
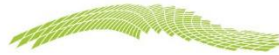




GOOD PRACTICE DESCRIPTION FORM

Title	Mechanical Inter-row weed control in vineyard
Proposer subject	Provincia Autonoma di Trento-PAT
Short description of the practice	<p>Mechanical inter-row tillage is a practice applied in vineyards for sustainable viticulture. In the past, weed control was manually with limited mechanical tillage, until the herbicides introduction. Herbicide has drastically reduced the time spent on this practice and all the efforts put on it. Nevertheless, nowadays herbicides are unsafe for human and environment is necessary to find out new practices more respectful. Mechanical inter-row weed control can be a good and correct alternative.</p> <p>To do inter-row tillage occurs 3 main types of machines that can be used in different times and conditions:</p> <ol style="list-style-type: none"> 1. EARTHING-UP/RIDGING/HILLING 2. HOEING OR HARROWING MACHINES 3. LAWN MOWER <p>1. EARTHING-UP/RIDGING/HILLING</p> <p>Earthing-up the vines consists in bringing soil back from the row to the plants, in order to create a mound. This practice is used on young plants to reinforce the emission of roots, thus helping their growth but also protecting them from the cold. At the end of winter, frost will have rendered thinner this plough's earth and destroy weed.</p> <p>Blades: they are knives that work inter-row, equipped with a movement regulation system. They penetrate the soil superficially by cutting and lifting the grassy soil. These blades cut the adventitious roots that will then dry out. This enables the soil to break up and helps separate the roots from the strip of soil.</p> <p>Disks: they are rounded, smooth or toothed discs, which furrow the ground superficially close to the plant removing the earth from the foot, if convex, or bring it back, if concave. It is an easy and fast operation.</p> <div style="text-align: center;">  </div> <p>Picture1. Radius SL Plus, Clemens. Blades with disk. It can be combined with rotary tiller</p>



2. HOEING or HARROWING MACHINES

This tillage depends on the type of machine is used, like as blades or with lateral translator.

This operation must be done in spring when there is a low presence of weeds. This practice make a shallow work (15cm) and take away the weeds.

TILLER OR HARROW: Toothed or blade harrows are implements made up of series of triangular or square or circular teeth, or blade with rotational movement with respect to their vertical axis. The work done is due to the breaking action, in the case of teeth, or cutting, in the case of blades.



Picture 2. Rotary Tiller, Clemens

3. LAWN MOWER

Frequencies of this operation in a season depend on the kind of weeds are present in vineyards and on water available. The mowing of the grass is recommended in vineyards with high vigour, on land rich in skeleton where the cutting of the grass does not include the movement of stones and vineyards arranged on steps or terraces, where there are erosion problems.

On market you can find different types of tools that mower the grass:

- Wire brushcutters
- Trunk cleaner (wire or cable ties) like as Shoots Remover. It can be twice functions: vertically shoots removal and machines that have the main function of grass control.
- Brushes: they are tools constituted by a rotary shaft on which rubber wires are inserted which turning perpendicular to the ground mower the grass. They are coupled to a lawn mower that leaves the inter row.



Picture 3. Wire Brushcutter



- Lawn mowers: they have rotating mowers, blades or knives that cut the grass. They can work close to the row or inter-row.



Picture 4. VBC Shoot remover



Picture 5. BioSystem. Weed mower Aedes with Inter-row brushes



Picture 6. Inter-row lawn mower DB12

Aim of the best practices	Inter-row tillage is very important to better tolerate water competition with permanent spontaneous grassing on all rows. In addition, it greatly improves the microclimate of the bunch, especially during ripening. This practice is fundamental to reduce the use of chemical weed management.
Expected Results	Improve the biodiversity on vineyards, reduce the pollution of herbicides, reduce resistance processes, aerate the soil, erosion reduction
Improvable or Critical Aspects	The processing with these tools can bring stones to the surface and in the centre of the inter-row, a manual passage provide to remove as much as possible; this is necessary in the first period of use, after which the fact of removing them greatly reduces the problem.

	In add, if brushcutters with plastic wires are used, the problem of releasing microplastics into the environment occurs in the long term
Limitation or Adaptability	<p>Limitation of HOEING: is difficult the first pass with blades because of the soil condition, that usually is wet and dump. For this reason is well Pre-unearthing or pass with lawn mower.</p> <p>Limitation of LAWN MOWER: is the rapid consumption of the threads and the risk of shooting stones around due to the high rotation.</p>
Bibliographic indications	<p>Appunti per il vignaiolo naturale- 2014. Ruggero Mazzilli</p> <p>Gestione del filare per una maggior sostenibilità ambientale nella conduzione dei vigneti. Ferrari F.lli Lunelli SpA</p> <p>www.cucchi-ma.it/en/portfolio-items/intercepts-tools-frame/</p> <p>https://www.clemens-online.com/</p> <p>https://www.bfmitaly.it/bfm-agricultural-machinery/</p>
References	Provincia Autonoma di Trento, Cantina Ferrari, Ruggero Mazzilli