A pellet weeding flamer machine

Gubiani Rino\*, Zucchiatti Nicola

*Department of Agricultural, Food, Environmental and Animal Sciences(D4IA), University of Udine, Via delle Scienze 208, 33100 Udine (Italy).*

[*rino.gubiani@uniud.it*](mailto:rino.gubiani@uniud.it)*; phone 3204365747*

**Keywords.** Weeding control, flame weeding, flaming, biomass-fuelled flamer design, vineyard

**Abstract.** Weed control is an important practice both in vineyard management (particularly in the case of organic farming) and in urban environments such as roadsides, gardens, public buildings, etc. In both of these environments, efforts are now being made to reduce or eliminate the use of plant protection products as they are potentially dangerous both to human health and the environment. In both these environments, efforts are now being made to reduce or eliminate the use of plant protection products as they are potentially dangerous to both human health and the environment. One method of controlling vegetation without using chemicals is to use flame weeding using a pellet stove.

The machine made by CS Thermos is a model that can be attached to the tractor's three-point hitch, and consists of: a 300-litre pellet tank; a feeding screw with a rotating grate; a horizontal flame outlet chimney, which is directed towards the ground via a special "bell", curved downwards to concentrate the heat produced on the under-row. The burner has a maximum heat output of 150 kW and is of the modulating type, with effective power adjustable from 30 kW to 150 kW. Two centrifugal fans, with a capacity of 700 m3/h and 250 m3/h respectively, provide the air necessary for both combustion and conveying the flame towards the ground.

From 2018 to 2021, the University of Udine set up a series of field trials to compare the effectiveness of biomass flame weeding with that of traditional techniques in two vineyards, one with traditional management, the other organic.

The results obtained highlighted the numerous advantages of flame weeding compared to traditional techniques: it avoids knocks and damage to the roots and vines, and the need to replace damaged plants, as well as loss of production; it is easier to choose the moment of intervention, without waiting for the soil to dry out after the rains.

Compared to traditional gas flame weeding, biomass flame weeding has the advantages of using a renewable energy source, and thus contributing to the reduction of emissions and the greenhouse effect linked to climate change; - it allows a certain saving in fuel costs: in our tests, the average pellet consumption was 50-60 kg/ha, with a cost, depending on the price (from 0. It can allow further savings in the prospect of using pellets from vine wood, obtained from pruning residues and therefore "self-produced" on the farm with possible recourse to inter-company services or contractors for the management of pelleting equipment.