





About WRAP



WRAP's vision is a world without waste, where resources are used sustainably.

We help businesses, individuals and communities reap the benefits of reducing waste, developing sustainable products and using resources in an efficient way.



Why is WRAP involved?

- Policy drivers – AD Strategy and Action Plan

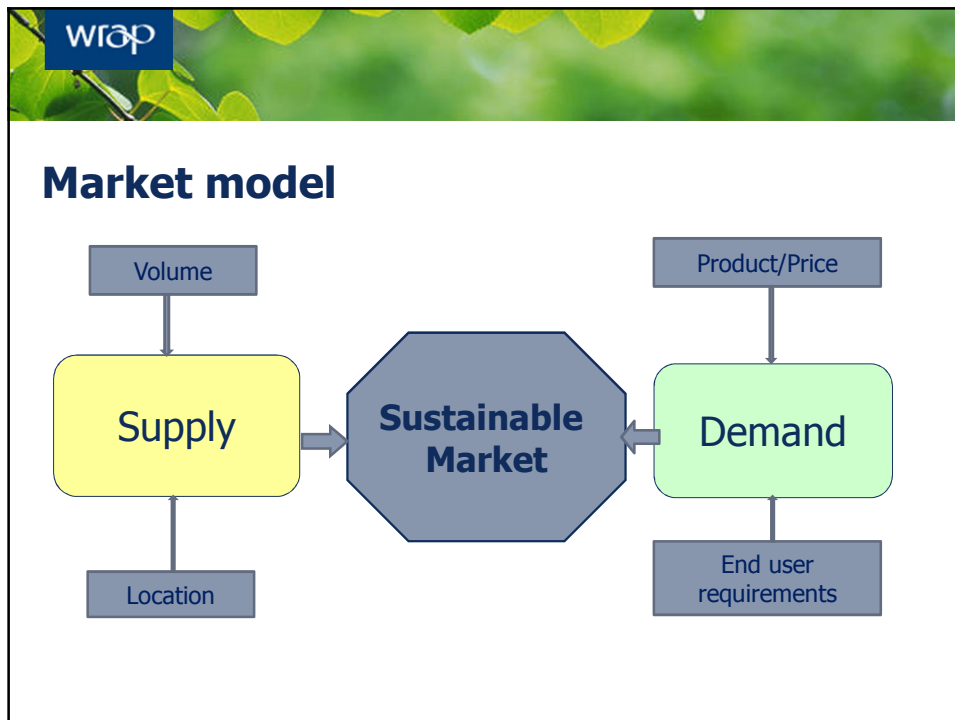
Closing the loop

- Digestate – key for closing the nutrient recycling loop
- Reduces use of primary resources/fertilisers - phosphate is a finite resource



Anaerobic Digestion Strategy and Action Plan
A commitment to increasing energy from waste through Anaerobic Digestion



Addressing the barriers

Developing the market for digestate by:

- Building safe and secure markets
- Promoting and developing BSI PAS110 specification
- Building skills and knowledge – operators and end users
- Obtaining evidence on digestate benefits – research and field trials
- Investigating new markets and opportunities

wrap

Promoting and developing quality products – BSI PAS110

Transforming 'waste' digestates into 'products'

- 12 operators certified to BSI PAS110
- Certified tonnage >400,000 (registered throughput)
- Under review

www.biofertiliser.org.uk



Biofertiliser
certification scheme

wrap

Why use digestate?

- **Nutrients**
 - N, P, K, S, Mg
 - Trace elements
- **Can save money**
- **Reduce carbon footprint**
- **Organic matter (fibre)**


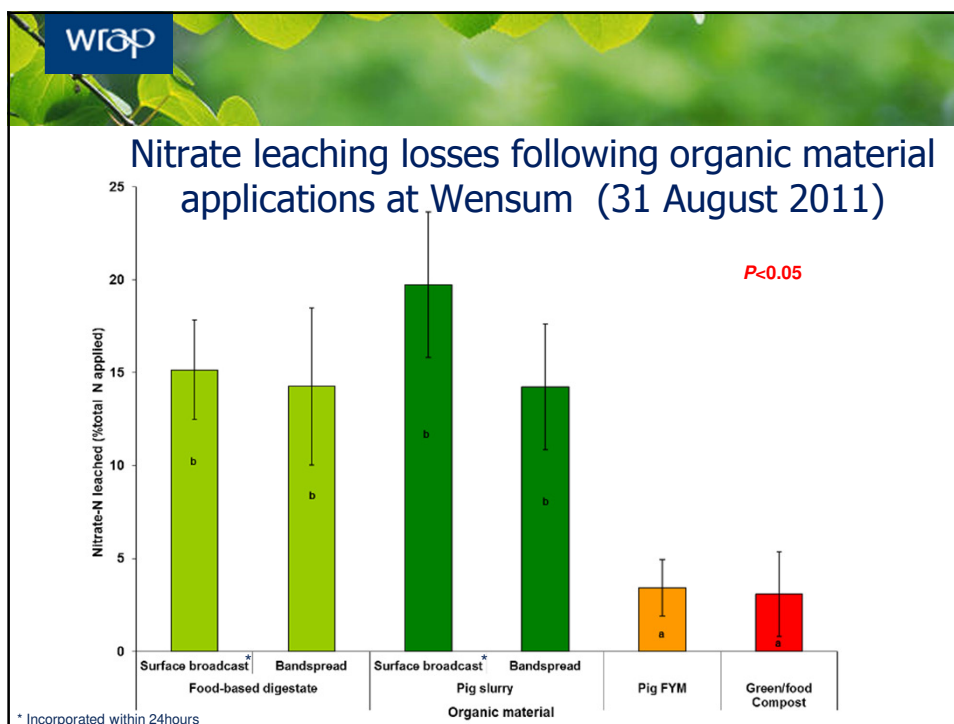


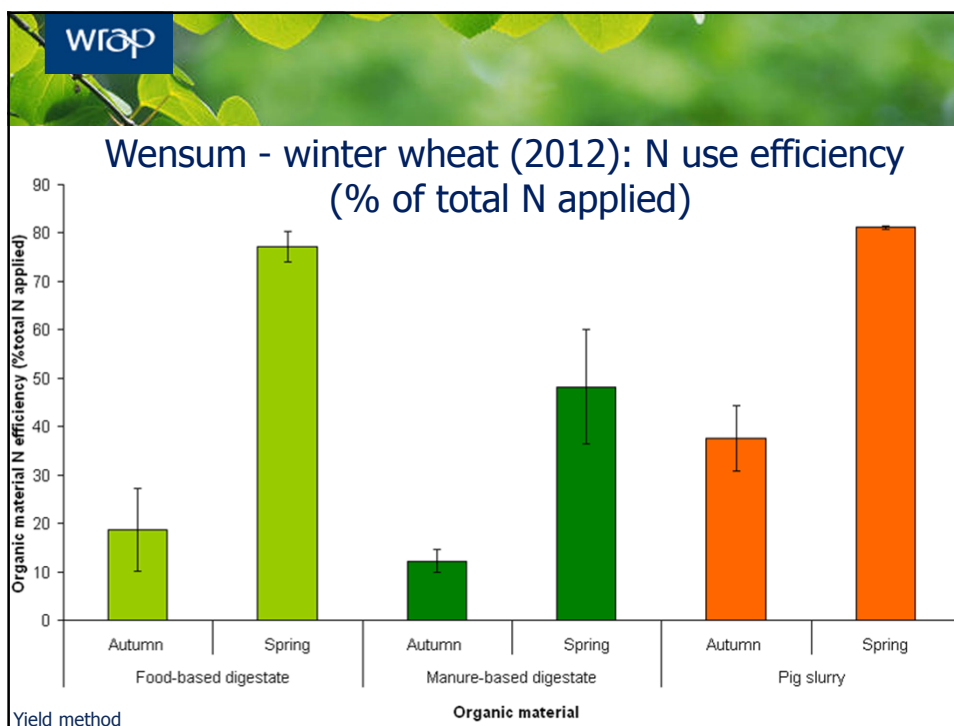
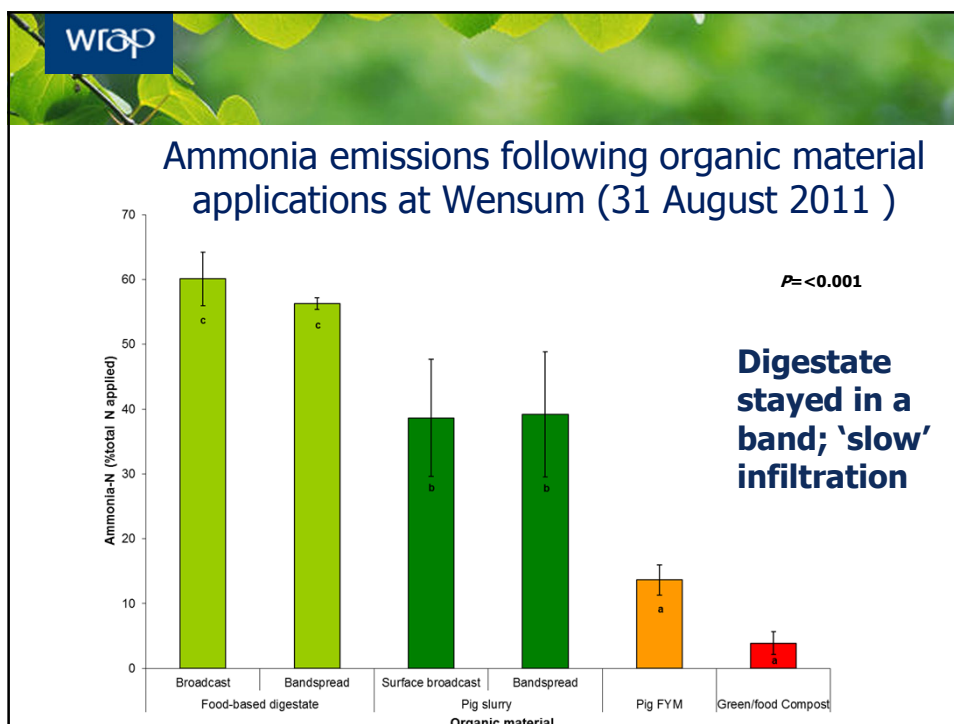

wrap

Agriculture Field research, 2010-14

- Joint WRAP and Defra research: the *DC-Agri* project
- Investigating the effects of digestate & compost on:
 - soil and crop quality
 - crop available nitrogen
 - nitrous oxide and ammonia emissions to air and leachate losses to groundwater, to help inform good practice for farmers

Providing training on the use of digestate and compost to maximise benefit



Reducing pollution through good practice

- Shallow injection of digestate to reduce volatilisation and loss of N to atmosphere
- Time of year – application in spring will increase up take of N by crop.
- Work will report in spring 2015



Developing other markets for digestates

- Most UK digestates are low dry matter (<10%)
- Can be separated
 - Fibre
 - Liquor
- Different fractions have different nutrient profiles
 - Different potential uses
 - Different potential markets





Other potential markets

- Horticultural applications
- Brownfield site restoration – soil improvement (growing energy crops)
- Soil manufacture
- Turf establishment
- Sports and amenity turf maintenance






Horticulture

Exploring the potential for quality digestate in horticultural applications:

- As a growing media additive
- In soil-less crop production – hydroponics
- Liquid feed for strawberries
- 4 projects from November 2012 to end of 2013






wrap

Findings to date


- Growing media - fibre demonstrating good potential
 - Useful nutrients
 - Different kinds can be difficult to handle
 - Contamination issues
- Hydroponics – high N content
 - Needs substantial dilution to substitute for conventional fertigation solutions
 - Supplementary nutrients also required to balance feed
- Handling and odour issues



wrap

Field experiments to grow energy crops on brownfield land

- Establishing energy crops on brownfield land
 - Fibre/whole digestates (compost)
- Fertilising energy crops on brownfield land
 - Whole and liquor digestates
- E.g. Burntstump - restored landfill site in Nottinghamshire growing Short Rotation Coppice willow for the last two years



Using digestate as a sport and amenity turf fertiliser

- Examines the use of liquid fraction digestate as a fertiliser for sports and amenity turfs
- Trials comprise of replicated research trials at the Sports Turf Research Institute and Cranfield University
- Market assessment & investigation on enhancement technologies.



Findings to date

- Fibre useful as a soil improver - limited quantities available
- Early evidence of yield increases
- Liquors good nutrient source but dilute and need ultra filtering to avoid blockages on standard spraying and spreading equipment
- Digestate behaves like fertiliser but application rates need to be managed carefully to avoid problems e.g. scorching, high conductivity
- Can be difficult to handle
- Odour a barrier to use on sports and amenity turf





Conclusions

- Digestate can be a very valuable resource but has to be managed carefully to maximise benefits
- Operators need to understand their products and potential markets
- Proven enhancement technologies needed to develop products if new markets are to be viable
- Further work needed to develop the case for digestate use in potential new markets



Thank you

Katherine.church@wrap.org.uk

Resources:

www.wrap.org.uk/dc-agri

www.wrap.org.uk/farming

www.wrap.org.uk/landscaping