilized** in Europe. A small portion is used as **firewood** but the most common practice is to burn prunings and plantation removal in **open fires** or in some cases to be **mulched in the soil**. Their **energetic utilization** in modern combustion systems usually corresponds to less than 5% of the management practices.

Olive tree and vineyard pruning chips and pellets can be certified with the **BIOMASUD®** BIOMASUD quality scheme.



Indicative fuel properties			
Property	Units	Olive tree pruning hog fuel*	Vineyard pruning pellet*
Moisture content	w-% a.r.	27	10
Ash content	w-% d.b.	4.2	4.5
Net Calorific Value	MJ/kg a.r.	12.9	15.7
Bulk density	kg/m ³ a.r.	230	710
Energy density	MWh/m ³ a.r.	0.83	3.10
N	w-% d.b.	0.93	0.81
S	w-% d.b.	0.08	0.07
Cl	w-% d.b.	0.04	0.02
Ca	mg/kg d.b.	9000	10000
K	mg/kg d.b.	5600	5400
Na	mg/kg d.b.	460	170
Si	mg/kg d.b.	2100	2800

a.r.: as received
d.b.: dry base

*Agrobiomass composition can vary significantly. The given values are only indicative of typical values for this type of agrobiomass. More information on the typical variation of prunings and plantation removal can be found in deliverables of the Biomassud Plus and uP_running projects.

Image sources: olive grove - www.costanavarino.com, pruning bale/integrated pruning collection - uP_running project, Olive tree hog fuel/pellets / peach tree uprooting - CETH



Integrated pruning collection and shredding at an olive grove

Peach tree uprooting and chips



Find out more about heating and use cases, fuel suppliers etc. in **AgroBioHeat's Agrobiomass Heating Observatory**



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