Increase the productive and economic output of cherry tree cultivation by means of new architecture systems

Summary

One of the main problems currently affecting cherry tree cultivation is the high management costs involved. Around 80% of the costs associated with cultivating cherry trees are related to maintenance tasks, such as thinning and collecting the thinned foliage. It is also a crop that takes a long time to become fully productive (after the tree is 3 years old), which means that adapting the crop to the demanding needs of a constantly changing market is extremely difficult.

One of the solutions proposed is to work on young developing trees in which production starts at a very early stage. The yield of trees can be improved by evaluating the application of various training techniques. The selective modification of their training also creates a crop with more uniform characteristics, leading to more standardised harvests and qualities of fruit, in terms of calibre and degree of ripeness.

That is why this pilot project aims to influence the management systems in the initial training in cherry tree growing to achieve simpler management with lower financial and labour costs, while simultaneously producing a harvest of uniform fruit in terms of quantity and quality; and also impacting on the crop's early entry into production.

Objectives

The project has the following specific objectives:

- Develop simple pruning techniques by means of vertical training on main branches which increase production per m^2.
- Optimise and simplify management, by means of standardised training that reduces the need for manual thinning.
- Reduce the use of phytosanitary treatments by creating "wall" type training that ensures a smaller amount of product covers a larger treated area.
- Assess improvements associated with fruit quality resulting from these new types of training.
- Attempt to bring forward the beginning of production of young crops, prioritising developments that promote this earliness.
- Assess the economic impact of the new management compared to the standard method.
- Transfer the results of the project to the sector, so that they can be applied in both cherry tree growing and to stone fruit crops with similar problems (superintensive crops).

Description of the actions carried out in the project

The following specific actions were taken to achieve these goals:

• Action 1: Characterisation of the current system. The company's usual vase training system was classified in terms of costs, performance and quality.

• Action 2: Changes in the training system. Based on vase training, work was done to give young cherry trees a new architecture (KGB, UFO).

• Action 3: Determine phenological and developmental changes. The project studied whether the change in cherry tree training affected development, phenology and early production.

• Action 4: Productive and quality analysis. The production and quality at harvest of the cherries was evaluated according to their variety and training.

• Action 5: Economic evaluation. Finally, an analysis was performed to study the economic components of each type of training and to determine the most viable system from an economic and environmental point of view.

Final results and practical recommendations

- UFO is a very productive system, but it also requires a larger initial investment: a high density of trees is needed, as well a structure to support the trees and greater technical knowledge when training the trees, but after they have been trained the rinsing of flowers and fruits can be mechanised, and harvesting is easier.
- KGB was the most productive system of all, due to the volume of the trees and the rapid entry into production. It is a system that is easy to handle and does not require structure, with a smaller initial investment than UFO. However, the mechanisation of tasks is more difficult to adapt to this system, and if a thorough thinning is not carried out it may have a negative impact on the final size of the fruit.
- The results of the project were optimal, and have been transferred to the Catalan cherry growing sector, so that other producers can improve their production.

Conclusions

- The new training systems (UFO and KGB) made it possible to increase cherry production per m^2 compared to vase training, particularly with the KGB.
- The UFO training system enables the thinning of flowers and fruits to be simplified and mechanised.
- Increasing the planting density reduced the volume of phytosanitary products applied per tonne of fruit produced.
- The training system influenced the measurement of the fruit and the distribution of calibres, because this variable is closely linked to production. Large calibres can therefore be obtained if the number of cherries is reduced by thinning flowers or fruits.
- The training system did not affect the other quality parameters (°Brix, colour, firmness).
- UFO-trained cherries began producing fruit earlier than traditional vase pruned cherry trees.
- The new training systems, and the KGB in particular, yielded better economic returns than traditional vase training.

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Subject area(s) of application

- ☒ Agricultural production system
- ☒ Agricultural practice
- ☒ Vegetable production and horticulture

Geographical area(s) of application

PROVINCE(S): LLEIDA
REGION(S): EL SEGRIÀ

Project website

http://olimpfruit.com/ca/blog/resum-del-projecte-cooperacio-la-innovacio-grups-operatius

More information on the project

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