Intercropping medicinal plants under cherry timber trees

Understory planting to improve productivity of plantations.
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Why combine *Melissa officinalis* L. with cherry trees?

Melissa officinalis L. (commonly known as lemon balm in English) is used to supply rosmarinic acid to the pharmaceutical sector. *Melissa officinalis* L., like many medicinal plants, is well adapted to partial shading. Cherry trees are a high value timber tree with good economic return. They generate little shade compared with other trees.

Melissa officinalis L. **plants under cherry trees with plastic mulch.**

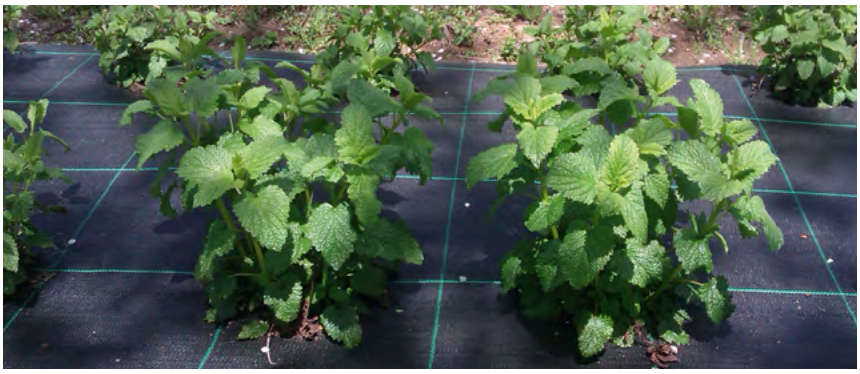
Melissaofficinalis L. **plants under cherry trees at the beginning of the spring.**

How to combine *Melissa officinalis* L. with cherry trees?

The combination of maize and cherry trees on the same unit land is an agroforestry system that can, with appropriate land management, enhance the profitability of both components. Due to lower tree densities, high value timber trees, such as cherry, may grow better on agricultural lands (with pH over 5.5) than on forest lands.

Melissa officinalis L. plants can be grown in the alleys between the tree rows. The rows of the trees should have a north/south orientation for light optimisation and there should be a 1.5 m buffer on both sides of the tree row. Adequate tree densities for high value timber cherry trees are usually between 666 and 1,333 trees/ha. In Galicia (NW Spain), trees are usually harvested when they are 25 years.

Melissa officinalis L. can be purchased as seeds (40-60% germination rate) and seeded. One crop lasts between 4 and 5 years and should be cultivated in alternate alleys to allow for tree pruning. *Melissa officinalis* L. should be established in the spring at a stocking rate of 30,000-40,000 plants/ha (40 and 70 cm spacing between rows) A nitrogen fertiliser should be applied (60 kg/ha for the first year and 80 and 60 kg/ha in the second year) at the beginning of the spring and after the first harvest, respectively. Weeds should be managed mechanically or through mulching (e.g. using plastic, bark or straw.)



Melissa officinalis L. **plants under cherry trees before the harvest.**

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Advantages

- Producing high value timber is a profitable land management use. However, it is a long-term economic investment. The combination of high value timber plantations with medicinal crops results in short, medium and long term returns.
- In addition, the combination of high value cherry trees and medicinal plants improves landscape aesthetics, which can encouarge rural tourism.
- Moreover, the system can also provide ecological benefits, such as increased rates of carbon sequestration and enhanced nutrient recycling.

Leaves of *Melissa officinalis* L. before flowering

Establishment and management

Cropping *Melissa officinalis* L. within the alleys at the time of establishing the cherry plantation will force cherry tree roots to penetrate deeper. This allows trees to be better anchored, increasing system resilience against extreme weather events. Growing *Melissa officinalis* L. in the shade, improves the level of rosmarinic acid in the plant, as flowering is delayed

Farm work organization

The period of heavy labour demand is different for cherry trees and the *Melissa officinalis* L. Coping with this requires careful planning and good time management. Any extension of the harvesting period of *Melissa officinalis* L. will require additional labour inputs. Short value chains should be developed for both the tree and the crop component, to make this activity profitable. Labelling products as agroforestry will make it easier for consumers to identify outputs as being linked to sustainable land use practices, and thus command a premium price.

Environment

Melissa officinalis L. is used in organic farming to reduce aphid attacks, which reduces the needs for pesticides in forest plantations, and diminishes negative environment impacts. Deeper tree roots can improve carbon sequestration and mitigate the effects of climate change. Better nutrient recycling is obtained as trees will uptake excess nitrogen and other nutrients.

Further information

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María Rosa MOSQUERA LOSADA, Nuria FEIRREIRO-DOMINGUEZ, Rosa ROMERO-FRANCO, Antonio RIGUEIRO-RODRIGUEZ

mrosa.mosquera.losada@usc.es

Crop Production and Project Engineering Department. Escuela Politécnica Superior. University of Santiago de Compostela, 27002 Lugo, Spain

www.agforward.eu

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