

Principles of design of intercropping

Problem

Studies on crop mixtures are not particularly common so farmers may lack knowledge about what best suits their objectives and conditions.

Solution

Principles for crop mixtures design (combinations of species, cultivars, densities, sowing patterns and fertilization) depending on targeted services.

Outcome

Tracking farmers' innovations to:

- reveal the diversity of mixtures cultivated
- show links between objectives and practices
- develop this practice

Practical recommendations

- Increasing resource use efficiency (light, nitrogen, water, etc.). Choice of species/cultivars with complementary temporal pattern, morphological and functional traits (height, habit, root system, etc.)
- Facilitating harvest and reduce losses. Choice of species/cultivars with robust stem to prevent the lodging-of the associated crop (e.g. Barley-pea, camelina-lentil)
- Ensuring that at least one species is always harvested. Choice of species/cultivars with complementary growth requirements and sensitivities (diseases, insects, extreme weather, ripening dates, etc.) (e.g. Faba bean-wheat)
- Harvesting a supplementary crop, achieving two crop cycles in one year. Choice of species with different life cycles, to be sown simultaneously and harvested separately (e.g. Rapeseed-buckwheat)

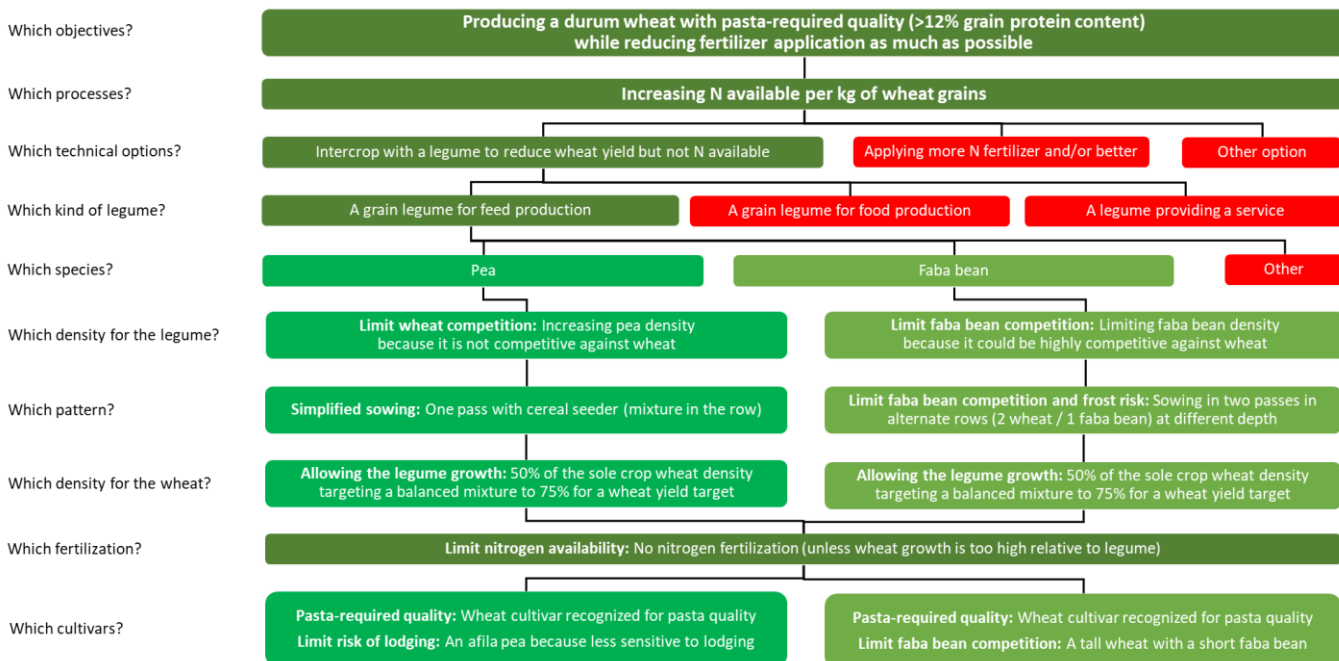


Figure 1: Example of the design of: 1) an additive durum wheat-pea intercrop versus 2) a substitutive durum wheat-faba bean intercrop

Practical testing/ Farmers' experiences

Tracking farmers' innovations revealed different practices and sub-objectives with the aim of 1) increasing yield and its stability, 2) controlling weeds and 3) increasing nitrogen supply in the cropping systems and then nitrogen self-sufficiency.





Further information

- Verret V., Pelzer E., Bedoussac L., Jeuffroy M.-H. Tracking on-farm innovative practices to support crop mixture de-sign: the case of annual mixtures including a legume crop (submitted)
- Verret V., Pelzer E., Bedoussac L., Jeuffroy M.-H. (2019) Traque aux innovations d'agriculteurs pour la conception d'associations d'espèces incluant des légumineuses. *Innovations agronomiques* 74:143-154
- Check the [Organic Farm Knowledge Platform](#) for more practical recommendations.

About this abstract

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ReMIX is a H2020 multi-actor project that will allow designing cropping systems based on agro-ecology for the benefit of farmers and the whole EU agricultural community. ReMIX will exploit the benefits of species mixtures to design more diversified and resilient agro-ecological arable cropping systems. Based on a multi-actor approach, ReMIX will produce new knowledge that is both scientifically credible and socially valuable in conventional and organic agriculture. The project will tackle practical questions and co-design ready-to-use practical solutions. The project will span from the specification of end-user needs and the co-design of in-field and on-farm experiments to demonstrations with evaluation of new varieties and practices. ReMIX will contribute to the adoption of productive and resilient agricultural systems. The project is running from May 2017 to April 2021

Website: www.remix-intercrops.eu

