

Land application of shellfish by-products

Traditional seafood waste disposal routes have become increasingly restricted, for example landfill is not permitted for raw or untreated seafood waste disposal. It is also desirable to divert waste from disposal routes to encourage its use in other ways. Although there are many options for utilising seafood by-products, for example edible products, pharmaceuticals and fertilisers, these are specialised processes, with limited infrastructure in the UK at present. More readily available routes such as construction materials or poultry feed, are still relatively scarce. Locating licensed disposal routes, such as rendering and incineration plants that take shell, is difficult and they are often prohibitively expensive.

As a result, seafood processors are currently finding it difficult to find practicable utilisation or disposal routes for their waste, particularly shell. The opportunities for utilising shellfish by-products on land have been investigated by ADAS (Ref 1). Land application is seen one of the lowest cost utilisation routes available to the majority of industry but it is essential to comply with legislative controls.

Is land application of shellfish by-products permitted?

Yes providing they are treated in accordance with the Animal By-product Regulations (ABPR) and appropriate licenses for applying waste derived material to land are in place (Waste Management Licensing Regulations).

What seafood by-products can be utilised on land and how can they be used?

Landspreading of waste or by-products must result in benefit to agriculture. The three characteristics of seafood by-products which are most likely to provide benefit are major nutrient content, lime content and organic matter content.

Shellfish by-products, including cooked shellfish, could be used for land application but they must first be treated according to the requirements of the ABPR. This includes rendering (heat treatment), composting or digestion in premises approved by the State Veterinary Service (SVS). Subsequent landspreading activities must be licensed by the local environmental regulator.

Clean, free-of-flesh shell, notably mollusc shell and crab carapace can be used on land for specific technical purposes which are land drains, footpaths, tracks and aggregates. The production of free-of-flesh shell for these purposes must be registered with the SVS. Approval to use these materials on land must be obtained from the environmental regulator.

How do I get a license to landspread waste?

The operation of an approved waste treatment system is a specialised and costly activity, normally contracted out to a waste management specialist who would have an effective and economical means of using the treated product on land. An individual company or a local consortium may be prepared to undertake the entire activity, as summarised in the following stages.

- 1) Treat the material to the full requirements of the ABPR at an approved site. Although this is not required for the production of free-of-flesh shell, this activity must be registered with the SVS.
- 2) At a laboratory, obtain chemical analysis of the final treated product to support a claim of agricultural benefit. Samples should be analysed for content of dry matter, total nitrogen,

ammonium-nitrogen, phosphorus, potassium, sulphur, magnesium, total neutralising value (for lime equivalent), organic carbon content (for organic matter) and the seven heavy metals, zinc, copper, nickel, lead, cadmium, chromium and mercury.

- 3) Establish contact with local farmers to discuss the benefits of the treated product, which will be evident from the laboratory analysis. Ideally, have available the nutrient content of other organic manures such as cattle manure, sewage sludge cake and green waste compost as a comparison to emphasise the superior characteristics of the treated seafood-based material. Heavy metal contents should be noted as suitably low.
- 4) Identify sites/fields which would be suitable to receive the material. Obtain chemical analysis of each site / field topsoil to support a claim that the land requires crop nutrients and to confirm that the initial soil heavy metal levels are satisfactory. Samples should be submitted for content of pH, lime requirement, phosphorus, potassium, nitrogen, magnesium and the seven heavy metals, zinc, copper, nickel, lead, cadmium, chromium and mercury.
- 5) Obtain a brief written statement on the potential benefit to agriculture of the proposed landspreading. This statement must be provided by a person with appropriate technical expertise who will typically be an agricultural consultant. The results of analysis of the treated waste and the field soils will form the basis of this assessment.
- 6) Contact the local environmental regulator to obtain application forms and written guidance to register the proposed activity.
- 7) Complete the application form. Submit the form to the regulator along with the laboratory analysis of the waste and the field soil plus location details of the spreading site including a site map. The expert's report confirming benefit to agriculture must be included along with any required payment to the regulator for dealing with the notification.
- 8) Await acceptance of the application from the regulator. It is an offence to carry out a landspreading activity before it is confirmed as accepted. Provided the application form is correctly filled out and all supporting documentation is in place approval can normally be counted on.
- 9) Engage the farmer or another registered waste management operator to transport and spread the waste at the notified site. The haulage may be done by the farmer on obtaining a waste haulage licence.
- 10) To continue the activity at the same farm in the following years a notification of renewal must be submitted annually.

How long will it take to get a licence?

This is largely dependant on the extent of ABPR approval required. For free-of-flesh shell and technical uses, the whole process could be completed relatively quickly i.e. within 2-3 months. But if full ABPR approval is required it could take much longer. Engaging with the relevant regulators and landowner from the outset and employing a suitably qualified agricultural consultant will help to reduce the timescales involved and avoid unnecessary work and delays.

Will I be able to landspread all my shellfish by-products?

It varies on the results of the analyses, site size and location, and by-product type and composition but there are maximum limits set for applying waste derived products to land. A maximum of 250 tonnes per hectare may be spread in any 12 months, subject to an upper limit of nitrogen in the material in Nitrate Vulnerable Zones. It is likely that only 15 - 30t/ha of composted seafood could be spread on any one site each year, as it typically contains high levels of nitrogen.

How much will a licence cost?

This will vary according to the level of pre-treatment undertaken, type of licence required, how much waste is to be spread on land and whereabouts in the UK you are. In England, the initial application fee is less than £600, with an ongoing annual fee of just over £400. This does not include pre-treatment, transport to site, landspreading activities, storage etc.

Estimated costs of land application

Estimates of the individual component costs of land application are provided. As every company and situation is different, businesses need to calculate their own costs before deciding whether land application is a cost-effective solution.

Licensing	Standard rates
Initial licence application	£600 ¹
Analysis of one sample of material and one site (all analyses)	£180
Agricultural consultant	£1,400 - £1,750
Annual renewal	£412 ¹
Pre-treatment (only one required)	Costs per tonne of material
Composting	£50 - £60
Rendering	£60 - £100
Incineration	£100 - £150
In-house shell cleaning (processing and washing)	£10 - £30 ²
Landspreading activities	Costs per tonne of material
Transport to site	£10 - £40
Storage and landspreading	£15 - £20
Licensing costs - Year 1	£2,180 - £2,530
Annual costs	
<ul style="list-style-type: none"> • Treatment to ABPR standards • License renewal • Landspreading 	<p style="text-align: center;">£10 - £150 per tonne £412 £25 - £60 per tonne</p>

¹ = rates for England. Other rates are available from the relevant environmental regulator.

² = provided by seafood industry

Conclusion

Shellfish by-products contain a large quantity of nitrogen and potentially valuable amounts of several other major crop nutrients. Additionally they contain organic matter which is becoming increasingly regarded as a benefit to farmers. Uses for free-of-flesh shell including land drains, or as a substrate for paths and tracks, are also beneficial to landowners. Government policy and legislation permit the land application of shellfish by-products providing they are treated to legislative standards and used in accordance with waste management licensing requirements. As such, land application is seen as a potentially viable outlet for the seafood processing sector.

Further information on the land application of shellfish by-products is available in Seafish Report 586 – Review of the application of shellfish by-products to agricultural land. Copies are available from Seafish – see contact list over page.

Useful Contacts

	England and Wales	Scotland	Northern Ireland
Environmental Regulator	www.environment-agency.gov.uk Tel - 08708 506 506	www.sepa.org.uk Tel - 01786 457700	www.doeni.gov.uk Tel - 028 9025 4754
ABPR Legislation and Guidance	England http://www.defra.gov.uk/animalh/by-prods/default.htm Tel - 08459 33 55 77 Wales www.countryside.wales.gov.uk Tel - 02920 825111	http://www.scotland.gov.uk/Topics/Agriculture/animal-welfare/15760/8534/Q/ViewArchived/On Tel - 0131 556 8400	http://www.dardni.gov.uk/index/animal-health/animal-by-products.htm Tel - 0289 052405
State Veterinary Service	For ABPR approvals http://www.svs.gov.uk/ or tel - 01905 768862 For local / regional contacts go to http://www.svs.gov.uk/contact/ahdo_locations.htm		
Agricultural consultants	Go to http://search.yell.com/ucs/HomePageAction.do Type agricultural consultants in the 'search for' box and your town / region in the 'located in' box The British Institute of Agricultural Consultants directory http://www.biac.co.uk/ Or search for 'agricultural consultant' using any search engine		
Soil Analysis	Go to http://search.yell.com/ucs/HomePageAction.do Type laboratories in the 'search for' box and your town / region in the 'located in' box Look through the list for soil analysis or environmental		
Seafish	For further information contact Michaela Archer e-mail m_archer@seafish.co.uk or tel 01482 327837		

Reference I: ADAS UK Ltd., Review of the application of shellfish by-products to agricultural land, Seafish Report no 586, August 2006.