

Practice abstract #3.14

The potential of plant communities in delivering ecosystem services



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KEY WORDS

Trade-offs, ecosystem service provision, arable field margins

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CHALLENGE

Enhancing ecosystem service provision in farmland landscapes has become crucial in recent years to not only boost food production, but also to improve biodiversity and soil health. Utilising areas of agricultural land to implement practices that enhance ecosystem service provision, such as hedgerows and field margins or strips, can help increase ecosystem service provision. In this context, the project explores the potential of designed annual plant communities in delivering ecosystem services.

SOLUTION

Annual plant communities have the potential to provide field margins delivering ecosystem services within the first year of sowing. Using plant-trait based research to design communities, we tested the efficacy of annual wildflower and crop-based communities to provide various plants required for ecosystem service delivery. Trade-offs were assessed between single function mixes, mixes combining all ecosystem services and mixes with underutilised, arable crops. Community traits, including vegetative, floral and bare ground cover, were collected. Reseeding performance was observed in each mix the following year.

OUTCOME

Within the first year of data Collection (three trials in 2022, 2023 and 2024), annual communities offered up significant levels of the plant traits required for ecosystem service provision. Communities designed for beneficial invertebrates offered flowering units throughout the season, with a variety of floral colour. Communities designed for soil and water protection provided good ground cover, along with growth at different heights to slow down water infiltration. Multifunctional communities saw little to no trades-offs when providing for both ecosystem services. Underutilised crop mixes underperformed compared to wildflower mixes, possibly due to reduced complexity of sown species. Single ecosystem annual communities performed well in the

following year (two trials 2022-2023 and 2023-2024).

Multifunctional, wildflower communities only performed well in soil and water protection plant traits.

PRACTICAL RECOMMENDATIONS

Data suggests that annual wildflower mixes that offer multifunctional ecosystem services can be used in the future as flexible and rotational strips or margins.

These have the potential to form part of legislation and land management schemes by governments, prompting their use to enhance multiple ecosystem services in arable landscapes.



About CROPDIVA

CROPDIVA wants to put 6 underused arable crops back in the fields: oats, hull-less barley for human consumption, triticale, buckwheat, faba beans and lupins.

27 European partners are joining forces to enhance agrobiodiversity in Europe. They will achieve this by focusing on crop diversity and creating local value chains.



This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement N°1010000847

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