

The Ten Year Perspective – Food Waste, Packaging and Compostables in the UK 2020-2030

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What is Driving BBIA Members?

- ❖ Industrial development of a sustainable local bioeconomy
- ❖ The biological loop starts, finishes with or in the case of water is influenced, by soil quality and soil health
- ❖ Members need healthy soils for 1st or 2nd generation feedstocks
- ❖ Symbiotic not parasitic relationships
- ❖ Current UK compostable plastics and packaging market ~ 15KT
- ❖ Optimistic but realistic compostable plastics and packaging market projections for 2030 is 100KT (BBIA) – 150 KT (BPF)
- ❖ Many members need sustainable organic recycling industry for product recycling

Biowaste - Where is the UK today?

- ❖ High proportion of garden waste collected separately
 - ❖ ~5 MT = ~80-90%
- ❖ Very low proportion of municipal food waste collected separately – most often, any bag permitted – wet AD
 - ❖ ~0.8 MT = ~10%
 - ❖ **Total capacity inc other organic wastes ~9MT**
- ❖ Economic model – gate fees* and subsidies
 - ❖ IVC gate fees - £50 - £55 / tonne
 - ❖ AD gate fees - £0 - £5 / tonne
 - ❖ Biogas/biomethane/heat subsidy/power sales - £60 - £70 / tonne
 - ❖ * - these are mode results taken from the 2019 WRAP gate fees report

Biowaste - Where is the UK today?

- ❖ National specifications for composts (PAS100) and digestates (PAS110)
 - ❖ End of waste status currently under review
- ❖ Low but + value, established markets – agriculture, horticulture – for quality compost
- ❖ At best very low but typically – **value**, very limited “market” – agriculture – for quality (whole) digestate
- ❖ Concern at levels of contaminants, particularly plastics
- ❖ Economic situation and competition ‘encouraging’ reduced processing times
- ❖ Turnover of industry 2017 - ?? **£350M?**

Biowaste – how does the UK compare to the best in Europe for food waste - Italy?

- ❖ High proportion of garden waste collected separately
 - ❖ ~2 MT
- ❖ High proportion of food waste collected– only compostable bags permitted but still contamination is an issue – IVC, AD + IVC/OAW
 - ❖ ~4.6 MT ~47%
 - ❖ **Total capacity inc other organic wastes 9MT**
- ❖ Established markets for compost as UK – uncomposted digestate cannot go to soil
 - ❖ High + value (€10+ / tonne)
- ❖ Economic model
 - ❖ Gate fees ~€100-180 / tonne
- ❖ Turnover of industry 2017 - **€1.8 billion**

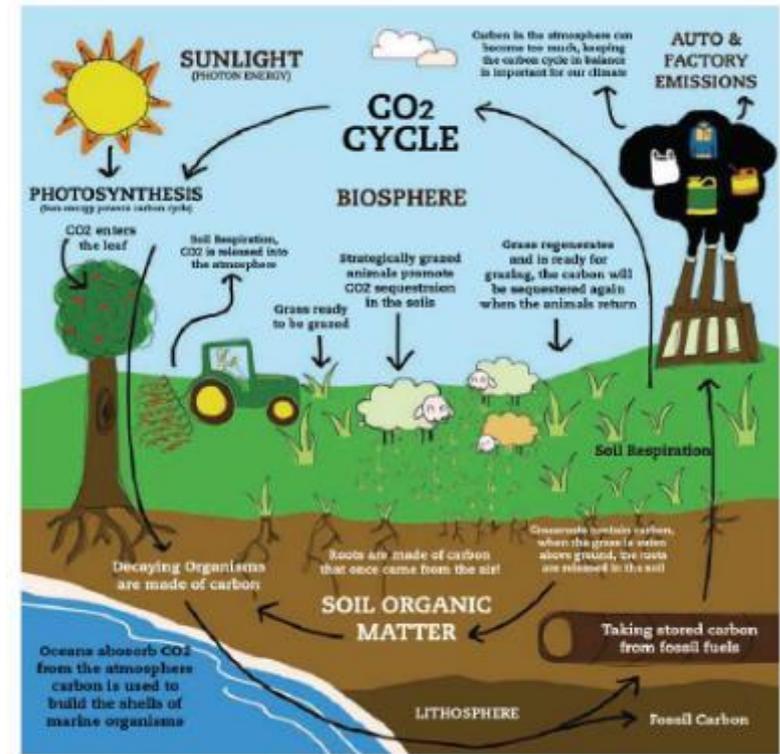
- ❖ **As a whole Europe collects just 16% of its food waste
66% of which is in Italy**

Today our Concerns are the same

- ❖ Climate Emergency
 - ❖ Health and Social Crisis
 - ❖ Air Pollution
 - ❖ Water Supply and Pollution
 - ❖ Non-renewable Resource Depletion
 - ❖ Biodiversity Loss
 - ❖ Plastic Pollution
 - ❖ Economic reset
- ❖ Soil, and therefore biowaste management impacts all of these

Soil – Why is it Important?

- ❖ Fundamental to life on Earth
- ❖ Carbon (sequestration)
- ❖ Air quality
- ❖ Water quality
- ❖ Food production
- ❖ Flood protection
- ❖ Biodiversity
- ❖ Essentially a non-renewable resource



But



Illustration by Jack Richardson for POLITICO

Mud and guts: Europe's forgotten environmental crisis

In a policy void, scientists are scrambling to save dying soils.

By EMMET LIVINGSTONE | 4/3/19, 8:00 PM CET | Updated 4/6/19, 7:02 AM CET



Soil erosion costs European farmers €1.25 billion a year

27 2018
Soil erosion costs European countries €1.25 billion in annual agricultural productivity loss and €155 million in the gross domestic product (GDP) loss, according to a JRC new study.



© Tim Glass - Adobe Stock.com

Soil erosion is the biggest threat to soil fertility and productivity, but the consequences do not stop there.

A recent JRC study combined biophysical and macroeconomic models to determine direct and macroeconomic costs of soil erosion, and the results are striking.

UK is 30-40 years away from 'eradication of soil fertility', warns Gove

Farmers must be incentivised to tackle decline in biodiversity, says environment secretary at launch of parliamentary soil body



▲ "If you slash soil in chemicals that improves yields... but ultimately you are cutting the ground away from beneath your own feet. Farmers love that," said Gove. Photograph: Klumy Stock Photo



Why we should discuss soil as much as we talk about coal

Published on March 25, 2019



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Soil / Soil Carbon loss

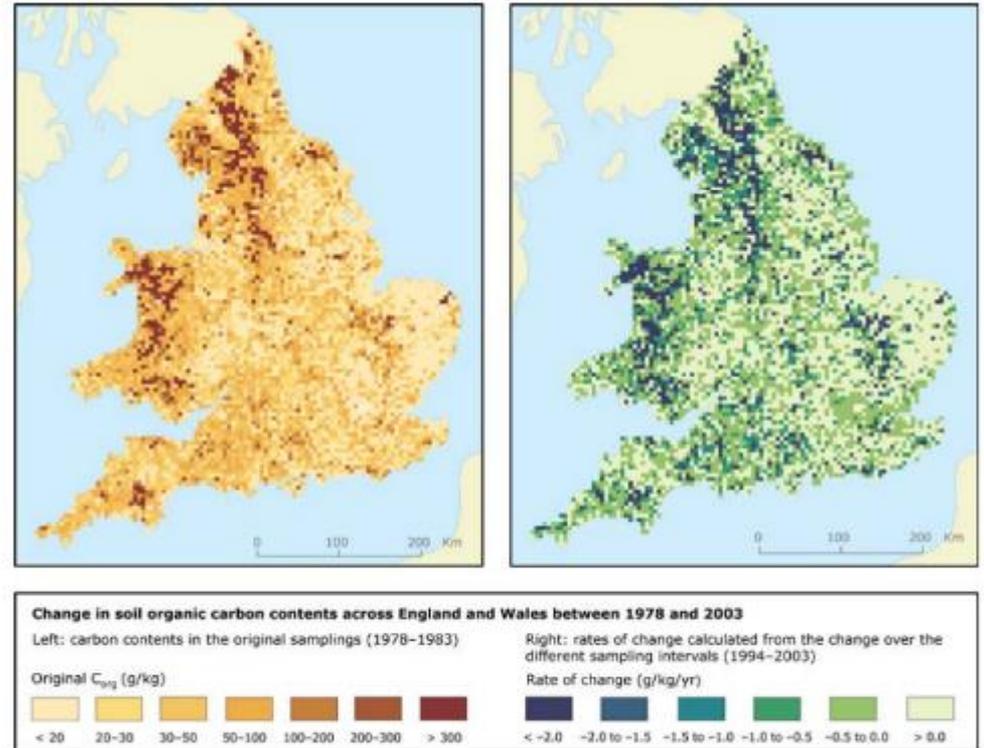
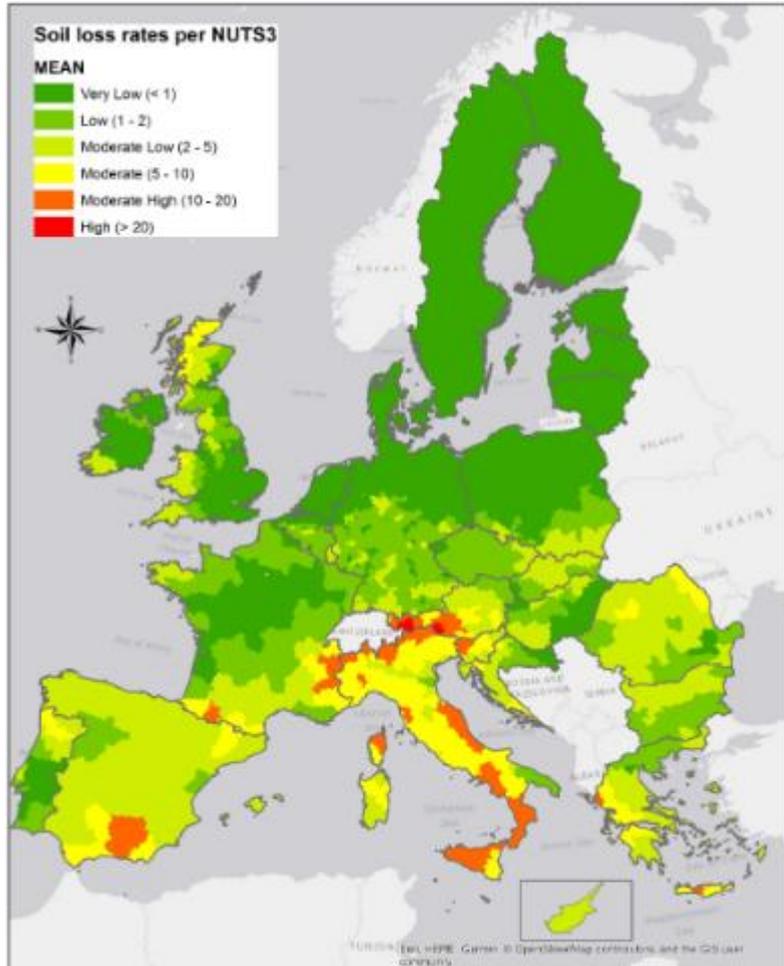


Figure 6: Changes in soil organic carbon content across England and Wales between 1978 and 2003. Source: Bellamy et al., 2005.

UK loses 3 MT of fertile topsoil every year

Biowaste – A simple solution?

- ❖ UK generates ~10-12 MT of biowaste / year
- ❖ 2000-2020 huge growth in capacity but limited collection
- ❖ Future brings mandatory biowaste – food / garden collections to England (catching up with rest of UK)
- ❖ **Biowaste can help meet targets to reduce GHG emissions, produce renewable energy, return nutrients to soil, restore the soil to soil loop that urbanisation has broken.**
- ❖ So job done?
- ❖ Today the limited collection means high competition for feedstocks resulting in:
 - ❖ Negligible gate fees
 - ❖ Lack of investment in upgrading existing facilities
 - ❖ Lack of attention on end outputs
 - ❖ Tolerance of contamination
 - ❖ 5% is contractually common, more is cited

Feedstocks - What does 5% plastic mean?

- ❖ 5% (wt) plastic = at least 6250 carrier bags / tonne
 - ❖ Mass loss in process = 9.5%
- ❖ Drag Effect
 - ❖ For every tonne of plastic a further 1.5-2 tonnes of organic waste is lost
- ❖ Cost
 - ❖ Italy @1.5% 6MT €100M
 - ❖ UK @5% 5 MT £200M+
 - ❖ EU @1.5% €1BN +
- ❖ Does not account for:
 - ❖ Machinery wear / tear, blockages, capacity to handle large quantities of plastics, resource loss, reduction biogas yield, loss of carbon attached to plastics
 - ❖ Microplastics in output

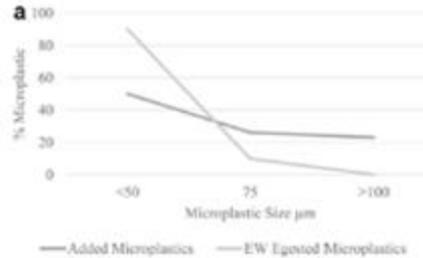


Micro-plastics in sludge and soil

- 10Mt/yr of organic wastes (incl. biosolids and composts) applied to farmland
- Estimated to include >100 kt of microplastics



Plastics in compost (from Bläsing and Amelung 2018)



Earthworms concentrate finer microplastic particles in their casts (from Lwanga et al. 2016)



21 MARCH 2019

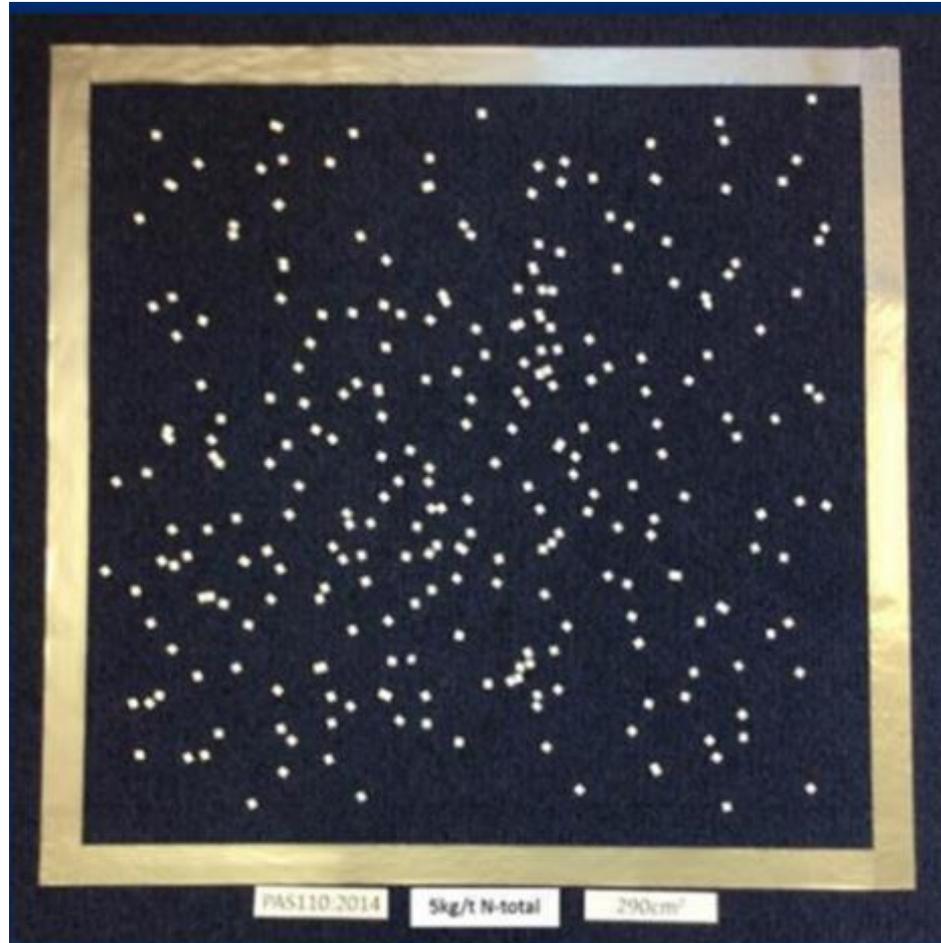
by Steve Emlinton

Agency warns over plastics in compost and AD

The Environment Agency has threatened a crackdown on poor performing composting and AD sites, where plastic is found in material to be spread to land.

And the action could have a knock-on effect on local authorities who could be in trouble for breaching duty of care rules for delivering contaminated feedstock to their organics contractors.

The 'good' stuff



Getting the Outputs right

Compaction and erosion 'a serious threat' to UK farm soils

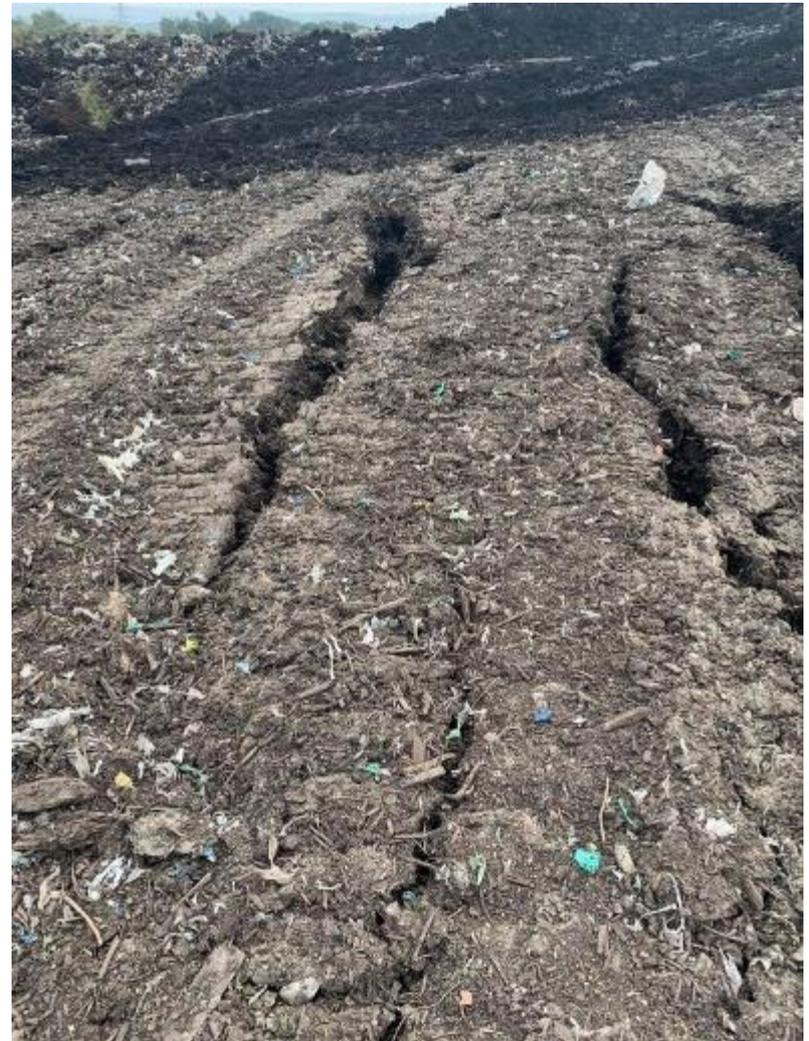


'Unsustainable' levels of soil erosion found in UK

22 April 2020 | by FarmingUK Team | Article, News, Research and Environment



'Unsustainable' soil erosion has been recorded in parts of the UK, according to a team of researchers



Impacts of Whole Digestate on Soil

- ❖ Fertiliser benefits of digestate well established but....
- ❖ Food waste digestate has negative effect on Light Fraction of Organic Matter
- ❖ Food waste digestate increases bulk density and thus compaction
- ❖ Food waste digestates increases worm mortality
- ❖ Electrical Conductivity of QP manures, slurries and digestates many times higher than permitted as waste spread to land
- ❖ Injected manures shown to desiccate soils, increase worm mortality and reduce avian biodiversity

Realising the Opportunity

- ❖ Millions of tonnes of nutrients and organic matter
- ❖ Balancing the benefits of energy potential with soils' needs
- ❖ Experience shows facility integration at scale provides systemic environmental, ecological, economic benefits where:
 - ❖ Design starts with the soil
 - ❖ Design ends with the collection

What has any of this got to do with compostables?

- ❖ Food waste collection must be clean, convenient and efficient
- ❖ Multiple evidences that bags are fundamental
 - ❖ Bags must be compatible with the system – the system must be compatible with the overarching needs
- ❖ Compostable bags are proven over and over to:
 - ❖ Improve efficacy of collection system
 - ❖ Reduce associated contamination
 - ❖ Not negatively impact quality processes or outputs
- ❖ Essential that the processes deliver the outcomes society demands
- ❖ Italy – various interventions on bags – market 100,000T
- ❖ So 1.5-2% input delivers 6MT of biowaste
- ❖ EPR for compostables – industry must be able to contribute financially to the system for which they are designed
- ❖ Must not lose perspective on scale

Conclusions

- ❖ Opportunities for environmental, ecological and economic improvement from biowaste are enormous
- ❖ They will only be realised if a systemic and strategy approach is taken
- ❖ Compostables are not a “plastic” issue they are a lubricant to enable biowaste collection – a bio-lubricant
- ❖ Policy makers and wider stakeholder engagement must go beyond the granular, almost myopic approach of today to a higher, more systemic level

Thank you for your attention

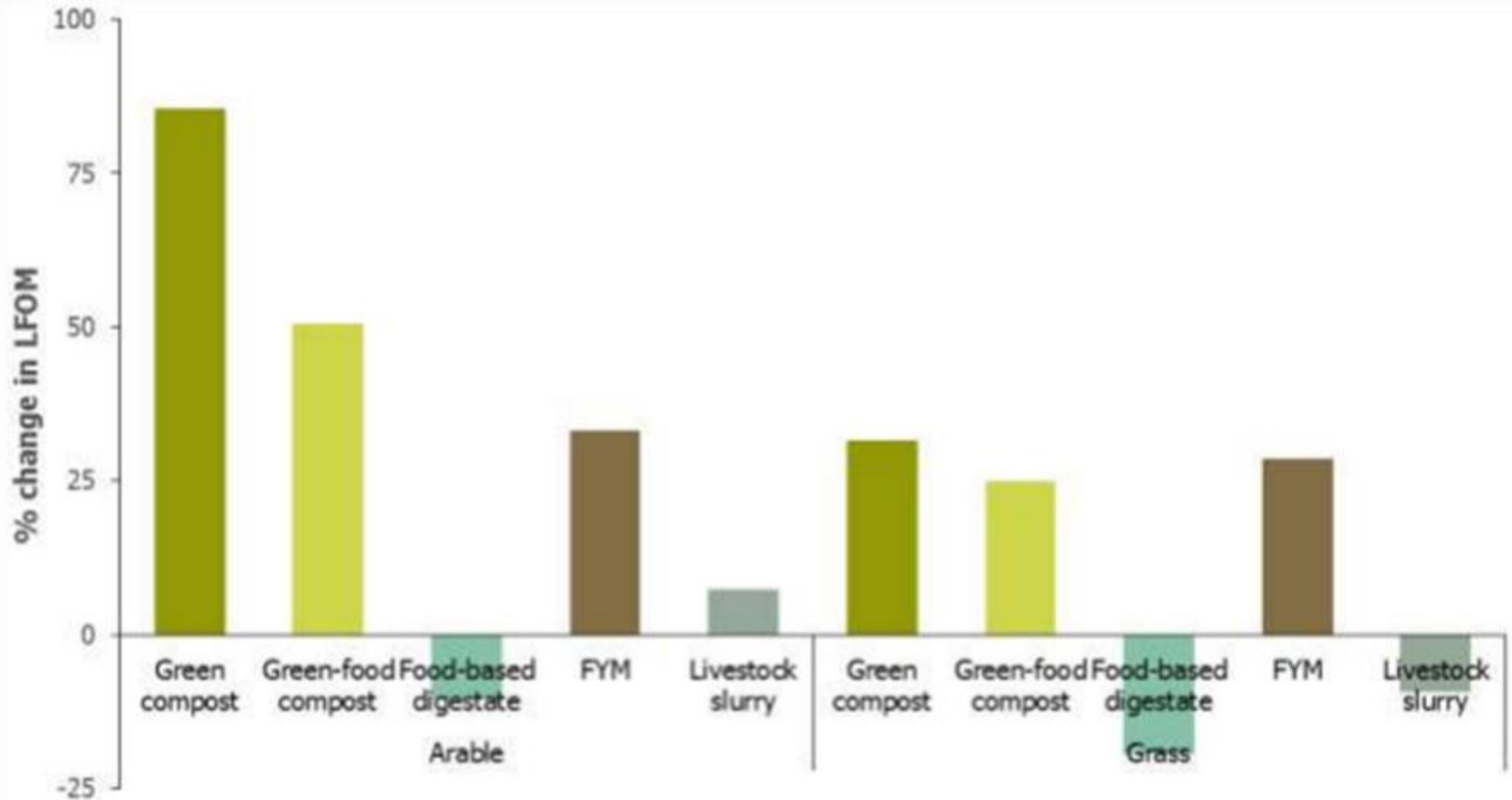
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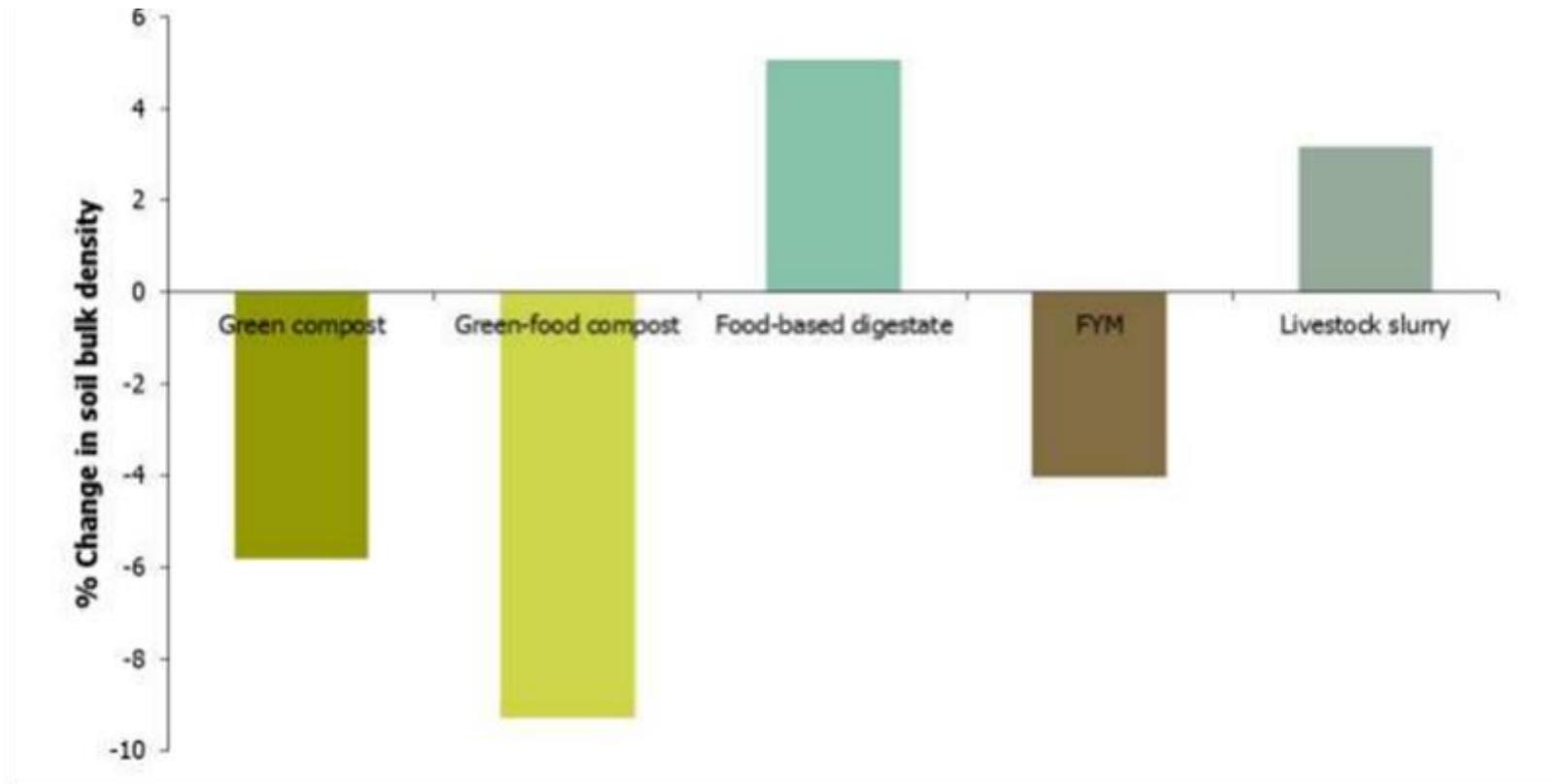
References

- ❖ BBIA Policy Paper <https://bbia.org.uk/wp-content/uploads/2020/12/BBIA-policy-paper-December-2020.pdf>
- ❖ WRAP DC Agri studies <https://www.wrap.org.uk/content/digestate-and-compost-agriculture-dc-agri-reports>
- ❖ Rollet et al, 2020, The effect of field application of food-based anaerobic digestate on earthworm populations <https://doi.org/10.1111/sum.12615>
- ❖ Onrust et al, 2019, Earthworm activity and availability for meadow birds is restricted in intensively managed grasslands <https://doi.org/10.1111/1365-2664.13356>
- ❖ WRAP, 2019, Gate fee reports <https://www.wrap.org.uk/collections-and-reprocessing/recovered-materials-markets/reports/gate-fee-reports>

Impact on LFOM (WRAP)



Impact on Soil Bulk Density (compaction) - WRAP



Earthworm Counts – Grassland (WRAP)

