

Regenerative Agriculture

Is it Producing the Goods?

Our thoughts, experiences and calculations:



A family farming opportunity

- **2020:** 150ha FBT + 48ha contract farming for the landlord (arable with 11ha HEFER grass)
- My father farmed on the north, east and south boundaries
- **2021:** Contract farming moved to FBT plus a further 107ha of father's. Total = 307ha (incl woodland, CSS and grass)
- Contract direct drilling – 100ha
- £105/ac incl farmhouse
- **Mark** – weekends & holidays on the farm
- **Kier** – bookkeeping (+1 other farming client) and building project management





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Our Strategy



1. Adopt a Regenerative approach to arable area so we can:

- Minimise operational costs as far as possible without disrupting yield potential (on a farm currently capable of national average yields)
- Boost soil organic matter and overall health to improve yield potential over the medium to long term
- Make a 300ha farm workable on a part-time basis with as little hired labour as possible
- Learn as much about doing it for use in Mark's day job!

2. Maximise Environmental Support Income to protect the many watercourses and diversify natural habitats to improve natural capital

3. Maximise non-farming income (to reduce impact of farming risks) through development of the range of traditional buildings

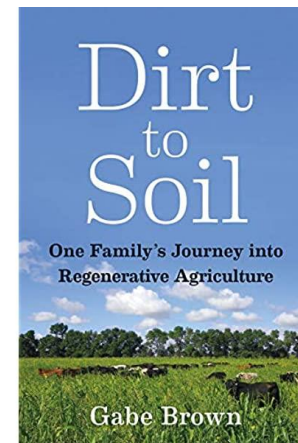
4. Enjoy living and raising our son on the farm

Regenerative Agriculture Definition

Regenerative agriculture is a conservation and rehabilitation approach to farming systems. It focuses on topsoil regeneration, increasing soil biodiversity, improving soil water percolation and storage, supporting carbon sequestration, thereby strengthening the health and vitality of farm soil.

Gabe's 5 Key Principles:

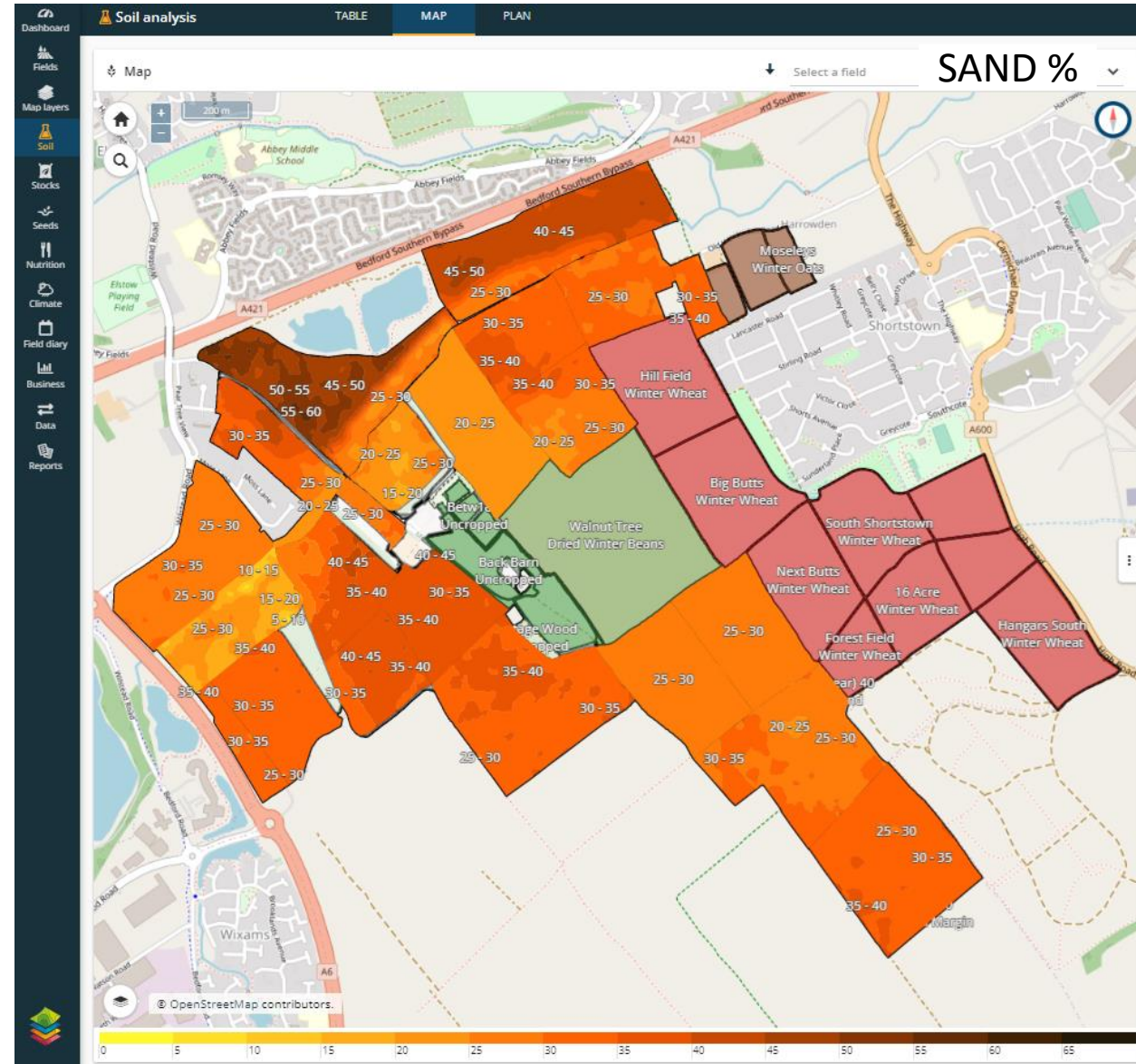
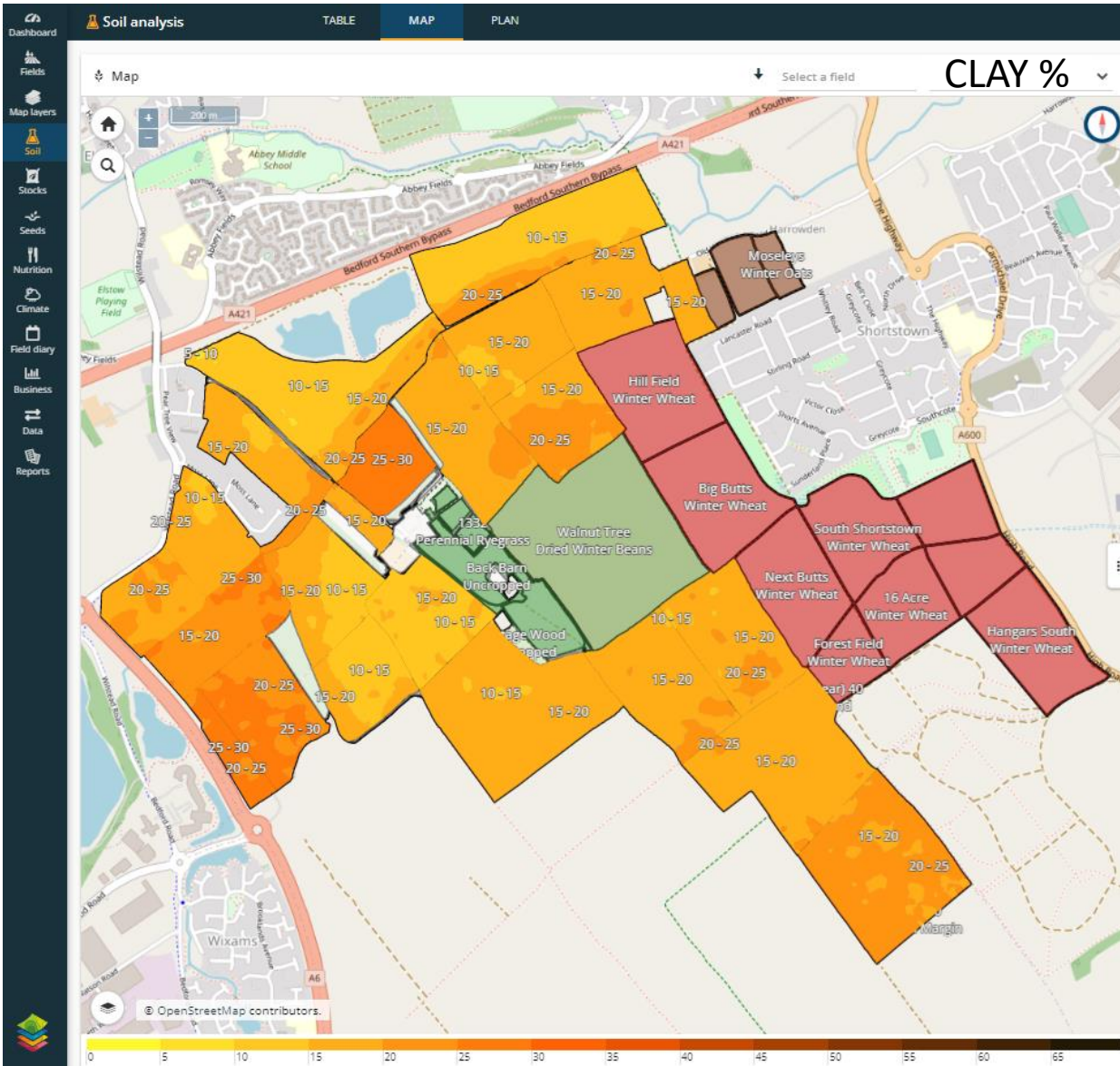
1. **Limited Soil Disturbance** – tillage destroys soil structure and oxidises organic matter to release carbon
2. **Keeping the Soil Covered** – prevents erosion, improves moisture retention, feeds and nurtures soil organisms and suppresses weed seed germination
3. **Diversity of species** – broadening crop rotations, use of cover crops & companion crops – to enhance ecosystem function
4. **Maintain living roots in soils throughout the year** – feed soil biology by providing its basic food source, carbon.
5. **Integrate animals** – grazing helps develop the nutrient cycle



Gabe Brown, North Dakota Farmer

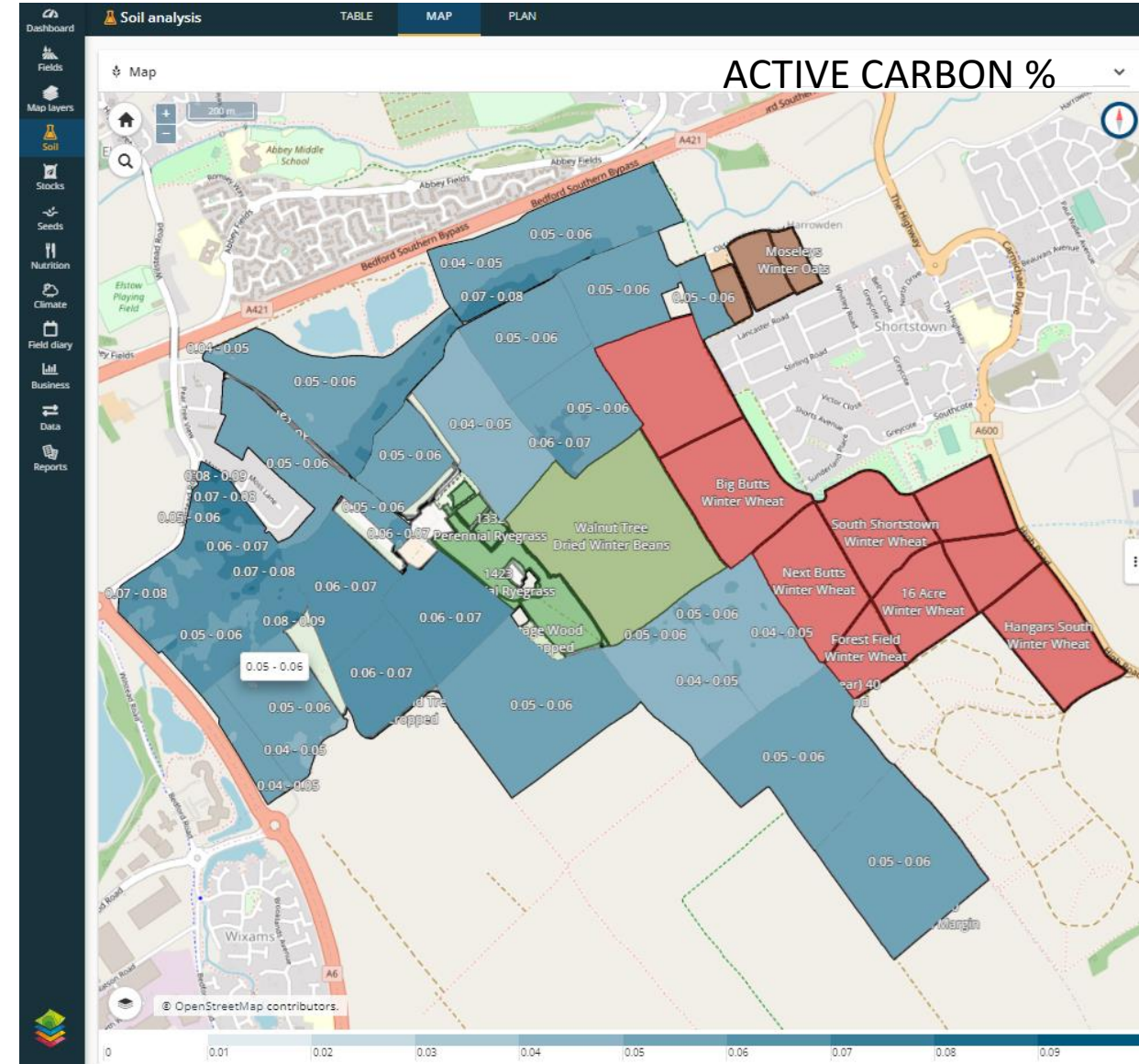
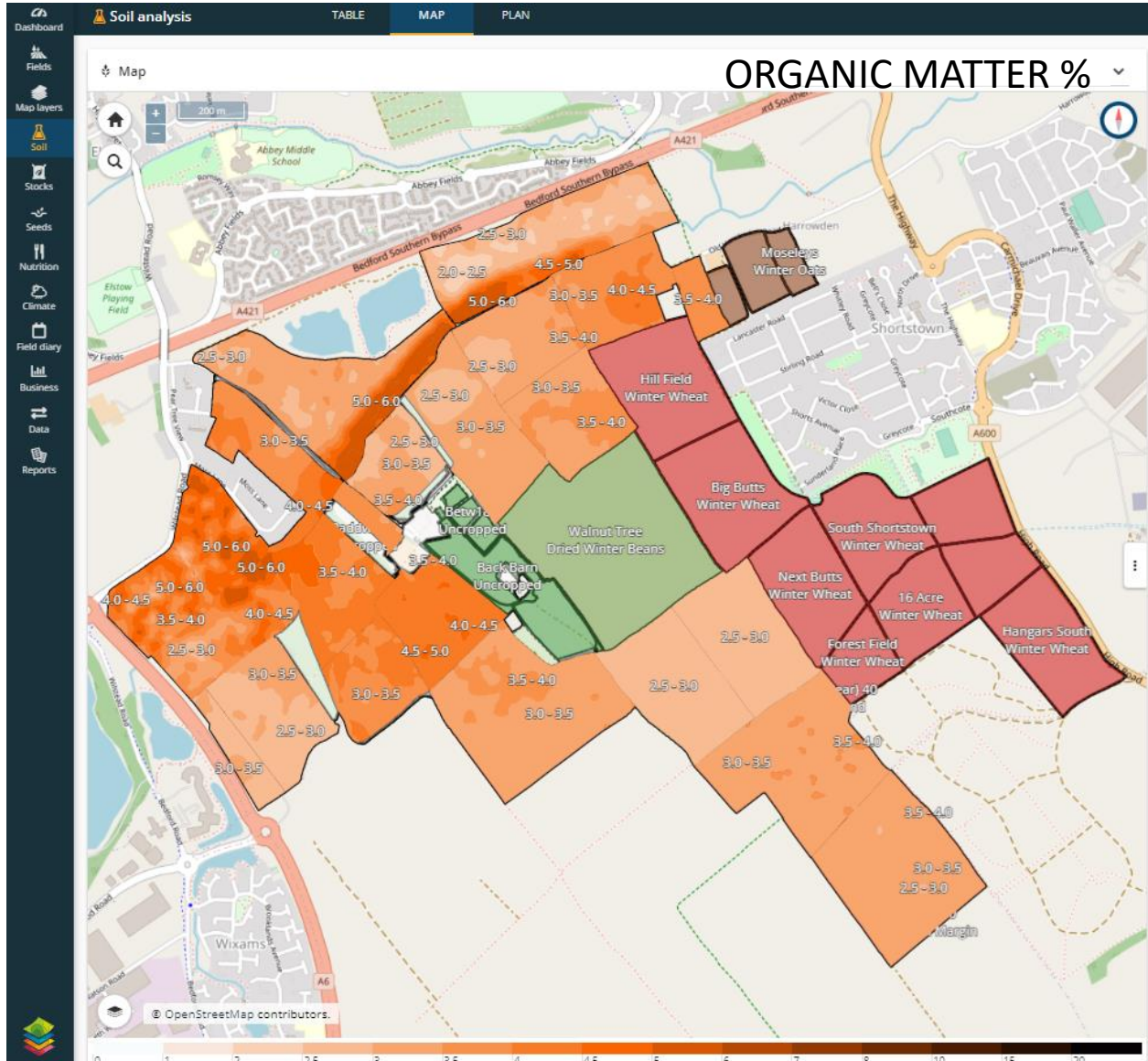
Our Soils – Clay & Sand %

Omnia Terramap Soil Analysis



Our Soils – Organic Matter % & Active Carbon %

Omnia Terramap Soil Analysis



The Shopping List!

+ our kit is new, has modern technology (RTK, Section control, Isobus etc), with long warranties
 - We have significant machinery finance costs draining cash on top of our rent

Fendt 724 Tractor & 16T Trailer



Amazone Fertiliser Spreader



Horsch AX24m Sprayer



4m He-Va Stealth Low Disturbance Subsoiler



JCB 536.70 Loadall



Horsch Avatar 6.16 Direct Drill (6m)



8.3m Cousins Ring Rolls (pulled by Mark's father's JD tractor)

1. Limited Soil Disturbance

- Low disturbance subsoiler- Essential in the 'TRANSITION PERIOD'
- Significantly boosts soil structure and aids crop establishment (eg 2022/3 oat crop)
- Enough on heavy land??
- Work rate: 20 ha/day
- Diesel – 15L/ha
- Running Cost - £48.50/ha (incl diesel)



1. Limited Soil Disturbance – Direct Drilling

Horsch Avatar 6.16 (6 metre, 3 metre section control)

- Strength, Reliability & Accuracy
- Twin hopper – 2 different seeds / mixes can be planted at once
- Variable Seed rate capability
- Low power requirement
- Excellent seed placement
- Total operating cost of drill = £55.50/ha
- Overall establishment saving over min-till and drill = up to £40/ha, mean £23/ha
- Direct drilling rules:
 - ✓ drill a week earlier than you would if you had cultivated
 - ✓ If the field surface is not level before drilling it never will be!
 - ✓ Increase seeds/m² by 10 to 20% (eg wheat drilled at 480 seeds)
 - ✓ Do not expect great results if soil surface is dry and hard!
 - ✓ Do not drill when wet (tine drill back-up?)



2. Keeping the Soil Covered & 4. Maintaining Living Roots



NO straw removed – all chopped, back to the soil

Cover Crop:

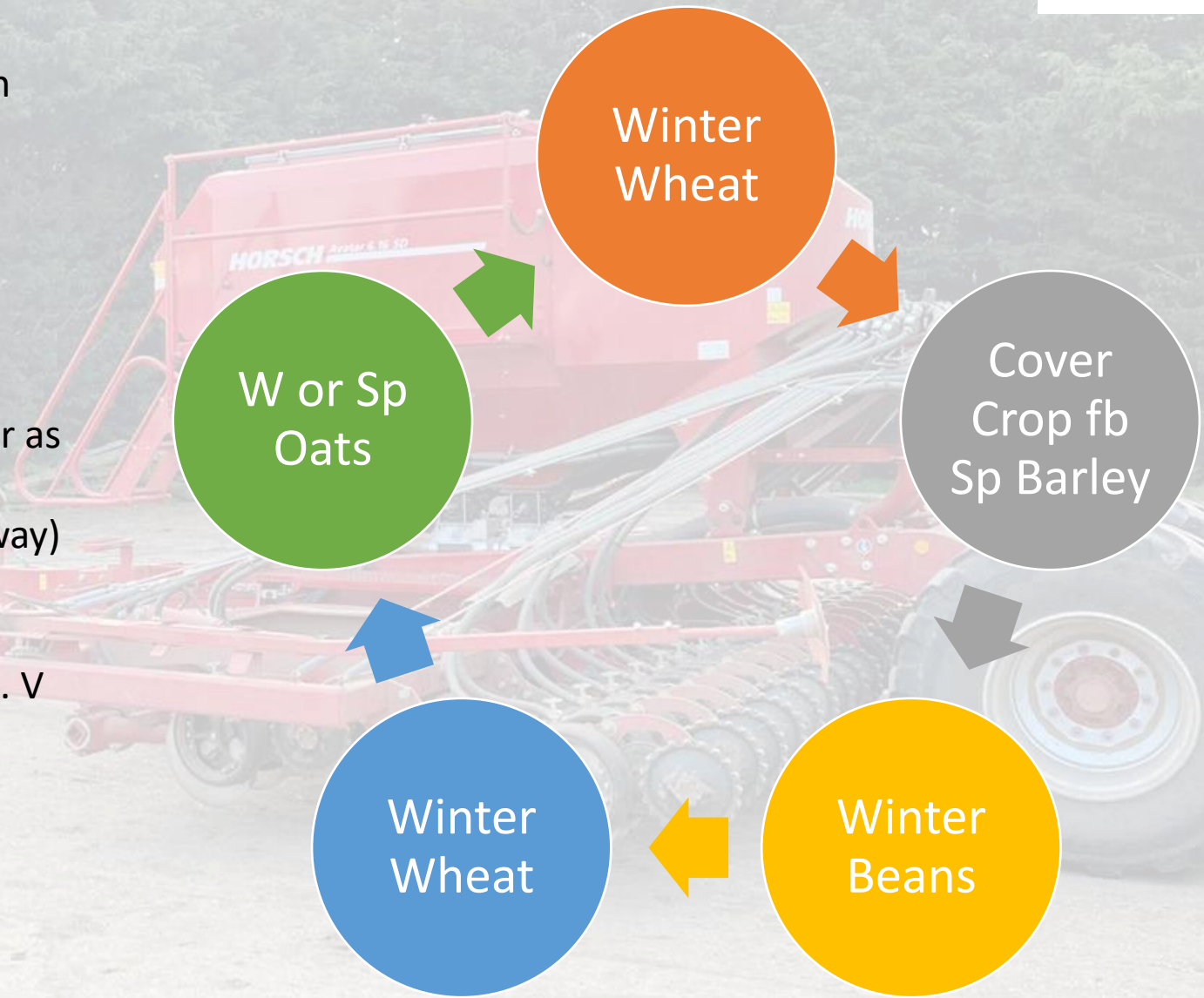
Kings Summera Cover Crop – sown @12kg/ha = £25.80/ha

- Direct Drilling - £55.50/ha (incl operator @£3.25/ha)
- £124/ha cover crop payment under Countryside Stewardship Scheme
- Reduce N application in following spring barley crop
- Early entry to field for spring cash crop drilling
- Key blackgrass control point in rotation
- No success or gain seen from short-term cover crops. Leave volunteers to grow and glyphosate before drilling.

3. Diversity of Species

Medium (sandy) clay loam soils with relatively high drought risk:

- **Winter Wheat – 100% Milling** to local mills
- 2023/4 Trial to **include clover in W Wheat** and reduce N application.
- **At least 2 legumes** in the rotation (Beans and clover in cover crop)
- Introducing **sheep to graze cover crops** this year as a trial
- **Oats** – direct sale to Richardsons mill (1 mile away)
- Choice of spring or winter oats dependent on blackgrass severity
- OSR – overcropped on this farm in last 20 years. V poor in 2022.
- 7 ha in Countryside Stewardship margins (AB 1, AB8, AB9, SW1)
- 11ha new woodland – Dec '22 planting – Woodland Carbon Code



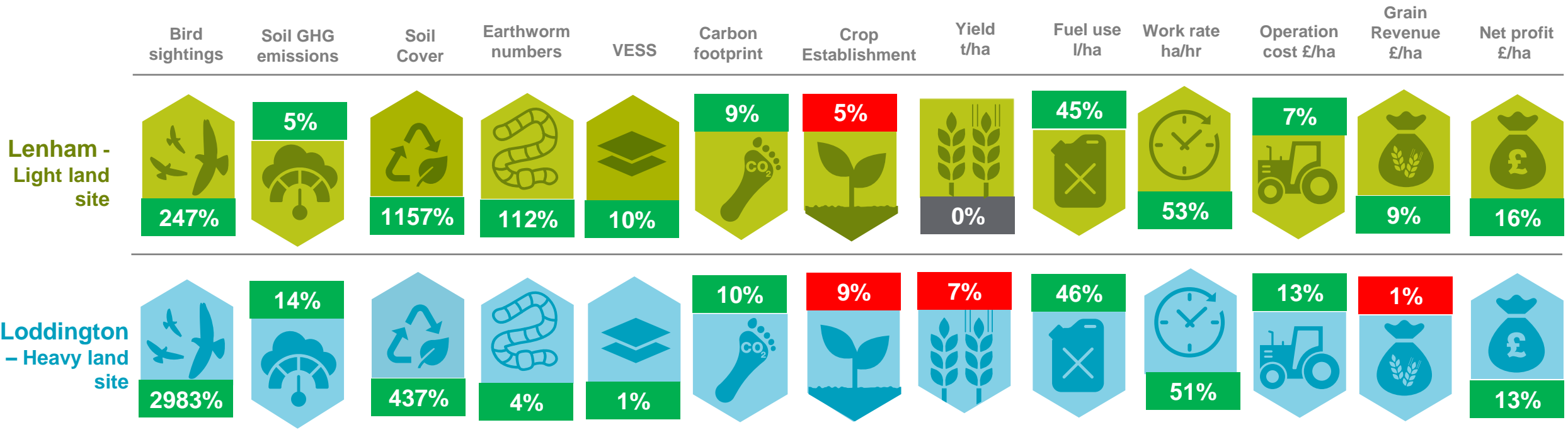
5. Integrate Animals Organic Matter

- 25mm screened compost from garden and municipal green waste
- Very low N but good P, K and micronutrient contribution to soils as well as organic matter (water retention & soil health)
- £3/T delivered
- Applied at 30T/ha through spinning disc spreaders at 12m width
- 2 spreaders – 800 tonnes spread per day
- Spreading cost = £28/ha
- Total Cost per ha = £118/ha – cost effective replacement to synthetic P&K fertiliser



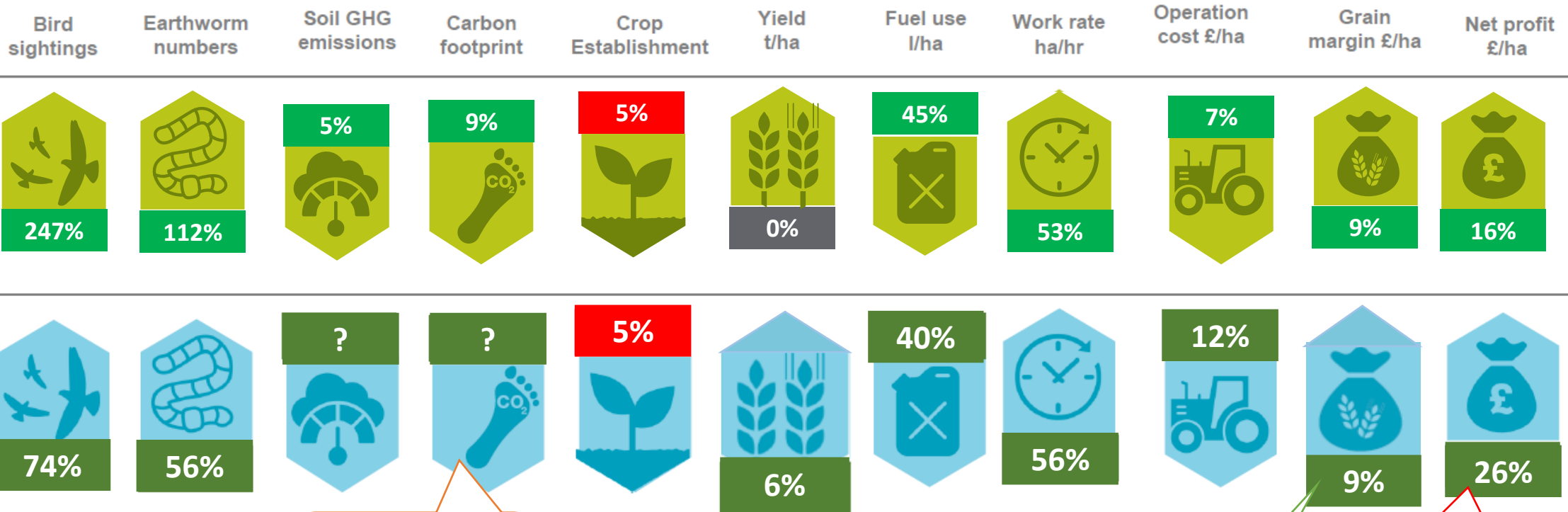
Syngenta Sustainable Farming Systems work in SP, FR & UK

UK results from heavy land and light land sites – conventional vs no/low tillage systems over 5 years to 2022



Our Results so far

Lenham -
Light land
site



Comparisons made with Mark's father's min-till/plough based approach

Cool Farm Tool shows we are sequestering ≈2T/ha carbon in our cropping system. New woodland will bring us to net positive on whole farm basis

Very small savings on crop protection, No savings on Nitrogen (yet) but savings on P&K fert

Very high depreciation costs currently but operational savings do deliver to P&L

Conclusions

Delivering the Goods?

1. Are we making money in the short-term?

- More than we would if we had adopted a low depreciation but higher operation cost approach
- Enough to provide us a very nice house on the farm but cash is stretched with finance on machinery

2. Are we improving our soils for long-term productivity?

- It is early days (organic matter will take years to build) but the initial signs are yes – eg earthworm numbers
- Much more research to do into soil effects eg biological activity – Biome Makers to study

3. Is Regenerative Ag for everyone?

- Light to medium soils, broadacre cropping – probably a survival route
- Very difficult to see how root crop and very high clay soils can deliver the soil benefits without yield impact
- BUT – we did not have the evolution option, we went ‘all in’ from our start. I would recommend evolution!
- There is much anecdote but a shortage of solid science – we need this to build confidence to invest

4. Is it helping me in my day job – YES! The impact is very positive - <https://www.syngentagroup.com/en/regenerative-agriculture>

5. Are we enjoying it.....?

