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Soil Carbon Report

Bob and Anne Davie – Bimbadeen 550 Back Beach Rd, Ventnor 3922

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Soil Carbon Report - Bob and Anne Davie – Bimbadeen 550 Back Beach Rd, Ventnor 3922

This report details baseline and follow up soil carbon sampling that has been undertaken on the 'Bimbadeen' property located at 550 Back Beach Rd, Ventnor 3922 (see figure 1) by Peter Ronalds 'Inspired AG solutions' and 'Western Port Catchment Landcare Network' between 2011 and 2023.

The soil carbon sampling documented in this report was conducted with the purpose being to obtain comprehensive soil carbon data on the farm, for the owner's information, and also as part of a number of trials and research programs.
The information in this report documents the methodology used to sample the soil for total carbon, and results obtained.

Sampling methodology

Soil carbon sampling and measurement should be conducted in a way that ensures the results are accurate, repeatable and based on current best practice, to ensure confidence to farmers and any potential purchasers of soil carbon, should any increase in carbon occur.

The sampling was conducted using several methodologies that were either specified by the landholder, or as part of a specific research program specified by a funder. Most of the recent sampling uses a number of methodologies required by the Federal Government's ERF program. This ensures that the soil sampling, laboratory analysis of the soil, measurement & recording is based on what is currently accepted as best practice.
*It should be noted that even though some aspects of the sampling methodology were based on a similar methodology to the ERF program, this sampling was not conducted as part of the Federal Government ERF program, or any other regulated carbon market programs. Follow up sampling was not randomised (as specified by the ERF program), and most of the follow up sampling were taken at the same GPS points as the original sample to increase reliability of results. It is extremely important that any future follow-up sampling adopts the same methodology as the baseline sampling to ensure consistency and reliability of the data obtained, and to accurately monitor changes in carbon stocks.

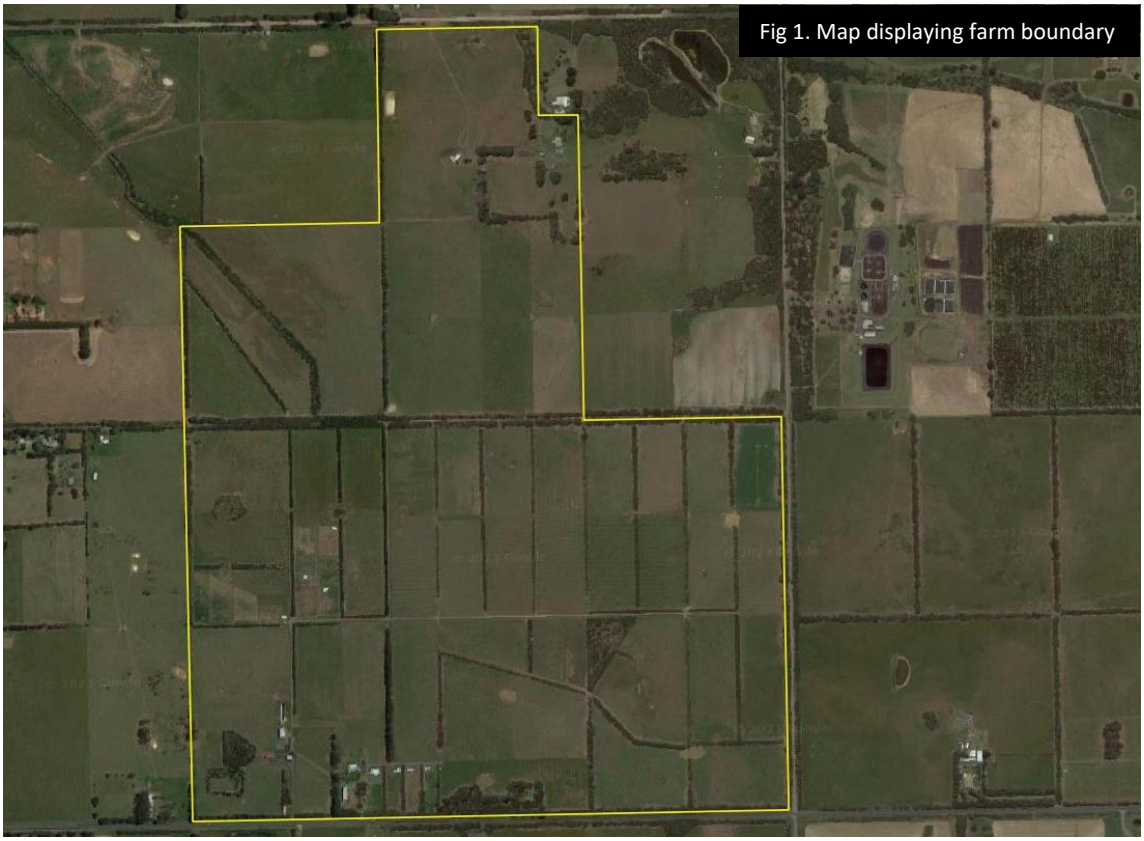

Fig 1. Map displaying farm boundary

Carbon Sampling Areas

Sampling has been conducted on most parts of the farm, with the owners requesting sampling - both in individual paddocks, and in groups of paddocks (see figure 2). These zones were broadly based on the location and treatment areas on the property, and are depicted below.

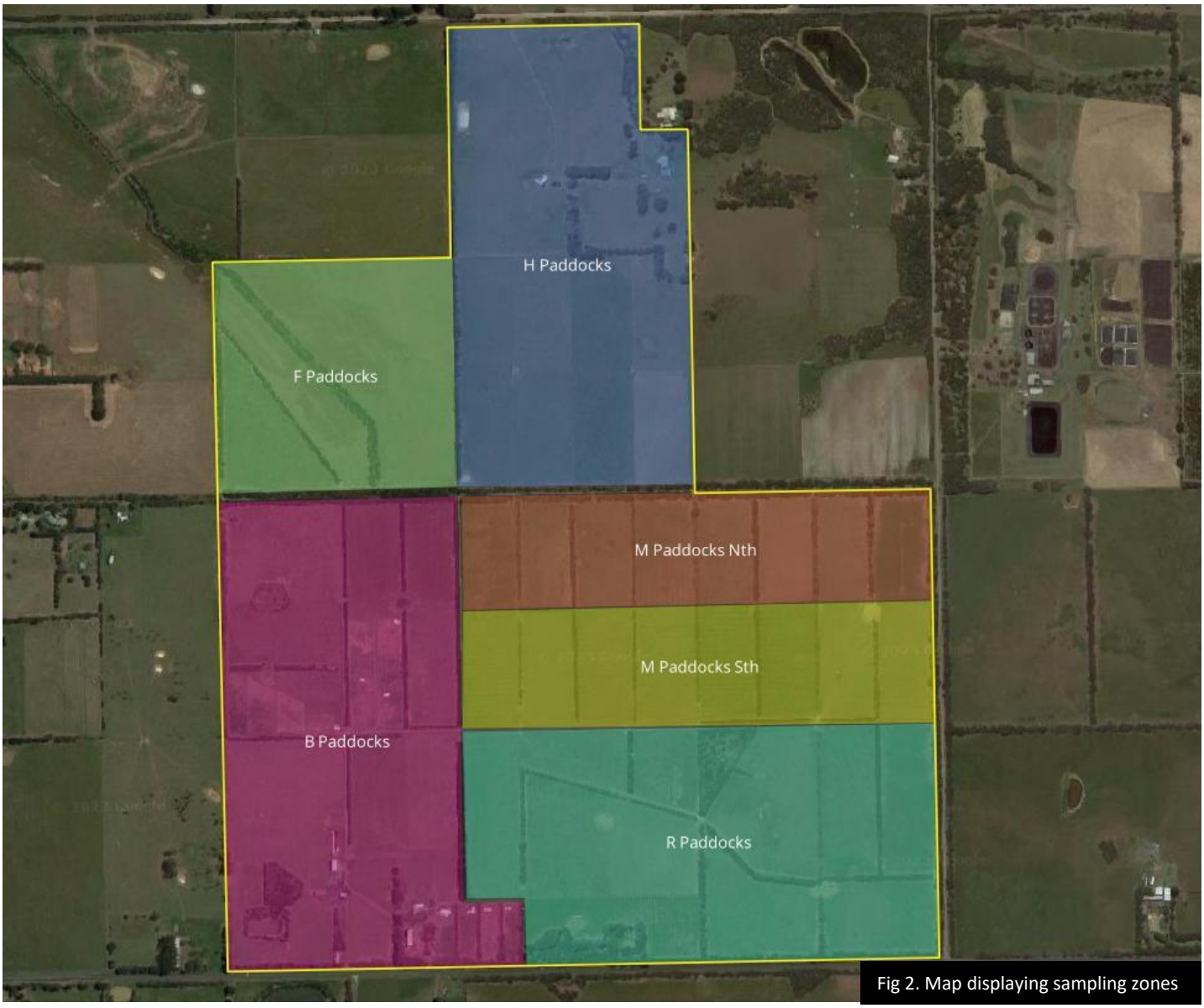

Fig 2. Map displaying sampling zones

Sampling sites

Prior to the sampling taking place, the owners designated the paddocks and zones that the soil sampling sites were to take place, with the aim being to collect as much data as possible over the areas proposed. Between 2011 and 2023 the majority of the farm was sampled, with some paddocks being sampled at least once, and some paddocks sampled numerous times (i.e. paddocks hosting demonstration sites).

Fig 3. Sampling sites

Figure 4 displays the paddock codes, which are used when naming the sample site. These correlate with the numbers on the soil sample photos for referencing. Each sample site was georeferenced and marked with Garmin GPSmap devices.

Fig 4. Map displaying paddock codes

Collection of soil samples

The soil core samples were collected with a Christie Hydraulic soil corer (see figure 5). The Christie soil corer is a specialised machine designed to take soil samples through a hydraulic coring & ram (not an auger) process. The soil cores were sampled to a depth of up to 1m (or nearest depth if rock or other obstacles were encountered). The coring tube was monitored on a regular basis for damage and the diameter was measured on a regular basis with electronic callipers to ensure accuracy when determining the soil volume.

Each core was photographed, labelled, measured, a waypoint was logged and coordinates collected with a Garmin GPS, which were then uploaded into a GIS mapping program. As a result, future soil samples can be taken at the same site (to within 5m) for comparative purposes.
In addition, the hole depth was also measured to check for soil compression during the coring process.

Whilst in the field, each sampling waypoint was recorded, and used as an identifying reference on all in-field collection
notes, core photos, GIS mapping program, sample bags, chain of custody for laboratory identification, laboratory results, and final calculations and reports.

Fig 5. Hydraulic soil corer

Georeferenced photos were taken of the soil core sample and the immediate surrounding landscape (see figures 6 and 7 for examples).

Fig 6. Core Sample reference photo

Fig 7. Surrounding landscape photo

Depending on the farm owners preference, most coil sample were separated into 4 sections (0-10cm, 10-30cm, 30-45cm & 45-100cm - or nearest depth) and then bagged and couriered to Southern Cross University Environmental Analysis Laboratory (EAL) for analysis. In most cases the cores were composited, meaning a number of core samples were combined at the same depth to reduce laboratory expenses. In the demonstration site paddocks, EAL tested each

individual core sample and provided a range of data which is then used to calculate the total Carbon. Individual soil core sample analysis is more expensive than compositing samples, but individual analysis provides significantly more information to the farmer which can be used to increase our understanding of soil carbon variances over the whole farm and is recommended.

EAL used the approved ERF methodology for soil carbon analysis (*Carbon Farming Initiative - Measurement of Soil Carbon Sequestration in Agricultural Systems 2018*), for most of the soil sampling results listed in this report. Analysis provided included; Moisture, Gravimetric water content on the Air Dry soil, Air Dry Mass, Oven Dry Mass, Gravel Content and Gravimetric Organic Carbon %. The lab data was collated along with the field data and a spreadsheet containing a range of complex formulas were used to determine the soil carbon results.

Explanation of Soil Carbon

Total soil organic carbon comprises several fractions that vary in size and decomposability (see figures 8 and 9).
The passive fraction 'resistant organic matter' is chemically stable and can take 100s to 1000s of years to turnover.
The 'humus' fraction, with a turnover rate of 20-40 years, consists primarily of organic compounds that are either resistant to decomposition or physically protected. Soil manipulations that disrupt soil aggregates (e.g., tillage) can influence the turnover of this pool, by exposing previously protected organic material to microbial decomposition.
The 'particulate organic matter' or labile fraction consists of smaller pools that can be readily utilised by micro-organisms. This fraction originates from new residues and living organisms (including micro-organisms) and turnover generally occurs within 2–3 years. The microbial component of this fraction represents only 1–5% of total soil organic matter. However, since this soil fraction is more sensitive to changes in management practices, significant differences can generally be measured earlier than in the larger, more stable pools. The capacity of a soil to supply nutrients is often defined by the proportion of total soil organic carbon that is labile.

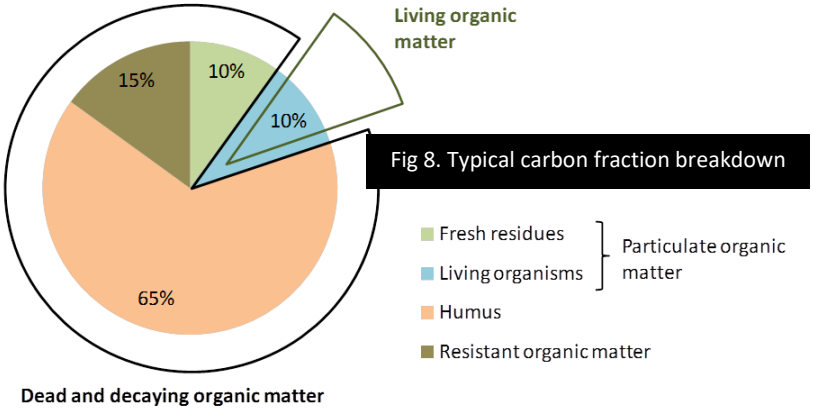

Fig 8. Typical carbon fraction breakdown

Fig. 9 The size, turnover time and composition of the 4 soil organic matter fractions

Fraction	Size micrometres (µm) and millimetres (mm)	Turnover time	Composition
Dissolved organic matter	<45 µm (in solution)	Minutes to days	Soluble root exudates, simple sugars and decomposition by-products. It generally makes up less than 5% of total soil organic matter.
Particulate organic matter	53 µm – 2 mm	2–50 years	Fresh or decomposing plant and animal matter with identifiable cell structure. Makes up 2–25% of total soil organic matter.
Humus	<53 µm	Decadal (10s to 100s of years)	Older, decayed organic compounds that have resisted decomposition. Can make up more than 50% of total soil organic matter.
Resistant organic matter	<53 µm – 2 mm	100s to 1000s of years	Relatively inert material, such as chemically resistant materials or organic remnants (e.g. charcoal). Can be up to 10% of soil organic matter.

References:
http://www.soilquality.org.au/factsheets/organic-carbon
https://www.agric.wa.gov.au/measuring-and-assessing-soils/what-soil-organic-carbon

Bulk Density

It is important to understand that when calculating soil carbon quantities per ha, the soil carbon % is only one part of the equation.
The Bulk Density of the soil, the moisture content & the gravel content also play a part in calculating total soil carbon levels.
A higher soil carbon % does not always correlate to a higher soil carbon rate/ha when comparing samples. There are other calculations that are required, including Bulk Density.

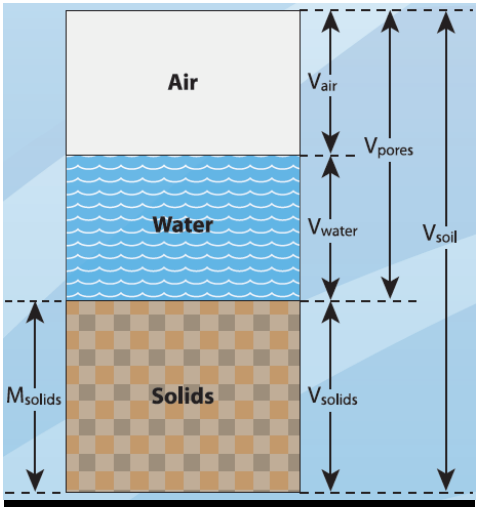

Fig 10. *Structural composition of soil, containing soil fraction (V_{solids}) and pore space for air (V_{air}) and water (V_{water}).*

The soil bulk density (BD), also known as dry bulk density, is the weight of dry soil (M_{solids}) divided by the total soil volume (V_{soil}). The total soil volume is the combined volume of solids and pores which may contain air (V_{air}) or water (V_{water}), or both (see figure 10). The average values of air, water and solid in soil are easily measured and are a useful indication of a soils physical condition. Soil BD and porosity (the number of pore spaces) reflects the size, shape and arrangement of particles and voids (soil structure). Both BD and porosity (V_{pores}) give a good indication of the suitability for root growth and soil permeability and are vitally important for the soil-plant-atmosphere system (Cresswell and Hamilton, 2002; McKenzie *et al.*, 2004).
It is generally desirable to have soil with a low BD (<1.5 g/cm^3) (Hunt and Gilkes, 1992) for optimum movement of air and water through the soil.

The critical value of bulk density for restricting root growth varies with soil type (Hunt and Gilkes, 1992) but in general **bulk densities greater than 1.6 g/cm^3 tend to restrict root growth** (McKenzie *et al.*, 2004). Sandy soils usually have higher bulk densities (1.3–1.7 g/cm^3) than fine silts and clays (1.1 – 1.6 g/cm^3) because they have larger, but fewer, pore spaces. In clay soils with good soil structure, there is a greater amount of pore space because the particles are very small, and many small pore spaces fit between them. Soils rich in organic matter (e.g., peaty soils) can have densities of less than 0.5 g/cm^3. Bulk density increases with compaction at depth and very compact subsoils or strongly indurated horizons may exceed 2.0 g/cm^3 (NLWRA, 2001; Cresswell and Hamilton, 2002).

Reference http://soilquality.org.au/factsheets/bulk-density-measurement

The bulk density results for this property are listed in the results tables.

In addition to carbon % and bulk density, it is important to account for gravel content in the soil. As with most soil measurements, total organic carbon is measured only on those soil particles that are less than 2 mm ('fine earth'), everything larger is classed as the 'coarse fraction' of gravel. If there is a significant gravel fraction in your soil, this means the organic carbon is concentrated into only the less than 2 mm component of the soil. So for any given organic carbon (%) when gravel is taken into account on a hectare basis the more gravel the lower the tonnes of organic carbon per hectare. *Reference:* http://www.soilquality.org.au/factsheets/organic-carbon

It should be noted that due to the geology of the region, some soil samples had significant quantities of gravel, sand and rock within the samples. Gravel content was taken into account when calculating results.

Soil Types

There are 4 soil types located on the farm which are shaded and coloured according to soil type. The classifications are marked in figure 11, and are as follows;

1. **Red Ferrosol (FEAA)** with a local classification named 'Red Hill' which is shaded red/brown. This soil is located in the higher elevated areas of the farm, and a small section just protruding into an eastern portion of the farm.
2. **Brown Chromosol (CHAB)** with a local classification named 'Flinders' which is shaded blue. This soil is located in the northern parts of the farm surrounding the ferrosol area, and is also located in eastern and southern parts of the farm.
3. **Redoxic Hydrosol (HYED)** with a local classification called 'Merricks' is shaded brown and located on the southern and eastern parts of the farm.
4. **Aquic Vertosol (VEAM)** with a local classification called 'Merricks (clay)' is shaded olive and located on the central part and north western parts of the farm.

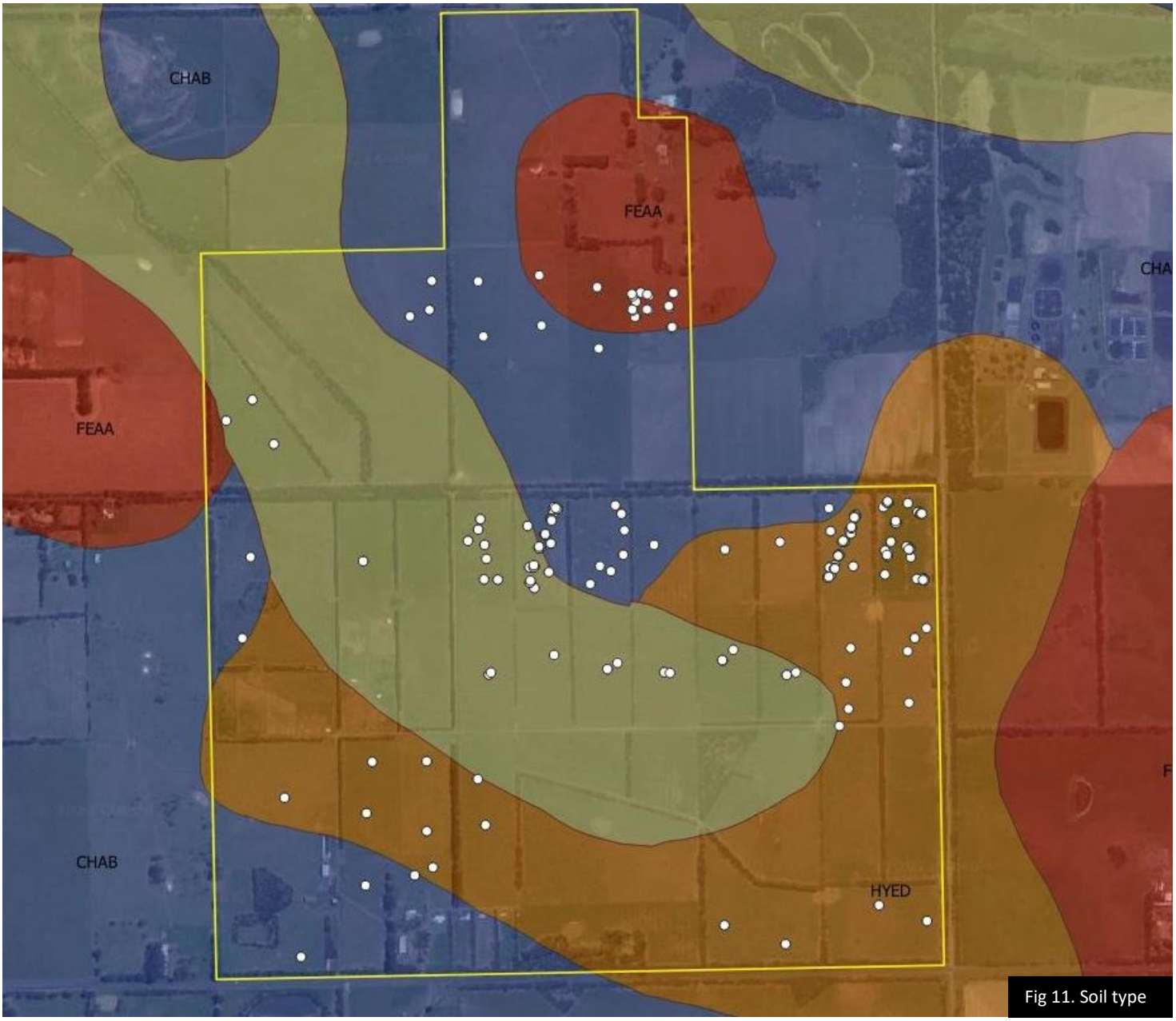

Fig 11. Soil type

More detailed descriptions of the soils are as follows;

1. **Red Ferrosol – (FEAA)**
   Ferrosols are associated with older volcanic landscapes. They are very deep and are probably some of the oldest soils in Victoria and are highly prized for primary production.
   They are important cropping (potato, cut flowers etc) and dairy soils in West Gippsland where they are associated with rolling hills. Red Ferrosols are easy to manage because of their highly stable aggregates that segregate easily and resist deformation upon cultivation. Ferrosols lack strong texture contrast between surface (A) horizons and the upper subsoil (B21) horizon. These soils are also characterised by relatively high levels of free iron oxide giving them the distinctive red colour. These soils display a gradual increase in texture (clay content) with depth. Surface soils are often clay loams that grade into light clays in the subsoil. The high iron levels can 'lock up' applied phosphorus but also contribute to this soil's well-developed soil structure. The structure is usually very fine (usually polyhedral), usually with smooth and often shiny faces. This well-developed structure provides plenty of opportunity for water, air and root movement.
   They are usually moderately to strongly acid throughout - a product of their good porosity, high rainfall and long periods of leaching. Although these soils are considered to be well structured and attractive for agriculture, they can degrade under intensive cropping from erosion and compaction and may also suffer from acidification.

   Typical soil profile
   Surface soil
   A1 - 0-30 cm - Dark brown; very fine clay loam; strong fine granular structure; friable when moist; moderately acid pH
   Subsoil
   B21 - 30-60 cm- Red; clay loam to light clay; strong fine polyhedral structure; moderately acid pH
   B22 - 60-90 cm+ - Red; light clay; strong polyhedral structure; strongly acid pH

Fig 12. Red ferrosol

2. **Brown Chromosol (CHAB)**
   Brown Chromosols are texture contrast soils with a sandy or loamy surface horizon overlying a clay-textured B horizon. The subsoil (B) horizon is not strongly acid (pH greater than 5.5) and it is not sodic in the upper 20 cm. The structure of the subsoil may range from massive to strongly structured. Brown Chromosols have brownish coloured upper subsoils.
   These soils generally have good soil physical properties, but can become hard setting after long periods of cropping. Some Chromosols have bleached subsurface (A2) horizons indicating poor internal drainage and seasonal waterlogging

Typical soil profile
Surface Soil
A1 - 0-20cm - Dark brown sandy loam; neutral pH.
A2 - 20-35cm - Sporadically bleached light sandy loam; slightly acid pH; sharp change to:
Subsoil
B21 - 35-80cm - Yellowish brown medium clay; moderate angular blocky structure; slightly acid pH;
B22 - 80-120cm - Light grey medium clay; strong polyhedral structure; slightly acid pH.

Fig 13. Brown Chromosol

3. Redoxic Hydrosol – (HYED)

Hydrosols cover a wide range of soils that are seasonally or permanently saturated, for at least 2-3 months in most years. They commonly occur in swamps and lower-lying depressions in the region. Saturation by a water table may not necessarily be caused by low soil permeability. Sometimes, site drainage will be the most important factor. Redoxic hydrosols are classified as those with a major part of the soil profile (or sub-soil if the profile is stratified) is mottled. These soils can display very colourful mottling.

The broad valley floors that comprise Quaternary alluvial sediments are mapped into the Merricks mapping unit. Generally the surface soils are dark grey very fine sandy clay loams or clay loams overlying, at a depth of about 100 mm a strongly bleached similarly textured subsurface layer. Strongly mottled grey with yellowish brown or yellowish grey light or medium clays generally occur between 400 and 600 mm, with some ironstone concretions above and below the clay. Medium to heavy clays occur from about 700 mm depth and continue into the deep subsoil. The pH's of the surface soil are around 5.0 to 6.0 and the subsoils about 5.5 to 6.5.

Because of their position in the landscape they tend to be poorly drained during wetter periods and are not usually used for horticulture but used for grazing. There are remnants of native vegetation, mostly swamp scrub and grassy woodland.

The proximity of this mapping unit to the sea, its low landscape position and generally shallow watertable, have resulted in soluble salts accumulation in the soil profile to such an extent, as to affect satisfactory pasture growth.

Fig 14. Redoxic Hydrosol

4. **Aquic Vertosol (VEAM)**

Vertosols are often called cracking clay soils. They have a clay texture throughout the profile; display strong cracking when dry, and shrink and swell considerably during wetting and drying phases. The surface soil is greater than 35% clay and the subsoil usually ranges from a light medium to heavy clay. Due to the nature of the clay minerals these soils shrink and swell considerable during wetting and drying cycles. The soils crack significantly when dry and usually these will open up at the soil surface.

Locally defined as 'Merricks clay' mapping unit, these soils are heavier than the Merricks mapping unit. Merricks clay has a dark grey, light clay surface soil and less conspicuous bleaches, or no bleaches at all. The medium or heavy clays generally begin before 300 mm depth. The vegetation and land use is similar to that on the Merricks mapping unit.

The proximity of this mapping unit to the sea, its low landscape position and generally shallow watertable, have resulted in soluble salts accumulation in the soil profile to such an extent, as to affect satisfactory pasture growth. On Phillip Island, these areas are particularly prone to high water tables and salinity.

Fig 15. Aquic Vertosol

Reference:
The Australian Soil Classification Third Edition https://www.publish.csiro.au/ebook/download/pdf/8016
https://vro.agriculture.vic.gov.au/dpi/vro/wimregn.nsf/pages/natres_soil_vertosols
https://vro.agriculture.vic.gov.au/dpi/vro/wgregn.nsf/pages/wg_soil_merricks_clay
https://vro.agriculture.vic.gov.au/dpi/vro/wgregn.nsf/pages/wg_soil_detailed_merricks
http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/soil_vic_contenders_red_ferrosol
http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/soil_vic_contenders_brown_chromosol

Elevation

The contour elevations and sampling site locations are displayed in figure 16. There is approx. 30m difference in elevation between the highest and lowest sampling sites. On this farm, the soil carbon levels were influenced more by soil type rather than elevation.

Fig 16. Elevation (m) of sampling sites

Soil carbon results for ‘Bimbadeen’ 550 Back Beach Rd, Ventnor 3922

Soil Carbon results are displayed in tables for the different areas/paddocks sampled, at the depths that were analysed. Some sites such as demonstration sites have been resampled numerous times. Other areas/paddocks have only been sampled once. The most recent soil cores for each area/paddock are also displayed.

Results 0-100cm depth

Figure 17 displays the most recent soil carbon levels (t/C/Ha) for each of the selected paddocks/zones that were sampled. The highest carbon levels were in paddock M6, with the lowest readings in paddocks R1, 13, 14 & 15 which had quantities of rock in the samples.

Fig 17 Soil carbon t/C/Ha results to 1m

Results to 30cm depth

Figure 18 displays the most recent soil carbon levels (t/C/Ha) for each of the selected paddocks/zones that were sampled. The highest carbon levels for 0-30cm depth were again in paddock M6, with the lowest readings in paddocks R1, 13, 14 & 15 which had quantities of rock in the samples. Higher soil crbon levels were located in the central area of the farm and specifically in the 'M' paddocks.

Fig 18 Soil carbon t/C/Ha results to 30cm

The 'Australian State of the Environment 2016' report https://soe.environment.gov.au/theme/land/topic/soil-carbon-dynamics or https://www.publish.csiro.au/sr/sr15008 states that soil organic carbon content across Victoria exhibits an extremely wide range (from 2–239t/C/Ha in the top 30 centimetres).

Results from 30-100cm depth

Figure 19 displays the most recent soil carbon levels (t/C/Ha) for each of the selected paddocks/zones that were sampled. The highest carbon levels at the 30-100cm depth were in paddock M4, with the lowest readings in paddocks R1, 13, 14 & 15 which had quantities of rock in the samples.

Fig 19 Soil carbon t/C/Ha results to 30cm

Paddock/area results

M16

M16

M16 was part of a demonstration and as a result samples were collected on an annual basis between 2018-2022. All sample sites were recorded with a GPS. The original intent was to utilise randomised sampling sites throughout the paddock, however in early 2020 it became obvious that due to variability in soils, it is imperative to sample at the same sites. As a result, samples taken in 2020, 2021 and 2022 were taken at the same sites as the original sampling in 2018. It is noted that the 2019 soil samples were analysed at 0-10cm, 10-30cm & 30-100cm. All other years the soil was analysed at 0-10cm, 10-30cm, 30-45cm & 45-100cm.

Gains were seen in nearly every parameter except for Bulk Density. As soil structure improves and becomes more aggregated, the soil can display lower bulk density readings. This is generally a positive.

M16	30/11/2018	6/12/2019	18/12/2020	15/12/2021	12/12/2022	
0-10cm Total Carbon (t/C/Ha)	48.53	54.93	55.04	56.29	56.87	⇧
10-30cm Total Carbon (t/C/Ha)	34.53	28.55	38.57	39.80	38.95	⇧
30-45cm Total Carbon (t/C/Ha)	19.08		18.29	18.05	20.68	⇧
45-100cm Total Carbon (t/C/Ha)	56.34	70.12	51.73	56.32	65.35	⇧
0-10cm Labile Carbon (t/C/Ha)	10.28	13.47	16.00	8.58	14.03	⇧
10-30cm Labile Carbon (t/C/Ha)	3.93	4.17	9.19	5.69	8.56	⇧
30-45cm Labile Carbon (t/C/Ha)	3.98		4.87	1.18	3.71	⇩
45-100cm Labile Carbon (t/C/Ha)	7.32	10.41	4.10	9.10	9.90	⇧
0-100cm Total Carbon (t/C/Ha)	**158.49**	**153.60**	**163.63**	**170.47**	**181.85**	⇧
0-100cm Labile Carbon (t/C/Ha)	**25.51**	**28.05**	**34.17**	**24.55**	**36.20**	⇧
0-10cm Total Carbon %	3.98	4.05	4.58	4.62	4.82	⇧
10-30cm Total Carbon %	1.10	0.92	1.32	1.36	1.32	⇧
30-45cm Total Carbon %	0.80		0.82	0.76	0.99	⇧
45-100cm Total Carbon %	0.67	0.67	0.63	0.67	0.79	⇧
0-10cm Labile Carbon %	0.84	0.99	1.33	0.70	1.19	⇧
10-30cm Labile Carbon %	0.12	0.13	0.32	0.19	0.29	⇧
30-45cm Labile Carbon %	0.17		0.22	<0.05	0.17	⇔
45-100cm Labile Carbon %	0.09	<0.1	0.05	0.11	0.12	⇧
0-10cm Bulk Density (g/cm^3)	1.23	1.37	1.22	1.24	1.22	⇩
10-30cm Bulk Density (g/cm^3)	1.61	1.59	1.55	1.72	1.57	⇩
30-45cm Bulk Density (g/cm^3)	1.74		1.69	1.74	1.66	⇩
45-100cm Bulk Density (g/cm^3)	1.58	1.57	1.58	1.60	1.54	⇩


DAVIE
M16 12/12/22
100 CM
GPS 817


DAVIE
M16 12/12/22
100 CM
GPS 818


DAVIE
M16 12/12/22
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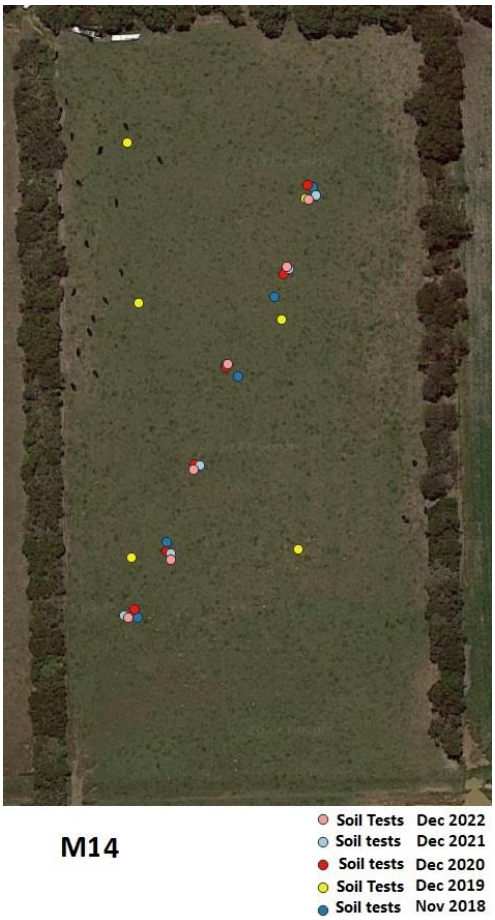
M14



M14 was part of a demonstration and as a result samples were collected on an annual basis between 2018-2022. All sample sites were recorded with a GPS. The original intent was to utilise randomised sampling sites throughout the paddock, however in early 2020 it became obvious that due to variability in soils, it is imperative to sample at the same sites. As a result, samples taken in 2020, 2021 and 2022 were taken at the same sites as the original sampling in 2018. It is noted that the 2019 soil samples were analysed at 0-10cm, 10-30cm & 30-100cm. All other years the soil was analysed at 0-10cm, 10-30cm, 30-45cm & 45-100cm.

Small gains were seen in most parameters, however there were some small reductions in labile carbon in 10-45cm depth, and total carbon in 0-10cm depth. As soil structure improves and becomes more aggregated, the soil can display lower bulk density readings. This is generally a positive.

M14	**30/11/2018**	**6/12/2019**	**18/12/2020**	**15/12/2021**	**12/12/2022**	
0-10cm Total Carbon (t/C/Ha)	63.07	51.29	51.87	57.55	58.82	⇩
10-30cm Total Carbon (t/C/Ha)	29.98	38.31	30.06	33.21	31.17	⇧
30-45cm Total Carbon (t/C/Ha)	18.71		15.10	20.25	19.56	⇧
45-100cm Total Carbon (t/C/Ha)	55.86	68.74	48.38	62.13	65.39	⇧
0-10cm Labile Carbon (t/C/Ha)	10.46	11.41	15.22	12.25	13.71	⇧
10-30cm Labile Carbon (t/C/Ha)	5.88	6.41	5.53	8.61	5.69	⇩
30-45cm Labile Carbon (t/C/Ha)	3.91		3.23	3.25	3.70	⇩
45-100cm Labile Carbon (t/C/Ha)	10.93	9.83	5.44	8.28	12.13	⇧
0-100cm Total Carbon (t/C/Ha)	**167.62**	**158.35**	**145.41**	**173.15**	**174.94**	⇧
0-100cm Labile Carbon (t/C/Ha)	**31.88**	**27.66**	**29.42**	**32.40**	**35.24**	⇧
0-10cm Total Carbon %	5.00	4.06	4.56	5.03	5.59	⇧
10-30cm Total Carbon %	0.92	1.26	1.15	1.06	1.21	⇧
30-45cm Total Carbon %	0.80		0.77	0.79	1.03	⇧
45-100cm Total Carbon %	0.69	0.70	0.68	0.77	0.88	⇧
0-10cm Labile Carbon %	0.83	0.90	1.34	1.07	1.29	⇧
10-30cm Labile Carbon %	0.18	0.21	0.21	0.28	0.21	⇧
30-45cm Labile Carbon %	0.17		0.17	0.13	0.20	⇧
45-100cm Labile Carbon %	0.14	<0.1	0.08	0.10	0.16	⇧
0-10cm Bulk Density (g/cm3)	1.32	1.28	1.19	1.18	1.13	⇩
10-30cm Bulk Density (g/cm3)	1.78	1.58	1.54	1.64	1.67	⇩
30-45cm Bulk Density (g/cm^3)	1.85		1.84	1.87	1.77	⇩
45-100cm Bulk Density (g/cm^3)	1.58	1.50	1.63	1.55	1.53	⇩


DAVIE
M14 12/12/22
100CM
GPS 823


M14
100CM
GPS 824


DAVIE
M14
100CM
GPS 825


DAVIE
M14 12/12/22
100 CM
GPS 826


DAVIE
M14 12/12/22
100 CM
GPS 827


DAVIE
M14 12/12/22
100 CM
GPS 828

M4

M4 was part of a demonstration and as a result samples were collected on an annual basis between 2018-2022. All sample sites were recorded with a GPS. The original intent was to utilise randomised sampling sites throughout the paddock, however in early 2020 it became obvious that due to variability in soils, it is imperative to sample at the same sites. As a result, samples taken in 2020, 2021 and 2022 were taken at the same sites as the original sampling in 2018. It is noted that the 2019 soil samples were analysed at 0-10cm, 10-30cm & 30-100cm. All other years the soil was analysed at 0-10cm, 10-30cm, 30-45cm & 45-100cm.

Small gains were seen in all parameters, except for small reductions in total and labile carbon in the 10-30cm depth. As soil structure improves and becomes more aggregated, the soil can display lower bulk density readings. This is generally a positive.

M4	**30/11/2018**	**6/12/2019**	**18/12/2020**	**15/12/2021**	**12/12/2022**	
0-10cm Total Carbon (t/C/Ha)	68.29	66.66	63.44	78.21	69.54	⇧
10-30cm Total Carbon (t/C/Ha)	62.80	53.27	51.25	50.23	64.32	⇧
30-45cm Total Carbon (t/C/Ha)	25.77		19.59	22.48	29.33	⇧
45-100cm Total Carbon (t/C/Ha)	64.50	70.45	41.90	44.13	68.39	⇧
0-10cm Labile Carbon (t/C/Ha)	11.99	14.13	15.34	13.37	15.80	⇧
10-30cm Labile Carbon (t/C/Ha)	11.80	7.70	10.01	6.14	11.48	⇩
30-45cm Labile Carbon (t/C/Ha)	2.88		4.44	3.22	4.53	⇧
45-100cm Labile Carbon (t/C/Ha)	8.39	13.31	6.98	7.90	9.13	⇧
0-100cm Total Carbon (t/C/Ha)	**221.36**	**190.38**	**176.18**	**195.05**	**231.58**	⇧
0-100cm Labile Carbon (t/C/Ha)	**35.05**	**35.15**	**36.77**	**30.62**	**40.94**	⇧
0-10cm Total Carbon %	7.09	7.45	6.71	7.81	8.76	⇧
10-30cm Total Carbon %	2.42	2.60	2.31	2.24	2.63	⇧
30-45cm Total Carbon %	1.29		1.21	1.21	1.55	⇧
45-100cm Total Carbon %	0.88	0.90	0.73	0.64	0.95	⇧
0-10cm Labile Carbon %	1.25	1.58	1.62	1.34	2.00	⇧
10-30cm Labile Carbon %	0.45	0.38	0.45	0.27	0.47	⇩
30-45cm Labile Carbon %	0.14		0.27	0.17	0.24	⇧
45-100cm Labile Carbon %	0.11	0.17	0.12	0.12	0.13	⇧
0-10cm Bulk Density (g/cm^3)	1.01	0.93	0.96	1.02	0.84	⇩
10-30cm Bulk Density (g/cm^3)	1.32	1.04	1.16	1.14	1.25	⇩
30-45cm Bulk Density (g/cm^3)	1.34		1.20	1.24	1.28	⇩
45-100cm Bulk Density (g/cm^3)	1.42	1.15	1.25	1.27	1.35	⇩


DAVIE
M4 12/12/22
100 CM
GPS 829


DAVIE
M4 12/12/22
100 CM
GPS 830


DAVIE
M4 12/12/22
100 CM
GPS 831


DAVIE
M4 12/12/22
100 CM
GPS 832


DAVIE
M4 12/12/22
100 CM
GPS 833


DAVIE
M4 12/12/22
100 CM
GPS 834

M2

M2 was sampled in May 2019. Depths sampled were 0-10, 10-30 & 30-95cm.

M2	**29/05/2019**
0-10cm Total Carbon (t/C/Ha)	93.73
10-30cm Total Carbon (t/C/Ha)	49.15
30-95cm Total Carbon (t/C/Ha)	62.98
0-10cm Labile Carbon (t/C/Ha)	24.77
10-30cm Labile Carbon (t/C/Ha)	11.66
30-95cm Labile Carbon (t/C/Ha)	16.39
0-100cm Total Carbon (t/C/Ha)	**205.86**
0-100cm Labile Carbon (t/C/Ha)	**52.81**
0-10cm Total Carbon %	9.29
10-30cm Total Carbon %	1.98
30-95cm Total Carbon %	0.82
0-10cm Labile Carbon %	2.45
10-30cm Labile Carbon %	0.47
30-95cm Labile Carbon %	0.21
0-10cm Bulk Density (g/cm^3)	1.05
10-30cm Bulk Density (g/cm^3)	1.28
30-95cm Bulk Density (g/cm^3)	1.23

M 2


DAVIE
29/5/19.
M2.
GPS.340 .cm.100


DAVIE
29/5/19.
M2.
GPS.341 100.cm.


DAVIE
29/5/19.
M2.
GPS.342 88 cm.


DAVIE
29/5/19.
M2.
GPS 343 83 CM


DAVIE
29/5/19.
M2
GPS.344 99 CM


29/5/19
M2.
GPS 345 100 CM.

M6

M6 was sampled in May 2019. Depths sampled were 0-10, 10-30 & 30-96.6cm.

M6	**29/05/2019**
0-10cm Total Carbon (t/C/Ha)	82.54
10-30cm Total Carbon (t/C/Ha)	64.66
30-96.6cm Total Carbon (t/C/Ha)	88.29
0-10cm Labile Carbon (t/C/Ha)	18.58
10-30cm Labile Carbon (t/C/Ha)	14.55
30-96.6cm Labile Carbon (t/C/Ha)	23.11
0-100cm Total Carbon (t/C/Ha)	**235.48**
0-100cm Labile Carbon (t/C/Ha)	**56.24**
0-10cm Total Carbon %	7.71
10-30cm Total Carbon %	3.04
30-96.6cm Total Carbon %	1.16
0-10cm Labile Carbon %	1.74
10-30cm Labile Carbon %	0.68
30-96.6cm Labile Carbon %	0.30
0-10cm Bulk Density (g/cm^3)	1.08
10-30cm Bulk Density (g/cm^3)	1.06
30-96.6cm Bulk Density (g/cm^3)	1.15

M6


DAVIE
29/5/19.
M 6
GPS 346
91CM.


DAVIE
29/5/19
M 6.
GPS 347
90CM.

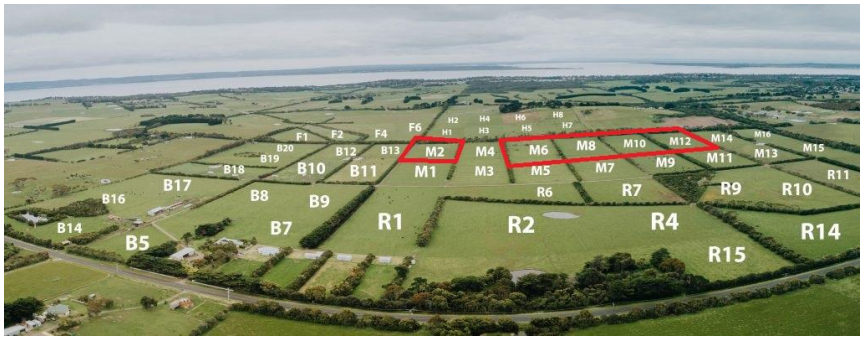

DAVIE
29/5/19.
M 6.
GPS 348
100CM.


DAVIE
M6
29/5/19
GPS 350
100 CM.


DAVIE
M6
29/5/19
GPS 351
100CM


DAVIE
29/5/19.
M6
GPS 352
97 CM.

M2, 6, 8, 10, 12



M2, 6, 8, 10 & 12 were sampled in Dec 2022 (1 core sample in each paddock). Depths sampled were 0-10, 10-30, 30-45 & 45-100cm.

M2, 6, 8, 10, 12	**12/12/2022**
0-10cm Total Carbon (t/C/Ha)	74.51
10-30cm Total Carbon (t/C/Ha)	56.62
30-45cm Total Carbon (t/C/Ha)	22.02
45-100cm Total Carbon (t/C/Ha)	60.33
0-10cm Labile Carbon (t/C/Ha)	15.06
10-30cm Labile Carbon (t/C/Ha)	8.19
30-45cm Labile Carbon (t/C/Ha)	3.13
45-100cm Labile Carbon (t/C/Ha)	7.30
0-100cm Total Carbon (t/C/Ha)	**213.48**
0-100cm Labile Carbon (t/C/Ha)	**33.68**
0-10cm Total Carbon %	8.70
10-30cm Total Carbon %	2.27
30-45cm Total Carbon %	1.21
45-100cm Total Carbon %	0.87
0-10cm Labile Carbon %	1.76
10-30cm Labile Carbon %	0.33
30-45cm Labile Carbon %	0.17
45-100cm Labile Carbon %	0.11
0-10cm Bulk Density (g/cm^3)	0.87
10-30cm Bulk Density (g/cm^3)	1.32
30-45cm Bulk Density (g/cm^3)	1.34
45-100cm Bulk Density (g/cm^3)	1.29


DAVIE
M2
100CM
GPS 835


DAVIE
M6
100CM
GPS 836

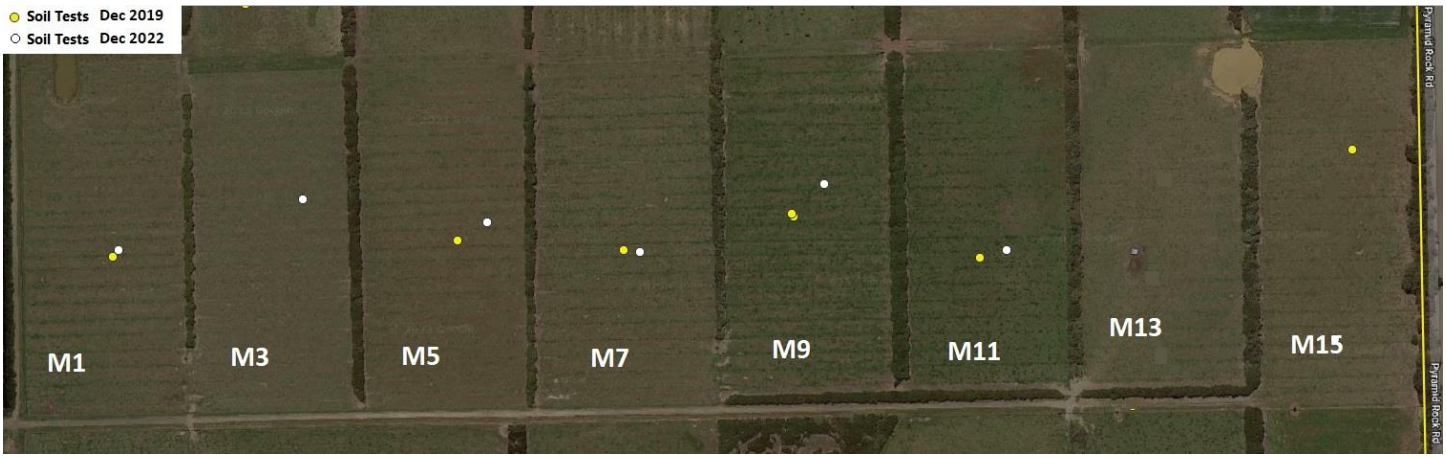

DAVIE
M8
100CM
GPS 837


DAVIE
M10
100CM
GPS 838


DAVIE
M12
100CM
GPS 839

M1, 5, 7, 9, 11, 15

M1, 5, 7, 9, 11 & 15 were sampled in Dec 2019. M1, 3, 5, 7, 9 & 11 were sampled in Dec 2022 (1 sample in each paddock). Depths sampled were 0-10, 10-30 & 30-100cm. Gains were seen in every parameter except for total and labile carbon in the 0-30cm depth range.



M1, 3, 5, 7, 9, 11, 15	**M1, 5, 7, 9, 11, 15 06/12/2019**	**M1, 3, 5, 7, 9, 11 12/12/2022**	
0-10cm Total Carbon (t/C/Ha)	81.58	79.70	⇩
10-30cm Total Carbon (t/C/Ha)	43.41	60.57	⇧
30-45cm Total Carbon (t/C/Ha)		21.47	⇧
45-100cm Total Carbon (t/C/Ha)	68.89	60.93	⇧
0-10cm Labile Carbon (t/C/Ha)	18.73	17.75	⇩
10-30cm Labile Carbon (t/C/Ha)	9.38	12.66	⇧
30-45cm Labile Carbon (t/C/Ha)		5.37	⇧
45-100cm Labile Carbon (t/C/Ha)	11.58	13.59	⇧
0-100cm Total Carbon (t/C/Ha)	**193.88**	**222.67**	⇧
0-100cm Labile Carbon (t/C/Ha)	**39.69**	**49.37**	⇧
0-10cm Total Carbon %	7.24	8.57	⇧
10-30cm Total Carbon %	1.74	2.67	⇧
30-45cm Total Carbon %		1.22	⇧
45-100cm Total Carbon %	0.71	0.78	⇧
0-10cm Labile Carbon %	1.66	1.91	⇧
10-30cm Labile Carbon %	0.37	0.56	⇧

30-45cm Labile Carbon %		0.30	⇧
45-100cm Labile Carbon %	0.12	0.17	⇧
0-10cm Bulk Density (g/cm3)	1.14	0.98	⇩
10-30cm Bulk Density (g/cm^3)		1.36	⇧
30-45cm Bulk Density (g/cm^3)	1.28	1.43	⇧
45-100cm Bulk Density (g/cm^3)	1.43	1.44	⇧


DAVIE
M.5
100 CM
GPS 847

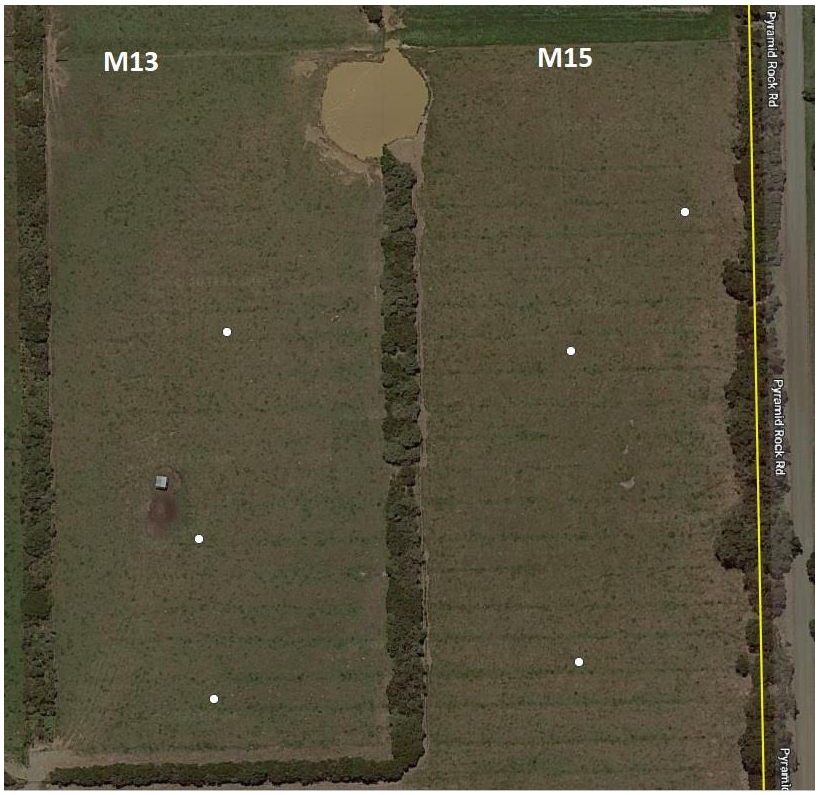

DAVIE
M.3
100 CM
GPS 850


DAVIE
M.1
100 CM
GPS 851

M13 & 15

M13 & M15 were sampled in Dec 2022. Depths sampled were 0-10, 10-30, 30-45 & 45-100cm.

M13, 15	**12/12/2022**
0-10cm Total Carbon (t/C/Ha)	72.63
10-30cm Total Carbon (t/C/Ha)	42.76
30-45cm Total Carbon (t/C/Ha)	19.31
45-100cm Total Carbon (t/C/Ha)	53.60
0-10cm Labile Carbon (t/C/Ha)	14.85
10-30cm Labile Carbon (t/C/Ha)	7.89
30-45cm Labile Carbon (t/C/Ha)	4.01
45-100cm Labile Carbon (t/C/Ha)	10.53
0-100cm Total Carbon (t/C/Ha)	**188.31**
0-100cm Labile Carbon (t/C/Ha)	**37.28**
0-10cm Total Carbon %	7.28
10-30cm Total Carbon %	1.64
30-45cm Total Carbon %	1.11
45-100cm Total Carbon %	0.76
0-10cm Labile Carbon %	1.49
10-30cm Labile Carbon %	0.30
30-45cm Labile Carbon %	0.23
45-100cm Labile Carbon %	0.15
0-10cm Bulk Density (g/cm^3)	1.04
10-30cm Bulk Density (g/cm^3)	1.46
30-45cm Bulk Density (g/cm^3)	1.45
45-100cm Bulk Density (g/cm^3)	1.42




DAVIE
M15
100cm
GPS 840


DAVIE
M15
100cm
GPS 841


DAVIE
M15
100cm
GPS 842


DAVIE
M13 12/12/22
100cm
GPS 843

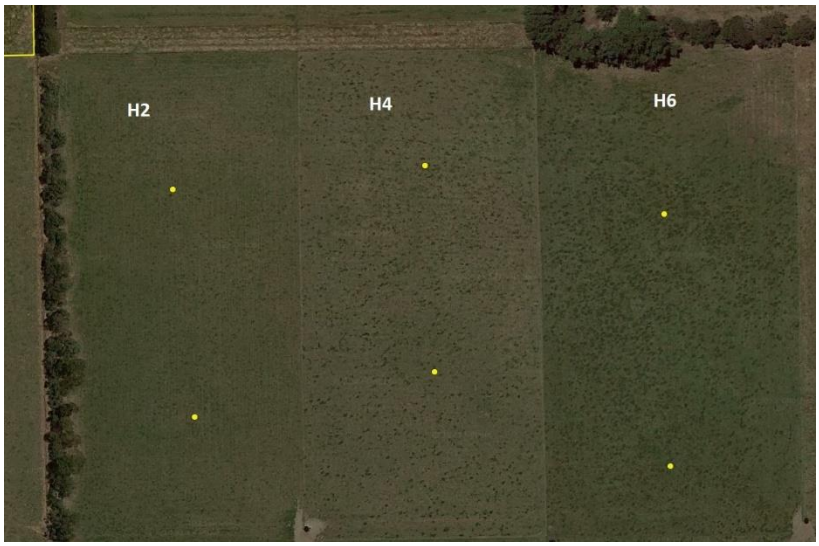

DAVIE
M13 12/12/22
100cm
GPS 844


DAVIE
M13 12/12/22
100cm
GPS 845

H2 4 & 6

H2, 4 & 6 were sampled in Dec 2021. Depths sampled were 0-10, 10-30, 30-45 & 45-100cm.

H2, 4, 6	**15/12/2021**
0-10cm Total Carbon (t/C/Ha)	60.64
10-30cm Total Carbon (t/C/Ha)	56.68
30-45cm Total Carbon (t/C/Ha)	23.42
45-100cm Total Carbon (t/C/Ha)	53.88
0-10cm Labile Carbon (t/C/Ha)	8.88
10-30cm Labile Carbon (t/C/Ha)	6.33
30-45cm Labile Carbon (t/C/Ha)	3.23
45-100cm Labile Carbon (t/C/Ha)	9.74
0-100cm Total Carbon (t/C/Ha)	**194.62**
0-100cm Labile Carbon (t/C/Ha)	**28.18**
0-10cm Total Carbon %	5.89
10-30cm Total Carbon %	2.53
30-45cm Total Carbon %	1.52
45-100cm Total Carbon %	0.83
0-10cm Labile Carbon %	0.86
10-30cm Labile Carbon %	0.28
30-45cm Labile Carbon %	0.21
45-100cm Labile Carbon %	0.15
0-10cm Bulk Density (g/cm^3)	1.04
10-30cm Bulk Density (g/cm^3)	1.13
30-45cm Bulk Density (g/cm^3)	1.03
45-100cm Bulk Density (g/cm^3)	1.20




DAVIE
H6
15/12/21
100 cm
GPS 761


DAVIE
H6
15/12/21
100 cm
GPS 762

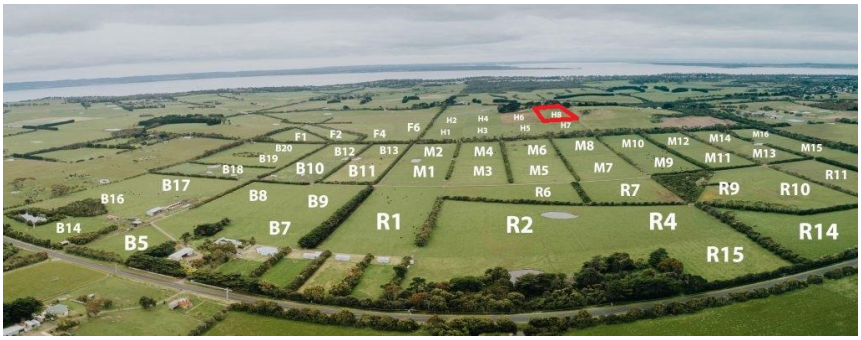

DAVIE
H4
15/12/21
100 cm
GPS 763


DAVIE
H4
15/12/21
100 cm
GPS 764


DAVIE
H2
15/12/21
100 cm
GPS 765


DAVIE
H2
15/12/21
100 cm
GPS 766

H8 and H8 SCARP



H8 was sampled in May 2011, Dec 2019, Dec 2021 and Jan 2023. The May 2011 sampling was conducted using the CSIRO developed SCARP methodology. This methodology involved setting out a 25m x 25m grid and taking 10 samples and compositing the samples are the following depths; 0-10cm, 10-20cm & 20-30cm. The sampling in Jan 2023 used the same methodology, and the same GPS located 25m x 25m grid. Depths sampled were again 0-10, 10-20, 20-30cm + 30-45cm & 45-100cm. In addition to this sampling, a single 1m core was analysed at the south western corner of the 25m x 25m grid. This sample was also analysed at 0-10, 10-20, 20-30cm + 30-45cm & 45-100cm depths. The purpose of this extra core was to explore soil carbon variability between an individual sample core, and a composite of 10 cores within a 25m x 25m area. Samples taken in Dec 2019 & Dec 2021 using the same GPS points, and were analysed at the following depths; 0-10, 10-30, 30-45cm & 45-100cm. Gains were seen in most parameters for the H8 SCARP methodology & also the other H8 sampling, however there were some slight reductions in some parameters.

H8	22/02/2019	15/12/2021	24/1/23	
0-10cm Total Carbon (t/C/Ha)	79.10	74.89	74.20	⇩
10-30cm Total Carbon (t/C/Ha)	60.45	61.10	71.23	⇧
30-45cm Total Carbon (t/C/Ha)	22.07	23.76	28.98	⇧
45-100cm Total Carbon (t/C/Ha)	49.78	41.98	49.40	⇩
0-10cm Labile Carbon (t/C/Ha)	7.27	9.42	15.66	⇧
10-30cm Labile Carbon (t/C/Ha)	9.62	9.23	11.69	⇧
30-45cm Labile Carbon (t/C/Ha)	4.01	2.83	4.90	⇧
45-100cm Labile Carbon (t/C/Ha)	2.38	2.65	6.52	⇧
0-100cm Total Carbon (t/C/Ha)	**211.41**	**201.74**	**223.82**	⇧
0-100cm Labile Carbon (t/C/Ha)	**23.28**	**24.13**	**38.76**	⇧
0-10cm Total Carbon %	7.10	6.52	7.21	⇧
10-30cm Total Carbon %	2.50	2.92	3.16	⇧
30-45cm Total Carbon %	1.41	1.51	1.74	⇧
45-100cm Total Carbon %	0.81	0.79	0.88	⇧
0-10cm Labile Carbon %	0.65	0.82	1.52	⇧
10-30cm Labile Carbon %	0.40	0.44	0.52	⇧
30-45cm Labile Carbon %	0.26	0.18	0.29	⇧
45-100cm Labile Carbon %	0.04	<0.05	0.12	⇧
0-10cm Bulk Density (g/cm^3)	1.12	1.15	1.05	⇩
10-30cm Bulk Density (g/cm^3)	1.22	1.05	1.16	⇩
30-45cm Bulk Density (g/cm^3)	1.05	1.05	1.12	⇧
45-100cm Bulk Density (g/cm^3)	1.18	0.96	1.25	⇧

H8 - SCARP	27/05/2011 (Composite of 10 cores)	24/01/2023 (Composite of 10 cores)		24/01/2023 (Individual core x1) taken in sth west corner of SCARP quadrant to compare
0-10cm Total Carbon (t/C/Ha)	65.77	74.20	⇧	54.45
10-20cm Total Carbon (t/C/Ha)	39.90	42.06	⇧	24.30
20-30cm Total Carbon (t/C/Ha)	23.40	29.17	⇧	18.99
0-10cm Labile Carbon (t/C/Ha)	14.64	15.66	⇧	11.19
10-20cm Labile Carbon (t/C/Ha)	8.74	7.10	⇩	3.96
20-30cm Labile Carbon (t/C/Ha)	4.32	4.59	⇧	3.10
0-30cm Total Carbon (t/C/Ha)	**129.07**	**145.44**	⇧	97.74
0-30cm Labile Carbon (t/C/Ha)	**27.71**	**27.35**	⇩	18.25
0-10cm Total Carbon %	6.46	7.21	⇧	5.21
10-20cm Total Carbon %	3.24	3.70	⇧	2.11
20-30cm Total Carbon %	2.02	2.62	⇧	1.50
0-10cm Labile Carbon %	1.44	1.52	⇧	1.07
10-20cm Labile Carbon %	0.71	0.63	⇩	0.34
20-30cm Labile Carbon %	0.37	0.41	⇧	0.24
0-10cm Bulk Density (g/cm^3)	1.02	1.05	⇧	1.06
10-20cm Bulk Density (g/cm^3)	1.23	1.18	⇩	1.15
20-30cm Bulk Density (g/cm^3)	1.16	1.14	⇩	1.29


DAVIE
H8
15/12/21
100 cm
GPS 755


DAVIE
H8
15/12/21
100 cm
GPS 756


DAVIE
H8
15/12/21
100 cm
GPS 757


DAVIE
H8
15/12/21
100 cm
GPS 758


DAVIE
H8
15/12/21
100 cm
GPS 759


DAVIE
H8
15/12/21
100 cm
GPS 760

B 6, 12, 14, 17, 19, 20

B 6, 12, 14, 17, 19, 20 were sampled in Dec 2019. Depths sampled were 0-10, 10-30 & 30-99.33cm.

B 6, 12, 14, 17, 19, 20	**06/12/2019**
0-10cm Total Carbon (t/C/Ha)	64.70
10-30cm Total Carbon (t/C/Ha)	38.07
30-99.33cm Total Carbon (t/C/Ha)	69.35
0-10cm Labile Carbon (t/C/Ha)	13.84
10-30cm Labile Carbon (t/C/Ha)	2.68
30-99.33cm Labile Carbon (t/C/Ha)	9.76
0-100cm Total Carbon (t/C/Ha)	**172.12**
0-100cm Labile Carbon (t/C/Ha)	**26.28**
0-10cm Total Carbon %	5.92
10-30cm Total Carbon %	1.42
30-99.33cm Total Carbon %	0.71
0-10cm Labile Carbon %	1.27
10-30cm Labile Carbon %	<0.1
30-99.33cm Labile Carbon %	<0.1
0-10cm Bulk Density (g/cm3)	1.11
10-30cm Bulk Density (g/cm^3)	1.37
30-99.33cm Bulk Density (g/cm^3)	1.44


DAVIE
B6 6/12/19
99 cm
GPS S66


DAVIE
B14 6/12/19
97 cm
GPS S67


DAVIE
B17 6/12/19
100 cm
GPS S69


DAVIE
B20 6/12/19
102cm
GPS 570


DAVIE
B12 6/12/19
102cm
GPS 571


DAVIE
B19 6/12/19
102cm
GPS 572

B 7, 8 9

B 7, 8 & 9 were sampled in May 2019. Depths sampled were 0-10, 10-30 & 30-100cm.

B 7, 8, 9	**29/05/2019**
0-10cm Total Carbon (t/C/Ha)	59.79
10-30cm Total Carbon (t/C/Ha)	46.75
30-100cm Total Carbon (t/C/Ha)	71.22
0-10cm Labile Carbon (t/C/Ha)	15.79
10-30cm Labile Carbon (t/C/Ha)	11.05
30-100cm Labile Carbon (t/C/Ha)	19.22
0-100cm Total Carbon (t/C/Ha)	**193.88**
0-100cm Labile Carbon (t/C/Ha)	**46.06**
0-10cm Total Carbon %	4.83
10-30cm Total Carbon %	1.73
30-100cm Total Carbon %	0.74
0-10cm Labile Carbon %	1.28
10-30cm Labile Carbon %	0.41
30-100cm Labile Carbon %	0.20
0-10cm Bulk Density (g/cm3)	1.24
10-30cm Bulk Density (g/cm3)	1.40
30-100cm Bulk Density (g/cm^3)	1.41


DAVIE
29/5/19
GPS 334
100 cm
B7


DAVIE
29/5/19
GPS 335
100 cm
B7


DAVIE
29/5/19
GPS 336
B9
100 cm


DAVIE
29/5/19
GPS 337
B9
100 cm


DAVIE
29/5/19.
B8 GPS 338 100CM.


DAVIE
29/5/19
B8
GPS. 339. 100. CM.

F 1 & 6

F 1 & 6 were sampled in August 2019. Depths sampled were 0-10, 10-30 & 30-96.63cm.

F 1, 6	**17/08/2019**
0-10cm Total Carbon (t/C/Ha)	55.17
10-30cm Total Carbon (t/C/Ha)	42.88
30-99.17cm Total Carbon (t/C/Ha)	75.34
0-10cm Labile Carbon (t/C/Ha)	11.23
10-30cm Labile Carbon (t/C/Ha)	10.07
30-99.17cm Labile Carbon (t/C/Ha)	10.04
0-100cm Total Carbon (t/C/Ha)	**173.39**
0-100cm Labile Carbon (t/C/Ha)	**31.34**
0-10cm Total Carbon %	4.47
10-30cm Total Carbon %	1.49
30-99.17cm Total Carbon %	0.75
0-10cm Labile Carbon %	0.91
10-30cm Labile Carbon %	0.35
30-99.3cm Labile Carbon %	<0.1
0-10cm Bulk Density (g/cm3)	1.28
10-30cm Bulk Density (g/cm3)	1.63
30-99.17cm Bulk Density (g/cm^3)	1.53


DAVIE 17/8/19
F6
100cm GPS 353


DAVIE 17/8/19
F6
100cm GPS 354


17/8/19 DAVIE
100cm GPS 355


17/8/19 DAVIE
100cm. GPS. 356


17/8/19 DAVIE
100cm. GPS. 357


17/8/19 DAVIE
F1
94 cm. GPS. 358

R 1, 13, 14 & 15

R 1, 13, 14 & 15 were sampled in August 2019. Depths sampled were 0-10, 10-30 & 30-99.17cm.

R 14, 15, 13, 1	**17/08/2019**
0-10cm Total Carbon (t/C/Ha)	40.37
10-30cm Total Carbon (t/C/Ha)	30.15
30-99.17cm Total Carbon (t/C/Ha)	59.23
0-10cm Labile Carbon (t/C/Ha)	11.17
10-30cm Labile Carbon (t/C/Ha)	6.34
30-99.17cm Labile Carbon (t/C/Ha)	8.71
0-100cm Total Carbon (t/C/Ha)	**129.74**
0-100cm Labile Carbon (t/C/Ha)	**26.22**
0-10cm Total Carbon %	3.18
10-30cm Total Carbon %	1.05
30-99.17cm Total Carbon %	0.68
0-10cm Labile Carbon %	0.88
10-30cm Labile Carbon %	0.22
30-99.3cm Labile Carbon %	<0.1
0-10cm Bulk Density (g/cm3)	1.43
10-30cm Bulk Density (g/cm3)	1.67
30-99.17cm Bulk Density (g/cm^3)	1.47


17/8/19 DAVIE
R14
100cm. GPS 359


17/8/19 DAVIE
R15
100cm. GPS 360


17/8/19. DAVIE
R13 CR.PR.BB.RDs.
100cm GPS. 361


17/8/19 DAVIE
R13
100 CM. GPS 362


17/8/19 DAVIE
R1
100 CM. GPS 363


17/8/19 DAVIE
R1
~~100 CM.~~ 95. CM
GPS 364.

Detailed Farm results for - Bob and Anne Davie 'Bimbadeen'

Soil Carbon results for paddocks sampled – 4 DEPTHS ANALYSED (most recent results displayed only)

Paddock	**M16**	**M14**	**M4**	**M2, 6, 8, 10, 12**	**M1, 3, 5, 7, 9, 11**	**M13 15**	**H2, 4, 6**	**H8**
Date	12/12/22	12/12/22	12/12/22	12/12/22	12/12/22	12/12/22	15/12/21	24/1/23
0-10cm Total Carbon (t/C/Ha)	56.87	58.82	69.54	74.51	79.70	72.63	60.64	74.20
10-30cm Total Carbon (t/C/Ha)	38.95	31.17	64.32	56.62	60.57	42.76	56.68	71.23
30-45cm Total Carbon (t/C/Ha)	20.68	19.56	29.33	22.02	21.47	19.31	23.42	28.98
45-100cm Total Carbon (t/C/Ha)	65.35	65.39	68.39	60.33	60.93	53.60	53.88	49.40
0-10cm Labile Carbon (t/C/Ha)	14.03	13.71	15.80	15.06	17.75	14.85	8.88	15.66
10-30cm Labile Carbon (t/C/Ha)	8.56	5.69	11.48	8.19	12.66	7.89	6.33	11.69
30-45cm Labile Carbon (t/C/Ha)	3.71	3.70	4.53	3.13	5.37	4.01	3.23	4.90
45-100cm Labile Carbon (t/C/Ha)	9.90	12.13	9.13	7.30	13.59	10.53	9.74	6.52
0-100cm Total Carbon (t/C/Ha)	**181.85**	**174.94**	**231.58**	**213.48**	**222.67**	**188.31**	**194.62**	**223.82**
0-100cm Labile Carbon (t/C/Ha)	**36.20**	**35.24**	**40.94**	**33.68**	**49.37**	**37.28**	**28.18**	**38.76**
0-10cm Total Carbon %	4.82	5.59	8.76	8.70	8.57	7.28	5.89	7.21
10-30cm Total Carbon %	1.32	1.21	2.63	2.27	2.67	1.64	2.53	3.16
30-45cm Total Carbon %	0.99	1.03	1.55	1.21	1.22	1.11	1.52	1.74
45-100cm Total Carbon %	0.79	0.88	0.95	0.87	0.78	0.76	0.83	0.88
0-10cm Labile Carbon %	1.19	1.29	2.00	1.76	1.91	1.49	0.86	1.52
10-30cm Labile Carbon %	0.29	0.21	0.47	0.33	0.56	0.30	0.28	0.52
30-45cm Labile Carbon %	0.17	0.20	0.24	0.17	0.30	0.23	0.21	0.29
45-100cm Labile Carbon %	0.12	0.16	0.13	0.11	0.17	0.15	0.15	0.12
0-10cm Bulk Density (g/cm^3)	1.22	1.13	0.84	0.87	0.98	1.04	1.04	1.05
10-30cm Bulk Density (g/cm^3)	1.57	1.67	1.25	1.32	1.36	1.46	1.13	1.16
30-45cm Bulk Density (g/cm^3)	1.66	1.77	1.28	1.34	1.43	1.45	1.03	1.12
45-100cm Bulk Density (g/cm^3)	1.54	1.53	1.35	1.29	1.44	1.42	1.20	1.25

Soil Carbon results for paddocks sampled – 3 DEPTHS ANALYSED (most recent results displayed only)

Paddock	**M2**	**M6**	**B6, 12, 14, 17, 19, 20**	**B7, 8, 9**	**F1, 6**	**R1, 13, 14, 15**
Date	29/05/2019	29/05/2019	06/12/2019	29/05/2019	17/08/2019	17/08/2019
0-10cm Total Carbon (t/C/Ha)	93.73	82.54	64.70	59.79	55.17	40.37
10-30cm Total Carbon (t/C/Ha)	49.15	64.66	38.07	46.75	42.88	30.15
30-95cm Total Carbon (t/C/Ha)	62.98	88.29	69.35	71.22	75.34	59.23
0-10cm Labile Carbon (t/C/Ha)	24.77	18.58	13.84	15.79	11.23	11.17
10-30cm Labile Carbon (t/C/Ha)	11.66	14.55	2.68	11.05	10.07	6.34
30-95cm Labile Carbon (t/C/Ha)	16.39	23.11	9.76	19.22	10.04	8.71
0-100cm Total Carbon (t/C/Ha)	**205.86**	**235.48**	**172.12**	**193.88**	**173.39**	**129.74**
0-100cm Labile Carbon (t/C/Ha)	**52.81**	**56.24**	**26.28**	**46.06**	**31.34**	**26.22**
0-10cm Total Carbon %	9.29	7.71	5.92	4.83	4.47	3.18
10-30cm Total Carbon %	1.98	3.04	1.42	1.73	1.49	1.05
30-95cm Total Carbon %	0.82	1.16	0.71	0.74	0.75	0.68
0-10cm Labile Carbon %	2.45	1.74	1.27	1.28	0.91	0.88
10-30cm Labile Carbon %	0.47	0.68	<0.1	0.41	0.35	0.22
30-95cm Labile Carbon %	0.21	0.30	<0.1	0.20	<0.1	<0.1
0-10cm Bulk Density (g/cm^3)	1.05	1.08	1.11	1.24	1.28	1.43
10-30cm Bulk Density (g/cm^3)	1.28	1.06	1.37	1.40	1.63	1.67
30-95cm Bulk Density (g/cm^3)	1.23	1.15	1.44	1.41	1.53	1.47

Important information

The information gathered from your sampling is significant as it provides you with a comprehensive set of baseline soil carbon data. This data is powerful because it has been conducted in a way that can provide confidence in the results obtained to the farmer for potential marketing, value adding produce, whole of carbon farm calculations and to any potential soil carbon buyers in the future. As you are implementing actions on your farm which are designed to build carbon, it would be worthwhile to undertake follow-up testing in a number of years to monitor for any changes.

Thanks for your business and please feel free to contact me by email or phone if you wish to discuss this report, require any more information and guidance in the future as to how the information can be used. Raw data, high-definition soil core photos etc can all be provided upon request,

Yours sincerely,

Peter Ronalds
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29th May 2023

APPENDIX – Raw Data

M16 – It should be noted that years 2018, 2019, 2020, and 2021 comprised 6 cores (each year) with the samples composited for the nominated depths; 0-10cm, 10-30cm, 30-45cm & 45-100cm.

However, the 2022 sampling was different in that each of the 6 cores were individually analysed at the nominated depths; 0-10cm, 10-30cm, 30-45cm & 45-100cm.

This was done to show the variability in results within a relatively flat paddock which comprises the same soil type.

Farm Data				Laboratory Data								Bulk Density			Soil Organic Carbon Results		
Farmer	Date	Sampling Reference	Sample Depth	Sample Code	Moisture	Gravimetric water content on the air dry soil (g water/g oven-dry mass)	Air Dry Mass (Mass of sub-sample composite)	Oven Dry Equivalent Mass **	Gravel Content (Stones and Organic Matter > 2mm)	Total Organic Carbon (LECO CNS2000 Analyser)	Labile Carbon	Soil Layer Depth	Core Radius	Bulk Density	TOTAL SOC (each depth)	TOTAL SOC (each core)	TOTAL SOC (Sample area)
			cms		%	g	g	g	g	% C	(%)	cm	cm	g/cm^3	t C/Ha	t C/Ha	t C/Ha
Davie	30/11/2018	M16	0-10cm	H6686/1	21.3	0.015	850	838	7.9	3.98	0.84	60	1.900	1.23	48.53	158.49	158.49
Davie	30/11/2018		10-30cm	H6686/2	12.8	0.008	2,209	2,191	53.0	1.10	0.12	120	1.900	1.61	34.53		
Davie	30/11/2018		30-45cm	H6686/3	16.1	0.014	1,794	1,770	142.4	0.80	0.17	90	1.900	1.74	19.08		
Davie	30/11/2018		45-98.83cı	H6686/4	23.1	0.042	6,041	5,799	78.0	0.67	0.09	323	1.900	1.58	56.34		
Davie	6/12/2019	M16	0-10cm	i9024/1	20.6	0.016	950	935	9.5	4.05	0.99	60	1.904	1.37	54.93	153.60	153.60
Davie	6/12/2019		10-30cm	i9024/2	13.2	0.010	2196	2175	45.3	0.92	0.13	120	1.904	1.59	28.55		
Davie	6/12/2019		30-97.17cı	i9024/3	20.6	0.025	7365	7183	72.3	0.67	<0.1	403	1.904	1.57	70.12		
Davie	18/12/2020	M16	0-10cm	K2060/1	22.8	0.016	921	906	11.4	4.58	1.33	60	1.988	1.22	55.04	163.63	163.63
Davie	18/12/2020		10-30cm	K2060/2	14.4	0.011	2,331	2,306	137.8	1.32	0.32	120	1.988	1.55	38.57		
Davie	18/12/2020		30-45cm	K2060/3	15.1	0.015	1,909	1,881	216.7	0.82	0.22	90	1.988	1.69	18.29		
Davie	18/12/2020		45-100cm	K2060/4	22.0	0.027	6,638	6,465	362.3	0.63	0.05	330	1.988	1.58	51.73		
Davie	15/12/2021	M16	0-10cm	M4767/1	21.2	0.024	936	915	13.0	4.62	0.70	60	1.981	1.24	56.29	170.47	170.47
Davie	15/12/2021		10-30cm	M4767/2	12.1	0.013	2,325	2,294	127.2	1.36	0.19	120	1.981	1.55	39.80		
Davie	15/12/2021		30-45cm	M4767/3	12.9	0.012	1,956	1,934	189.4	0.76	<0.05	90	1.981	1.74	18.05		
Davie	15/12/2021		45-100cm	M4767/4	21.3	0.031	6,688	6,489	266.9	0.67	0.11	330	1.981	1.60	56.32		
Davie	12/12/2022	M16 817 L1	0-10cm	N6067/1	28.5	0.014	157	155	11.6	3.98	0.88	10	2.004	1.23	45.38	158.62	181.85
Davie	12/12/2022	M16 817 L2	10-30cm	N6067/2	14.8	0.009	438	434	77.2	1.10	0.19	20	2.004	1.72	31.18		
Davie	12/12/2022	M16 817 L3	30-45cm	N6067/3	18.1	0.027	339	330	95.1	1.14	0.15	15	2.004	1.76	21.44		
Davie	12/12/2022	M16 817 L4	45-100cm	N6067/4	24.0	0.032	1,091	1,057	27.2	0.74	0.09	55	2.004	1.53	60.62		
Davie	12/12/2022	M16 818 L1	0-10cm	N6067/5	30.3	0.017	154	151	1.8	4.81	1.33	10	2.004	1.20	57.02	150.83	
Davie	12/12/2022	M16 818 L2	10-30cm	N6067/6	14.7	0.007	397	395	4.2	1.14	0.25	20	2.004	1.56	35.22		
Davie	12/12/2022	M16 818 L3	30-45cm	N6067/7	13.5	0.008	344	341	5.6	0.45	0.11	15	2.004	1.80	11.99		
Davie	12/12/2022	M16 818 L4	45-100cm	N6067/8	19.2	0.021	1,172	1,148	14.5	0.52	0.14	55	2.004	1.66	46.59		
Davie	12/12/2022	M16 819 L1	0-10cm	N6067/9	31.7	0.023	138	135	2.7	6.18	1.64	10	2.004	1.07	64.66	200.91	
Davie	12/12/2022	M16 819 L2	10-30cm	N6067/10	15.2	0.008	396	393	2.8	1.45	0.43	20	2.004	1.56	44.90		
Davie	12/12/2022	M16 819 L3	30-45cm	N6067/11	15.4	0.018	317	312	6.0	0.93	0.21	15	2.004	1.65	22.60		
Davie	12/12/2022	M16 819 L4	45-100cm	N6067/12	23.8	0.030	1,066	1,035	3.2	0.84	0.11	55	2.004	1.50	68.76		
Davie	12/12/2022	M16 820 L1	0-10cm	N6067/13	25.7	0.016	163	161	1.3	4.53	0.92	10	2.004	1.27	57.24	200.61	
Davie	12/12/2022	M16 820 L2	10-30cm	N6067/14	20.6	0.015	352	346	5.1	1.77	0.42	20	2.004	1.37	47.81		
Davie	12/12/2022	M16 820 L3	30-45cm	N6067/15	25.6	0.031	266	258	0.1	1.47	0.23	15	2.004	1.36	30.14		
Davie	12/12/2022	M16 820 L4	45-100cm	N6067/16	26.7	0.031	999	969	7.7	0.86	0.12	55	2.004	1.41	65.42		
Davie	12/12/2022	M16 821 L1	0-10cm	N6067/17	28.0	0.015	164	162	3.7	4.77	1.06	10	2.004	1.28	59.73	194.08	
Davie	12/12/2022	M16 821 L2	10-30cm	N6067/18	14.3	0.008	406	403	11.8	1.14	0.22	20	2.004	1.60	35.29		
Davie	12/12/2022	M16 821 L3	30-45cm	N6067/19	18.4	0.019	278	272	3.9	1.13	0.22	15	2.004	1.44	24.07		
Davie	12/12/2022	M16 821 L4	45-100cm	N6067/20	24.3	0.030	1,081	1,050	1.5	0.90	0.18	55	2.004	1.52	74.99		
Davie	12/12/2022	M16 822 L1	0-10cm	N6067/21	27.1	0.017	160	157	2.1	4.66	1.32	10	2.004	1.24	57.21	186.06	
Davie	12/12/2022	M16 822 L2	10-30cm	N6067/22	13.8	0.006	401	399	23.1	1.32	0.22	20	2.004	1.58	39.27		
Davie	12/12/2022	M16 822 L3	30-45cm	N6067/23	10.6	0.010	367	363	147.2	0.80	0.11	15	2.004	1.93	13.86		
Davie	12/12/2022	M16 822 L4	45-100cm	N6067/24	21.1	0.026	1,152	1,123	52.3	0.89	0.08	55	2.004	1.63	75.73		

M14 - It should be noted that years 2018, 2019, 2020, and 2021 comprised 6 cores (each year) with the samples composited for the nominated depths; 0-10cm, 10-30cm, 30-45cm & 45-100cm.

However, the 2022 sampling was different in that each of the 6 cores were individually analysed at the nominated depths; 0-10cm, 10-30cm, 30-45cm & 45-100cm.

This was done to show the variability in results within a relatively flat paddock which comprises the same soil type.

Farm Data				Laboratory Data								Bulk Density			Soil Organic Carbon Results		
Farmer	Date	Sampling Reference	Sample Depth	Sample Code	Moisture	Gravimetric water content on the air dry soil (g water/g oven-dry mass)	Air Dry Mass (Mass of sub-sample composite)	Oven Dry Equivalent Mass **	Gravel Content (Stones and Organic Matter > 2mm)	Total Organic Carbon (LECO CNS2000 Analyser)	Labile Carbon	Soil Layer Depth	Core Radius	Bulk Density	TOTAL SOC (each depth)	TOTAL SOC (each core)	TOTAL SOC (Sample area)
			cms		%	g	g	g	g	% C	(%)	cm	cm	g/cm^3	t C/Ha	t C/Ha	t C/Ha
Davie	30/11/2018	M14	0-10cm	H6691/1	16.8	0.017	910	895	38.0	5.00	0.83	60	1.900	1.32	63.07	167.62	167.62
Davie	30/11/2018		10-30cm	H6691/2	9.3	0.009	2,436	2,414	203.5	0.92	0.18	120	1.900	1.78	29.98		
Davie	30/11/2018		30-45cm	H6691/3	13.9	0.016	1,915	1,885	301.3	0.80	0.17	90	1.900	1.85	18.71		
Davie	30/11/2018		45-100cm	H6691/4	24.2	0.044	6,025	5,773	291.6	0.69	0.14	323	1.900	1.58	55.86		
Davie	6/12/2019	M14	0-10cm	i9020/1	24.5	0.016	890	876	14.2	4.06	0.90	60	1.904	1.28	51.29	158.35	158.35
Davie	6/12/2019		10-30cm	i9020/2	15.9	0.010	2184	2163	90.1	1.26	0.21	120	1.904	1.58	38.31		
Davie	6/12/2019		30-99.5cm	i9020/3	22.2	0.027	7310	7119	412.4	0.70	<0.1	417	1.904	1.50	68.74		
Davie	18/12/2020	M14	0-10cm	K2067/1	13.0	0.017	899	884	36.8	4.56	1.34	60	1.988	1.19	51.87	145.41	145.41
Davie	18/12/2020		10-30cm	K2067/2	7.7	0.009	2,310	2,288	346.2	1.15	0.21	120	1.988	1.54	30.06		
Davie	18/12/2020		30-45cm	K2067/3	10.2	0.016	2,079	2,047	602.9	0.77	0.17	90	1.988	1.84	15.10		
Davie	18/12/2020		45-100cm	K2067/4	21.2	0.029	6,825	6,632	1,365.4	0.68	0.08	330	1.988	1.63	48.38		
Davie	15/12/2021	M14	0-10cm	M4773/1	14.3	0.022	894	874	28.0	5.03	1.07	60	1.981	1.18	57.55	173.15	173.15
Davie	15/12/2021		10-30cm	M4773/2	8.7	0.010	2,444	2,419	103.3	1.06	0.28	120	1.981	1.64	33.21		
Davie	15/12/2021		30-45cm	M4773/3	11.9	0.013	2,098	2,071	166.5	0.79	0.13	90	1.981	1.87	20.25		
Davie	15/12/2021		45-99.66cm	M4773/4	22.4	0.025	6,400	6,242	311.0	0.77	0.10	328	1.981	1.55	62.13		
Davie	12/12/2022	M14 823 L1	0-10cm	N5878/1	30.0	0.017	144	142	3.9	4.53	1.05	10	2.004	1.13	49.64	174.76	174.94
Davie	12/12/2022	M14 823 L2	10-30cm	N5878/2	11.9	0.008	431	427	103.8	1.02	0.16	20	2.004	1.70	26.19		
Davie	12/12/2022	M14 823 L3	30-45cm	N5878/3	19.5	0.027	302	294	17.1	1.17	0.18	15	2.004	1.55	25.71		
Davie	12/12/2022	M14 823 L4	45-100cm	N5878/4	26.2	0.035	1,014	979	16.6	0.96	0.14	55	2.004	1.42	73.22		
Davie	12/12/2022	M14 824 L1	0-10cm	N5878/5	30.1	0.016	145	143	2.3	4.27	1.15	10	2.004	1.13	47.63	149.33	
Davie	12/12/2022	M14 824 L2	10-30cm	N5878/6	16.2	0.008	420	416	51.9	1.14	0.23	20	2.004	1.65	32.96		
Davie	12/12/2022	M14 824 L3	30-45cm	N5878/7	11.9	0.013	451	445	248.3	0.73	0.15	15	2.004	2.37	11.57		
Davie	12/12/2022	M14 824 L4	45-100cm	N5878/8	23.4	0.032	1,044	1,011	208.4	0.89	0.19	55	2.004	1.48	57.16		
Davie	12/12/2022	M14 825 L1	0-10cm	N5878/9	27.1	0.015	167	164	7.8	3.63	0.83	10	2.004	1.30	45.12	160.19	
Davie	12/12/2022	M14 825 L2	10-30cm	N5878/10	13.5	0.011	421	417	29.7	0.92	0.16	20	2.004	1.65	28.20		
Davie	12/12/2022	M14 825 L3	30-45cm	N5878/11	16.2	0.021	327	320	41.4	0.89	0.15	15	2.004	1.70	19.74		
Davie	12/12/2022	M14 825 L4	45-100cm	N5878/12	20.8	0.028	1,170	1,138	150.6	0.85	0.25	55	2.004	1.66	67.13		
Davie	12/12/2022	M14 826 L1	0-10cm	N5878/13	29.2	0.018	149	146	6.5	5.64	1.45	10	2.004	1.16	62.62	175.60	
Davie	12/12/2022	M14 826 L2	10-30cm	N5878/14	13.4	0.007	423	420	32.2	1.01	0.21	20	2.004	1.67	31.00		
Davie	12/12/2022	M14 826 L3	30-45cm	N5878/15	15.4	0.015	292	288	29.9	0.87	0.21	15	2.004	1.52	17.86		
Davie	12/12/2022	M14 826 L4	45-100cm	N5878/16	26.2	0.032	1,070	1,038	14.5	0.79	0.12	55	2.004	1.51	64.12		
Davie	12/12/2022	M14 827 L1	0-10cm	N5878/17	30.4	0.020	146	143	9.4	6.03	1.53	10	2.004	1.14	63.90	190.36	
Davie	12/12/2022	M14 827 L2	10-30cm	N5878/18	12.6	0.013	436	430	211.7	1.75	0.23	20	2.004	1.72	30.75		
Davie	12/12/2022	M14 827 L3	30-45cm	N5878/19	23.8	0.035	275	266	60.0	1.63	0.29	15	2.004	1.42	26.81		
Davie	12/12/2022	M14 827 L4	45-100cm	N5878/20	28.9	0.043	1,028	986	112.1	0.99	0.12	55	2.004	1.44	68.91		
Davie	12/12/2022	M14 282 L1	0-10cm	N5878/21	32.5	0.028	120	117	5.0	9.44	1.74	10	2.004	0.93	83.98	199.42	
Davie	12/12/2022	M14 282 L2	10-30cm	N5878/22	14.7	0.012	424	419	77.2	1.40	0.29	20	2.004	1.67	37.95		
Davie	12/12/2022	M14 282 L3	30-45cm	N5878/23	12.8	0.017	391	385	157.9	0.86	0.20	15	2.004	2.05	15.68		
Davie	12/12/2022	M14 282 L4	45-100cm	N5878/24	22.3	0.034	1,184	1,145	195.8	0.82	0.16	55	2.004	1.67	61.82		

M4 - It should be noted that years 2018, 2019, 2020, and 2021 comprised 6 cores (each year) with the samples composited for the nominated depths; 0-10cm, 10-30cm, 30-45cm & 45-100cm.

However, the 2022 sampling was different in that each of the 6 cores were individually analysed at the nominated depths; 0-10cm, 10-30cm, 30-45cm & 45-100cm.

This was done to show the variability in results within a relatively flat paddock which comprises a change in soil type with core samples ID 829-832 situated in a Brown Chromosol soil, and core samples ID 833-834 situated in an Aquic Vertosol soil.

Farm Data				Laboratory Data								Bulk Density			Soil Organic Carbon Results		
Farmer	Date	Sampling Reference	Sample Depth	Sample Code	Moisture	Gravimetric water content on the air dry soil (g water/g oven-dry mass)	Air Dry Mass (Mass of sub-sample composite)	Oven Dry Equivalent Mass **	Gravel Content (Stones and Organic Matter > 2mm)	Total Organic Carbon (LECO CNS2000 Analyser)	Labile Carbon	Soil Layer Depth	Core Radius	Bulk Density	TOTAL SOC (each depth)	TOTAL SOC (each core)	TOTAL SOC (Sample area)
			cms		%	g	g	g	g	% C	(%)	cm	cm	g/cm^3	t C/Ha	t C/Ha	t C/Ha
Davie	30/11/2018	M4	0-10cm	H6692/1	21.3	0.037	708	683	28.9	7.09	1.25	60	1.900	1.01	68.29		
Davie	30/11/2018		10-30cm	H6692/2	20.0	0.034	1,860	1,799	33.8	2.42	0.45	120	1.900	1.32	62.80	221.36	221.36
Davie	30/11/2018		30-45cm	H6692/3	27.0	0.041	1,425	1,368	10.5	1.29	0.14	90	1.900	1.34	25.77		
Davie	30/11/2018		45-96.67cr	H6692/4	28.5	0.068	5,325	4,986	18.2	0.88	0.11	310	1.900	1.42	64.50		
Davie	6/12/2019	M4	0-10cm	i9016/1	21.8	0.045	663	635	24.3	7.45	1.58	60	1.904	0.93	66.66		
Davie	6/12/2019		10-30cm	i9016/2	21.6	0.044	1486	1424	24.5	2.60	0.38	120	1.904	1.04	53.27	190.38	190.38
Davie	6/12/2019		30-99.33cr	i9016/3	28.7	0.048	5706	5444	127.6	0.90	0.17	416	1.904	1.15	70.45		
Davie	18/12/2020	M4	0-10cm	K2068/1	16.9	0.038	741	714	9.2	6.71	1.62	60	1.988	0.96	63.44		
Davie	18/12/2020		10-30cm	K2068/2	20.4	0.040	1,795	1,726	75.0	2.31	0.45	120	1.988	1.16	51.25	176.18	176.18
Davie	18/12/2020		30-45cm	K2068/3	26.2	0.049	1,399	1,334	130.1	1.21	0.27	90	1.988	1.20	19.59		
Davie	18/12/2020		45-100cm	K2068/4	22.1	0.043	5,288	5,071	848.4	0.73	0.12	330	1.988	1.25	41.90		
Davie	15/12/2021	M4	0-10cm	M4774/1	20.1	0.048	787	751	10.2	7.81	1.34	60	1.981	1.02	78.21		
Davie	15/12/2021		10-30cm	M4774/2	22.5	0.049	1,770	1,686	24.6	2.24	0.27	120	1.981	1.14	50.23	195.05	195.05
Davie	15/12/2021		30-45cm	M4774/3	30.3	0.061	1,459	1,374	0.0	1.21	0.17	90	1.981	1.24	22.48		
Davie	15/12/2021		45-100cm	M4774/4	28.1	0.055	5,440	5,157	96.0	0.64	0.12	330	1.981	1.27	44.13		
Davie	12/12/2022	M4 829 L1	0-10cm	N6066/1	26.4	0.030	135	132	1.9	5.51	1.03	10	2.004	1.04	56.64		
Davie	12/12/2022	M4 829 L2	10-30cm	N6066/2	20.2	0.021	369	361	1.9	1.78	0.28	20	2.004	1.43	50.60	188.28	
Davie	12/12/2022	M4 829 L3	30-45cm	N6066/3	20.6	0.029	297	289	5.0	1.02	0.15	15	2.004	1.53	22.84		
Davie	12/12/2022	M4 829 L4	45-100cm	N6066/4	23.8	0.040	1,125	1,081	17.2	0.69	0.07	55	2.004	1.57	58.20		
Davie	12/12/2022	M4 830 L1	0-10cm	N6066/5	35.3	0.034	125	121	0.8	5.90	1.41	10	2.004	0.96	56.32		
Davie	12/12/2022	M4 830 L2	10-30cm	N6066/6	24.6	0.029	348	338	5.1	2.02	0.29	20	2.004	1.34	53.23	201.20	
Davie	12/12/2022	M4 830 L3	30-45cm	N6066/7	30.9	0.053	237	225	0.4	1.36	0.21	15	2.004	1.19	24.19		
Davie	12/12/2022	M4 830 L4	45-100cm	N6066/8	27.4	0.044	1,025	982	8.4	0.87	0.09	55	2.004	1.42	67.46		
Davie	12/12/2022	M4 831 L1	0-10cm	N6066/9	43.0	0.056	106	100	3.6	9.12	2.30	10	2.004	0.79	69.83		
Davie	12/12/2022	M4 831 L2	10-30cm	N6066/10	33.0	0.059	302	285	0.4	2.46	0.44	20	2.004	1.13	55.38	218.40	
Davie	12/12/2022	M4 831 L3	30-45cm	N6066/11	36.5	0.073	231	215	0.0	1.67	0.24	15	2.004	1.14	28.52		
Davie	12/12/2022	M4 831 L4	45-100cm	N6066/12	28.4	0.050	985	938	4.6	0.87	0.11	55	2.004	1.36	64.67		
Davie	12/12/2022	M4 832 L1	0-10cm	N6066/13	37.8	0.070	91	85	1.7	9.77	2.12	10	2.004	0.67	64.36		
Davie	12/12/2022	M4 832 L2	10-30cm	N6066/14	33.5	0.061	309	291	0.6	2.77	0.40	20	2.004	1.15	63.83	223.52	
Davie	12/12/2022	M4 832 L3	30-45cm	N6066/15	37.4	0.073	233	217	0.1	1.48	0.29	15	2.004	1.15	25.49		
Davie	12/12/2022	M4 832 L4	45-100cm	N6066/16	30.0	0.054	974	924	0.3	0.95	0.15	55	2.004	1.34	69.84		
Davie	12/12/2022	M4 833 L1	0-10cm	N6066/17	36.5	0.065	111	104	1.1	9.87	2.18	10	2.004	0.83	80.76		
Davie	12/12/2022	M4 833 L2	10-30cm	N6066/18	25.0	0.042	320	307	0.4	3.00	0.62	20	2.004	1.22	72.87	253.56	
Davie	12/12/2022	M4 833 L3	30-45cm	N6066/19	26.7	0.041	271	260	1.3	1.62	0.17	15	2.004	1.37	33.31		
Davie	12/12/2022	M4 833 L4	45-100cm	N6066/20	34.9	0.067	878	823	0.1	1.02	0.15	55	2.004	1.19	66.63		
Davie	12/12/2022	M4 834 L1	0-10cm	N6066/21	40.2	0.070	98	92	0.9	12.41	2.98	10	2.004	0.73	89.33		
Davie	12/12/2022	M4 834 L2	10-30cm	N6066/22	29.4	0.043	316	303	1.9	3.77	0.80	20	2.004	1.20	90.01	304.50	
Davie	12/12/2022	M4 834 L3	30-45cm	N6066/23	27.6	0.044	264	252	4.9	2.12	0.37	15	2.004	1.34	41.63		
Davie	12/12/2022	M4 834 L4	45-100cm	N6066/24	38.2	0.057	871	825	0.4	1.28	0.21	55	2.004	1.20	83.53		

Other M paddocks

Farm Data				Laboratory Data								Bulk Density			Soil Organic Carbon Results		
Farmer	Date	Sampling Reference	Sample Depth	Sample Code	Moisture	Gravimetric water content on the air dry soil (g water/g oven-dry mass)	Air Dry Mass (Mass of sub-sample composite)	Oven Dry Equivalent Mass **	Gravel Content (Stones and Organic Matter > 2mm)	Total Organic Carbon (LECO CNS2000 Analyser)	Labile Carbon	Soil Layer Depth	Core Radius	Bulk Density	TOTAL SOC (each depth)	TOTAL SOC (each core)	TOTAL SOC (Sample area)
			cms		%	g	g	g	g	% C	(%)	cm	cm	g/cm^3	t C/Ha	t C/Ha	t C/Ha
Davie	29/05/2019	M2	0-10cm	*i2396/1*	32.2	0.026	729	711	24.5	9.29	2.45	60	1.900	1.05	93.73		
Davie	29/05/2019		10-30cm	*i2396/2*	19.0	0.021	1772	1736	48.3	1.98	0.47	120	1.900	1.28	49.15	***205.86***	***205.86***
Davie	29/05/2019		30-95cm	*i2396/3*	27.5	0.035	5644	5453	219.7	0.82	0.21	390	1.900	1.23	62.98		
Davie	29/05/2019	M6	0-10cm	*i2391/1*	28.7	0.034	761	736	8.5	7.71	1.74	60	1.900	1.08	82.54		
Davie	29/05/2019		10-30cm	*i2391/2*	21.5	0.034	1497	1448	0.5	3.04	0.68	120	1.900	1.06	64.66	***235.48***	***235.48***
Davie	29/05/2019		30-96.63c	*i2391/3*	27.3	0.052	5476	5203	14.4	1.16	0.30	398	1.900	1.15	88.29		
Davie	12/12/2022	M2, 6, 8, 10, 12 835-839	0-10cm	*N5879/1*	34.7	0.041	569	547	6.7	8.70	1.76	50	2.004	0.87	74.51		
Davie	12/12/2022		10-30cm	*N5879/2*	24.3	0.034	1,721	1,665	97.9	2.27	0.33	100	2.004	1.32	56.62	***213.48***	***213.48***
Davie	12/12/2022		30-45cm	*N5879/3*	25.9	0.039	1,313	1,263	115.6	1.21	0.17	75	2.004	1.34	22.02		
Davie	12/12/2022		45-100cm	*N5879/4*	28.1	0.047	4,693	4,483	110.5	0.87	0.11	275	2.004	1.29	60.33		
Davie	6/12/2019	M1, 5, 7, 9. 11, 15 (ave over M1, 3, 5, 7, 9,11, 13, 15)	0-10cm	*i9012/1*	16.0	0.029	799	776	6.7	7.24	1.66	60	1.904	1.14	81.58		
Davie	6/12/2019		10-30cm	*i9012/2*	15.3	0.027	1789	1742	33.6	1.74	0.37	120	1.904	1.28	43.41	***193.88***	***193.88***
Davie	6/12/2019		30-99.33c	*i9012/3*	23.4	0.037	7014	6765	101.2	0.71	0.12	416	1.904	1.43	68.89		
Davie	12/12/2022	M11 9 7 5 3 1	0-10cm	*N5875/1*	33.5	0.038	768	741	38.0	8.57	1.91	60	2.004	0.98	79.70		
Davie	12/12/2022		10-30cm	*N5875/2*	20.1	0.027	2,104	2,049	340.7	2.67	0.56	120	2.004	1.36	60.57	***222.67***	***222.67***
Davie	12/12/2022		30-45cm	*N5875/3*	24.4	0.042	1,677	1,610	288.1	1.22	0.30	90	2.004	1.43	21.47		
Davie	12/12/2022		45-100cm	*N5875/4*	26.4	0.040	6,235	5,997	64.8	0.78	0.17	330	2.004	1.44	60.93		
Davie	12/12/2022	M 13 15	0-10cm	*N5877/1*	32.1	0.029	813	790	35.6	7.28	1.49	60	2.004	1.04	72.63		
Davie	12/12/2022		10-30cm	*N5877/2*	18.5	0.021	2,250	2,204	239.9	1.64	0.30	120	2.004	1.46	42.76	***188.31***	***188.31***
Davie	12/12/2022		30-45cm	*N5877/3*	24.1	0.037	1,696	1,636	330.4	1.11	0.23	90	2.004	1.45	19.31		
Davie	12/12/2022		45-100cm	*N5877/4*	25.2	0.041	6,124	5,882	585.0	0.76	0.15	330	2.004	1.42	53.60		

B, R & F Paddocks

Farm Data				Laboratory Data								Bulk Density			Soil Organic Carbon Results		
Farmer	Date	Sampling Reference	Sample Depth	Sample Code	Moisture	Gravimetric water content on the air dry soil (g water/g oven-dry mass)	Air Dry Mass (Mass of sub-sample composite)	Oven Dry Equivalent Mass **	Gravel Content (Stones and Organic Matter > 2mm)	Total Organic Carbon (LECO CNS2000 Analyser)	Labile Carbon	Soil Layer Depth	Core Radius	Bulk Density	TOTAL SOC (each depth)	TOTAL SOC (each core)	TOTAL SOC (Sample area)
			cms		%	g	g	g	g	% C	(%)	cm	cm	g/cm^3	t C/Ha	t C/Ha	t C/Ha
Davie	29/05/2019	B7, 8 & 9	0-10cm	*i2395/1*	22.1	0.020	860	843	1.8	4.83	1.28	60	1.900	1.24	59.79		
Davie	29/05/2019		10-30cm	*i2395/2*	13.9	0.019	1944	1907	72.3	1.73	0.41	120	1.900	1.40	46.75	***177.76***	***177.76***
Davie	29/05/2019		30-100cm	*i2395/3*	19.6	0.041	6974	6699	148.0	0.74	0.20	420	1.900	1.41	71.22		
Davie	17/08/2019	R14, 15, 13, 1 (ave	0-10cm	*i5174/1*	25.5	0.019	991	972	110.4	3.18	0.88	60	1.900	1.43	40.37		
Davie	17/08/2019	over R1, 2, 3, 4, 5,	10-30cm	*i5174/2*	18.2	0.016	2307	2271	315.0	1.05	0.22	120	1.900	1.67	30.15	***129.74***	***129.74***
Davie	17/08/2019	6, 7, 8, 9, 10, 11,	30-99.17c	*i5174/3*	24.5	0.031	7122	6910	1015.5	0.68	<0.1	415	1.900	1.47	59.23		
Davie	17/08/2019	F1, 6 (ave over F1,	0-10cm	*i5115/1*	29.8	0.021	888	871	31.4	4.47	0.91	60	1.900	1.28	55.17		
Davie	17/08/2019	2, 3, 4, 5, 6, 7)	10-30cm	*i5115/2*	19.7	0.014	2248	2216	262.9	1.49	0.35	120	1.900	1.63	42.88	***173.39***	***173.39***
Davie	17/08/2019		30-96.63c	*i5115/3*	24.7	0.042	7483	7180	362.4	0.75	<0.1	414	1.900	1.53	75.34		
Davie	6/12/2019	B6, 12, 14, 17, 19,	0-10cm	*i9018/1*	16.3	0.026	774	755	8.1	5.92	1.27	60	1.904	1.11	64.70		
Davie	6/12/2019	20 (ave over B1, 2,	10-30cm	*i9018/2*	12.7	0.022	1914	1872	42.5	1.42	<0.1	120	1.904	1.37	38.07	***172.12***	***172.12***
Davie	6/12/2019	3, 4, 5, 6. B10, 11,	30-99.33c	*i9018/3*	21.8	0.038	7076	6815	148.1	0.71	<0.1	416	1.904	1.44	69.35		

H Paddocks

Farm Data				Laboratory Data								Bulk Density			Soil Organic Carbon Results		
Farmer	Date	Sampling Reference	Sample Depth	Sample Code	Moisture	Gravimetric water content on the air dry soil (g water/g oven-dry mass)	Air Dry Mass (Mass of sub-sample composite)	Oven Dry Equivalent Mass **	Gravel Content (Stones and Organic Matter > 2mm)	Total Organic Carbon (LECO CNS2000 Analyser)	Labile Carbon	Soil Layer Depth	Core Radius	Bulk Density	TOTAL SOC (each depth)	TOTAL SOC (each core)	TOTAL SOC (Sample area)
			cms		%	g	g	g	g	% C	(%)	cm	cm	g/cm^3	t C/Ha	t C/Ha	t C/Ha
Davie	27/05/2011	SCDAV01	0-10cm	*B4111/10*			1154	1154	0.0	6.46	1.44	100	1.900	1.02	65.77	**65.77**	129.07
Davie	27/05/2011	SCDAV01	0-20cm	*B4111/11*			1396	1396	0.0	3.24	0.71	100	1.900	1.23	39.90	**39.90**	
Davie	27/05/2011	SCDAV01	0-30cm	*B4111/12*			1312	1312	0.0	2.02	0.37	100	1.900	1.16	23.40	**23.40**	
Davie	15/12/2021	H2 H4 H6	0-10cm	*M4771/1*	23.0	0.044	804	771	8.7	5.89	0.86	60	1.981	1.04	60.64	***194.62***	***194.62***
Davie	15/12/2021		10-30cm	*M4771/2*	20.4	0.041	1,741	1,671	14.9	2.53	0.28	120	1.981	1.13	56.68		
Davie	15/12/2021		30-45cm	*M4771/3*	33.6	0.041	1,190	1,144	3.7	1.52	0.21	90	1.981	1.03	23.42		
Davie	15/12/2021		45-100cm	*M4771/4*	32.0	0.084	5,270	4,861	38.1	0.83	0.15	330	1.981	1.20	53.88		
Davie	22/02/2019	H8	0-10cm	*H9390/1*	16.8	0.047	799	763	4.7	7.10	0.65	60	1.900	1.12	79.10	***211.41***	***211.41***
Davie	22/02/2019		10-30cm	*H9390/2*	22.7	0.062	1,761	1,658	10.4	2.50	0.40	120	1.900	1.22	60.45		
Davie	22/02/2019		30-45cm	*H9390/3*	26.8	0.053	1,130	1,073	9.4	1.41	0.26	90	1.900	1.05	22.07		
Davie	22/02/2019		45-96.67cr	*H9390/4*	29.2	0.127	4,733	4,199	8.5	0.81	0.04	315	1.900	1.18	49.78		
Davie	15/12/2021	H8	0-10cm	*M4779/1*	20.7	0.052	895	850	0.8	6.52	0.82	60	1.981	1.15	74.89	***201.74***	***201.74***
Davie	15/12/2021		10-30cm	*M4779/2*	23.7	0.054	1,632	1,549	0.0	2.92	0.44	120	1.981	1.05	61.10		
Davie	15/12/2021		30-45cm	*M4779/3*	29.7	0.062	1,238	1,166	0.0	1.51	0.18	90	1.981	1.05	23.76		
Davie	15/12/2021		45-100cm	*M4779/4*	35.8	0.082	4,240	3,920	2.0	0.79	<0.05	330	1.981	0.96	41.98		
Davie	24/01/2023	1442 L1 H8	0-10cm	*N8275/1*	15.3	0.039	136	131	1.4	5.21	1.07	10	1.985	1.06	54.45	**54.45**	**161.59**
Davie	24/01/2023	1442 L2 H8	10-20cm	*N8275/2*	22.6	0.049	150	143	0.0	2.11	0.34	10	1.985	1.15	24.30	**24.30**	
Davie	24/01/2023	1442 L3 H8	20-30cm	*N8275/3*	26.7	0.056	168	159	2.8	1.50	0.24	10	1.985	1.29	18.99	**18.99**	
Davie	24/01/2023	1442 L4 H8	30-45cm	*N8275/4*	27.7	0.057	222	210	3.6	1.12	0.17	15	1.985	1.13	18.67	**18.67**	
Davie	24/01/2023	1442 L5 H8	45-100cm	*N8275/5*	27.4	0.063	909	856	0.0	0.65	0.08	45	1.985	1.54	45.18	**45.18**	
Davie	24/01/2023	1440-1443 SCARP	0-10cm	*N8508/1*	16.4	0.041	1348	1295	20.9	7.21	1.52	100	1.985	1.05	74.20	**74.20**	**223.82**
Davie	24/01/2023	1440-1443 SCARP	10-20cm	*N8508/2*	17.8	0.038	1517	1462	58.6	3.70	0.63	100	1.985	1.18	42.06	**42.06**	
Davie	24/01/2023	1440-1443 SCARP	20-30cm	*N8508/3*	21.5	0.041	1463	1406	29.8	2.62	0.41	100	1.985	1.14	29.17	**29.17**	
Davie	24/01/2023	1440-1443 SCARP	30-45cm	*N8508/4*	25.5	0.048	2185	2085	23.8	1.74	0.29	150	1.985	1.12	28.98	**28.98**	
Davie	24/01/2023	1440-1443 SCARP	45-100cm	*N8508/5*	22.9	0.066	7443	6984	3.2	0.88	0.12	450	1.985	1.25	49.40	**49.40**	