

Chelmsford Monitor Farm

Meeting title: Fertility building and organic weed control

Date: 10 January 2020

Speakers: John Pawsey (Shimpling Park Farms); John Williams (ADAS)



Modern organic farming systems John Pawsey

- Shimpling Park Farms Ltd: 1471ha of organic cropping, 1000 breeding ewes, 0.8 HP/ha (with combine), 68gasoil/ha, 3 full time staff and 1 full time shepherd, partial organic conversation in 1999
- Reasons for going organic included that there were great people locally to learn from, conservation minded, farming landscape in 1999, made financial sense
- Rotation:
 - Year 1: grass/clover/herbal ley or diverse clover mixture
 - Year 2: grass/clover/herbal ley or diverse clover mixture
 - Year 3: winter spelt/wheat or spring quinoa
 - Year 4: spring oats/barley
 - Year 5: winter beans or spring peas, inter-cropped?
 - Year 6: spring barley - under-sown
....but prepared to change.
- Diversity is key – design a system that works for each soil type and on your farm. Be prepared to change, eg. fields with different fertility levels, feeds with a weed problem.
- Pests: inter-row hoeing to push dirt against wheat plants to protect against gout fly; building beneficial numbers; disrupting lifecycles
- Diseases: bi-cropping (eg. oats and beans), varietal blending, crop spacing
- Weeds: row spacing, inter-row hoeing (objective is to hoe 70% of the field), drainage, rotation inc. livestock, crop architecture, eg. spelt in a first cereal situation is great for shading
- System Chameleon – inter-row hoe and drill; main aim of the hoe is to separate the green part of the plant from the roots, parallelogram design on the hoe. Hoe at GS32-33 – wait until the canopy is just about to close.
- Sheep: best way to increase organic matter? Using grass leys is key. In trials, the sheep were shown to have reduced black-grass levels by 20%. NZ Romneys are the breed used, strict culling policy enforced (bad feet, need to worm, can't lamb on their own).
- Is organic no-till possible? There are a few trying it, but significant challenges involved.
- Surveying and monitoring: Important to know what you have got. Surveys at Shimpling Park Farm include: birds, bees, dragonflies, pond, wasps, botanical etc



- Gross margins:
 - Non-organic, 3 year rotation: £773/ha
 - Organic rotation without sheep: £865/ha
 - Organic rotation with sheep: £945/ha

*"The 20th Century
was the century of
chemical agriculture.
The 21st Century will
be the century of
biological agriculture"
Prof Tim Benton*

Take-home messages

- Ensure diversity in everything** = key (rotation design, cultivation, drilling dates, crop competition, crop spacing, companion cropping, livestock, mechanical weeding)
- Consider wider opportunities of going organic and positive growth of the market.

Further information

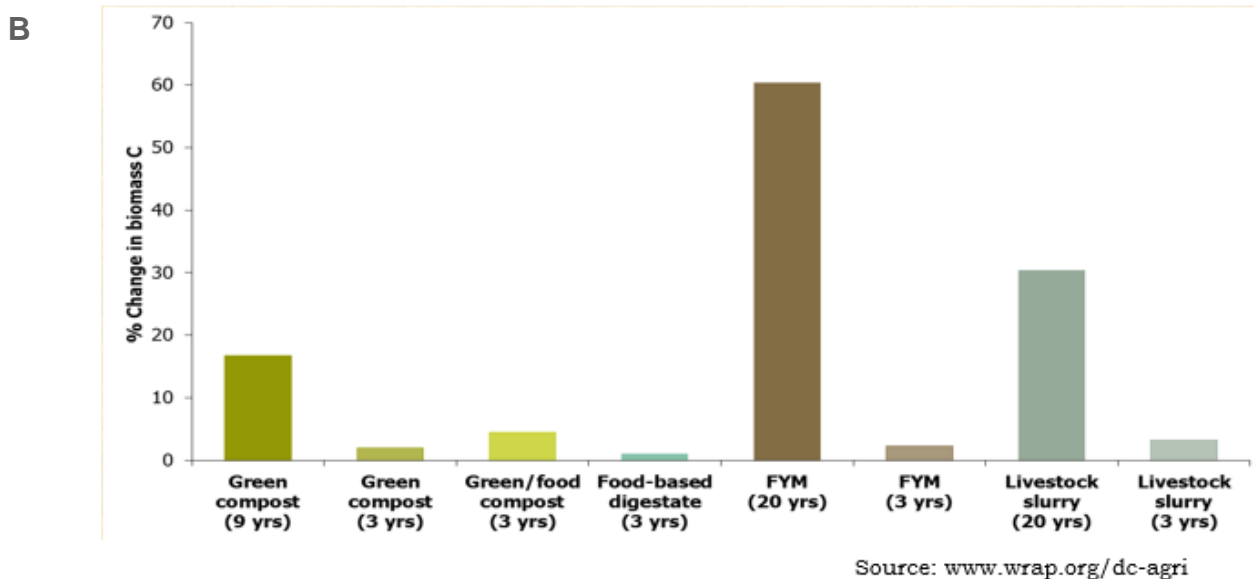
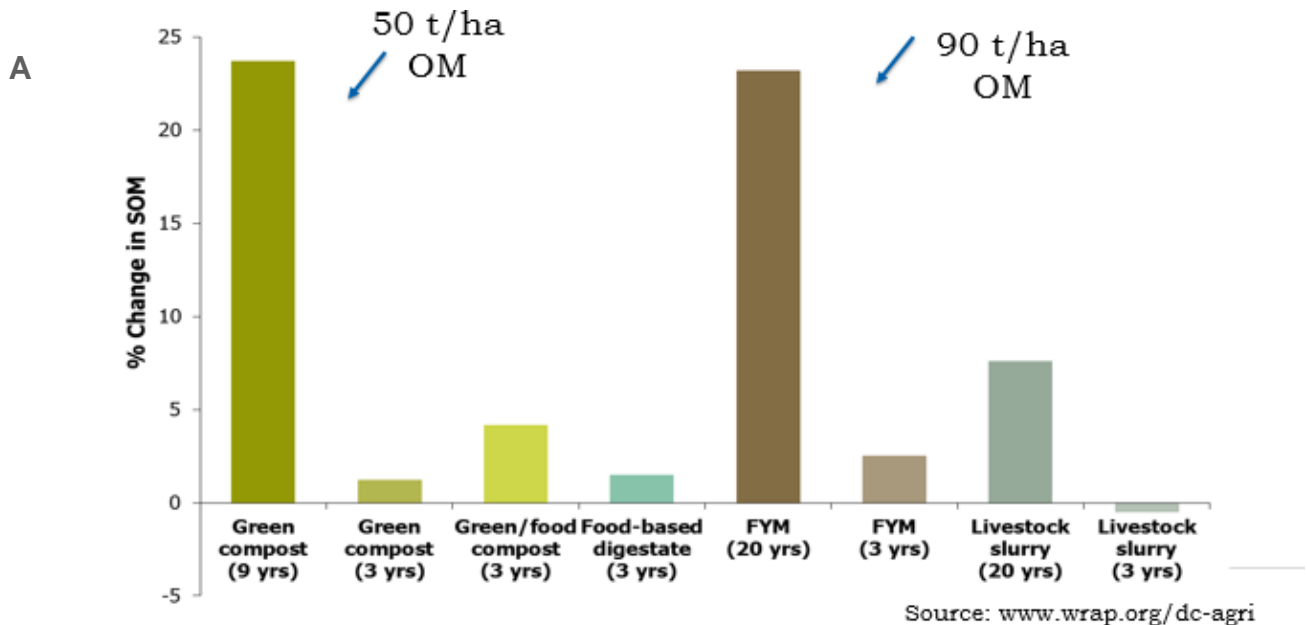
- [Livestock and the arable rotation](#)
- [Maxi-cover crop research project](#)
- Research Review: [Weed control options and future opportunities for UK crops](#)

Benefits of using organic materials John Williams

- Soil organic matter has many benefits including: positive effect on aggregation and structure, food source and habitat for soil biology, which leads to nutrient cycling, water relations and carbon store.
- Soil organic matter measurements can be used as an overall indicator of soil quality
- What can we do to maintain/increase soil organic matter in arable systems?
 - Convert to permanent grassland
 - Introduce rotational grass
 - Use cover crops/green manures; incorporate residues
 - Apply organic materials
- Permanent grassland can increase soil organic matter, eg a 25% was noted on an Oxfordshire research site, but there isn't an exponential increase.
- Cover crops are useful for many areas, eg. over-winter soil cover, N capture, soil structuring. However, there is limited evidence of organic matter increases.
- Organic materials are a very good source of organic matter, but all give very different levels of organic matter increases:

Organic material	Dry matter (%)	Application rate (250 kg/ha total N)	Organic matter applied (t/ha)
Cattle FYM	25	42	5.5
Broiler Litter	60	8	2.5
Green compost	60	33	4.5
Biosolids cake	25	23	3.8
Pig slurry	4.0	70	2.0

- The graphs below show the change in organic matter % in one research project (DC-Agri soil quality), with sites across the UK and in different rotations. A = Organic manure applications increases on soil organic matter content; B = The effect on topsoil microbial biomass carbon.



- If you are wanting to build organic matter, best to have bulky manures. The application rate for some of the organic materials also needs to be quite significant.
- If applying organic materials, make sure that you are complying with [Farming Rules for Water](#) and [NVZ regulations](#).
- Measure soil nutrients and conduct manure analysis (or use RB209 standard figures). Take these into account when carrying out fertiliser recommendations.

Take-home messages

- Organic materials are valuable sources of plant nutrients and organic matter

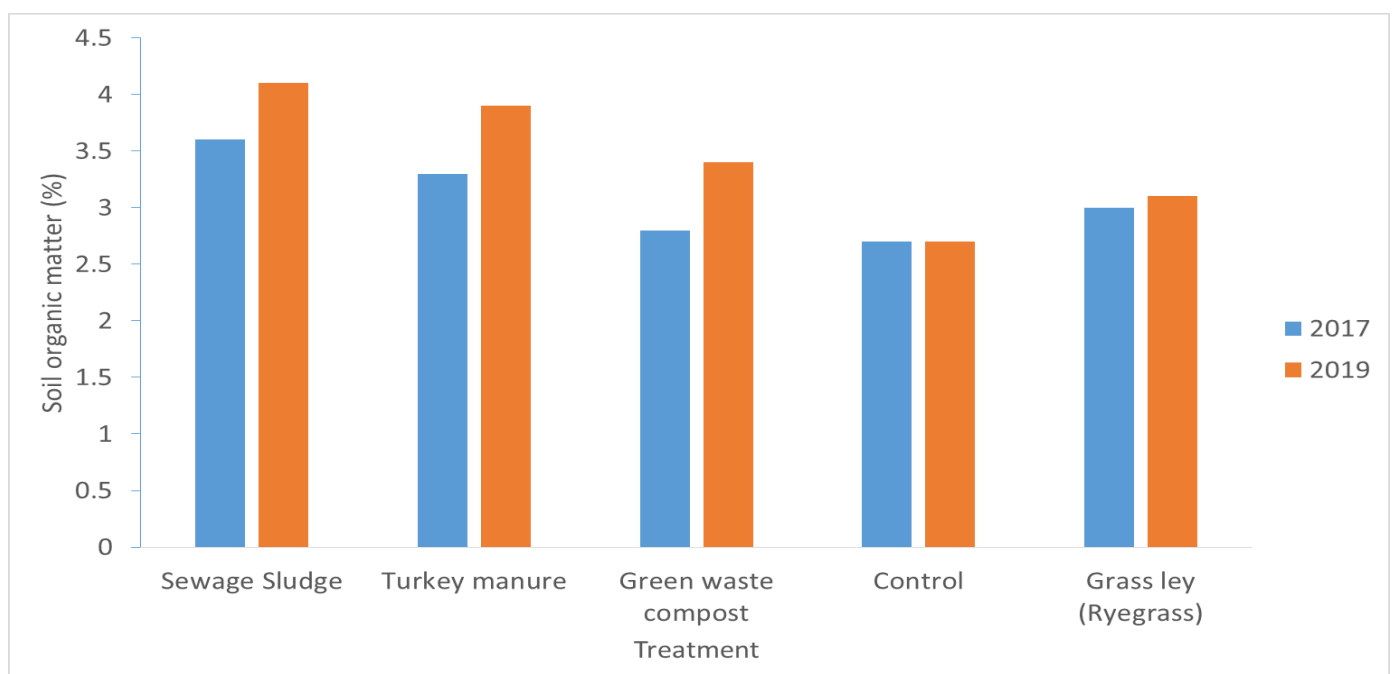
- The quality and quantity of organic matter varies with manure type
- In arable soils, increasing organic matter can improve water holding capacity, soil structure and increase crop yields
- Applications must be planned to comply with legislation:
 - Crop requirement
 - Soil sampling
 - Application rate
 - Application timing
- Allowing for nutrients supplied by manures will reduce fertiliser bills

Further information

- [Nutrient management guide \(RB209\)](#)
- GREATSOILS: www.ahdb.org.uk/greatsoils

BROOKFIELD ORGANIC MATTER TRY-OUT RESULTS

- Brookfield, a clay loam soil, field at Parklands Farm was used to test the best way of increasing soil organic matter over the three year Monitor Farm period.
- The field was split into five sites:
 1. Biosolids – 20t/ha applied in 2017 and 2018
 2. Turkey litter – 20t/ha applied in 2017 and 2018
 3. Green waste compost – 20t/ha applied in 2017 and 2018
 4. Control
 5. Grass ley – ryegrass ley mix, established in 2017, grazed
- The impact of the organic materials treatments on organic matter over the time can be seen below:



AHDB resources

- Understand your business costs with AHDB's benchmarking tool Farmbench at ahdb.org.uk/farmbench
- Monitoring tools are available at ahdb.org.uk/tools
- Sign up to market information and research newsletters at ahdb.org.uk/keeping-in-touch
- Find out what's going on at other Monitor Farms and Strategic Farms at ahdb.org.uk/farm-excellence
- All AHDB events can be found at ahdb.org.uk/events
- For guidance on how Brexit will impact your business, see ahdb.org.uk/brexit

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