



REFOREST

Living Lab 7: United Kingdom

*Integrating biomass
and food crops at
Cockle Park*



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Living Lab 7

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The farm

I have been the Farms Director at Newcastle University Farms since 2017. Cockle Park Farm is one of Newcastle University's practical learning and research farms. It's a 307-hectare (ha) mixed farm which is 18 miles north of Newcastle. The agroforestry plot here is 21 ha, it was established in spring 2022. There are 8.5 full time employees working across Cockle Park and Nafferton Farm, the other university farm.



We adopted a conservation agriculture approach at the farm right from the beginning, and I believe we are the only UK university farm to have a grazing system for our dairy herd. We currently have 250 dairy cows. There is a diverse cropping system on the farm, which includes spring cropping in the rotation and bi-cropping of the forage whole crop. There are also pigs and cereals, oilseed rape and arable crops grown on the farm.

We have a block of willow used for biomass that was planted 23 years ago; it's harvested to create a biofuel product. And we have a new agroforestry field with willow poplar coppice as an experiment. There are two double rows of trees, with 60-70 cm between the double row and then there is a 1.7m gap between those. So, the width of the tree strips is 4.6m and the inter-row distance is 24m, with arable crops in the alleyways.



The way to agroforestry

My grandfather was a farmer and he wouldn't let any of his children farm! In those days, it was really hard work; you were invariably working for someone else and had nothing at the end of it. When I told him I was going to agricultural college he advised me against it. But I went, and managed a couple of farms before Cockle Park. I also knew a bit about educational farming, having worked for Plumpton College and been a Governor of Hadlow College.

The decision to move towards a conservation agriculture approach at the farm was largely because we wanted to get ahead of the challenges that are going to be faced by other commercial farms in 10 years' time. Agroforestry was being talked about, I felt we should have some at the university, and I discussed various options with the academics. One we discussed in more detail was incorporating willow for biomass, because we'd had experience with willow and I had seen that there was good biodiversity in the understory of our existing block. Doing research on agroforestry will hopefully inform Government SFI policy and the Countryside Stewardship Scheme in the future. I would like to think it will also help other farmers with questions they may have.



The willow block already having been established was a good starting point for us. It's ideal for producing a biofuel so we can create an income stream from it. This isn't something that is currently being done on a large scale in the UK, so we hope that the research at the farm will help fill in some of the knowledge and experience gaps in years to come.

I think the gaps we are trying to address are mostly around impacts of trees on pests and some agronomic ones i.e. how will the crop in-between the rows behave? Will we have to change our management? How will the soil workability change over a wet or dry period? There are various agroforestry-related discussion groups I am part of, including the ReForest North of England living lab network. There was a kick-off meeting held at Cockle Park in May 2023 where farmers and other stakeholders met and exchanged experiences and ideas about agroforestry and the challenges they face.

Agroforestry in practice

One of the main challenges we face at Cockle Park Farm is having an income stream that can support the project. The lack of co-ordinated policy and stewardship schemes for agroforestry in the UK means there isn't the financial support for projects like ours, we have found that existing schemes have limitations in being applied to agroforestry. The economic research that is being done here will hopefully inform policy in the future to make more money available. We have adapted the layout of the fields to be able to claim for the mid-tier Countryside Stewardship scheme and at the same time accommodate for new research carried out in the university.

There is a lack of established agroforestry systems in the UK, especially those in-between being new and more mature (5 - 7 years old). This means there is a gap in knowledge and expertise within agroforestry research compared to other agricultural research areas. Our agroforestry system is just becoming established, we have only been doing this for a few years, so we don't have answers to all the agronomic and economic questions that are being asked of us yet.

When I was looking for advice before setting up the system, there weren't any experts in planting willow for biomass, and advice received wasn't suited to our situation at the farm. We were advised against sowing the understory at the same time as planting the willow trees. Perhaps with professional agroforestry advice this wouldn't have been the case. So, a practical recommendation I would suggest to fellow farmers is sowing the understory at the same time as planting the trees and finding an experienced agroforestry farmer or advisor when starting your project. I would also advise finding a network of agroforestry farmers in your area to get advice and start discussions, this has helped us when making decisions on the farm in the past.

Also, do your research and take advice but if you are trying something different, sometimes it's good to go with your gut instinct!



What is ahead?

We want to continue investigating sustainable farming practices: integrating animals into the arable system, practising an outdoor grazing system, and diversifying the cropping system. Also, collecting data on soil, biodiversity, invertebrates and mammals, and LiDAR (Light Detection and Ranging) readings on the willow biomass. We will focus on soil workability, how fungicide rates impact yield and biodiversity, and the impact of the trees on the timing of fungicide application. The profit and profitability of a large-scale agroforestry system will also be continually monitored.

We will continue to create a biofuel from willow biomass and hope to get an income from the agroforestry strips. Some new crops will be introduced such as top fruit for Stu Brew (a students' brewing company) to make cider/perry and juice.

I hope our research will inform new and existing large scale agroforestry projects elsewhere. If it can contribute to the workshops held by the living lab network, that would be great. We often get asked questions relating to agronomy and pests and diseases that we don't feel able to answer fully, so being part of this network will hopefully help equip us with some answers.





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