Bioremediation systems in the UK. Current position, systems, regulation and future possibilities.

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History

- 1997 2000 Laboratory trials, small scale field work on biobeds
- 2000 2002 Development of commercial scale trials
- 2002 2007 continued trials and protracted discussions on acceptability of bioremediation with Government Authorities in UK under Agricultural Waste Regulations, approval given in 2007
- 2008 Biofilter trial and adoption.
- 2009 2010 Slow adoption of biobeds, Catchment Sensitive Farming develops with grants for installations
- 2010 2013 Grants available more widely and Water Supply Companies supporting Bioremediation systems to reduce water treatment costs and problems.

Regulatory control

Government's Environment Agency (EA), control all waters and also all 'wastes' management and licensing

All water managed in Catchments

Catchment Sensitive Farming (CSF) developed to assist farmers in reducing pollution in all forms





RIVER STOUR MONITORING POINTS

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Biobeds

- Now approved as Best Practice by Environment Agency (EA) from 2007
- Slow uptake of biobeds by farmers now 250 in England and Wales
 - Lined biobed required
 - Must be registered with EA
 - Seen as complex by farmers
 - Increased cost
 - Mistrust of development time and possible changing regulations
 - Too large?











Biofilters

- Initially following ideas from Belgium
- UK trial in 2008, 9 pesticides, 8 fully retained, one 97.8% retained at 31 x less.
- 14,000 I washings in 6 months
- 3 x IBC structure
- Under £500
- Rapidly increasing interest











Costs

Biobed – DIY £2000
 Purchased £3000 - £12000

Biofilter – DIY under £500
Purchased £1000 - £2500

• Filling area - £2500 - £6000 (Steel grid)

CSF Priority catchments - Grants

- Wide range of improvements to avoid pollution from many influences, maximum £10,000 per business
- Sprayer fill areas £1250
- Biobeds £3500
- Biofilters £625
- Roofed areas £42 per m²
- Phytobacs 50% ?
- For how long?



Capital Grant Scheme



Roofed areas – reduce water amounts for treatment

 Changing views, very low liquid production per season, 2001 – 20001 ?



Alternative systems

 Phytobac, has approval from EA based on bioremediation but non in UK or trial work

yet.



Alternative systems

 Heliosec, Syngenta. 2 in England in 2012, possible another 10 for study in 2013. No approval from EA yet.



Future - more questions than answers

- No further research known/planned in UK
- Will alternative systems be approved, can volumes mix/liquids ratios be accepted or varied?
- Biobeds basis agreed, experience good, other ingredients of the mix need evaluation, farmer confidence needs improving, better support information.
- Biofilters relate mix volume to contaminated water volumes, size and number of containers, series or parallel designs, plant growth evapo-transpiration, farmer confidence needs improving, better support information
- Roofed systems, low water volumes important.
- Evaporation systems, UK conditions, basis for design? Container volumes?
- Evaporation/remediation systems, volumes related to flow
- Other systems?

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