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Reaching Agroforestry's Full Potential with Successional Agroforestry? Part 3

Welcome back for the final part of this blog series. Today we will wrap up the body of the series by considering what constitutes value and how successional agroforestry can work to create value from multiple angles. If you have not read the previous installments, you can find Part 1 [here] and Part 2 [here].

The Value Proposition

"Although conversion of open cropland to alley-cropping agroforestry with short-rotation trees has been shown to increase the gross margin (including crops and tree biomass used for biofuel feedstock) from €489 ± 5 ha−1 to €518 ± 5 ha−1 46, a recent farmers' survey revealed that a major obstacle for agroforestry implementation is establishment cost, which was estimated at €1800 ha−1 36. Additional perceived hindrances were irregular income from harvest of aboveground tree biomass (commonly carried out every four to seven years for biofuel feedstock) and price fluctuations of wood46. Yet, there appeared to be a widespread willingness among the interviewed farmers to establish agroforestry if these financial obstacles would be ameliorated. The financial compensation that the farmers perceived as necessary to encourage agroforestry establishment was much higher than the above-mentioned costs. Farmers estimated an initial financial support for establishing agroforestry on their fields at €2718 ± 345 ha−1, followed by an annual support of €511 ± 54 ha−1 36. Interviewed taxpayers, outside the farming community, showed a willingness to pay a tax with a median value of €20 year−1 per person for environmental benefits and landscape amenities associated with agroforestry47."
I have to admit that I was a bit surprised at the inclusion of this section in the paper. Pleasantly surprised, that is, because although at first it feels incongruous with the rest of the research, it is actually vital to the discussion of agroforestry. After all, farmers ultimately have to choose to adopt these practices or there won't be any potential to strive for.

Value from a farm economics point of view

Although this section was not posed as a suggestion by the authors, I will take the liberty of turning it into a suggestion and then expand on how our project is taking it up. Self serving, I know, but perhaps useful.

Self-suggestion: address farmer concerns about implementation costs and future market opportunities by incorporating successional agroforestry principles.

Every agroforestry system has a lag time between establishment and first harvest.* That delay may be short under some circumstances, like short rotation biomass production, but it is still there. Other systems, which may include other kinds of woody cash crops, likely have longer delays before revenue begins to flow. I call this gap the "Achilles' Heel of agroforestry." Despite all the benefits that the "deliberate inclusion of woody plants" can have in agriculture, the fact remains that farmers know that perennials take time to mature. This weakness is not a secret and the reluctance of farmers to adopt agroforestry practices without support during both implementation and beyond seems to me to be a problem worth investigating.

**I should make it clear that I am not including orchards in my comments and am trying to address silvoarable and ecosystem service applications of agroforestry more so than orchards or vineyards.*

Every season without revenue from the system is a lost opportunity to use that space and time for, not perhaps profit, but revenue generation. Considering how to use the open niches before the "main" cash crop comes to maturity is one of the most appealing aspects about successional agroforestry. Of course, one of the biggest concerns we have in our broader context is "how" to fill those successional gaps in a way that is economically viable. How do we ensure that the succession from one cash crop to the next is smooth, or, to put it another way, that the early cash crops do not hinder the establishment or ongoing maintenance of those that come later?

We've planned the LillNAP system to incorporate successional cash crops in simplified crop combinations. In our system, a single ten-meter-long section will have perhaps five different cash crops, with only say two or three producing revenue at any one time. Our plan generally calls for the following sequence, with overlap of course: garlic - strawberries - currants - rhubarb - tree fruit.

We have not planned what comes after the tree fruit stage to any degree of readiness in part because this is a pilot project. We've never seen a system like this before or even know how what we have planned will actually turn out. Therefore planning beyond this time horizon doesn't seem like a plausible thing to do. We have a good idea that the trajectory of soil health and yield should improve through time, working towards the site's potential, but we don't know yet what lies beyond say ten to fifteen years. We can use adaptive management and purposeful disturbance events as tools when the time comes.

In a successional agroforestry system the implementation costs are greater than a monocultural one, however the profit can be potentially much greater. This is because you not only add up the revenues from each subsequent cash crop, but also distribute the risks and costs across multiple, ideally reinforcing, cash crops. Instead of implementing a champion model where only one species is supposed to determine the fate of the entire system, we want to put together teams of species that provide redundancy and resilience.

I will be the first to acknowledge that at this point in time we are working, in our climate and in our context, with theory, design, and projections. There are a lot of unanswered questions about how to

do this, hence the pilot project. Still, with time, I believe we will be able to design second and third generation successional agroforestry systems that are capable of filling this gap quite effectively.

Beyond money

Before wrapping up and turning to the conclusion, I think it is worth taking the time to think about some of the implications of the massive gap between the calculated costs of implementation and what farmers would want to see provided to them.

That there should be a difference between what the 'actual' costs are and what farmers perceive should not be surprising. What is surprising is just how large of a gap there is between the two in this scenario: nearly 1,000 euros or 1,5 times the calculated cost. Despite the "rationalization" of agriculture, which in some sense is what modern, scientifically informed agriculture set out to accomplish, farmers continue to see the value of their land, time, and other resources as reaching beyond the spreadsheet.

As I mentioned at the start of this piece (Part 1), those of us engaged in advocacy for different systems really should bear in mind that for many farmers, the farm is not just a place of primary production. Farming invariably leads to the physical manifestation of the values and personalities of the people who live and work the land. Their hopes, dreams, aspirations and yes, their failures are on display for the whole world. A sense of legacy and obligation imbues a farm. And that everything is so much more visceral than most other kinds of work; work which simply does not compare to the farmer who is literally creating a testament to their values- and that of their predecessors- across the landscape.

When we advocate for different ways of farming we absolutely cannot afford to ignore how farmers feel about those changes. We aren't asking that they make alterations to the layout of a factory floor or rewrite lines of digital code stored on servers halfway around the world. We are asking them to make changes to the very world around them, to call for something new in the space they call home.

Yet, their home and its legacy is also a place of business: how farms balance the needs of both is not so easy. Positive economic development has to enter the equation or else the farm will lack the ability to exercise agency in our contemporary culture. That said, for all its power and influence, economics alone cannot account for how or why a farmer believes their farm has value.

We may be very good (or not) at pricing out the return on investment, changes to the ecosystem, and the opportunities that come with changing methods or paradigms. But perhaps we are not yet so good at engaging in constructive dialogue with farmers about what they want and why. If there is a climate emergency, if there is a pressing need to reduce reliance on inputs created with energy from states hostile to liberal democracy, then perhaps we also need to take the time to talk to farmers not solely as outside experts, but as fellow citizens. How do they see their farms? What are the challenges they see? How can we advance their interests together with the interests of the rest of society?

Perhaps, after those conversations, an answer to why a farmer perceives they need an additional 50% investment will emerge.

So where does successional agroforestry fit into this picture? Agroforestry systems are long lived systems. They are intergenerational. Many may not, even with the best intentions and management, reach their full potential until those who planted them have long passed away. The legacy of an agroforestry system can stretch hundreds of years into the future. Successional agroforestry, with its emphasis on moving the whole farm system towards achieving the goals, dreams, and aspirations of those who live and work the land, is well positioned to move the conversation about "what a farm should do" out of a unidimensional focus on rational business propositions and into the world of values.

If we want agroforestry to be adopted by the majority of farmers, successional agroforestry just might be one way we can address the concerns of all stakeholders at once. This doesn't mean that all the problems and challenges will go away. Farming will always be risky and, as I've said on more than one occasion, we are in the first generation phase of these ideas. I'll go even further and say that we likely will not reach the full potential of agroforestry for a few hundred years. There won't be anything for the next generation to criticize and improve upon if we don't get started planting now.

Conclusion

I hope that this serial blog has helped situate our Lill-Nägels project in the conceptual space being explored by farmers and researchers investigating agroforestry. The Lill-Nägels Agroforestry Project is piloting the potential of these systems through design and management which encourages the site's potential to express itself, as opposed to designing a system thinking that we have it all figured out. Our project is very much a first generation attempt, in our region and specific context, at aiming for "the full ecological and economic potential of agroforestry." We will get many things wrong, but it is encouraging to see that our approach to agroforestry has anticipated the perceptive suggestions put forward by Edzo Veldkamp, Marcus Schmidt, and their fellow authors.

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