Productivity and quality of maize under cherry trees

How to optimize maize growth under cherry trees
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Maize plants under cherry trees in Galicia (NW Spain)

Why combine maize with cherry trees?

Maize is in great demand all over Europe as livestock feed. However, intensive maize production requires large amounts of inputs, including fertilizer and water, which results in low returns and high environmental costs.

Currently, quality timber cherry trees have a high market value due to a shortage of supply.

The combination of high value timber trees with maize may be more profitable than maize and tree monocultures and result in enhanced ecosystem services.

Maize plants with cherry trees in Galicia (NW Spain)

How best to combine maize with cherry trees?

In areas with adequate water supply, light is the most limiting factor to growing maize. To reduce the amount of light captured by the trees it is advisable to:

a) plant trees widely spaced (at low density);
b) plant trees in a north-south orientation;
c) plant cherry trees with late bud break.

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.

Maize plants can be grown in the alleys between the tree rows. The rows of the trees should have a north/south orientation, and there should be a 1.5 m buffer on both sides of the tree row. As maize is a C4 species, light is a limiting factor to growth. Cherry tree varieties should be selected based on timing of bud break; cherry varieties with late bud break should be used to allow maize establishment under less shady conditions.

Maize established with young cherry tree before harvest

AGFORWARD Agroforestry for Europe

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Advantages

- Producing high value timber is a profitable land management use. However, it is a very long-term investment. The combination of high value timber plantations with maize is advantageous because it provides an annual revenue.
- Cherry-maize agroforestry systems improve ecosystem services.

Harvest period of maize established under cherry trees

Establishment and management

Tree planting density and age are important factors when it comes to the combination of cherry trees and maize. The most shade tolerant maize varieties should be selected. Moreover, a low tree density with an adequate distribution of the trees along paddock borders is required to increase productivity of the system compared with monoculture systems. In general, in Galicia (NW Spain), due to the reduction of the surface available to crops, tree distances of 6 m reduce maize yields by 20% although, due to the tree value, productivity of the total system increases. High value cherry trees and maize can be established concurrently to force the trees to develop deeper roots. This improves anchoring of the trees and avoids tree growth reduction due to root damage.

Environment

Deeper tree roots can improve carbon sequestration which mitigates the effects of climate change. Better nutrient recycling is also obtained as trees will take up the excess of nitrogen and other nutrients. This type of agroforestry system, therefore, decreases the need for fertilisers, and reduces the carbon footprint of the farm as less external inputs are required.

Further information

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