

## Pembrokeshire Monitor Farm soil health scorecard

### What is the soil health scorecard?

In 2016, AHDB and BBRO funded the five-year [Soil Biology and Soil Health Partnership](#). With its focus on soil health, one ambition is to produce a toolkit to assist with its measurement and management. An output of the project is the development of a soil health scorecard which uses a traffic light system to score soil health indicators. Threshold values are used to score the results as red (requires further investigation), amber (continue to monitor) or green (no action needed). As part of the project, the scorecard was tested on seven experimental sites over a range of soil management histories and soil types. In autumn 2019, Monitor Farm hosts from [Canterbury](#), [Diss](#), [Huggate](#), [Loppington](#), Pembrokeshire, [Saltash](#) and [Vale of Belvoir](#) each had six fields sampled and assessed using the scorecard approach. Information on the scorecards on other Monitor Farms can be found on their webpage

### Farm background

Tom Rees farms a mixed 280ha farm in Haverfordwest, Pembrokeshire, with an average rainfall of 1200mm. Tom's flexible arable rotation includes wheat, oilseed rape, potatoes and beans, with oats on the heavier land.

He's been using cover crops for 5-6 years and attributes a lot of his soil success to their use in the rotation. Since using cover crops he has noticed that the ground is easier to work and values the benefit of them in the rotation, "cover crops are just as important to us as other crops in the rotation and we treat them that way", he said.

The cover crops fit well into their business; 25-30% of the land is used for spring cropping and a cover crop is sown. The cover is grazed by their own flock which covers the cost.

### Cultivations

Tom has been doing minimum tillage on the majority of the farm for 10 years, however he doesn't have a blanket approach to cultivations. He decides the cultivation need for the field depending on the crop and soil condition.

"The sandy clay loam is a self-structuring soil but one patch of land is heavier clay so it requires a little more cultivation.

The ground before oilseed rape is also slightly more cultivated but the oilseed rape acts as a cultivation for the next crop", Tom said

Although potatoes have been grown on the land previously in a land swap agreement, this year Tom grew potatoes himself for the first time. In doing so, he has been able to halve the number of passes by preceding the crop with a cover crop. The cover crop was grazed down, followed with a 13" cultivation, ridging and tilling. To further reduce the number of passes, Tom would like to explore combining the ridging and tilling process.

### The scorecard at Pembrokeshire Monitor Farm

Generally the results from the scorecard were as expected for Tom. He was slightly surprised that the clay content in West (good) was higher than West (poor), which is a field sampled twice due to the performance of the field area. The drainage is poorer in West (poor) so he thinks that perhaps the clay content is higher further down the soil profile.

Although the earthworm counts for three fields appear poor, Tom was encouraged by the numbers. This is because the samples weren't taken at a good time to be representative of earthworm numbers in the soil. Therefore, the high numbers in Little Headland and Big Croft, were reassuring. Big Croft is also in its third year after potatoes which has given him confidence in the soils ability to recover after the crop.

Previously, Tom has had P, K, Mg and pH testing done on farm and carries out variable rate application. He adds muck to the fields in the form of poultry litter and FYM from their own cattle and has seen an increase in P and K levels. As a result of the muck additions, he would like to continue to monitor organic matter levels. Since adding organic matter, he now plans his rotation much further in advance, so each year he has a good indication of which crops will be grown in each field so he can plan OM additions, cultivations and cover cropping accordingly.

The visual element of the scorecard was a bonus to Tom. He would like to have this in the future to be able to keep an eye on the status of the soil and map the farm. Further discussions about soil health will continue in the final Pembrokeshire Monitor Farm meetings and onwards.

### Soil health scorecard – Autumn 2019

Field name	Little Headland	Big Croft	West (Good)	West (Poor)	Ragweed	Pelcomb
<b>Current crop</b>	W Wheat	W Wheat	WOSR	WOSR	W Wheat	W oats
<b>Texture</b>	Silty Clay	Silty Clay Loam	Clay	Clay	Silty Clay Loam	Clay
<b>% clay</b>	37	35	44	37	33	57
<b>pH</b>	7.0	6.4	7.1	7.1	6.5	6.1
<b>SOM %</b>	7	7.1	6.5	5.9	6.6	7.2
<b>Ext P - mg/l (Index)</b>	21 (Index 2)	35 (Index 3)	21 (Index 2)	19 (Index 2)	23 (Index 2)	10 (Index 1)
<b>Ext K - mg/l (Index)</b>	223 (Index 2+)	218 (Index 2+)	150 (Index 2-)	110 (Index 1)	154 (Index 2-)	91 (Index 1)
<b>Ext Mg - mg/l (Index)</b>	77 (Index 2)	120 (Index 3)	73 (Index 2)	75 (Index 2)	63 (Index 2)	77 (Index 2)
<b>PMN (mg/kg)</b>	59	60	57	56	61	58
<b>CO<sub>2</sub>-burst (mg/kg)</b>	123	127	119	111	132	123
<b>VESS</b>	2.0	2.0	2.0	3.0	2.5	2.5
<b>Earthworms (No/pit)</b>	9	12	5	3	3	1

## Further information

[Principles of soil management](#)

[Field drainage guide](#)

[Arable soil management: cultivation and crop establishment](#)

[Introduction to soil biology](#)

[How to count earthworms](#)

[Soil Biology and Soil Health Partnership](#)

[Testing the soil health scorecard](#)

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