3.2.5. Mulching in tree crops.

3.2.5.1. Description.

Mulching under tree crops is the practice of using inert material for covering the lanes to protect the soil against erosion, improve soil quality and control weed growth. For cost, and environmental reasons, mulching is carried out using pruning residues from the trees, although in some situations pruning residues or straw are brought from other farms. Mulching is sometimes used to achieve an effective soil protection when planting an orchard or vineyard on very steep terrain while other techniques, for example cover crops or vegetated barriers are implemented. Mulching is also used as a substitute for, or complement to, cover crops, especially in arid and semiarid areas. There are many other mulching materials, see for instance NRCS (2011), but their costs normally restrict their use in orchards. In soils with a high stone content the stones may be used to cover the surface of the orchard soil and create a stone mulch. Although not recommended and now abandoned for environmental reasons, you can still find historic descriptions of mulching using plastic material in some crops e.g. pineapple fields.

The major advantages of mulching using pruning residues or straw are summarized in Table 3.2.5.1. Please note that to achieve an effective protection against sheet and rill erosion, or to reduce weed growth enough biomass to cover most of the ground during the rainy season is needed. In this respect residues from pruning material, which tend to decompose more slowly than residues from herbaceous plants, provide a more lasting cover. To be effective mulching material needs to be applied regularly to provide effective cover all year round. A reference figure for achieving effective mulching is 3.5-6 t ha-1 dry of biomass (e.g. straw or chopped pruning residues).

Table 3.2.5.1. Main benefits of mulching with organic materials.

#	Benefit
1	Control of water (sheet and rill) and wind erosion.
2	Increase of organic carbon and aggregate stability in the top (0-5 cm depth approximately) soil layer.
3	Reduces weed infestation.

Mulching might have occasionally negative side effects and it is important to take precautions to avoid these (Table 3.2.5.2).

Table 3.2.5.2. Precautions when using mulching in tree crops.

#	Caveat
1	Always check that there are not plant pathogens or diseases that can be spread or promoted if using a mulch.
2	Try to chop the pruning material to a size that facilitates uniform distribution in the farm and avoid propagation of plant pathogens and diseases.
3	Check the C:N ratio of your mulching material to correct for: a) temporal sequestration of soil N if C:N ratio is too high. b) avoid using mulching materials with high N content in areas connected to streams.
4	Check that there is no negative effect on protected flora and fauna (e.g. reptiles, ..).
5	Note that mulching will interfere with efforts to establish a cover crop. Take appropriate measures (e.g. spreading on alternate lanes) to avoid negative effects.

3.2.5.2. Images of different examples of mulching.

Figure 3.2.5.1. Lanes of an olive orchard mulched with chopped pruning residues in Spain (Photo J.A. Gómez).

Figure 3.2.5.2. Olive orchard mulched with cereal straw in Spain (Photo J.A. Gómez).

Figure 3.2.5.3. Mulch transported by rill flow in a very long slope (Photo J.A. Gómez).

Figure 3.2.5.4. Vineyard with mulched interrow in Hungary (Photo T. Dostal).

Figure 3.2.5.4. Mulch of non-chopped pruning residues in an olive orchard in S Italy (Photo J.A. Gómez).

3.2.5.3. Selected References.

NRCS, 2011. National Resource Conservation Services. Iowa Conservation Practice 484. Available at **https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_006305.pdf**

NRCS, 2018. Natural Resources Conservation Service. Conservation Mulching Code 484. **https://efotg.sc.egov.usda.gov/references/Public/IN/484_Mulching.pdf**

WOCAT 2013 Mulching (Kenya). Available in **https://qcat.wocat.net/en/wocat/technologies/view/technologies_1318/**
Note that in WOCAT database there are several examples of mulching.

Return to Table 3.1.1.