

How can agroforestry contribute towards biodiversity conservation?

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Summary

Agroforestry is the deliberate integration of trees and shrubs into the farm operation. Based on an online workshop held 20/10/2021 (tinyurl.com/nhdc4r4k) we conclude that:

- Biodiversity is under threat and agroforestry presents an opportunity to increase farmland biodiversity
- Optimising functional diversity, that delivers ecosystem services, requires active management
- Agroforestry implementation should account for the current biodiversity status of the farmland and wider landscape-level integration
- There are trade-offs to consider throughout the development of an agroforestry system and long-term support is important
- Agroforestry can contribute towards various UK policy targets, as such a range of funding options and schemes should be considered and developed

Intro

It is widely acknowledged that none of the Aichi Biodiversity Targets have been met¹. In the UK, the RSPB State of Nature Report 2019 concluded "There has been no let-up in the net loss of nature in the UK"². Agriculture is a major driver of biodiversity loss and so a major focus for remediation, and the 2030 Target 10 of the UN draft Post 2020 Global Biodiversity Framework requires that global agriculture be both biodiverse and resilient.

Trees are inherently biodiverse³, hosting insects, birds, and many other species, and deliberate incorporation of trees in agroecosystems (agroforestry) has been shown to dampen environmental extremes⁴. Agroforestry within and around fields can also improve connectivity between high quality habitat patches such as woodlands.



Key findings

Based on evidence presented in, and feedback to, an online workshop held 20/10/2021:

1. Agroforestry increases farmland biodiversity. In UK arable agroforestry, ensuring a flowering tree understory improves pollination and pest management services.
2. Agroforestry on already biodiverse farmland should be done with care. A species inventory should be taken and interventions should specify targets for enhancement.
3. Advice and guidance, including support from professional ecologists, should be taken throughout agroforestry projects. This is especially important in high diversity farmland.
4. Agroforestry can contribute to various policy targets and areas including, for example, the UK Agriculture Act 2020, UK Environment Bill and England Tree Strategy.
5. Policy support for agroforestry can include initiatives beyond Countryside Stewardship / Environmental Land Management, for example current or future funding schemes within: Local Nature Recovery strategies, national/local climate change targets, and the Clean Air Strategy.

Background to our findings

We held an online workshop to explore the role of agroforestry in biodiversity conservation with a range of stakeholders. The focus of the workshop was to discuss what role agroforestry can play in UK biodiversity conservation and restoration, and what a supportive policy environment would look like. This was examined through a series of presentations by invited speakers and audience interaction. The workshop was organised by the Organic Research Centre (ORC) and funded by the A Team - Farming the Future initiative.

Three experts presented their view from research, farming practice and advocacy perspectives:

Research perspective

Tom Staton, a doctoral researcher at the Centre for Agri-Environmental Research at the University of Reading, discussed his research on how agroforestry can enhance biodiversity in low-diversity English arable systems. His work demonstrates an increase in the diversity of species (Shannon Index) in agroforestry crop alleys compared to arable control fields⁵. He presented evidence that trees in arable fields can support more invertebrates, including wild pollinators, although there is a trade off with weed pressure⁶. Tipping the balance of biodiversity in favour of useful pollinators and predatory insects can be achieved by maintaining a flowering tree understory⁵.

Farming perspective

Carolyn Richards, a mixed farmer based in Devon, related her experience of developing nature conservation strategies on her land using trees including hedgerow restoration, woodland management, and wider land management such as reduced inputs on permanent pasture. In contrast to many very low diversity arable systems, her pastureland is species rich. Each agroforestry intervention requires a detailed knowledge of species present and expert advice to ensure that existing diversity is enhanced and not negatively impacted.

Advocacy perspective

Helen Chesshire, Senior Farming Advisor at the Woodland Trust, discussed the policy context of agroforestry both internationally and in England. Discussion of agroforestry in England is currently dominated by the developing Environmental Land Management (ELM) scheme, but it was stressed that this is only one of many policy drivers. It is important to consider the contribution that agroforestry can make in other policy areas such as climate change mitigation, clean air, and the National Food Strategy. Novel routes to funding agroforestry, such as biodiversity net gain and private sector initiatives, were also presented.

Audience perspective

The audience of farmers, civil servants and other stakeholders were interested in the practical aspects of agroforestry implementation: Which tree species should I plant? Will trees damage my land drainage systems? At what density should I plant trees? This supports that a lack of knowledge about agroforestry is a key barrier to its uptake, as evidenced in previous research led by ORC (see: tinyurl.com/AgrPB1).

Concerns were raised around tensions between pasture management actions and woodland actions within the Sustainable Farming Incentive component of ELM. The need for education around potential clashes in the outcomes of agroforestry as well as long term planning and monitoring were also discussed.

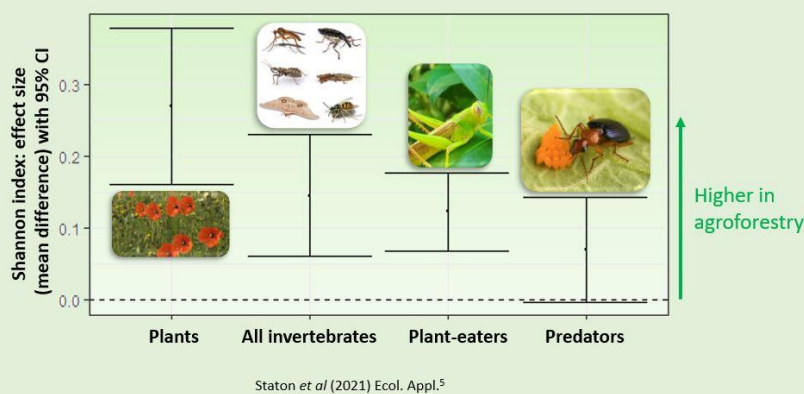
You can watch the online workshop in full at: tinyurl.com/nhdc4r4k

“AGROFORESTRY CAN ENHANCE BIODIVERSITY AND ECOSYSTEM SERVICE PROVISION RELATIVE TO CONVENTIONAL AGRICULTURE AND FORESTRY IN EUROPE AND COULD BE A STRATEGICALLY BENEFICIAL LAND USE IN RURAL PLANNING.”

Torralba et al. (2016) *Agric, Eco & Env*⁷

UK arable agroforestry: higher biodiversity

Significantly higher plant and insect diversity in agroforestry crop alleys:



Policy recommendations

Recommendation 1

Support agroforestry to work towards the delivery of 2030 Action Target 10 of the UN Post-2020 Global Biodiversity Framework in the UK: for agroecosystems that are both resilient and productive.

Recommendation 2

In England, the expansion and management of diverse agroforestry systems should be incentivised via the new Environmental Land Management scheme (ELM). Agroforestry can simultaneously deliver a wide range of public goods including biodiversity conservation and restoration.

Recommendation 3

Agroforestry can and should be an important delivery tool for a range of policy areas within England, including the path to Net Zero and the National Food Strategy, as well as delivering for nature. These wide-ranging policy areas must be integrated to avoid unintended consequences and structured in such a way that public and private finance can be blended.

Recommendation 4

Agroforestry is a complex system, and the many benefits are because of ecological and economic interactions. It can be challenging to provide policy support, regulations and monitoring frameworks that encompass complexity. Supporting access to research, training, practical guidance, and peer to peer mentoring will be important to realise the biodiversity and other benefits of agroforestry in practice.

Conclusions

Introducing agroforestry will increase biodiversity on much farmland but it is not a silver bullet. Getting the right type of biodiversity in UK arable systems (i.e. pollinator and predator rich) requires special management such as the introduction of a flowering tree understory. Agroforestry in already-biodiverse farmland needs to be approached carefully. Poorly planned planting of trees on such land could conceivably decrease biodiversity. While the post-Brexit ELM system dominates discussions round agroforestry in England, it is by no means the only policy driver or route to funding agroforestry.

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DISCLAIMER

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