Agroforestry ELM Test

Silvoarable workshop

Whitehall Farm, Cambs., 12 October 2021

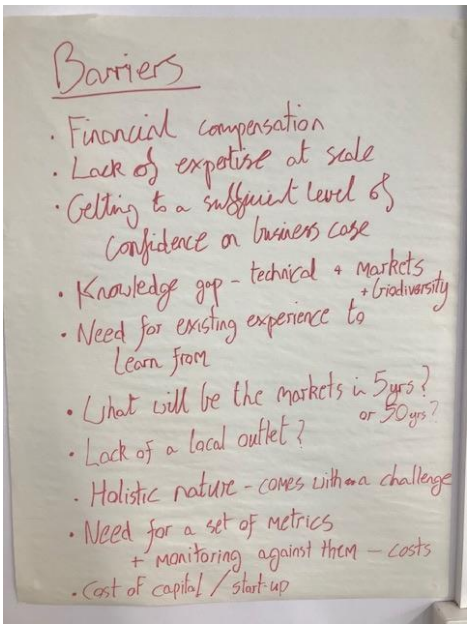
Notes of the meeting

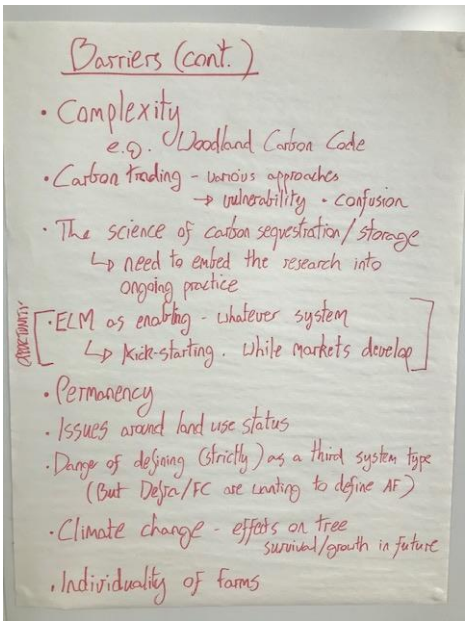
Present:

Keith Barnham, Clive Baylie, Georgie Bray, Robert Brett, Richard Gantlett, Ross Guyton, Roderick Hague, Alice Hunns, Jake Locke, Andrew Long, Sophie Mott, Steve Newman, Tom Pearson, Archie Ruggles-Brise, Ken Wooding, Sebastian Young

Project team: Stephen Briggs (monitor farmer), Helen Chesshire, Will Simonson, Colin Tosh

Can agroforestry work for you – what have been the barriers?





The discussion reinforced the findings of the evidence review in terms of the two main barriers to implementing agroforestry:

- Lack of knowledge. There is a lack of expertise at scale (it is important to have existing experience to learn from, but this is still too few and far between), and the required knowledge was not just about the technical and practical aspects, but also about the markets, and also ecosystem services delivery.
- Uncertain financial proposition. Farmers need to get to a sufficient level of confidence on the business case. Is a local outlet, such as the farm shop/café at Whitehall Farm) necessary for success? Not necessarily, but identifying markets is important and challenge here is not knowing what the markets will be like in 50 years' time, or even 5 years' time in terms of trees that begin cropping sooner. There are also the capital and other start-up costs to consider.

The holistic nature of agroforestry means that it comes with a challenge. Also the issue of the individuality of farms, and therefore how you design a scheme that is widely applicable.

On ecosystem services, there is the need for a common set of metrics and a protocol for monitoring against them, and this monitoring needs costing into the operation. Ecosystem delivery is fraught with complexity, as illustrated by the Woodland Carbon Code. There are various carbon trading schemes and this creates confusion and risk. The science of carbon sequestration and storage lags behind what the practice is demanding, but at the same time the ongoing practice is an opportunity to embed the research within it.

We began to discuss what ELM can provide to support AF. People saw it as an enabler: kick-starting AF projects and getting them to the point at which the markets can develop and take over (in terms of remuneration).

The permanency of AF systems was discussed, in relation to issues on land use status (both Defra and FC are wanting to define AF as a third system type, but there are issues in doing so, e.g. schemes designed to capture carbon would potentially need different rules/regulations to schemes designed to produce a food crop).

Climate change is a further issue to consider in how, for example, it can affect tree survival and growth in the future.

Tour of the Silvoarable system at Whitehall Farm

We were given a tour by Stephen Briggs of his 52 ha silvoarable system at Whitehall Farm. 4,500 apple trees have been planted in single lines within 3 m wide strips, with 3 m between trees. The alleys in between. The tree lines are 24 m wide, operated in a traffic control system using 6 m wide machinery. This creates a density of 85 trees/ha. The lines are a bit off North-South to maximise the sun falling on both sides of the trees. The trees were planted at age 2 years with a post, tie, wire-mesh guard and mulch mat. Bamboo canes were added afterwards to provide a perch for pigeons which were otherwise bending and damaging the young trees. There was a mortality rate of 5% and the dead trees were replaced. There are 13 varieties of apples, and they are pruned and harvested by hand. The pruning takes 2-3 mins per tree and aims to achieve a goblet shape with light coming

into the centre of the tree. Roots are also pruned to a depth of about 12 inches to avoid resource competition.

The trees provide benefit in terms of reducing wind and evapotranspiration, thus protecting the soils and crops. There is 1:30 wind interruption, i.e. a 3 m tall tree ameliorates the wind over a distance of 30 m. Temporal and spatial resource partitioning means that a Land Equivalent Ratio of about 1.25 is achieved, compared to a maximum of about 1.4 achievable in such systems. Late maturing apple varieties mean that harvesting is taking place on the stubble, avoiding any conflict between operations. A harvest of about 5t of fruit per hectare is being realised, with some varieties doing better than others – and the heritage varieties generally giving a more reliable year-by-year crop.

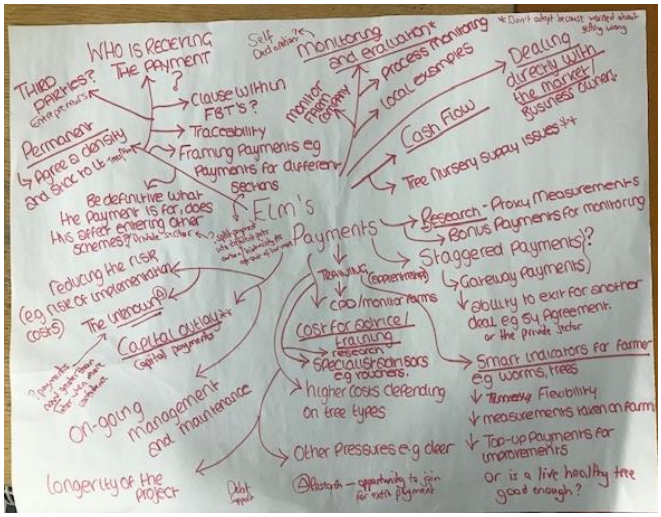
We discussed the model of having different enterprises looking after different components of the AF system. This is already happening at Whitehall Farm (e.g. honey production). Separate management of the tree component by a fruit grower specialist could help maximise its profitability.

Numerous university studies have been undertaken at Whitehall Farm and have provided baseline and monitoring data on the performance of the system. Approximately 4.5 t/ha of additional carbon storage is being obtained, and there are improvements to biodiversity such as bird populations, e.g. farmland birds such as lapwings and skylarks, and raptors such as barn owl. Against conventional wisdom, the arable crops are growing and yielding more within 6-8 m of the tree rows compared to the centre alleys. Comments from attendees farming similar agroforestry systems confirm this effect and suggest it takes several years to develop. This was discussed by the group in relation to microbial ecology of soils.

Supporting AF options: what are the issues, what should be the building blocks?

Groupwork report back

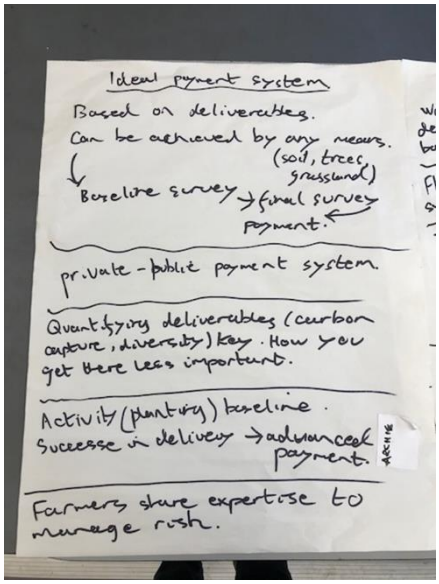
Payments #1 (ELM)

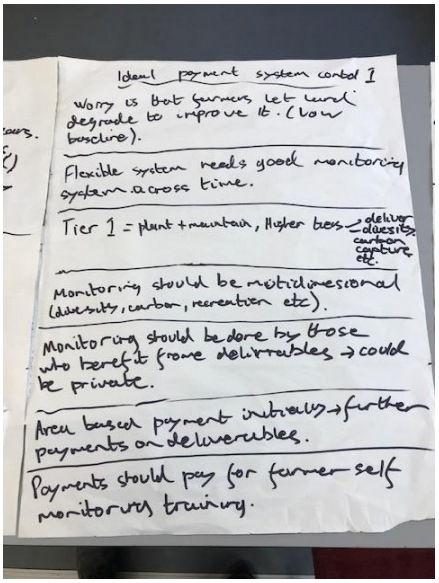


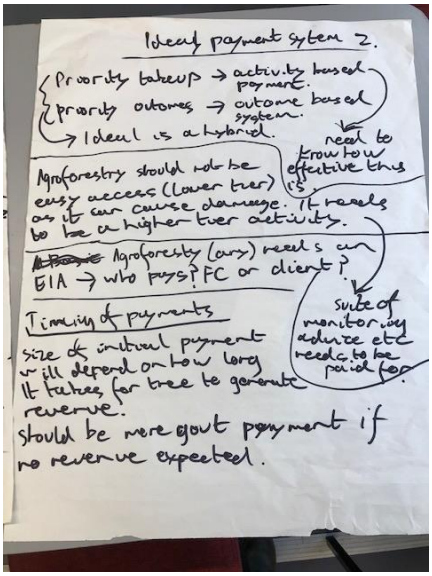
- There are some high initial capital costs for AF that need funding
- Staggered "gateway" payments at different stages of the AF operation would also be helpful. These could be at key milestones, with a branching option at each milestone.

- Ability to exit government payments when it makes sense to opt for private payments. Five year agreements would allow those opportunities for opt-out
- Ability to split payments for different goods being produced by the system (e.g. biodiversity, carbon) so that farmers can choose to opt out of specific elements – for example if a farmer wants to take the carbon element to the private market. Alternatively, could this be done in time rather than in space? It is important to avoid double-funding, e.g. of carbon
- Janet Hughes has said that Defra does not want to get in the way of the carbon markets. ELM will not pay for carbon, but instead will focus payment on biodiversity and other ecosystem services.
- However, this approach counters the idea of AF as a whole farm system.
- The status quo is for landowner/occupiers to be the recipient of payments, but another model would be 3rd party entrepreneurs working with a cluster of farmers.
- Verification is important but difficult. SMART indicators are important, but the range of variables that are relevant is wide. One practicable option would be to focus on the count or density of healthy trees, in the assumption that the local ecology is doing the rest in terms of the benefits that the tree is affording to the system. This would keep it simple, and on a self-declaration basis which is preferable.
- A bonus payment for research and monitoring embedded into the operation (i.e. farmers would need to buy in to this). In international development projects, monitoring and evaluation often represents up to 20% of the overall budget.
- Bonus payments for those who can demonstrate knowledge gain as part of CPD could also be considered.
- Have a payment scale that reflects levels of certainty, i.e. higher payments for higher uncertainty.
- Payment for advice could be handled though a voucher system analogous to extension services overseas.

Payments #2 (Thinking outside the box)



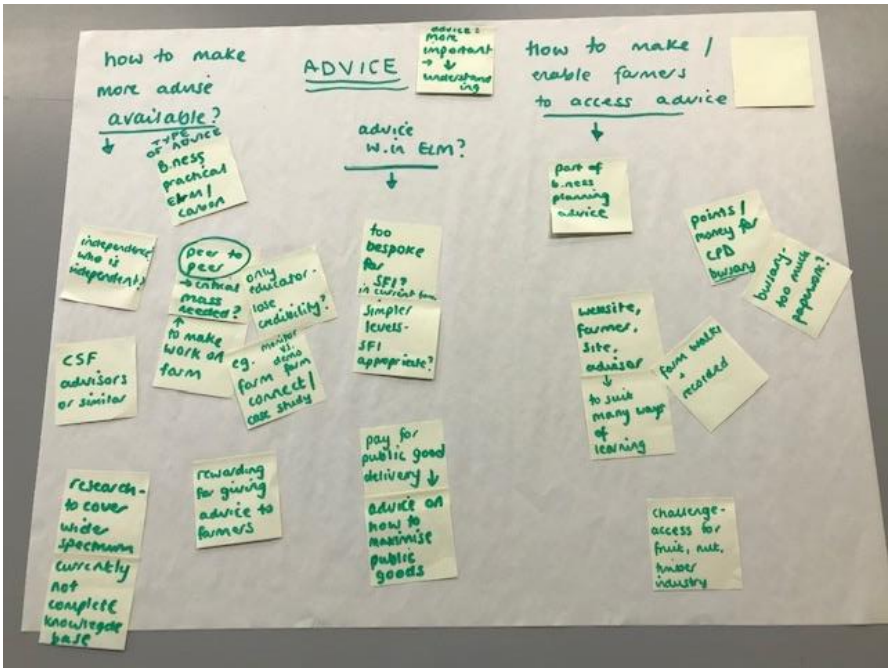




- Imagined a payment system that was based on deliverables rather than the system by which they were achieved (e.g. AF or not). Payment would be based on baseline and final survey comparison. Quantifying the deliverables (carbon capture, biodiversity) key – how you get there is less important.
- AF needs to be supported by a blend of public and private funding, with two tiers to cover broad uptake as well as focussed high-level (there is evidence that farmers want tiers):
    - Broad tier 1: like an area-based payment system whose aim was to plant and maintain the trees (other outcomes not considered)
    - High level: higher uplift payment based on evidence of better delivery
- The broad/basic or entry tier would be activity based, and the high level tier would be outcomes based – requiring effective multi-dimensional measurement and monitoring.
- Perverse outcomes need to be avoided, e.g. farmers letting land degrade to create a poor baseline. The baseline needs back-dating to avoid this. Those already doing good need to be rewarded. Farmers could share expertise to manage risk.
- With monitoring, the onus is on those benefitting from the deliverables to do the monitoring. This could be the private sector.
- The payments-by-results Test & Trial looked at the question of self-assessment. Farmers required quite a lot of training to do self-assessment. Payments should cover the costs of farmers being trained in self-assessment.
- In discussion the question was raised whether AF options should be accessible to everyone. It needs to be done well, with the right tree in the right place, so should it sit in a higher level of ELM and not SFI? As an example, if done without due consideration AF has the potential to negatively impact the habitat of species such as some farmland birds that are specialised to more open farm landscapes.
- Any type of agroforestry needs an EIA, but who pays? FC or client?
- Funding could range in the degree to which they cover capital costs, depending on the level of certainty about the marketable products. Public funding mitigated by expectation for private returns. The initial payment amount could also depend on how long it takes for the trees to generate revenue. There should be more gov't payment if revenue isn't expected.
- In conclusion, a hybrid (public-private) payments system is needed for AF as a hybrid farm system, and it needs to sit within a clear, effective regulatory framework.

Advice and guidance

- The types of advice that are needed include business (e.g. how to access fruit, nut, timber markets), practical and environmental (i.e. how to maximise public goods).
- Different forms of advice are relevant: online resources, farmers, sites, advisors, recorded (virtual) farm tours. (Analysis of cluster farmer interview results as part of the current AF Test project indicate what types of advice and guidance are used at different stages of the acquisition of expertise of agroforestry.)
- Peer-to-peer is the most effective method of learning because of the high trust levels, but it needs to link to hard facts and figures coming from research.
- Monitor farms have a role, but to the extent that they are "on a journey" means they may not demonstrate best practice. A network of commercial demonstration farms would be most effective, but the problem is that this network doesn't yet exist. A critical mass of AF practice is needed to make this work.



- There isn't yet a complete knowledge base and further research is needed on a range of AF approaches.
- Advice for AF needs to be independent, e.g. not tied to chemical companies as with some agronomy advice. Various areas of advice are needed for AF, and this may require a suite of advisors– it is difficult for one advisor to cover all aspects.
- The advice needs to come from beyond the mainstream agriculture sector, joining up other sectors such as forestry and soft-fruit growing. Is there the case for bringing back ADAS?
- Business advice may come best from peer-to-peer, whilst advice on biodiversity could be sought from conservation NGOs.
- One can imagine different levels of advice depending on entry level into AF payments:
    - Basic – attending a webinar
    - Intermediate – receiving individual advice
    - Advanced – points/money towards a bursary
- There was a lot of support for the bursary approach: allowing farmers to select the type of advice they needed at any one time on their AF journey, e.g. design of scheme, pruning/maintenance of trees, monitoring of biodiversity. Farmers would need to provide proof of how uses and perhaps requires an accreditation system to ensure advice providers are of a satisfactory standard.
- AF maybe too bespoke to wrap up into SFI in its current form, except for the simplest levels of practice.

Agroforestry ELM Test

Upland Silvopasure Workshop

Cannerheugh Farm, Cumbria, 02 Nov 2021

Notes of the meeting

Present:

Charlotte Bickler (ORC, field visit only), Jenny Bowes (Farmer), Janie Caldbeck (ORC, field visit only), Jim Campbell (Farmer), Ruth Dalton (Pasture Fed Livestock Association), Jane Emerson and Peter Stoeken (Farmers), Kate Gascoyne (The Farmer Network), Rasmus Henriksen and Azareth (Farmers), Andrew Hewitt (Farmer), Neil Johnson (National Trust), Peter Leeson (Woodland Trust), Viv Lewis (farmer), Tim Nicholson (Natural England), Rachel Penn (Woodland Trust), Nick Prince (Farmer/Forestry Commission), Nicola Renison and Paul Renison (Monitor Farmers), Jim Stobart (Farmer), Peter Welsh (ex Natural England/National Trust), Kenneth Wilson (Woodland owner).

Project team: Helen Chesshire, Will Simonson, Colin Tosh

Defra observer: Lynne Pye

Agenda:

09.30-10.00	Arrival at Cannerheugh Farm (directions on next page)
10.00-10.30	Coffee, introductions, objectives of the day
10.30-12.15	Farm tour to see agroforestry in practice
12.15-12.30	Travel from Cannerheugh Farm to Gamblesby Village Hall
12.30-13.15	Lunch and discussion
13.15-14.30	Groupwork: agroforestry in ELM, focussing on payments and advice
14.30-15.30	Report back and discussion
15.30-16.00	Summary and conclusions
16.00-16.30	Tea and depart

Tour of the lands of Cannerheugh Farm and its silvopasture system, conducted by Nic and Paul Renison

Cannerheugh farm's 360 acres are used to rear suckler beef cows, lambs, pigs, and chickens. The farmers describe themselves as practicing regenerative agriculture, and while their focus is on farming without substantial manmade inputs, they are not registered organic. The farm has a focus on localised, high intensity grazing with regular (daily) rotation of animals. Agroforestry to date has focused on providing shelter for animals, and people, as they plan to diversify into glamping

provision. Production of woodchip for winter bedding (hazel and sycamore) and providing browse for livestock (willow) is also a motivation. Their decision to develop shelterbelts was influenced by the severe winter weather of 2018 when it became clear to them that current winter provisions for animals outdoor was insufficient. The farm is extremely exposed to the elements and occurs at an elevation of 850 to 1100ft ASL.

The Renison's rotational grazing is currently focused on their cows and occurs in two different systems. The first is a series of small paddocks (each <<1ha) that cows are rotated between on a daily basis. Provision of drinking water has proved a major challenge to the operation of this system and grazing undertaken by the animals in the paddocks is supplemented in an adjacent field where haybales are provided (Picture 1). Close to these paddocks we were shown a new hedgerow planted in the last couple of years to delineate theirs from neighbouring land. It was necessary to water this new hedgerow in spring and summer during establishment and this is done using the same water supply used to water the paddock cows.

The other rotational grazing system is more substantial by area, consisting of a series of 6 acre fields that cows are, again, rotated between on a daily basis (Picture 2). The Renisons use this increasingly popular localised, short duration, moderate grazing to ensure that grass withing fields is regularly stimulated to grow and put down deep roots. They provide no fertiliser inputs to their fields, but all fields contain clover which provides nitrogen.

The Renisons keep several hundred hens, with a focus on mobile housing. We were shown two small pens containing hens that can simply be dragged to a different area of the field (Picture 3). Their laying hens roam free among long grass around a mobile laying unit around the size of a large caravan with laying boxes and an open mesh floor. This unit is opened and closed morning and night and so far the Renisons have had no issues with fox predation. This focus on mobile hen housing ensures no areas of grass are damaged through prolonged use, and a dispersed, low level, of nutrient input into the fields from the birds' droppings (Picture 4).

The Renisons' land contains conventional blocks of mature and semi-mature forestry that have been inherited from previous owners, and younger (planted within the last 5 years) strips of shelterbelt agroforestry planted by the Renisons.

We were shown a block of around an acre, created under the Countryside Stewardship Woodland Grant Scheme, and consisting of densely planted pines with margins of broadleaf natives (Picture 5). The Renisons expressed their dissatisfaction with this woodland block and stated their intention to thin the pines and replant to improve habitat and ensure a better age structure to the tree population.

Another, very attractive, sparse woodland consisted of mixed maturity native species that has recently been supplemented by the Renisons at its margins with willow plugs and aspens (Picture 6). This fenced woodland patch contains deer and is used by the Renisons to graze pigs. They state that the pig grazing increases diversity of the woodland understory and this is consistent with ecological theory relating intermediate disturbance to high plant diversity levels. An area surrounding a pond that is also grazed by pigs similarly appeared to contain more plant species than the surrounding grass fields grazed at lower intensity.

A shelterbelt tree strip has been planted around a shallow catchment stream. This is classic agroforestry comprising multiple functions. The shade provided to the stream is intended to buffer freshwater organisms from global warming. Catchment planting can also lessen flooding

downstream. Lastly, the Renisons stated that they plan a glamping area below the agroforestry strip and the trees were planted to provide shelter from the wind with this in mind.

We were show numerous semi mature hedgerows at the margins of grazing paddocks planted by the Renisons in 2015 under Higher Level Stewardship (Picture 7). As with most of the Agroforestry at Cennerheugh farm, trees were deer fenced but no protection from rabbits was provided. This decision is site specific; some farms may require other fencing arrangements depending on the nature of their wild mammal population. The Renisons did this hedgerow planting themselves and here there was discussion among the touring group on issues surrounding hedgerow planting. There is some dissatisfaction at the quality of work done by many contractors and it was felt that incentives or training needs to be provided to improve the quality of work. Many farmers would prefer to plant and maintain hedgerows themselves but lack confidence in their ability to do this. Cooperation between famers to assist each other was discussed as was the utility of shared equipment schemes. There was also discussion around the lack of tree planters and tree nurseries. These sectors need support to develop resilient business models.

The pièce de resistance of Canneheugh agroforestry is an immature multilayer, native multispecies shelter belt occurring close to the area where their sheep were worst affected during the winter of 2018 (Picture 8). This strip will presumably be a major if not the principal area of overwintering shelter for many of the Renisons' animals. The Renisons intend that all their new agroforestry planting will eventually be grazed by their livestock animals and they hope to be able to woodchip sections of the agroforestry for provision of livestock bedding.

Many of the 6 acre grazing paddocks also contain recently planted in-field trees. These are planted in groups of 5 or so saplings and protected by substantial wood guards (post and rail; Picture 9) or in a smaller arrangement of a couple trees protected by wire mesh. The new spiked wire "cactus protector" is being used to protect some of these small plantings (Picture 10). Tree cages cost around £150 and cactus guards £15-£25 depending on scale. There is no single right solution to tree protection. Some loss of crab apple trees to voles was experienced.

A newly planted 120 tree block planted on a hilly area above those so far described was pointed out to us by the Renisons and beyond that, not visible to observers, was described an area that will be managed under HLS Woodland Grazing.

It should be noted that the Renisons' agroforestry has been planted with considerable care and thought and professional advice has been sought throughout their planting activity. In addition to the many nature-positive features already covered, additional landscape-level considerations such as maximising habitat patch connectivity through agroforestry, has clearly been considered. The Woodland Trust advisor who advised them during much of their tree planting, Peter Leeson, was present on the tour.


Picture 1


Picture 2


Picture 3


Picture 4


Picture 5


Picture 6

Picture 7

Picture 8

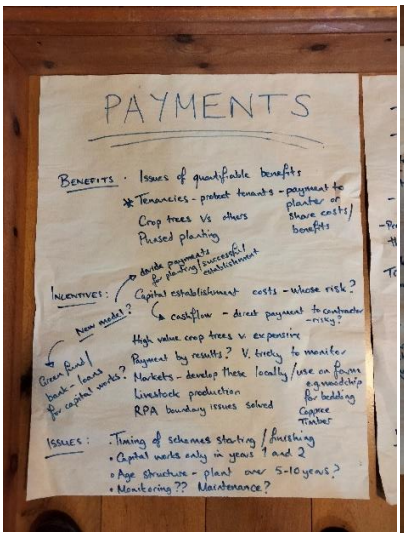
Picture 9

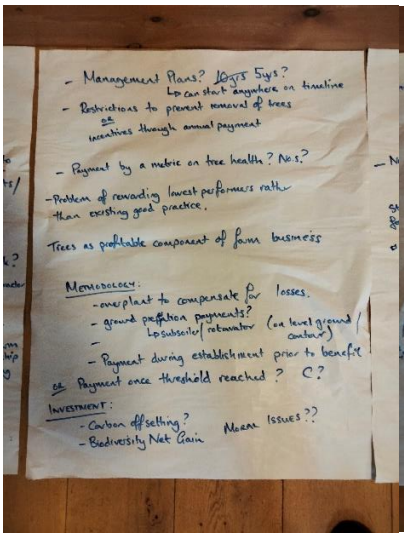
Picture 10

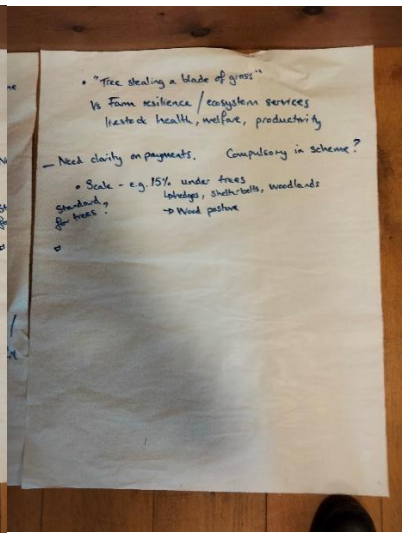
Supporting AF options: what are the issues, what should be the building blocks?

Groupwork report back

Payments #1 (ELM)



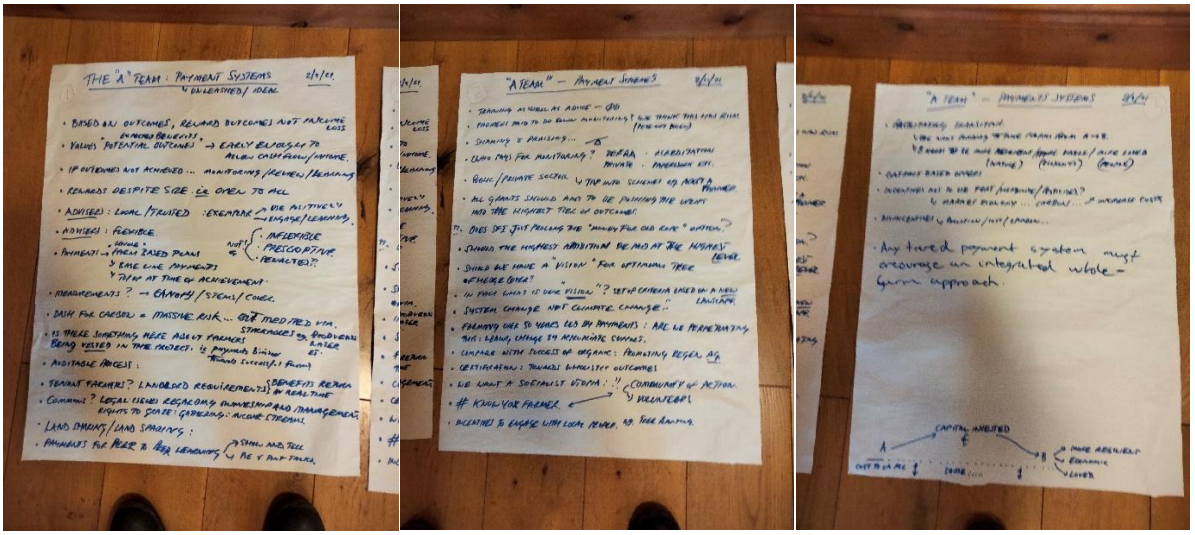




- There are some high initial capital costs for AF that need funding.
- The idea of contractors getting paid directly for tree planting, rather than the farmers, was raised. Though it could help cash flow for some farmers, this didn't receive wide support.
- A "Green Fund" was proposed: a loan covering costs of project; particularly relevant if grower will eventually produce high value crops from trees (e.g. walnuts).
- Payments should be staggered across different stages of the agroforestry project.

- Farmers could be required to follow a 5- or 10-year "plan", and/or be enabled to enter such a plan at any point. It would have to be assessed to ensure the project would provide public benefits. Annual payments would be made through the plan period.
- Who will do the monitoring of projects and at what stage of the project?
- ELM should avoid the pitfall seen in some other payment schemes of starting at the wrong time of year, and for example missing a winter planting season.
- Agroforestry projects are being stalled due to uncertainty round ELM.
- Strong feeling that ELM needs to be retrospective so that farmers currently delivering public goods are not disadvantaged because they can't improve their land much more when ELM starts.
- Need to avoid perverse outcome of unscrupulous farmers damaging existing tree assets to create a lower baseline and be paid more.
- Land must be prepared for agroforestry (e.g. contouring, banking) and this should not be forgotten in the payment system.
- Private investors could potentially pay farmers for carbon and biodiversity. There are moral issues to do with biodiversity offsetting. A monoculture of sycamore and diverse tree lines are "chalk and cheese" and their difference in biodiversity terms needs to be reflected in the payment system. There should be a bonus for complexity.
- Many farmers think that trees "steal productive land". How can we overturn this point of view? Sceptical farmers need to be on board too.
- 60% of farmers doing something beneficial on land would be considered a success.
- Farmers are frustrated by the current lack of clarity around payments in ELM.
- Could a system such as set-aside be instigated e.g. targeting 15% of land under trees.
- Payments of £600/hectare are likely to be required and likely higher as basic payments are phased out.
- There should be more money for more complex agroforestry: a tiered system is needed.
- Good advice at the beginning of a project is necessary as farmers involved in badly designed projects become disinterested.
- Woodland Trust and Natural England are in a good position to advise farmers.
- Woodland Trust are currently cash flowing agroforestry projects as the money from CS isn't enough or not flexible enough to fund most aspects of agroforestry
- Farmers and advisors need to think very carefully about all costs involved in the project up front.
- Annual increments in payments (due to inflation) need to be incorporated. How can different costs across different environments be incorporated? For example, planting on upland fells is a different proposition to planting on Romney Marsh.
- Agroforestry potentially clashes with the short-term nature of many tenancies. The correct types of agreements are required for different tenancy/ownership arrangements. It is important that farm tenants are not disadvantaged by schemes benefiting their landlords.

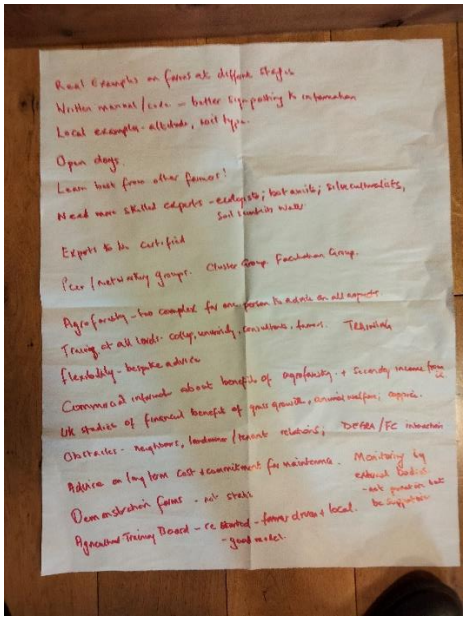
Payments #2 (Thinking outside the box)



- Many of the issues raised by the other groups were reiterated by this group: Tenancy clash issues, monitoring issues (and how monitoring will be paid for).
- Farmers need money for the transition but the end point needs to deliver what was intended by the farmer. Therefore, money should be paid initially with more payments for outcomes. For transition to be attractive it needs to be (1) resilient, (2) economically viable, and (3) loved.
- Locally tailored advice and exemplars are required.
- The payment system should reward outcomes – not just when these are realised down the line, but beforehand (i.e. on an annual basis during the transition).
- Agroforestry projects need to be accreditable. SFI needs to set a high enough bar.
- Advice on what is required generally in relation to trees within ELM would be useful to farmers e.g. "We should aim for 30% of land under trees by 2030".
- Agroforestry needs to be integrated into a whole farm approach rather than simply being an isolated measure. A whole farm approach should be rewarded within ELM.
- ELM should be wary of building disincentives to nature-friendly action into it.
- Farmers have got used to receiving payments.
- Carbon trading is considered a risk to farming by many.
- Government changed farming post war and can do it now.
- Cumbria may be a good model for changes as it is a tight-knit community and already runs many schemes. Some schemes in Cumbria have, however, ended due to lack of interest from farmers.
- Farmers should be rewarded (potentially paid) for facilitating other farmers to take positive action.
- There is a lack of knowledge about fruit and nut trees which are likely to play a big part in agroforestry.
- Knowledgeable (of agroforestry) people are difficult to access currently. There is too much trial and error in agroforestry practice at present.
- Payment of farmers through entering trials where farmers must provide evidence of what they have done within the trial.

- Farmers that have already taken nature-friendly action on their land should not be penalised within ELM. Farmers are willing to act now but some are afraid they won't be paid within ELM if they do so.
- Should all payments within ELM require that a certain amount of tree cover be reached?

Advice and guidance



- Need on-farm examples of agroforestry at different stages of development. Advice is a long-term requirement that evolves through the life cycle of the trees
- Given how soil/climate conditions vary, local information is required, especially in relation to which trees species are appropriate.
- There is generally not enough good advice around.
- Advice needs to come from a range of advisors (ecologists, botanists, soil scientists etc).
- More info on the economic benefits of agroforestry is needed.
- Should advisors/experts require certification? Advisors also need good training – many general advisors will not have experience in agroforestry and are only one or two steps in front of the farmers themselves.
- Should farmers be able to score advisors on how well they do? (Like TripAdvisor)
- With AF being such a long-term proposition, it would be a good idea for farmers to get a second opinion.
- Facilitation groups are a good option especially to initiate interest, give confidence and to share lessons learnt.
- How can we get farmers to think about trees and their benefits more?
- Should farmers be required to have regular meetings about progressive agricultural techniques?

- Forestry and farming training needs to be improved in colleges and universities: there is not enough ecology etc in current courses. And forestry and farming needs to be integrated and not kept as separate subjects.
- Need flexibility in ELM to accommodate the large variety of agroforestry systems.
- ELM should not be too prescriptive and should allow farmers to choose from a variety of options.
- Not enough is known about agroforestry and carbon capture.
- Need farmer driven research rather than seed company driven research.
- Should farmers be accredited and paid for delivering advice? Innovators have an important role in encouraging others to consider agroforestry but can only give a limited amount of their time so could be paid to host farm demo visits and or mentoring.
- Advice should be free to start with, perhaps via farm workshops or via NE or NGOs
- The issue of short term tenancy agreements and the long term nature of agroforestry leading to a clash again arose.
- Do landlords need education in the benefits of agroforestry?
- How do we advise farmers that are disinterested?
- There is a perception of poor interplay between Defra and the Forestry Commission at present.
- Actual effort involved in the establishment and management of agroforestry system is not clear at the moment.
- Current punitive inspections are viewed negatively by farmers.
- Demo farms can be useful but have a tendency to become too specialised.
- Should a system like the Agricultural Training Board be brought back?
- Advice on marketing tree products is needed and how to develop added value

Agroforestry ELM Test

Silvopoultry and Wood Pasture workshop

FAI Farms, Wytham, Oxfordshire, 10 November 2021

Notes of the meeting

Present:

Host: Silas Hedley-Lawrence, Farm Manager

David Brass, Angus Clarke, Matthew Davies, Ed Dee, Neil Nicholson, Martin Sly, Anthony Ogilvie Thompson, Matthew Woodcock

Project team: Stephen Briggs (Abacus Agriculture), Helen Chesshire (Woodland Trust), Will Simonson (ORC)

The silvopoultry system at FAI Farms, presentation by Clare Hill

FAI Farms established a silvopoultry system through a Defra-funded poultry and natural environment project, to study the animal welfare and productivity benefits that trees can bring: lower mortality, better feather cover, better quality eggs. Trees were planted as whips in mixed stands of conifers (e.g. Scots pine) and hardwoods (e.g. ash, oak). Whilst challenging in terms of management, such diversity is good for nature and creates a variety of microclimates and conditions for the Hy-Line Brown hens. Their preferences for different trees and behaviour (scratching, dust bathing, pecking) were studied. The mobile sheds are moved every day to avoid over-trampling. The results of the project have informed tree cover requirements as part of RSPCA Assured free-range supermarket eggs.

On the farm tour we looked at the old ranges with their well-established (20 year-old) mixed tree stands, hearing from David Brass about his own system in which his trees are planted in rows and are much easier to manage ("farmers ain't foresters"). His trees are densely planted downwind to catch the ammonia plumes. The economic case for poultry for him is clear: mortality decreases whilst the number of class A eggs increases.

The next chapter: bringing trees into the farm system as a whole

FAI Farms are planting trees across the farm, including fruit and nuts, to provide shelter/browsing for livestock, crops, and biodiversity benefits. Through Countryside Stewardship Higher Tier, wood pasture is being restored to extend and blur the edges of the habitat of Wytham Wood. Trees help reduce heat stress of cattle and reduce housing and input costs. This approach contributes to the regenerative farming focus of the farm operation, which aims to draw carbon back into the soil to improve not only soil health but also plant, animal and ultimately human health too, and also contributing to climate change mitigation targets. The rotational grazing system encourages the liquid carbon pathway, through which grass root exudates react with the soil microbes to sequester carbon into the soil. Organic residuals, including leaf litter, are trampled and incorporated into the soil by cattle.

On the Farm tour we looked at the parkland area which is being replanted with trees following maize cultivation 30 years previously. The land is heavy clay with springs. Through the Adaptive Multi-Paddock (AMP) grazing system, the area is divided into 153 cells (mapped in Agriweb), each of area 0.4 ha. With a few bales for supplementary food, the cost of feeding the cattle is half it would be in barns. The bales are sourced from local SSSI hay meadows with 130 species in the sward. Some cells are more sheltered than others, but the trees ameliorate the wind conditions as well as improving the mineral cycle. Soil health has improved from middle-of-range to second highest score based on an observation-based monitoring. The grass thatch has an important soil insulating function that encourages an early flush of growth in the spring; it also cools the soils in the summer. Poaching is kept in check by the rotational system, but at a certain level stimulates germination. Some natural oak regeneration was observed. In another part of the farm, trees have been relocated from the chicken ranges 18 months ago and showed good survival. Patches of scrubland are being encouraged including as nursery areas for regenerating trees protected by deer/livestock by the bramble. Elsewhere, woodland/wood pasture creation and hedgerow restoration aims to create corridors between Wytham Wood and the riparian habitats. Both biodiversity and livestock productivity (as measured by fertility rates, live weight gains, and other measures) are being benefited from regenerative approach.

Integrated crop-livestock-forestry systems in Brazil, presentation by Murilo Quintiliano

Integrated crop-livestock-forestry systems (ICLFS) involve cultivation, grazing and forestry in rotation, combination or succession in the same area. The benefits they bring are: recovery of degraded pastureland, improvement of soil structure and biology, and cost reduction and diversification. Furthermore, pests can be reduced, and water retention and carbon sequestration increased. ICLFS are mostly to be found in the Cerrado region of Brazil, using fast-growing eucalyptus and teak species often planted in three rows with 4 x 3 m spacing between and along rows, with electric fencing providing the only protection. Establishment is rapid and allows grazing of beef cattle in the first year.

The main challenges and barriers experienced in widespread uptake are:

- Information asymmetry; higher labour expertise; cost of land use conversion; use of different machinery; difficult management system; market uncertainties; and adoption focussed on marginal land only.

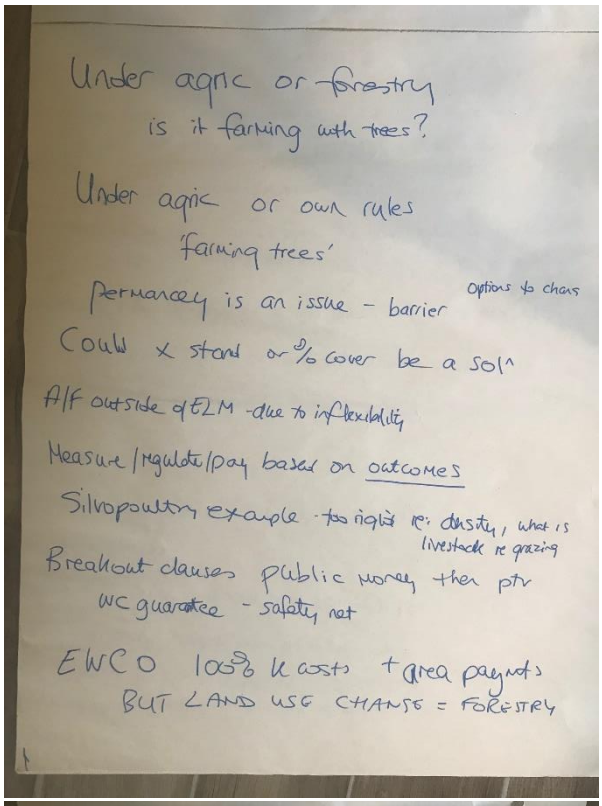
Such challenges can be surmounted by:

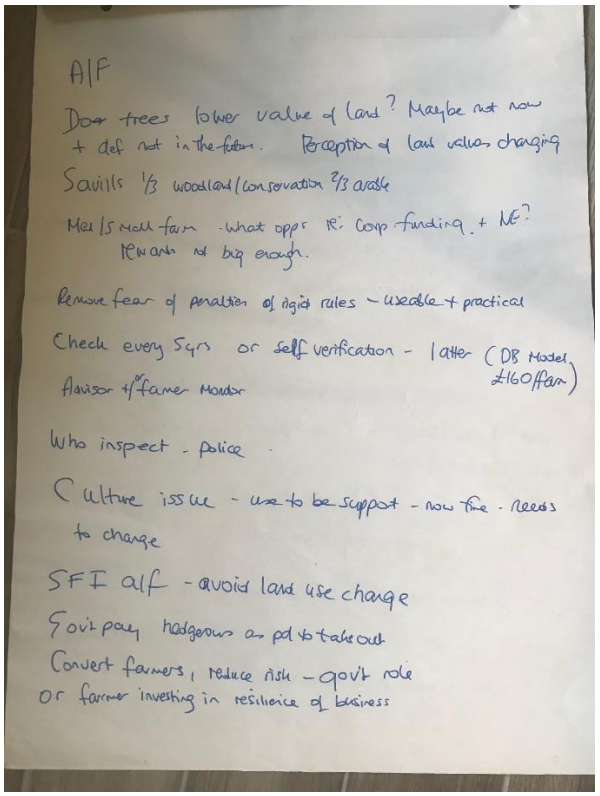
- Better knowledge transfer from academics to farmers; training and advice; systematization of metrics; finance support for implementation at farm level; and financial compensation for all the listed benefits of the system.

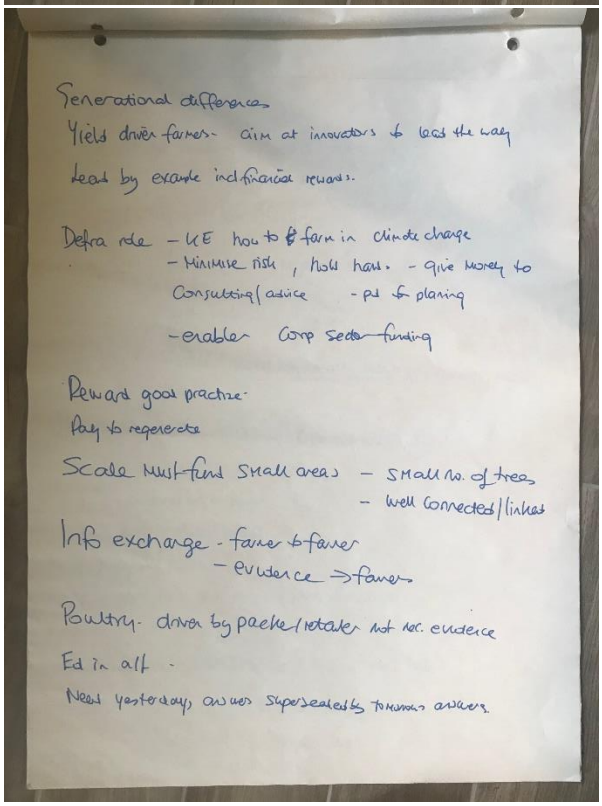
Supporting AF options through Environmental Land Management: discussion

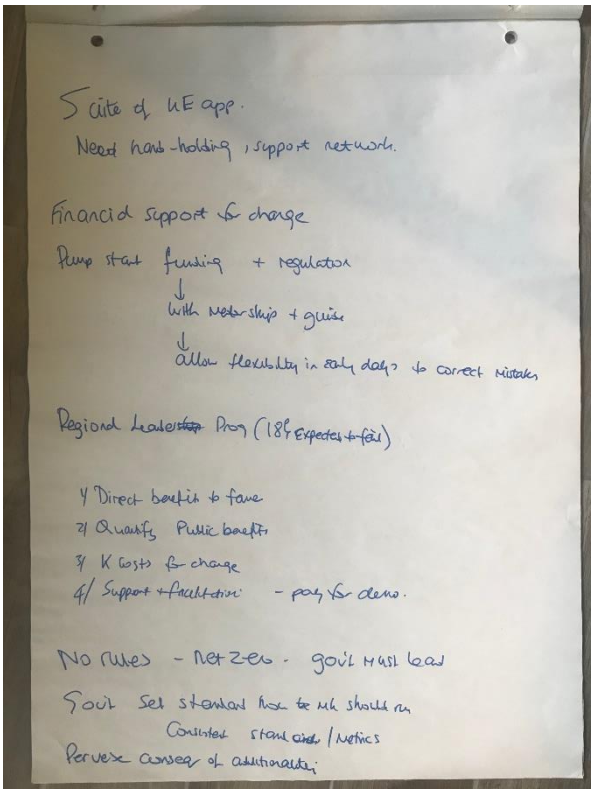
- Question of how agroforestry should be treated from a land use point of view. Agriculture, forestry, a third system type? Creating woodland is a permanent land use change, but farmers often don't want to be committed to permanency.
- Option of doing agroforestry outside of ELMs may be preferable if the scheme is too rigid. ELM is currently going down a prescriptive approach.
- If we are focussing on particular outcomes, how they are achieved should be of less concern. An outcomes-based approach gives flexibility. But there's the challenge of how you design a scheme that allows flexibility.
- Breakout clause that allows you to come out of public funding to benefit from private funding. Cf Woodland carbon guarantee, where the government guarantees an amount (a safety net).
- Comparison with EWCO (which doesn't include agroforestry): a layered approach with basic grant for planting trees and shelterbelts, etc., plus series of capital payments delivering other benefits (e.g. water, biodiversity, public access).
- In the future, land rates will be more based on natural capital, including presence of trees and species-rich grassland. According to Savilles the most valuable farms are two-thirds farmed land and one third woodland and other environmental features.
- The perception of smaller farmers is that there is no benefit, in terms of publicity, for adopting environmental options, whilst risk of non-compliance is high. The risks outweigh the rewards. (Goes back to question of needing flexibility.)
- Do farmers prefer to be assessed (e.g. every five years) or self-verify? Support for the latter option. Farmers and advisors working together can avoid regulatory mishaps. There has been a culture shift in the last ten years, from help/support to regulation.
- Farmers want little risk and not to be out-of-pocket. (Yet farmers, like any business, should accept some risk.) With agroforestry, there is the argument of resilience, for example with longer drier springs becoming more common.
- A certain group of farmers are solely interested in yield and therefore locked into their intensive system. If there is no payback in 18 months, they won't change. If moving from 10 bales (production) to 12 bales involves going through a phase of 4 bales, this is an obstacle. The target audience for AF systems is not them, nor the converted, but rather those who have some interest: the middle band of farmers.
- Need examples of mature schemes with clear financial rewards in order to drive change. Needs to be evidence that regen and AF makes a difference. However, even with evidence (e.g. on silvopoultry benefits) there is a lack of take-up. They'll do it if told to by the buyer.
- What should Defra invest their limited money on?

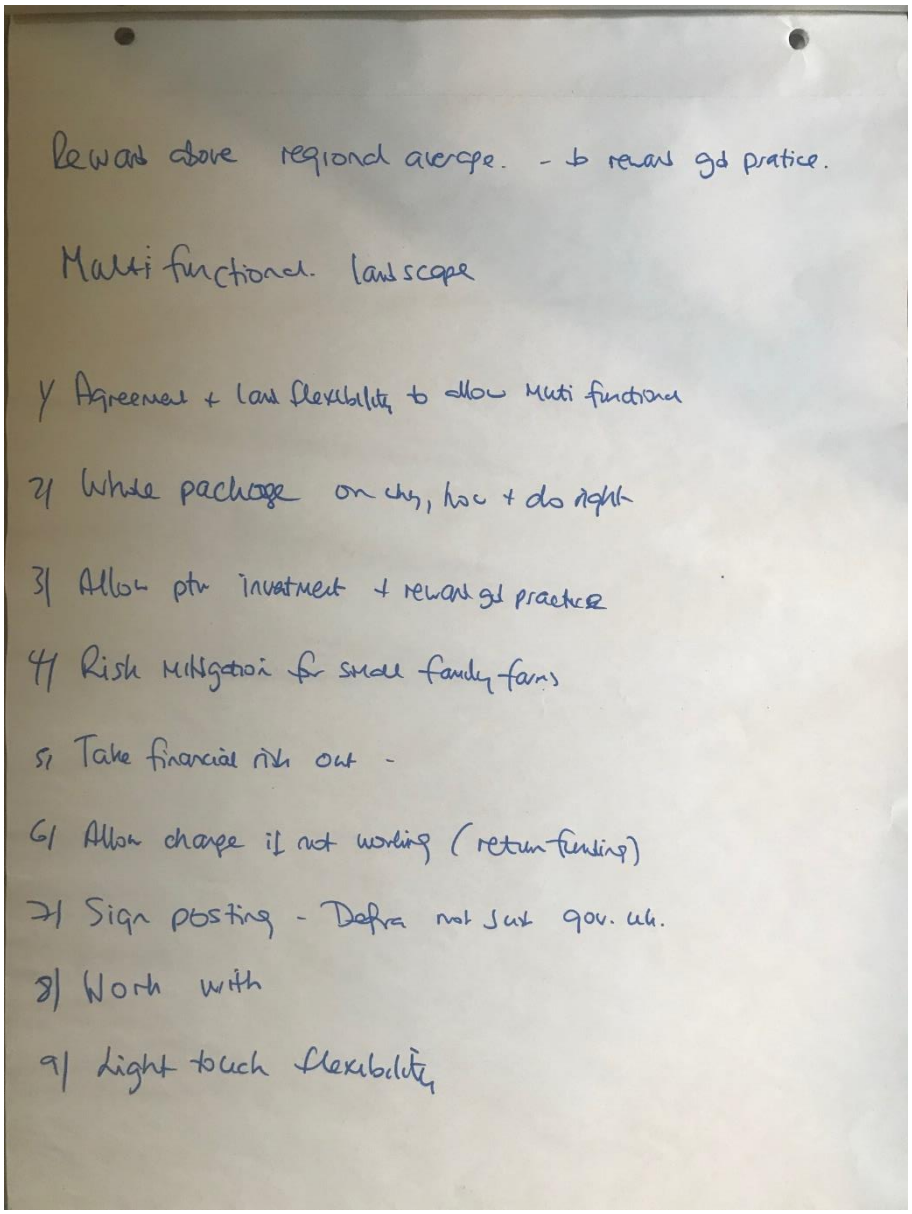
    - Knowledge sharing? There is a lot of academic work but it is not in farmer-accessible language.
    - Minimising risk?
    - Simple grant funding to pump prime?
    - Development of infrastructure to help farmers understand what assets they have?
- Focus on number of trees rather than areas. Small areas can have large effects, e.g. through connectivity, and should be included in future schemes. The idea of SFI is that it is based on a whole farm plan (though this is not the case with the current pilot.)
- Issue of farmers not planting now because they may get rewarded in the future.
- Farmers need hand-holding and support networks (e.g. Whatsapp groups) to manage change. The experience of GWCT suggests that farm visits are most effective to encourage change. To accept funding should mean to accept mentoring. It shouldn't be punitive.
- Can we learn from the LEADER model? Some projects are expected to fail, but most (80%) to succeed.
- A system must satisfy the following:
    - It must benefit the farmer economically
    - It must quantify the public goods
    - It must cover capital costs of change to the system
    - It must provide support and facilitation.
- Farmers are already finding markets for carbon (example of farm in W Australia selling carbon to Microsoft). But without consistency of measurement, it's currently like the Wild West. There are 62 carbon calculators available. The Woodland Carbon Code is good but not broad enough. A Soil Carbon Code and Hedgerows Carbon Code are under development. In the poultry sector, carbon emissions have to be declared.
- To avoid perverse outcomes (lowering of baseline), use a regional average.
- Final thoughts on what Defra could help with:
    - Allow land/agreement flexibility to allow multi-functional use
    - Provide a whole package of education/mentoring
    - Allow private investment and reward good practice
    - Mitigate risk for family farms
    - Take financial risk away
    - Allow change if system is not working
    - Sign-posting (Defra not just gov.uk)
    - 'Work with'
    - Light touch – allow flexibility.


Under agric or forestry
is it farming with trees?
Under agric or own rules
'farming trees'
permanency is an issue - barrier
options to chang
Could x stand or % cover be a soln
AF outside of ELM - due to inflexibility
Measure / regulate / pay based on outcomes
Silvopasture example - too rigid re: density, what is livestock re grazing
Breakout clauses public money then ptr
WC guarantee - safety net
EWCO 100% K costs + area payments
BUT LAND USE CHANGE = FORESTRY


AF
Does trees lower value of land? Maybe not now + def not in the future. Perception of land value changing
Savills 1/3 woodland / conservation 2/3 arable
Mel / 5 Well farm - what opps re: Comp funding + NE?
rewards not big enough.
Remove fear of penalties of rigid rules - useable + practical
Check every 5yrs or self verification - latter (DB Model £160ffarm)
Advisor + farmer Monitor
Who inspect - police
Culture issue - use to be support - now fine - needs to change
SFI AF - avoid land use change
Govt pay hedgerows as pd to take out
Convert farmers, reduce risk - govt role
or farmer investing in resilience of business


Generational differences
Yields driven farmers - aim at innovators + lead the way
lead by example incl financial rewards.
Defra role - UE how to be farm in climate change
- Minimise risk, hold hand - give money to
Consulting / advice - pd for planning
- enabler Comp Sector funding
Reward good practice
Pay to regenerate
Scale Must fund small areas - small no. of trees
- well connected / linked
Info exchange - farmer to farmer
- evidence → farmers
Poultry - driven by packer / retailer not reg. evidence
Ed in AF -
Need yesterday, answers superseded by tomorrows answers


Suite of UE app.
Need hand-holding, support network.
Financial support for change
Pump start funding + regulation
↓
with Mentorship + guide
↓
allow flexibility in early days to correct mistakes
Regional Leadership Prog (18% Expected to fail)
1/ Direct benefit to farm
2/ Quantify Public benefit
3/ K costs for change
4/ Support + facilitation - pay for demo.
No rules - Net Zero - govt must lead
Govt Set standard how to ML should run
Consistent standards / Metrics
Perverse consequ of additionality



Reward above regional average. - to reward gd pratice.

Multi functional. landscape

1/ Agreement + land flexibility to allow Multi functional

2/ Whole package on sky, hsc + do right

3/ Allow ptr investment + reward gd practice

4/ Risk Mitigation for small family farms

5/ Take financial risk out -

6/ Allow change if not working (return funding)

7/ Sign posting - Defra not just gov.uk.

8/ Work with

9/ Light touch flexibility

Agroforestry ELM Test

Woodland grazing and wood pasture workshop

Egypt House Farm, Rushlake Green, 23 November 2021

Notes of the meeting

Present:

Hosts: Mike Harding (Egypt House Farm) and Jason Lavender (Monitor farmer, High Weald AONB)

Claire Harding, Gerard Hayes (woodland grazing project in Somerset), Kamil Kustosz (food project manager), Mark Simmons (farm environmental advice)

Project team: Ian Knight (Abicus Agriculture), Ben Raskin (Soil Association), Will Simonson (ORC)

Agroforestry at Egypt House Farm - Introduction

Mike has farmed at Egypt House Farm for nine years, going organic five years ago. On its 100 acres of heavy clay, sheep (120 ewes) is the main enterprise and beef is also produced: there are currently a herd of 10 Sussex and Longhorn cows with calves sold to the Ethical Butcher (London). Livestock are all pasture fed and additional winter pasture is rented. Additional enterprises are glamping and soap making ('Hedgehunter soaps'). With the premium on organic beef bring relatively small, the annual organic certification fee (and that for PFL) is an unwelcome cost.

The walnut agroforestry system covers one tenth of the farm. Trees were planted in two fields; the oldest trees are five years and the youngest two years. Of 180 trees originally planted 160 have survived.

Farm tour

We passed a small field where there had been a community supported agriculture enterprise (Wildroots) on the edge of which a walnut tree that spontaneously appeared (not traditional in the area) gave rise to the idea of walnut planting on a larger scale. Potential markets for niche products (butter, oil) provided the further motivation needed. The tree stock is from a Kent supplier (The English Walnut Company) at a cost of £30 per tree. The varieties used were Buccaneer, Broad View, and two varieties from Czech Republic: Jupiter and Mars. Different varieties would have been chosen for timber. Martin Crawford gave advice on these varieties. The trees are grafts onto a disease resistant rootstock and provide vigour.

In the two paddocks, 50 walnut trees were planted in 2017, 50 in 2018 and 80 in 2019. The trees were planted in lines, offset and with 10-12 m spacing to allow machinery access. The planting didn't involve any subsoiling. Biochar was added to each planting hole. Each tree was supported by a post and tie and was protected with wire mesh. They are maintained by vegetation clearance (competition from the grasses can be problematic) and pruning. Mike had received conflicting advice about weed control. A weed membrane was used but encouraged voles leading to some tree damage. The dry summers that followed planting meant that it was a struggle to keep the trees alive in those first years. The question of potential damage to field drains was raised but considered to be not a concern in most cases of in-field tree growing.

Cattle have been excluded from the fields due to damage from rubbing; this problem had not been foreseen. We discussed different options to allow co-existence of trees and cattle in establishment phase, including cactus guards (expensive) and single line electric fences.

The two agroforestry fields are separated by a line of cobnuts, and upwind a line of poplars and alders has been planted for shelter including to ameliorate the wind conditions for better pollination.

At another location on the farm we looked out onto the wider High Weald AONB: a medieval landscape of small fields and relatively high (30%) tree cover. A hedgerow had been planted with support from an EDF grant scheme to mitigate visual impact of pylons. This replaced a hedge taken out in the 1960s/70s and is also the line of a footpath. Thick hedges and copses are evident in this landscape.

We discussed a vision for agroforestry and woodland grazing in this wooded landscape. From a farmer's perspective, it is important not to sacrifice existing grazing resources, and from a landscape architectural perspective, naturalistic plantings rather than straight in-field rows of trees are preferable. Replacing lost hedges was considered a priority, and in general the best starting point for planning agroforestry in this sensitive landscape would be to carry out map searches and seek to replace lost wooded features. In this respect, the impact of ash dieback is also relevant and very evident in our sights. What to do with these areas? They are currently dangerous to enter because of tree limbs shattering and falling. The important industrial heritage and archaeology of this area also needs to be recognised in any scheme.

What about woodland grazing? We visited a small copse with a pond (originally dug for marl?) to discuss the potential benefits (revitalising the woodland vegetation, shelter for livestock, nutritional and other welfare benefits of tree browse, pest/disease control) and disbenefits (impact on sensitive flora associated with the ancient woodlands of the High Weald). In the case being observed, the pond would need fencing off. Many copses and woodlands have a poor offer of browsing/grazing resources and benefits of woodland grazing could be minimal. Over-grazing and trampling are generally of concern, for example pigs in woods can be destructive.

Agroforestry and Environmental Land Management

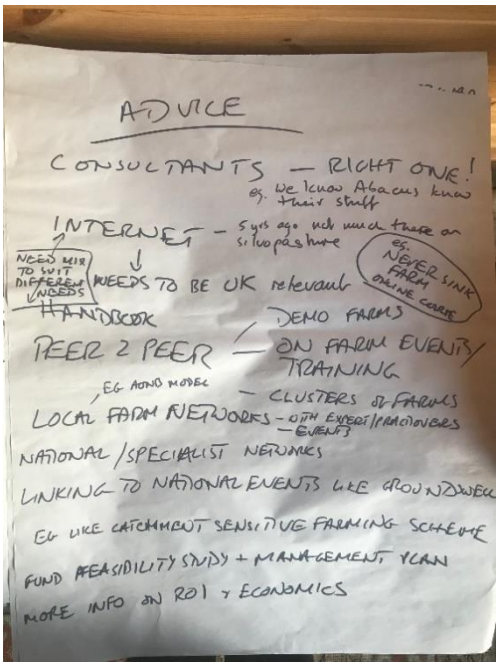
The ELM scheme, currently being designed and piloted, is to be rolled out in full in 2027. Aimed to replace both Pillar 1 (Basic Payment Scheme) and Pillar 2 (including Environmental and Countryside Stewardship) it will mean that direct payments for owning land will give way to payment for public goods over and above a baseline statutory requirement. The question is, how best to pay farmers for public goods delivery, and what should this look like in the case of woodland grazing, wood pasture and other agroforestry?

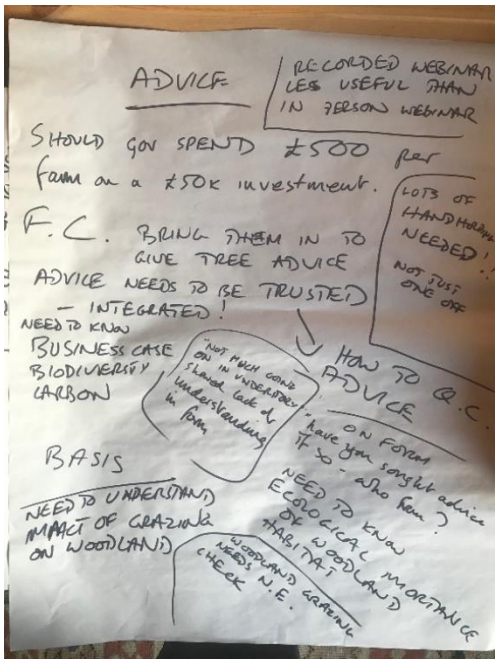
We discussed challenges to widescale uptake of agroforestry with different sectors (NFU, environmental NGOs, the Forestry Commission) coming at it from different perspectives. The challenge is to present a scheme that isn't over-complicated.

Discussion points: Advice for supporting AF options through Environmental Land Management

- Agroforestry required a high degree of 'hand-holding'. Government spend of £500 for a £50K investment in an agroforestry project would represent value for money if increasing the probability of success.
- Media for receiving advice range from online resources to handbooks, advisors and consultants, and peer-to-peer learning. Availability of both on-line and on-farm options is needed to suit different need and stages. Peer-to-peer learning options include demonstration farms, on-farm events and training, and cluster farms.
- There is a lot of material about planting trees but not so much on combining trees with animals. There are more resources from the US than the UK; UK-relevance is important. It is difficult to distinguish good and bad advice/guidance materials.
- How could Defra support the dissemination of advice? Options given included organising on-farm events, networks of demonstration farms (for example there are three in the Weald for mob grazing) and providing training.
- How do you find out about such resources? In the Weald there is a Whatsapp group. Local farm networks are important. The Catchment Sensitive Farming model of farmers accessing guidance is also relevant.
- Some of the standards have online-learning as an entry-level, paid requirement (e.g. for the farm woodland standard there is a webinar on woodland threats). Recorded webinars are less useful than in-person ones.
- There is a lack of information on return-on-investment, i.e. how to make money from agroforestry. In general, quality advice is needed on different aspects (business, carbon, biodiversity…). It needs to be quality-controlled and trusted. The FC are experts in tree planting and an obvious choice for giving that practical advice.
- Advice specific to woodland grazing, for example on presence of rare species, would be important, requiring Natural England expertise. Some woodland flora including Ancient Woodland Indicator Species are not necessarily tolerant of grazing so care should be exercised where livestock are introduced to woodlands where there is no history of such management. Could there be a case for woodland grazing not being supported at entry-level because of its bespoke nature?

- An application form for an agroforestry SFI standard could include a question on whether the farmer has sought advice.

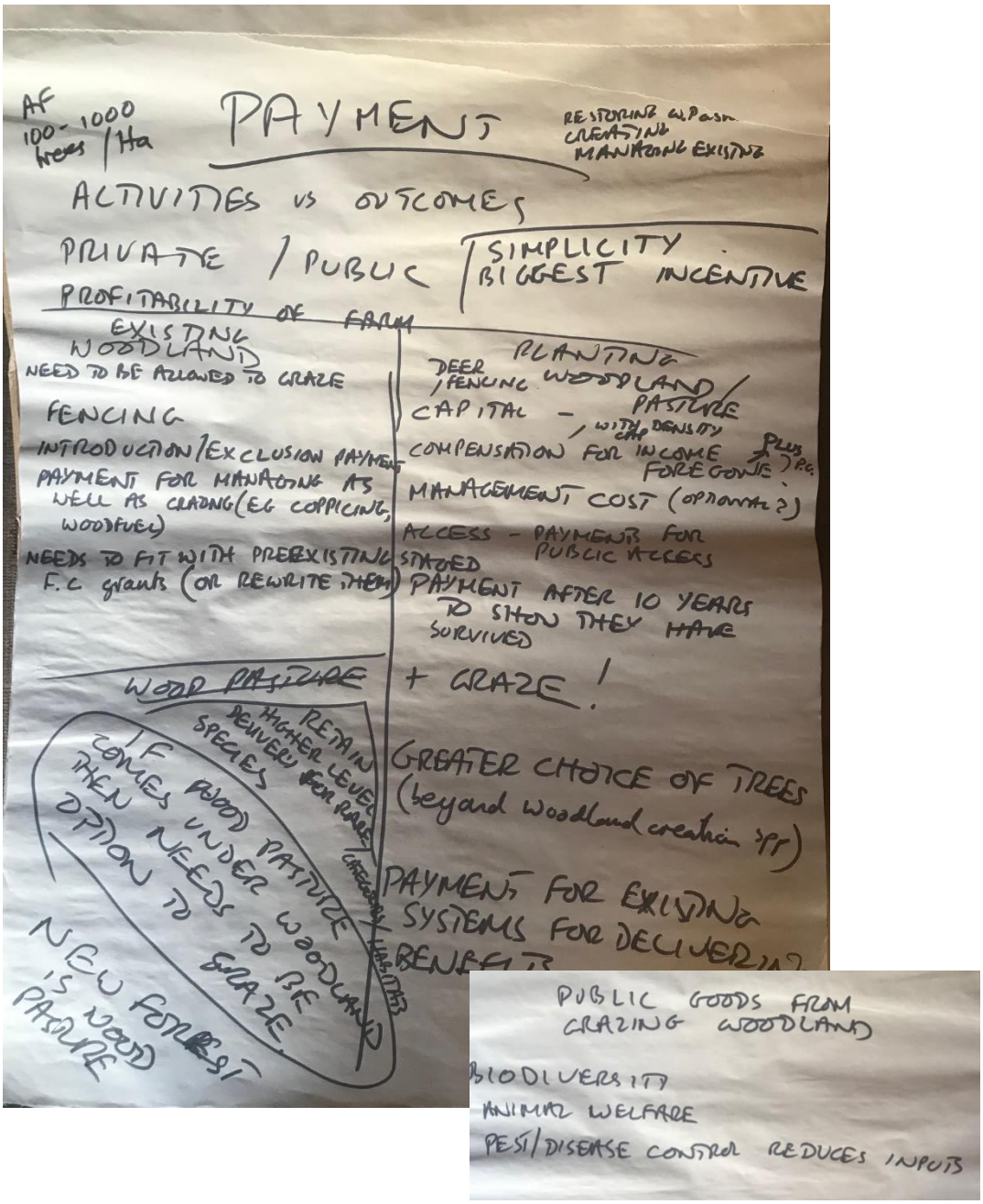




Discussion points: Payments for supporting AF options through Environmental Land Management

- We started off considering woodland grazing and asking the question: will Defra want to fund it? In other words, what are the public goods derived from woodland grazing? They include animal welfare benefits as well as conservation management in some carefully controlled circumstances.
- Farmers are not currently prevented from putting animals in woodlands, but woodlands are not economical to manage. Most woods in the High Weald don't offer grazing resources.
- In general, there were different opinions on definitions of woodland grazing, wood pasture and silvopasture, and how to define them. It may be more helpful to consider a spectrum of varying tree cover density and arrangement, from woodland with glades to fields with individual trees and small copses. Flexibility to design the system according to local conditions and farmer's objectives would be welcome.
- What payment incentives should there be? Capital costs (including deer fencing), management or maintenance payments (if allowing flexibility in system design and management), outcome-based payments (for surviving trees after 10 years) and allowing public access.
- Compensation for income foregone was more contested: is it too difficult to calculate? Or would it require some threshold minimum density of trees to kick in?
- As well as flexibility, simplicity of whatever payment mechanism is decided would be the most incentivising. New ELM agroforestry options need to fit in with existing (e.g. FC) tree planting schemes.

- With regard to biodiversity outcomes, we discussed how the Local Nature Recovery component could be particularly relevant here. Schemes should be focussed not just on rare species but aiming to keep more common species common. Ian talked about the environment bank model of gaining credits for, e.g., doubling species diversity on farm. Acoustic recording devices and other modern technologies may help in robust monitoring of biodiversity gains.
- In terms of using numbers of trees as a performance metric, care is needed. Even in improved grasslands and arable land there may be alternative beneficial long-term outcomes to those associated with increasing tree cover.
- Regional groups can be important as a mode of implementation. Good examples include Sustainable Agriculture Research and Education (SARE) in the US, and the Farming in Protected Landscapes (FiPL) scheme.
- Main messages to Defra were about keeping ELM agroforestry options simple and flexible, facilitated by peer-to-peer learning opportunities.


AF
100 - 1000
trees / Ha
PAYMENT
RESTORING & Plan
CREATING
MANAGING EXISTING
ACTIVITIES vs OUTCOMES
PRIVATE / PUBLIC
SIMPLICITY
BIGGEST INCENTIVE
PROFITABILITY OF FARM
EXISTING WOODLAND
NEED TO BE ALLOWED TO GRAZE
FENCING
INTRODUCTION / EXCLUSION PAYMENT
PAYMENT FOR MANAGING AS WELL AS GRAZING (EG COPPICING, WOODFUEL)
NEEDS TO FIT WITH PREEXISTING F.C grants (OR REWRITE THEM)
PLANTING
DEER / FENCING
WOODLAND / PASTURE
CAPITAL - WITH CAP DENSITY
COMPENSATION FOR INCOME FORGONE (PLUS P.G.)
MANAGEMENT COST (OPTIONAL?)
ACCESS - PAYMENTS FOR PUBLIC ACCESS
STAGED PAYMENT AFTER 10 YEARS TO SHOW THEY HAVE SURVIVED
WOOD PASTURE
+ GRAZE !
RETAIN HIGHER LEVEL BENEFITS FROM RANGE / CONTINUAL TREE COVER
IF COMES UNDER WOODLAND THEN NEEDS TO BE GRAZED
OPTION TO
NEW FOREST IS WOOD PASTURE
GREATER CHOICE OF TREES (beyond Woodland creation ??)
PAYMENT FOR EXISTING SYSTEMS FOR DELIVERING BENEFITS
PUBLIC GOODS FROM GRAZING WOODLAND
BIODIVERSITY
ANIMAL WELFARE
PEST/DISEASE CONTROL REDUCES INPUTS

Agroforestry ELM Test

Silvhorticulture workshop

Dartington Estate, 8 December 2021

Notes of the meeting

Present:

Hosts: Rafael Pompa (monitor farmer), Marina O'Connel (Apricot Centre)

Project team: Ian Knight, Ben Raskin, Will Simonson

Lucas Ashland, Lucy Bates, Chelsea (@Wiltshire Wildlife Trust), Gabriel David, Andy Dibben, Nathan Einbinder (Schumacher College), Emma Jones, Tanya Luke, Tom Parsons, Zenna Pascoe, Jon Perkin, Anna (@Riverford), John Richards, Samantha Sandberg, Ulrich Schmutz, Edward Scott, Lloyd Stone, Daniel Stover, Sally Westaway

Discussion: does or can agroforestry work for you?

Integrating trees into the horticultural production system gives rise to benefits such as wind protection (even after 5 years), temperature regulation, water infiltration, pollination and pest control services, as well as the tree crop as an additional enterprise. Disease incidence (e.g. apple scab and canker) can be less on agroforestry fruit trees compared to orchards due to their lower density.

Nevertheless, a number of practical considerations in establishing a silvo-horticultural operation became obvious in the course of the discussion, including:

- Tree protection. Trees can be browsed or damaged by deer, rabbits, voles and grazing animals. There are different options for protection including tree guards (issue of labour for maintaining them), vole guards, cactus guards, electronic collars on livestock (though there may be animal welfare issues). Planting thorn trees/bushes around or among the trees can offer some protection.
- Mulching. Use of mulch mats can encourage shallow rooting. FC recommend woodchip instead – a thick (10-15 cm) application on planting plus one or two more applications thereafter (type of woodchip doesn't make too much difference). Straw is not long-lasting.
- Tree choice and stock. Bare-root versus pot-grown. Variable harvest depending on timing of blossoming and frosts.

Silvohorticulture and Environmental Land Management

Three groups considered how payment incentives as well as advice/guidance provision should be designed to encourage silvohorticultural and other agroforestry practice under Environmental Land Management.

Payments: Group #1 (Ben Raskin)

<u>Flexibility</u>

- Agroforestry needs a targeted approached based on local priorities, e.g. specific species, flooding risk;
- There are big questions on permanence of trees – agroforestry support might need to be different to woodland schemes, with different management options, e.g. short-life fruit trees, coppicing;
- Need to link to private environment credits such as the catchment market model of Wessex Water/ WWT. All opportunities need to be left open until the market is developed and more understood.

What should be supported?

- Admin assistance to demonstrate improvements and navigate the complexity;
- Forestry gardens if supported would need a separate scheme with higher payment rates;
- Partnership opportunities – however, money would be needed for advisors and facilitation;
- Required maintenance of trees: we need to learn from the example of unmanaged woodland plantings that are often now almost worthless from a timber point of view due to neglect;
- Payments need to reflect the TRUE cost of planting, protection and management;
- Support should include processing and supply chain investment – e.g. woodchippers, harvesting equipment;
- Infrastructure, which can be a big cost.

When to pay support?

- Payment times – turnaround on payments is a significant challenge, particularly given long term return on investment with most tree planting;
- Paying for good practice and outcomes that have already been achieved: need to make sure that farmers don't rip out existing trees to get money for planting new ones;
- SOON – FOMO (Fear Of Missing Out) is massive at the moment, lots of farmers sitting on their hands waiting to see whether there will be better/easier support.

Other comments

- Standardisation of advice: currently it is not clear where to go for good knowledge. There are lots of advisors moving into this area but often not with much expertise;
- Any support needs to be credible to the public purse;
- Income Foregone is not necessarily appropriate for horticultural agroforestry;
- Rotational rewards is a particular issue in horticulture where much land is rented. How to reward and encourage planting on shared land?
- How close to a hedge can I grow? Weedy edges can compete with crops. In silvohorticultural systems the benefit to farmers may not be so obvious compared to livestock systems.

Payments: Group #2 (Ian Knight)

The group discussed a scenario of two payment stages with a successful inspection requirement to move to the second stage. The stages would be for (1) establishment and (2) maintenance and the following points were made:

Stage 1 - Establishment

- Planning is crucial and therefore advice and guidance should be sought on matters such as species, crop cycles, agronomy, soil;
- Early-stage planning should include aspects such as carbon funding, innovation requirements;
- Funding for upfront costs is necessary: e.g. labour, GIS/Sat Nav, trees, soil analysis, drainage, machinery;
- Eligibility criteria would need to be considered, e.g., size of holding;
- Some potential issues here include slow payments, admin requirements; land tenure (access to scheme by farm tenants), supply of plant stock;

Stage 2: maintenance

- Staged payments might be needed to reflect costs at different stages of establishment through to harvest, depending on the system/crop.

A potential support structure could therefore look like the following:

- Stage 1
    - 1 – Peer-to-Peer and/or group training, e.g. BASIS, Future Farming Resilience programme
    - 2 – One-to-one advice and guidance (if still required after (1) above) on agroforestry design and planning, adopting a whole farm approach
    - 3 – Financial support towards capital costs associated with establishment
- Stage 2
    - 4 – Financial support towards maintenance costs, i.e. for years 1-3 or potentially longer for some crops.

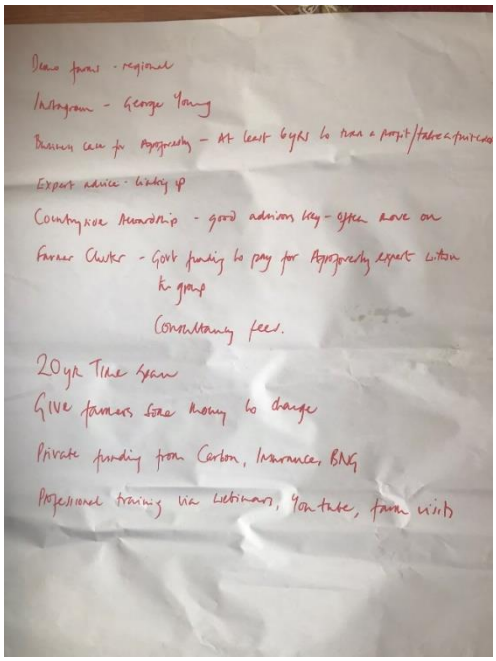
Other questions raised include:

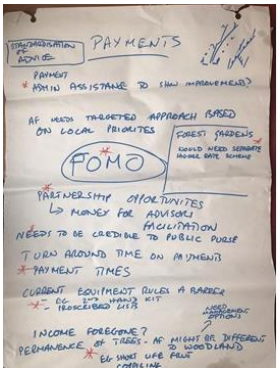
- What about landscape recovery? Would ongoing payment support be needed where agroforestry is part of such a scheme?
- What about payments for existing plantings? How should public goods being delivered by existing plantings be rewarded?
- Water infiltration benefits of agroforestry – how to measure and reward.

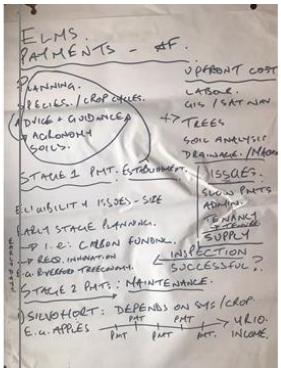
Advice and Guidance

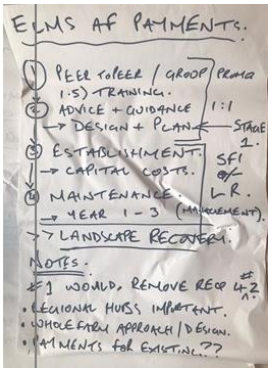
- Sources of guidance for farmers include demonstration farms and case studies. Nothing can replace being able to see agroforestry being practiced, not least because every region is different and so local examples are very important. Demonstration farmers need to be compensated.
- Other sources of information are workshops and online sources such as Instagram. Could YouTube influencers become important? Online modules on different topics would work well.
- Advice is needed on different aspects, not least the practicalities of choosing tree species, how to plant, establish and protect trees, but also the ecology and economics.
- As an example, Marina gives advice on agroforestry design. This is a service she charges for. She also receives visitors to the Apricot Centre but often doesn't charge them.

- How do you know who the experts are? How can you be confident about the advice you are receiving?
- FarmED is an example of a demonstration farm and also agroforestry training workshop provider.
- Workshop costs vary considerably, from £500/2days at FarmED to £120/2days at Dartington. An ORFC in the Field event at Wakelyns attracted a range of stakeholders and costed £140/2 days.
- The Agroforestry Handbook is a good source of information; this needs to be widely disseminated.
- Martin Crawford is a valuable source of advice on tree varieties.
- An example was given of how Countryside Stewardship was supported near Peterborough. The advisors in this case were very helpful, although they moved on and this is always a vulnerability of local network support.
- Another example of relevance is a cluster of 52 farms in the Cotswolds region supported by a FIPL grant and with a paid facilitator. The objectives of this cluster are mainly environmental and carbon is monitored as a proxy of soil health. The initiative is match-funded by the farmers themselves who pay £1/ha to participate.
- The cluster farm approach demands a level of openness, to be found more in young farmers.









Farm tour

We first passed a 50-acre silvoarable system, Broadlears. This was planted in 2016 and consists of lines of elder (double rows) and apple trees (single rows) alley-cropped with wheat-barley-oats. There is undersowing with black medick and white clover as a green manure in the rotation. Population wheat and heritage varieties are sown for a premium market. The setting up of a milling company and bakery allows vertical integration. 5% of the field area is taken up by the tree rows.

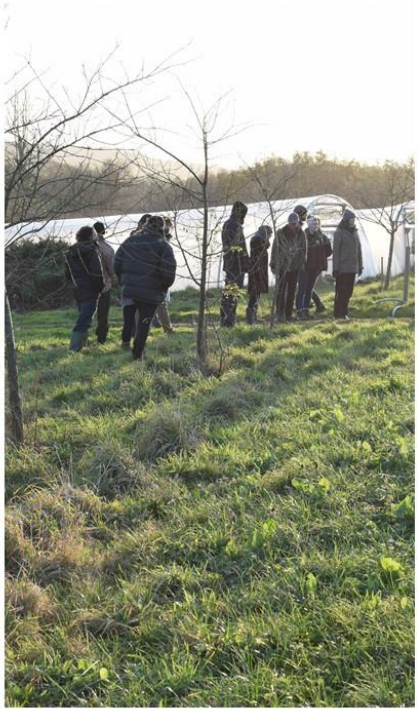
The Apricot Centre is on land held on a 999 year lease by the Biodynamic Land Trust and let to the Apricot Centre, a CIC with the dual purpose of food production and providing therapy to children. The site covers 13 ha (36 acres) and originally comprised three arable fields under intensive cropping of barley, and two wetland meadows. Deep-rooted green manures and agroforestry is part of the strategy of biodynamic conversion that is helping to bring the farm back to life. The farm employs 6.5 staff working across the enterprises of fruit, veg and eggs. The focus is direct selling of high value crops. Annual turnover is £280K, or £800K including training and psychotherapy.

The objectives of the agroforestry approach are climate change mitigation and adaptation, food and biodiversity. The main silvohorticulture field has lines of hazel, other natives and fruit trees (e.g. damsons) along contours with 28 m spacing on a south facing slope. This arrangement was decided upon for purposes of water management (keyline philosophy) and wind amelioration; shading from tree rows is reduced because of the slope and provides some benefit in terms of prolonging the harvest. It does constrain the use of machinery however (precision hoeing is difficult on a camber) and pedestrian tractors and wheel hoes are routinely used. The compartments between tree rows are of equal size and managed in rotation including squash, beans, sweetcorn, green manures. There are some intensive no-till beds. Soil conditions vary from very shallow soils at the top to 1 m depth topsoil at the bottom of the slope. The hazels, coppiced for biomass, are planted in double rows

Benefits of the system include natural pest control: pigeon-proof netting is removed from the Brassicas in the summer to allow insects (predators) to move onto the crop from the tree lines. Carbon sequestration is estimated to be 10t C/ha, offsetting emissions of approx. 5t C/ha (Farm Carbon Toolkit estimates). Worms have increased by 100% and bird species by 30%. Some tree lines provide a windbreak to protect the polytunnels. Products from the trees include crab apple jelly and birch sap.

The poultry system consists of 150 egg-laying White Leghorns in mobile housing moved around the fields every six weeks. Eggs are selling at £2.50/half dozen. A new batch of hens replaces a third of the flock every year, with Facebook used to rehome retired hens. The chickens are an important part of fertility management and benefit the trees by scratching around the base. They are used in the agroforestry field as well as orchards which have 6 m spaced trees to allow the poultry houses in between.

In other parts of the farm, the wet meadows were restored through conservation grazing by two cows. In one area perry pears are planted. These are on standard rootstocks so will attain a height of 30 ft. A forest garden used for child therapy, meanwhile, receives 1000 visitors per year, aiming to reduce stress levels through ‘forest bathing’. This is a very valuable service in terms of wellbeing benefits, whilst also being the most profitable part of the whole farm on an area basis.



Agroforestry ELM Test

Lowland Silvopasture Workshop

10th February 2022, Online

Notes of the meeting

Present:

Helen Jackson Brown (Farmer), Edd Colbert (FarmEd), Tim Downes (Monitor farmer), Polly Dumbreck (Farmer), Andrew Ferguson (Farmer), Jonathan Lovegrove Fielden (Farmer), Bill Grayson (Farmer), Caroline Hurdly (Farmer), Richard Jordan (Farmer), Jake Locke (Startup), Andrew Long (Farm advisor), Kate Mayne (Farm advisor), Geoff Newman (Natural England), Danielle Olding (Farm advisor), Sam Phillips (Farmer), Lan Qie (Academic), Charles Smart Hunter (Farmer), Chris Stoate (researcher), Mandy Stoker (Farmer), Daniel Stover (farmer), Edward Tate (Farmer), Rosie Venn (Researcher), Stephen Ware (Farmer), Emma Watson (Farmer)

Project team: Ben Raskin, Will Simonson, Stephen Briggs, Ian Knight, Colin Tosh

Agenda:

14.30-14:45	Introductions, objectives of the day, introduction to lowland silvopasture (Will Simonson, ORC)
14:45-15:15	Video tour of his farm by Midlands lowland silvopasture monitor farmer Tim Downes
15:15 – 16:15	Breakout room 1: group discussion of payments for lowland silvopasture within ELM (participants will be randomly allocated, Chair: Stephen Briggs, Abacus Agriculture)
15:15 – 16:15	Breakout room 2: group discussion of an ideal payments system, unconstrained by ELM (participants will be randomly allocated, Chair: Ben Raskin, Soil Association)
15:15 – 16:15	Breakout room 3: group discussion of advice and guidance within ELM (participants will be randomly allocated, Chair: Ian Knight, Abacus Agriculture)
16:15-17:00	Group feedback and open discussion
17:00	End

Session Chair: Colin Tosh, ORC

Tour of the lands of "The Farm", Longnor, south Shropshire, and its silvopasture system, conducted by Tim Downes

Note: While this workshop was held online, an attempt was made to maintain the basic structure of the workshops previously held. With this in mind, on 09 Feb Colin Tosh visited and interviewed Tim Downes at his farm. Interviews were undertaken at four areas of the farm: an introductory session in the farmhouse, at the willow agroforestry site, at the mixed tree species agroforestry site, and the walnut plantation. The visit was video recorded and the video shown to online workshop

participants prior to in-depth discussions, to follow the convention generally adopted during this workshop series of conducting in-person farm tours before group discussion session. The following is a summary of the farmer's narrative with stills from the video recording, which is available for viewing on request. The following is not intended to be a full description of the farm; this is available elsewhere (https://www.agricology.co.uk/field/farmer-profiles/tim-downes)

Farmhouse discussions

The Farm at Longnor comprises 405 hectares split across several sites and farmed under a mixed tenure model. The farm has 500 dairy cows across two sites and at the time of the visit block calving was underway. The farm has been organic since 1998 with cows fed exclusively on grass and tree fodder. The farmer travelled extensively during his time as a Nuffield Scholar in 2003 and is influenced by Irish and New Zealand grazing principles.

The farm produces milk for the OMSCO cooperative under their PWAB (produced without antibiotics) scheme and this was a significant motivation for the farmer planting medicinal trees such as willow for the animals to browse. In developing agroforestry, the farmer also wanted to increase the area of useable land without acquiring further hectarage: by farming in the third (vertical) dimension. Agroforestry allows an increased volume and variety of vegetation for animal browsing and the animals also benefit from a favourable microclimate within the trees.

Five main tree species have been planted on site within two "trial sized" areas organised into tree strips with grass alleys (roughly 6m wide) in-between: a common general conformation for both arable and pastoral agroforestry in the UK. Crack and white willow comprise one alley-strip plantation, while the other consists of a mixed stand of small leaf lime, sycamore, disease resistant elm, and hornbeam. All trees are edible and were chosen and planted as part of a browsing trial initiated in 2014 in collaboration with the Woodland Trust and Harper Adams University (https://tinyurl.com/mr4cts3r). Woodland Trust paid for the trees but all other costs in the development of the agroforestry system (maintenance effort, fencing, extra labour, etc) have been met by the farmer. Woodland Trust restricted choice to native species. Trees are 2-3 m apart and have been offered protection during early years (4-5 years) and during key growing periods by electric fencing. Fencing can also be strategically moved closer and closer to trees within season to control the rate of browsing. Use of electric fencing allows cows to browse trees without damaging the main stems. Willow trees have grown prodigiously and were pollarded to 5ft in 2020, obtaining 6 compacted trailer-fulls of material which was dried and chipped and fed back to the cows. The

willows grow 3m of stem each year, producing a large quantity of biomass. While the cows provide some level of structural maintenance of trees, they predominantly take leaves and not stems and occasional structural maintenance by the farmer is required. The farm also runs a wood burning stove which is fired from renewable scrub and hedgerow material as well as trees that have been blown over: the amount of material produced by the willows is considerably more than required for this form of domestic heating.

The spread of weeds from the agroforestry strips is not a big issue for the farmer and is likely to be more serious in silvoarable systems. The tree strips are likely quite beneficial for soil structure in silvopastoral systems as they act as a significant worm bank. Studies done on site have shown that worms occur at a density of 25-30 per squared spade depth meter within the agroforestry lines but at a density of only 3-4 in pasture. Similar findings have been reported in silvoarable agroforestry at the Wakelyns Agroforestry site used in research by the Organic Research Centre.

Discussions at willow agroforestry

Crack and white willows were established from cuttings 2014 in spring which is a good time for planting cuttings due to high soil moisture levels. The farmer advised that approx. 1ft long pieces of around an inch diameter make especially good willow cuttings for planting. Willows are excellent trees for attracting beneficial organisms. They are very commonly infested by aphids in summer [author's note: willows have their own specialist aphid that doesn't utilise herbaceous crops] and these in turn attract beneficial organisms such as parasite wasps and ladybirds. Birds also utilise the trees and worms are found beneath them in large numbers. Soil carbon analysis has been done at three soil depths at "The Farm" and carbon footprinting undertaken, as part of the farm's designation as a strategic AHDB dairy farm. Willows contain an aspirin precursor and are believed to mimic the properties of aspirin when ingested. The farmer will give cows feeling unwell access to browsing willow and newly calved cows will also have access to willow during this physiological demanding time in their life.

Discussions at the mixed species trial area

The original trial that resulted in the planting of the mixed species stand (see above) aimed to determine which tree species show a number of favourable characteristics: will be browsed by cows, have nutritional content, have medicinal properties, will tolerate regular browsing, and provide a good microclimate for the cow. The trial found that all species planted provide useful levels of beneficial minerals and this can lead to saving as mineral supplements do not need to be purchased. The farmer had the trees planted under the assumption that they could be removed if they "don't work" and he does not believe that farmers necessarily should consider agroforestry "permanent": it is usually clear to the farmer when trees are young whether they are doing a good job and if they aren't they can be removed. A more serious consideration is how you are using the land. The areas used for agroforestry at "The Farm" are permanent pasture so suited to agroforestry. Farmers rotating land between livestock and arable and arable farmers undertaking diverse rotations may find agroforestry less suitable. Unlike arable agroforestry, there is no need for trimming of tree roots and only occasional need for pollarding or coppicing to keep foliage within reach of cows. Treatment of stem branches on silvoarable and silvopastoral is quite different. These are encouraged in silvopastoral to increase browsing but discouraged in silvoarable to minimise shade.

The way the farmer learned about agroforestry corresponds well to the findings of a previous interview analysis (https://tinyurl.com/4vysnyd2) submitted by the Agroforestry Elm Test: person to person interactions (with agroforestry farmers and NGOs such as the Woodland Trust and the Organic Research Centre) were as important as studying books and online resources.

Expanding on earlier discussion, the farmer stated that maintenance of the trees is fairly minor, involving fence fixing, propping up slanting trees and wind damaged trees, and replacing any dead trees with help from the Woodland Trust. Straw and bark mulch were used in the establishment of trees to retain moisture around the roots.

Recalling earlier discussions, the farmer here stated that another advantage of agroforestry is having trees but not having land classified as forestry. He also stated that he has felt for some time that agroforestry is likely to be viable for subsidy payment in the future and this was a significant if slight motivation for planting the agroforestry.

Discussions next to walnut plantation


The farmer has planted 20 walnut trees around the collecting yard of the farm. He read that the trees emit volatiles (scents) that are unattractive to parasitic insects of the cows and flies that bother the animals and states that they appear to be effective in this regard.

The farmer and his farm are a Test and Trials pilot for the SFI, with a particular focus on soil carbon benefits of agroforestry. The farmer is particularly keen that his historical efforts to run a sustainable farm are recognised in SFI and this is an important issue for many of the progressive and sustainable farmers taking part in the Agroforestry Test. The process surrounding SFI is not currently clear to him and he is constantly bombarded with paperwork and new information that he struggles to keep up with. He hopes that in and round field trees will be viable for multiple parts of the SFI: water quality, air quality, hedgerow standards. This would allow him to expand his agroforestry operations.

Discussions in the dairy

Cows are milked twice a day and this is less than most intensively farmed dairies. Many of his cows are currently at the end of their lactation and are about to calve and following calving they will go out to fields to graze. Ultimately, his milk goes to White Farms in Somerset to be made into cheese which is sold in upmarket US supermarkets (equivalent to Waitrose in UK).

The farmer sees some potential for agroforestry to be incorporated into the branding of milk and cheese: “Made from leaf-fed cows”. Cheese and milk from his cows probably have elevated levels of

tannins due to the tree browsing but he doesn't know if this would impact the flavour and make the taste more pleasant or interesting to consumers.

Questions addressed to Tim Downs following showing of video tour

Q: Do cows have a preference for crack or white willow?

Downes ("Answer (A)" hereafter): No preference he is aware of. Willows are superior to the other species he has planted in terms of mineral composition.

Q: Would you plant trees next to cow tracks or would this slow them too much through browsing?

A: Trees better placed within the field itself, not around tracks.

Q: Who coordinated the browsing trial on your farm?

A: Nigel Rendall from Nottingham University, Woodland Trust, and Harper Adams started the trial.

Q: How close to the trees do you place the electric fence?

A: Fencing starts far away and is brought in as they mature and can cope with browsing.

Q: What distance are the trees from each other?

A: 2-3 meters. Could be less to make a hedgerow arrangement.

Q: How does tree browsing impact milk/cheese flavour?

A: Not much info. An article on banana leaf browsing and milk composition was placed in chat area of meeting by Ben Raskin.

Q: Does browsing reduce methane emission levels from cows?

A: Unclear at present [Bill Grayson highlighted an initial trial on his land suggesting reduced emissions in wooded areas but more data is needed].

Q: Does too much tannin compromise protein digestion?

A: Hasn't been found in willow browsing at least.

Q: Have you had any disease issues with trees? Would you not recommend any species?

A: Some willow got soot and mould but not a major issue. Elm current healthy.

Q: Do you know of any recyclable tree guards?

A: We do recycle plastic guards but plastic in farming system is not good. Recyclable and compostable versions are very expensive. Perhaps greater use of electric fencing is the answer. If nothing is likely to browse your sapling, the guards are unnecessary. Tree guards made from Sheep's wool are currently available.

Q: Crack willow can achieve a wide trunk girth. Is this a problem for the next generation?

A: We have been trying to control this through coppicing.

Q: Could you give us more details about the resistant Elm you used?

A: The stock was supplied by Thorpe Trees through the Woodland Trust.

Q: Is you willow hay palatable?

A: Yes, even dried and chipped branches were eaten. 2 inches in diameter was the thickest we used.

Breakout room groupwork report back and discussion

Advice and guidance (facilitator Ian Knight)

While ostensibly a discussion of advice and guidance within ELM, this breakout group was broad in theme and also included opinion and discussion around payments, regulation, and practical issues in agroforestry. Points relating strictly to advice and guidance are listed first in the bullet points below.

- Perception that there will be no advice and guidance in SFI and this will be supplied in higher level schemes.
- Farmers need advice on why they are doing agroforestry. Farmers need help designing systems with clear objectives. Everything else follows from that.
- On a practical level in agroforestry it is good to have a good understanding of your farm, your fields, and your infrastructure and how agroforestry fits in to this. A whole farm view is needed.
- Knowing the purpose of the agroforestry you are doing is essential.
- Everyone's farm is different so the advice and guidance required will be different for each farm.
- Case studies are important. Shows people how they can follow a similar, if not identical, approach.
- Without advice and guidance in agroforestry in ELM, trees simply won't survive.
- Offer farmers a consultation with their ELM payment, to be used near the start of the project.
- Other agroforestry farmers such as Stephen Briggs are the best source of advice and guidance.
- Sometimes an experienced agroforestry farmer simply saying "just do it" is all that's needed. Giving farmers confidence.
- Specialist discussion groups a good source of advice and guidance.
- Visiting other people's farms a good source of advice and guidance.
- Reading sources such as Ben Raskin's handbook is useful.
- Farmers should learn from those that have been doing agroforestry for a long time
- 2-day design workshop such as that of FarmEd, which involves small group learning, is effective and costs less than hiring specialist advisers. 4 facilitators with different specialities. One to one feedback on design with follow up.
- Defra could provide information when farmers apply for schemes on who their neighbours are and what they are doing to facilitate peer-to-peer learning.

- Clusters developed within the Agroforestry ELM Test could potentially be built up into peer-to-peer learning clusters for agroforestry in the future.
- Neighbour farmers co-designing agroforestry can share the cost of advice and guidance. Such collaboration could also lead to cheaper procurement by increasing volumes.
- LNR is presumably designed to facilitate neighbour interaction on nature recovery projects. Will involve allocating a facilitator to bring people together.
- Farmers don't want to plant trees currently due to uncertainty around ELM.
- Currently too many unknowns in relation to Agroforestry in ELM.
- Where does agroforestry fit into the farmers business model? It has to be seen as a long-term investment, a slow burn, a legacy.
- Legislative issues round agroforestry. Trees could be ready in 15 years. When do you need felling licences, EIAs?
- Could the forestry sector take over farmers land to plant small plantings?
- Through biodiversity, developers could potentially pay landowners to plant trees on their land to offset the impact of their development. Landowners could also claim for carbon credits.
- Hopefully we are moving away from agriculture vs forestry to simply "land use".
- No Woodland Carbon Code equivalent for agroforestry.
- Seems wrong that woodland planted under the Woodland Carbon Code cannot be grazed by animals as it is perfect for this.
- How do you protect trees when establishing them when grazing sheep in traditional orchards?
- How do you accommodate undulating ground when grazing sheep in traditional orchards so you can use rotational grazing?
- Worry that too much emphasis put on willows in alley agroforestry as they have the potential to destroy land drains
- One farmer has had great difficult with animals killing establishing trees by browsing on them.
- Need tall tree guards with browsing animals. Current grant system doesn't recognise this problem and the costs of dealing with this issue.
- How much support do farmers need to produce commercial timber alongside commercial farming operations?

Payments 1 (Ideal payment system, unconstrained by ELM, facilitator Ben Raskin):

In this breakout group, participants were asked to think about what the "ideal" payment system for agroforestry would look like, regardless of how the ELM system is currently structured or will be structured in the future. The idea was to promote unconstrained and innovative thinking and ideas.

- Biggest barrier is capital cost on land areas above 180 acres. This leaves you chasing biodiversity and carbon markets – which are difficult and don't fit agroforestry.
- Any payment system needs to be flexible and allow people to try new ideas with few penalties. Mistakes will be made. Perhaps small-scale trial grants could be made available.
- Having grant aid for our orchard was what made it happen quicker. Two thirds of cost were funded through stewardship and management costs.
- If you are planting trees to bring benefit to your business, then rewards will come to the farm. Depending on the scale of capital investment, ongoing management cost would not be expected to be paid.
- Real concern about stacking benefits from a public purse.
- Loans could work but add complication and risk.
- Current Woodland Creation Offer excludes livestock.
- Complexity of an agroforestry project is not necessarily the problem, but accessing the right partner.
- How do I compare current grants and subsidy opportunities with potential future offers?
- Slowness of establishment with trees makes agroforestry problematic from a business and subsidy viewpoint.
- I am not an agroforestry practitioner, but I think we need more evidence on public goods delivered by agroforestry and how to measure them. We need mechanisms for monitoring public goods benefits in a simple and standardised way.
- I am very happy very happy to be part of every research project I am asked to do: flood meadows, M40 air quality. I am very keen to prove agroforestry can work as a system but I can't do it without the funding. My farm is two thirds arable and one third meadow.
- Support for infrastructure does help: fencing, felling machinery.
- In the old days tree-work such as coppicing would be managed at estate level.
- What worries me most is that the grants insist on native trees. We need trees that are going to be useful, not just natives. Nobody is doing proper timber trees. We need to look at species like poplar and faster growing oaks and Paulownia.
- Biochar can help for longer term carbon storage
- Capital grants should be available for high tech no-fence systems where animals wear collars that emit a noise when approaching restricted areas.
- I/we bought a woodland planted under a grant with previous owner and we now want to graze it but there are too many trees. How should we remove extra trees? Do we need

permissions moving from woodland to grazed woodland? There seems to be no commercial interest in the timber.

- I have a dairy farm and planted walnuts around the houses and a few strips linking woodland. Willow and alder were planted predominantly. In planting these trees I was just interested to see what the cows do.

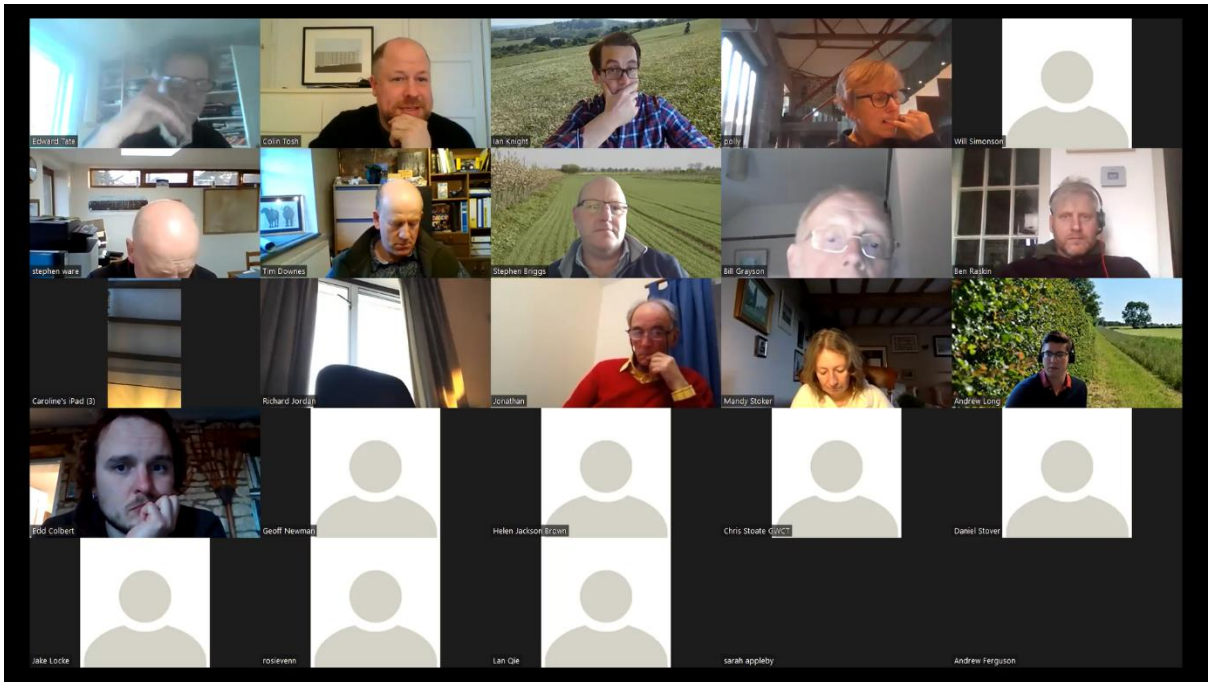
Payments 2 (Payments within ELM, Facilitator Stephen Briggs):

In this breakout room, participants were asked to consider what a payment system for agroforestry might look like, given what is known of how ELM is structured now and how it may be structured in the future.

- Existing agroforesters should be rewarded, not just new entrants.
- The forms that need to be filled in should be basic and simple.
- Capital payments should be available for establishment/protection.
- Annual payments should be available for maintenance.
- Re maintenance, evidence on ongoing costs would be helpful to design options. Has this been looked at in detail through research?
- The requirements of hedgerows in ELM have gone up: plants per unit length gone up by 50%. There is a lot of cost in preparing ground and then maintaining it (e.g. bramble control).
- There is a dearth of economic data on agroforestry but many farmers keep detailed records on their agroforestry operation so the lack of economic data is not due to a lack of research material.
- What should be funded: the trees, protection, advice & guidance? Some present suggested all of these.
- There is a need for a payment scheme that fits the different forms of AF and is flexible in other regards e.g. farm type.
- Under the SFI, there is a requirement to restrict livestock grazing under trees. You can graze up to a hedge in an SFI pilot.
- An overly prescriptive payment system will be a hindrance to uptake.
- The payment system should support natural regeneration of trees; this gets by shortage of tree stock and creates added value.
- Agroforestry fits well within objectives of SFI, however, SFI is a base-level system with no capital element. Could establishment better fit with LNR including both capital and advice support, with ongoing support through SFI?
- However, LNR needs collaboration across a number of farms and this may be a problem for small farmers.
- There is evidence for public benefits in agroforestry and this should be recognised.
- A management income-foregone approach is one possibility.

- There should be payments for ecosystem services however there is concern about C sequestration through no ploughing, increasing root mass.
- It is important that previous responsible land management is not ignored and there should be a baseline maintenance payment for existing ES delivery.
- Blended finance was mentioned including selling carbon, though this needs carbon assessment in the round. GHG emissions on-farm are still difficult to measure. The Woodland Carbon Code is currently considered difficult to apply.
- Advisors are needed to get trees in the right place. On-farm advice is needed, including hydrological knowledge. A holistic package of advice on different ecosystem services is needed.
- Shropshire Council's funding is on a Shared Outcomes basis. They are running a pilot on agroforestry and orchards which is intentionally light on advice and guidance to see what happens.
- Farmers need to know what species to grow, how to design planting and the medicinal properties of trees.
- There is a need for ongoing care of assets and so also for courses to learn skills in tree management – could this be brought into ELM?
- Permanence issue: for inheritance tax purposes there is a need to prove that woodland is being managed.
- Other than woodland for grazing, for AF the land use classification doesn't change and legislation for felling licences doesn't necessarily apply.
- Don't lose sight of food production. Will there be a trade-off with biodiversity?
- There needs to be consistency between different SFI standards.
- One farmer would like to link his tree planting to urban planting but there are boundary and other issues. Legislation is too prescriptive and not flexible enough.
- Grazing under trees should be encouraged as a means of fire prevention.

General Discussion



- Have an agroforestry option that lifts the cap on capital items for an agroforestry scheme and then joins it to a separate maintenance payment.
- The stress caused to tenant farmers currently by the flux in payment mechanisms needs to be recognised.
- Farm clusters could allocate an accredited advisor to carry out audits of farms within ELM, potentially reducing costs for this function.
- Farmers need guidance on what evidence needs to be gathered for payments so they are not wasting their time. Evidence gathering could be done either by the farmer themselves or an advisor.
- Land manager could be rewarded for gathering information that builds the evidence base for agroforestry and feeding it back to Defra. On the other hand, do farmers have time to do fill in more forms?