



**Farm
Carbon
Toolkit**



DUCHY *of* CORNWALL

Soil & Carbon

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Farm Carbon Calculations

Carbon calculator is a useful tool to assess farm efficiency

The big four emitters are:

1. Livestock
 2. Feed
 3. Fuel
 4. Fertiliser
- Efficiencies
Savings?

The big four carbon storage areas are:

1. Soil
 2. Woodland
 3. Hedgerows
 4. Habitats
- Resilience
Biodiversity,
Stewardship
Efficiencies

Farm efficiency

Emissions	tonnes CO ₂ e	%
Fuels	11.54	2.58%
Materials	2.14	0.48%
Inventory	18.61	4.16%
Crops	65.41	14.63%
Inputs	128.70	28.79%
Livestock	220.68	49.36%
Total	447.08	100%

Offset	tonnes CO ₂ e	%
Habitats	-1.48	6.25%
Hedgerows	-11.30	47.82%
Other (E.G. Recycling)	-1.02	4.33%
Woodland	-9.83	41.60%
Total	-23.63	100%

Meat produced per unit carbon 8-10tCO₂e/tonne of meat (live weight)

Milk produced per unit of carbon 0.9kg CO₂ per kg FPCM

Why soils? And why Dartmoor?

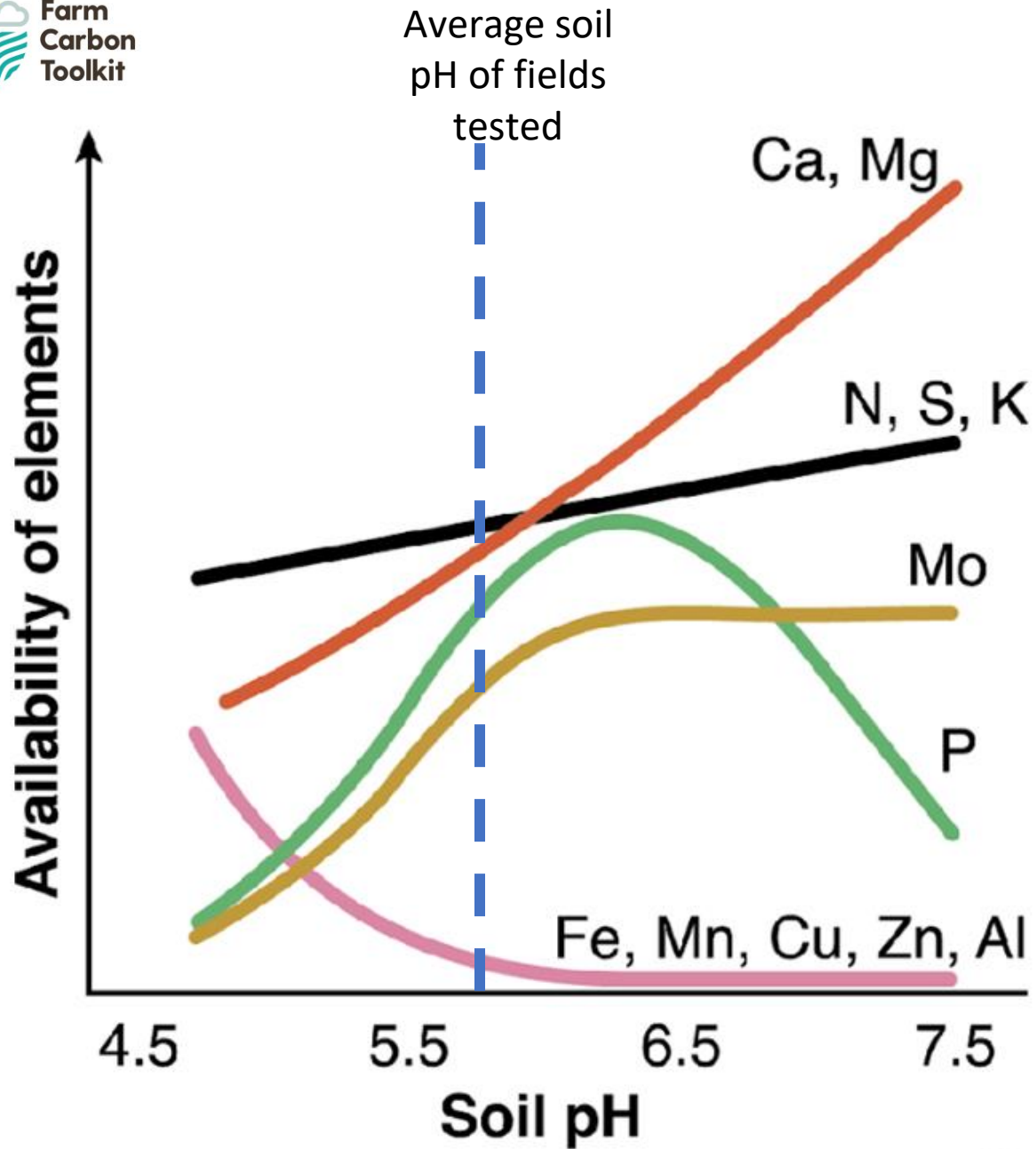
- 40% more carbon per hectare is held in Dartmoor soils compared to Bradninch Estate
- Per ha this difference (382tCO₂e) is equal to:
 - 1811 ewes
 - 167 tonnes of ammonium nitrate
 - 170 finished beef animals

Scope for more carbon storage?

- Across fields sampled on DOC Dartmoor fields Soil organic matter (%) to 0.5m:
 - Minimum = 3.77%
 - Maximum = 51.6%
 - Average = 14.82%
- 20ha increase in soil organic matter by 1% is estimated to be the same as:
 - 80ha deciduous woodland (5-10 years old)
 - 3422 ha of rough grazing moving to scrub

	VESS top	VESS bottom
Bradninch	1.3	2.0
Duchy Eastern District	2.2	2.7
Dartmoor	1.1	1.3

	pH	Available phosphate	Available Potassium	Available Magnesium
Bradninch	6.41	33.0	125.2	209.2
Duchy Eastern District	7.04	21.9	139.2	167.4
Dartmoor	5.77	16.9	81.6	102.7



Source: Department of Primary and Regional Development Industries of the Government of Western Australia

Fertiliser savings?

Ammonium nitrate = £870/tonne (imported October 2022)

If you put 250kgN/ha on your grass, at average pH = 5.5
only 70% is available = wasting 75kgN/ha

- 1 tonne (£870) is lost every 5ha
- 30% saving on carbon from fertiliser across Dartmoor farms (DoC) assessed = 158tCO₂e

Livestock footprint

- Animal performance
 - Fertility figures - improving reproductive KPIs can be a way to reduce your footprint.
 - 100 cows - 80% survival to weaning - 80 calves
 - 90 cows - 90% survival to weaning - 81 calves
 - **10% reduction in carbon footprint**
 - 250 ewes - 85% lambing percentage - 213 lambs
 - 200 ewes - 105% lambing percentage - 210 lambs
 - **20% reduction in carbon footprint**
- Finishing - reduction in days to finishing has benefits across the business, can be achieved with
 - improved grazing management (rest is key)
 - genetics