

Fundamentals of implementing Integrated Crop-Livestock-Forestry systems with eucalyptus trees

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Introduction

ICLF systems are inherently more complex than grain crops and their cycle duration depends mainly on the tree component. In this context, it is essential to correctly implement the system avoiding later management problems that are often irreversible. Attention to the several planning details and caution when defining each implementation step, for each system components can determine success and failure in such initiatives. This summary presents aspects related to the implementation of ICLF systems having eucalyptus as tree component, with particular emphasis on soil preparation, planting, spatial arrangement of trees and pruning/thinning.

Results and Conclusions

Area selection - When defining an area for implementing an ICLF system, it is necessary to bear in mind that the site should provide minimum conditions for cultivating annual crops, such as soybeans, maize and sorghum, which require greater soil fertility than most tropical grasses and eucalyptus trees demand. **Soil preparation and fertilization** - It is important to observe if the area has a sharp slope, requiring terraces to be built and the adoption of other measures to prevent erosion and soil conservation. Particularly in Brazilian *Cerrado*, soils usually have chemical properties which are unfavorable for cash crops without prior fertilization, once they usually present high levels of exchangeable Al³⁺ and high active acidity (low pH), and low P content. Fertilization with phosphorus at 40 to 50 cm depth at furrowing is very important for eucalyptus. **Planting seedlings** - In case of planting seedlings grown in tubes, the work can be done manually or by using specialized seedling transplanter machines. Seedling losses should not exceed 5%. **Spatial arrangement of trees** - It is more common to arrange trees in single or triple rows, in east-west orientation, preferably. To define spacing between trees and rows, one must consider the end-use of wood, like saw timber, lamination, firewood, fence poles, pulp and charcoal. Broader spacing trees grow faster, resulting in logs with wider diameters at the end of the ICLF cycle. **Grain crops** - Annual crops in the first and second years amortize part of the initial investment of implementation. In Brazil, traditional crops like soybeans, maize and rice have been successfully used as crop component in the system. **Grazing forage** - In tropical condition, the species like *Brachiaria brizantha* cvs. Marandu, Piatã and Xáraes, *B. decumbens* cv. Basilisk, *Panicum maximum* cvs. Aruana, Mombaça and Tanzânia, and *P. spp.* cv. Massai, are good options for ICLF systems due to their good shade tolerance. **Pruning and thinning** - The removal of the lower tree branches and twigs, must be carried out before introducing animals in the system to avoid spoil timber quality. The first pruning is done when tree trunk reaches an average diameter of 6 cm at breast height (DBH), it is removed a maximum of 1/3 of the tree canopy. In 12-14 years, the trees will be clear-cut and the system can restart. **Closing remarks** - The steps presented above provide initial guidelines for introducing an ICLF system with eucalyptus trees. All orientations presented in this section should be part of a set of guidelines that form a comprehensive project for implementing the ICLF system.

References cited

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