

Digestate and compost use in agriculture

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wrap



Good practice guidance for agricultural contractors

Good practice guidance

Anaerobic digestate and compost can be considered renewable fertilisers, much like livestock slurry and farmyard manure.

This guide provides an introduction to compost and anaerobic digestate, the importance of supplying the right quality, and how they should be applied to the field.

The guide is intended to complement rather than replace other statutory or good practice guidance for handling these materials. Separate guidance is available for farmers, growers and agronomists to help them make the best use of digestate and compost. These materials are available at www.wrap.org.uk/using-renewable-fertilisers

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1.0 What are digestate and compost?

1.1 Digestate

Digestate (also known as 'anaerobic digestate' or 'biofertiliser') supplies readily available nitrogen that allows farmers to reduce their inputs of conventional fertiliser. It is one of the products of anaerobic digestion (AD), which is the controlled biological decomposition of biodegradable materials such as food wastes and animal manures in the absence of oxygen.

Digestate is normally produced 'whole' (a slurry with a dry matter content of around 5%), but this can be separated into fibre and liquor fractions.



Whole digestate

1.2 Compost

Compost is both a soil conditioner and a source of major plant nutrients, including readily available potash, made from the controlled biological decomposition of either solely green waste (e.g. lawn clippings, prunings, woody material) or from a mix of green waste and food waste, in the presence of oxygen.

Compost usually contains little readily available nitrogen, although soil nitrogen supply can be increased over the long term following its repeated use. Compost has a liming value, while repeated use over time can increase soil organic matter levels, improving workability and water retention properties.



Compost (image courtesy of Audrey Litterick)

2.0 Supplying material of the right quality

Digestate and compost that is certified under the **Biofertiliser Certification Scheme**¹ and the **Compost Certification Scheme**² does not normally need an environmental permit or exemption to be in place for their application to land. In other words, waste-derived digestate and compost become products (i.e. they are no longer wastes) once certified under the relevant scheme.

A core requirement of each certification scheme is compliance with the baseline quality specifications, set by the British Standards Institution:

- **Publicly Available Specification 110**³ (PAS110) for anaerobic digestate, and
- **Publicly Available Specification 100**⁴ (PAS100) for compost.

While each PAS specifies minimum quality criteria, they also allow customers to specify higher quality thresholds. It is important to check whether farmer and grower customers have any additional quality requirements.



Trailing hose bandspreader (image courtesy of Gask Farm)

3.0 Hauling digestate and compost

Composts certified under the Compost Certification Scheme (CCS), and digestates certified under the Biofertiliser Certification Scheme (BCS) are considered products, and a waste carrier licence is not required to haul these materials.

Registration may be required if hauling materials that are derived from inputs that include food waste (or other allowed animal by-products), whether they are certified or not – see **Section 5.0**.



4.0 Storing digestate and compost on farm (before use)

Certified digestates and composts are considered products, and environmental permits or waste management licenses or exemptions are not required to store them.

However, should they be stored “indefinitely with little or no prospect of being used”, then it is likely that the environmental regulators will consider them to be wastes, and appropriate authorisations would be needed to continue their storage.

Specific requirements⁵ apply to digestates and composts stored in Nitrate Vulnerable Zones.

4.1 Temporary field heaps in Nitrate Vulnerable Zones

Field heaps of compost and fibre digestate should be carefully managed to minimise the risks of water pollution.

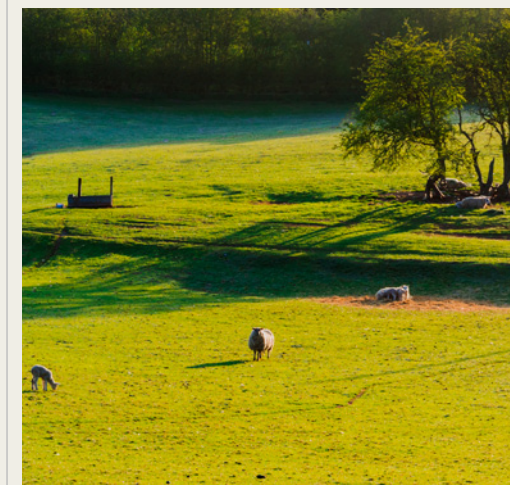
Temporary field heaps must:

- Be made from compost and fibre digestate solid enough to be stacked in a freestanding heap;
- Not give rise to free drainage from within the stacked material; and
- Should occupy as small a surface area as is needed to support the weight of the heap without it collapsing.

Farmers must:

- Make sure the field heap is at least 10 metres from any surface water (e.g. a river, pond or ditch) or land drain, or 30 metres if the land slopes at 12 degrees or more;
- Make sure the location of the field heap isn't liable to being waterlogged or flooded;
- Locate field heaps at least 50 metres from a spring, well or borehole;
- Move the field heap at least every 12 months;
- Leave a two year gap before returning to the same site; and
- Keep a record of the sites used for field heaps and the dates of use.

Stores for liquid digestates must comply with the requirements of the **SSAFO regulations**⁶. These stores must not be sited within 10 metres of inland or coastal waters without written agreement from the environmental regulator.



5.0 Are there special considerations for digestate and compost made from food waste?



Digestate and compost derived from inputs that include food waste (or other allowed animal by-products) are covered by the Animal By-Product Regulations, irrespective of whether they are certified by the biofertiliser or compost certification schemes. There are a number of statutory requirements associated with the haulage, storage and application of these materials, including:

- A requirement for hauliers to register with the **Animal and Plant Health Agency**⁷ (APHA), unless they work as a transporter for a site that's already approved or registered with APHA to handle animal by-products;
- Consignments of digestate and compost destined for use on agricultural land must be **accompanied by documentation**⁸ drawing the recipient's attention to the statutory grazing and harvest intervals associated with these materials; and
- Digestate and compost stores do not need to be **registered with APHA**⁹ if the stores are at the same place where the materials will be used. However, when stored on farm, digestate and compost must be stored in such a way that livestock cannot access them before they are applied to land. Once applied to land, the statutory grazing and harvest intervals apply.

6.0 Can digestate and compost be used for all crops?

Digestate and compost are compatible with all crops, but should only be used in line with the requirements of the Renewable Fertiliser Matrix (see **Section 9.0**). The Matrix is based on digestate and compost that are certified by the Biofertiliser and Compost Certification schemes.

6.1 Use of digestate and compost on organic holdings

The governing **EU regulation for organic farming**¹⁰ lists the types of compost and digestate that are considered acceptable for use by organic farmers and growers. Farmers should check with their organic certifying body before placing an order for digestate or compost – and only compliant material should be supplied.



7.0 How should digestate and compost be applied to the field?

Similar to livestock slurries, liquid digestates can pollute surface water if applications are not managed carefully. In particular, digestate and compost should not be spread on frozen, snow-covered or waterlogged ground, or within 10 metres of a watercourse.

Additional good practice guidance for the application of livestock manures and slurries should be followed when applying compost and digestate. Detailed information can be found in:

- the **Code of Good Agricultural Practice**¹¹ in England;
- the **Code of Good Agricultural Practice for Wales**¹²; and
- the **Prevention of Environmental Pollution from Agricultural Activity**¹³ in Scotland.

✓ Best practice for applications

- Liquid digestate should be applied using precision application equipment such as band spreaders or shallow injectors or, where appropriate, be incorporated rapidly into the soil. This will significantly increase the amount of nitrogen available for crop uptake and reduce the amount lost as ammonia.
- Broadcasting digestate with a splash-plate is not recommended.
- Compost and fibre digestate can be spread with most conventional muck spreaders.
- All equipment should be well maintained and calibrated for the type of material being applied.



Image courtesy of ADAS

Food-based digestate is an effective renewable fertiliser supplying crop available nitrogen, of which a high proportion is ammonium. It is known that livestock slurries that contain a high proportion of ammonium-N may sometimes have a negative impact on earthworms, and this effect may also be seen sometimes following applications of food-based digestate.



Image courtesy of SRUC

It is recommended that ammonium-N loading rates are controlled by following normal good practice, as outlined in this guidance document, and that users adjust application rates using up-to-date digestate nutrient analysis data in order to reduce the possibility of any negative impacts. Rapid on-farm nitrogen meters (e.g. Agros and Quantofix) meters can be used to provide on-site measurements of digestate ammonium-N contents.

8.0 What if I have doubts about the quality of the material?

Farmers are encouraged to reject consignments of digestate and compost if the quality of the material does not meet their expectations.

To avoid unnecessary costs, find out in advance what the farmer requires and provide information to show that the materials meet these requirements. If the quality of the material is different to that expected, contractors can refuse to haul or apply it. Customers, particularly new customers, may ask to be present in the field when the first load is applied.



9.0 The Renewable Fertiliser Matrix

		BSI PAS 110 digestate				BSI PAS 100 compost			
Cropping category		Pasteurised ¹		Non-pasteurised		Green		Green/food	
Fresh produce	Group one	✓	Before drilling or planting ²	✗	NOT within 12 months of harvest and also at least six months before drilling or planting ²	✓	Before drilling or planting ²	✓	Before drilling or planting ²
	Group two	✓	Before drilling or planting ²	✗	NOT within 12 months of harvest and also at least six months before drilling or planting ²	✓	Before drilling or planting ^{2,3}	✓	Before drilling or planting ^{2,3}
	Group three	✓	Before drilling or planting ²	✓	Before drilling or planting ²	✓	Before drilling or planting ^{2,3}	✓	Before drilling or planting ²
Combinable and animal feed crops		✓	May be applied before and after drilling or planting ⁵	✓	May be applied before and after drilling or planting ⁵	✓	May be applied before and after drilling or planting ⁵	✓	May be applied before and after drilling or planting ⁵
Grassland and forage – grazed		✓	Statutory no-graze intervals apply ⁴	✓	Three week no grazing period applies	✓	Three week no grazing period applies	✓	Statutory no-graze intervals apply ⁴
Grassland and forage – harvested		✓	Statutory no-harvest intervals apply ⁴	✓	Three week no harvest period applies	✓	Three week no grazing period applies	✓	Statutory no-graze intervals apply ⁴

Notes

1. Derived from feedstocks that include Animal By-Products (ABPs), according to the requirements of the European Animal By-Products Regulations (Regulation (EC) No. 1069/2009 and Commission Regulation (EU) No. 142/2011, as implemented by the nations of the UK and Northern Ireland). Pasteurised digestates also include those derived from inputs that have undergone prior processes equivalent to pasteurisation.

2. Target of zero and absolute limit of <0.1% (m/m dry weight) glass must be achieved.

3. May be applied as mulch.

4. In accordance with the Animal By-Products Regulations (see above). These currently stipulate intervals of two months for pigs and three weeks for other livestock.

5. No specific additional risk-management approaches are required for this cropping category, as regulatory and good practice requirements apply to this (and all other) categories.

9.0 The Renewable Fertiliser Matrix

9.1 Cropping categories

*Note that this group also includes non-edible ornamental crops.

Fresh produce	Group one	Crops that the customer can eat raw and which do not have a protective skin that is removed before eating; they may also have a significant risk or history of pathogen contamination:	Whole head Lettuce, Leafy Salads (including any vegetable leaf you can eat raw), Celery, Salad Onions, Radish, Fresh and Frozen Herbs, etc.
	Group two	Crops that the customer can eat raw and which either have a protective skin or grow clear of the ground, or that have no history of pathogen contamination:	Apple, Beetroot, Blackcurrant, Blueberry, Broad Bean, Broccoli, Cabbage, Carrot, Capsicum, Cauliflower, Celeriac, Cherry, Courgette, Cucumber, Garlic, Green Beans (other than runner beans), Melon, Mushroom, Onion (red and white), Pea, Pear, Peach, Plum, Raspberry, Strawberry, Sugar Snap Peas, Sweet Corn, Tomato and Tree Nuts, etc.
	Group three*	Crops that the customer always cooks:	Artichoke, Runner Bean, Leek, Marrow, Parsnip, Potato, Pumpkin, Squash, Swede, Turnip, etc.
Combinable and animal feed crops		Wheat, Barley, Oats, Rye, Triticale, Field peas, Field beans, Linseed/flax, Oilseed rape, Sugar beet, Sunflower, Borage.	
Grassland and forage – grazed		Grass, Forage swedes and turnips, Fodder mangolds, Fodder beet, Fodder kale, Forage rye and triticale, Turf.	
Grassland and forage – harvested		Grass silage, Forage maize, Haylage, Hay, Herbage seeds.	

Notes and references

- 1 <http://www.biofertiliser.org.uk/>
- 2 <http://www.qualitycompost.org.uk/>
- 3 <http://www.wrap.org.uk/content/bsi-pas-110-specification-digestate>
- 4 <http://www.wrap.org.uk/content/bsi-pas-100-compost-specification-1>
- 5 <https://www.gov.uk/guidance/storing-organic-manures-in-nitrate-vulnerable-zones>
- 6 <https://www.gov.uk/guidance/storing-silage-slurry-and-agricultural-fuel-oil>
- 7 <https://www.gov.uk/guidance/transporting-animal-by-products>
- 8 <https://www.gov.uk/guidance/making-fertiliser-from-processed-animal-by-products-abps>
- 9 <https://www.gov.uk/guidance/using-animal-by-products-at-compost-and-biogas-sites>
- 10 See Annex I of Commission Regulation (EC) No 889/2008 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:250:0001:0084:EN:PDF>
- 11 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69344/pb13558-cogap-090202.pdf
- 12 <http://wales.gov.uk/docs/drah/publications/110420cogapwales2011introen.pdf>
- 13 <http://www.scotland.gov.uk/Resource/Doc/37428/0014235.pdf>

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