

Aim: To reduce the concentration of harmful and persistent pesticides in farmyard runoff

Biobed at Manor Farm, Salle



Background information

- The concept of biobeds was initially developed in Sweden in the early 1990s
- Biobeds provide a practical and convenient way to deal with contaminated water from sprayer washdown areas
- Biobeds dilute pesticides and enhance microbial activity to breakdown pesticides
- Liquid pesticide waste to a maximum of **15,000 litres per year**.
- Biobed treatment area = $12 \times 3 = 36 \text{ m}^2$
- The biobed input/output sumps and porous pots in the drain field at Manor Farm are sampled for pesticides every two weeks



Washdown area and chemical storage

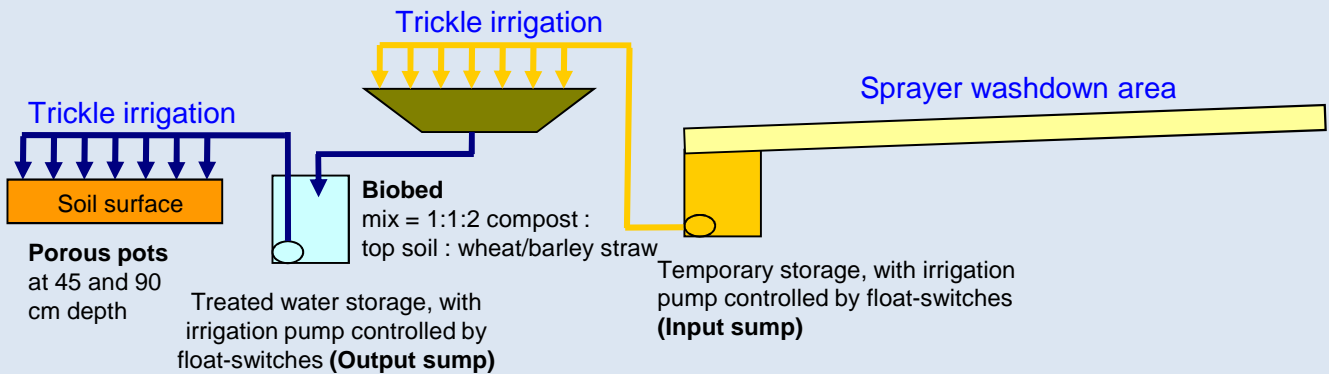


Drain field area with porous pots



Porous pot sampling flask

Schematic diagram of the biobed process and irrigation to the drain field



Pesticide data

Pesticide	Date	Input sump ($\mu\text{g/L}$)	Output sump ($\mu\text{g/L}$)	Porous pots ($\mu\text{g/L}$)
Mecoprop (to control broadleaf weeds)	14-Nov-13	18300	235	44.2 (n=10)
	18-Dec-13	6310	221	1.5 (n=10)
	10-Jan-14	644	432	26.0 (n=10)
	24-Jan-14	704	348	5.5 (n=10)
	18-Feb-14	209	93	6.1 (n=10)
	04-Mar-14	127	107	5.4 (n=10)
	19-Mar-14	354	216	3.1 (n=10)

Pesticide	Date	Input sump ($\mu\text{g/L}$)	Output sump ($\mu\text{g/L}$)	Porous pots ($\mu\text{g/L}$)
Fluroxypyr (to control broadleaf weeds and woody plants)	14-Nov-13	466	1.37	0.31 (n=10)
	18-Dec-13	638	0.50	0.05 (n=10)
	10-Jan-14	201	21.70	0.48 (n=10)
	24-Jan-14	272	0.55	0.11 (n=10)
	18-Feb-14	185	5.00	0.50 (n=10)
	04-Mar-14	108	0.72	0.50 (n=10)
	19-Mar-14	364	5.00	0.50 (n=10)

Pesticide	Date	Input sump ($\mu\text{g/L}$)	Output sump ($\mu\text{g/L}$)
Chlorotoluron (to control broadleaf and annual grass weeds)	24-Jan-14	309	1.11
	18-Feb-14	256	1.80
	04-Mar-14	311	0.94
	19-Mar-14	1030	1.23

Pesticide	Date	Input sump ($\mu\text{g/L}$)	Output sump ($\mu\text{g/L}$)
Propyzamide (to control broadleaf and grass weeds)	24-Jan-14	490	1.88
	18-Feb-14	225	1.72
	04-Mar-14	243	3.43
	19-Mar-14	215	3.32

Summary

- European Drinking Water Directive standards = 0.1 $\mu\text{g/L}$ for each individual pesticide; 0.5 $\mu\text{g/L}$ for total pesticides
- Observations suggest that the biobed is very effective at reducing pesticide concentrations
- Data from the porous pots suggest that additional natural attenuation occurs in the drain field
- The biobed represents a very cost-effective method for reducing pesticide concentrations in farmyard runoff

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