

Co-Design and set-up of innovative fruit-based agroforestry cropping system in Belgium



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CONTEXTE and OBJECTIVE

The required reduction of agricultural inputs without significant productivity loss needs a fundamental redesign of cropping systems. The optimization of various ecological services associated to adapted biodiversity will only be possible by modifying deeply the composition, structure and organization of agro-ecosystems. Combining pome fruit trees and vegetables in agroforestry systems represent one of such deep change. The aim of this research is to validate under a long term field study, the sustainability of such innovative fruit-based agroforestry cropping system in Belgium.

MATERIALS AND METHODS

Which steps have been organized for the participative co-building ?

- ✓ Literature reviews and visits of pre-existent setups,
- ✓ Proposals for different spatial arrangements and prototypes have been elaborated and evaluated through participative discussions involving scientists, advisors and farmers,
- ✓ Links with genetic innovations for rootstocks and cultivars,

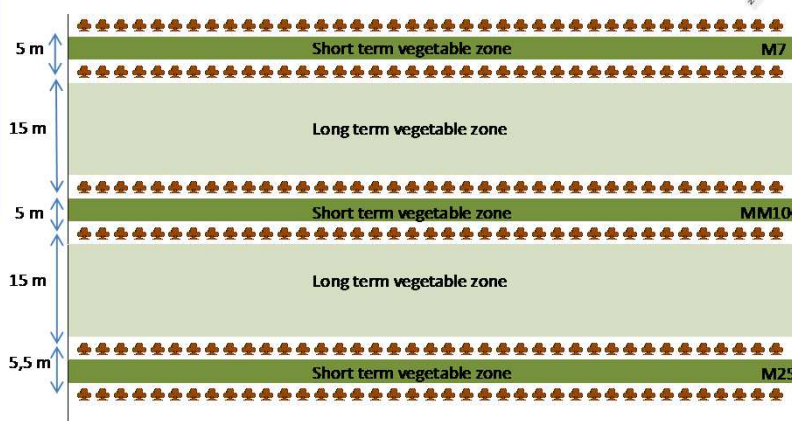
Main questions discussed ?

- (i) How to optimize the various ecological services associated to adapted biodiversity such as regulation of microclimate, protection against erosion, biological control, soil life processes, allelopathy, pollination, rootstock and cultivar choice, prophylactic scab control through leaf litter reduction, ...?
- (ii) How to adapt the mechanization without limiting plant interactions with perennial and/or annual crops ?
- (iii) How to reach a high income per surface unit allowing economic viability of farms in a capital intensive economic system ?



RESULTS

An innovative fruit-based agroforestry cropping system, under organic farming, established in 2014 at Gembloux in Belgium. The basic design is presented here :



PERSPECTIVES

Two other on-farm fruit-based agroforestry cropping prototypes in Belgium are conducted on two pilot farms. In the same agroforestry site, specific experiments focused on vegetable management are set-up.