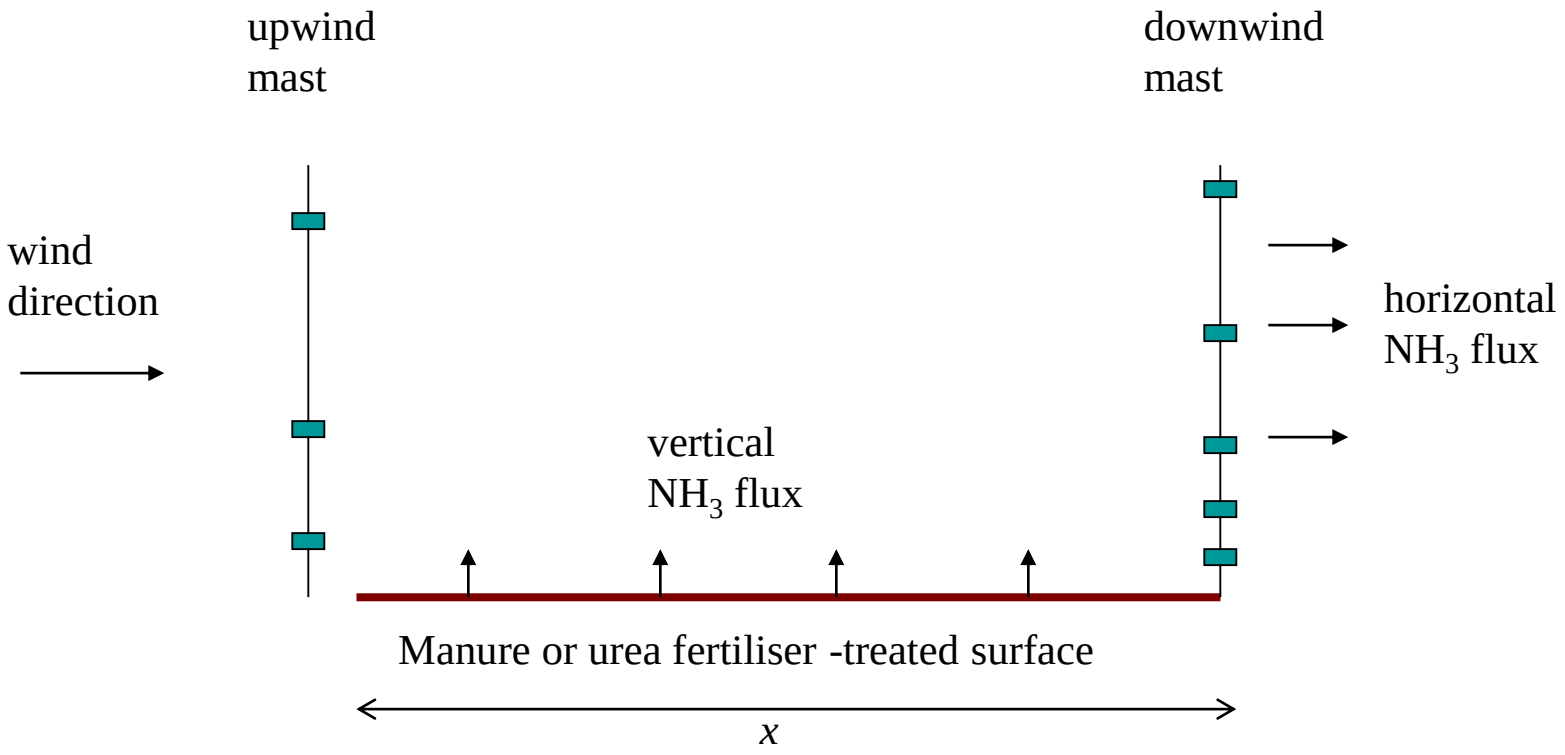
Ammonia emissions – FIELD

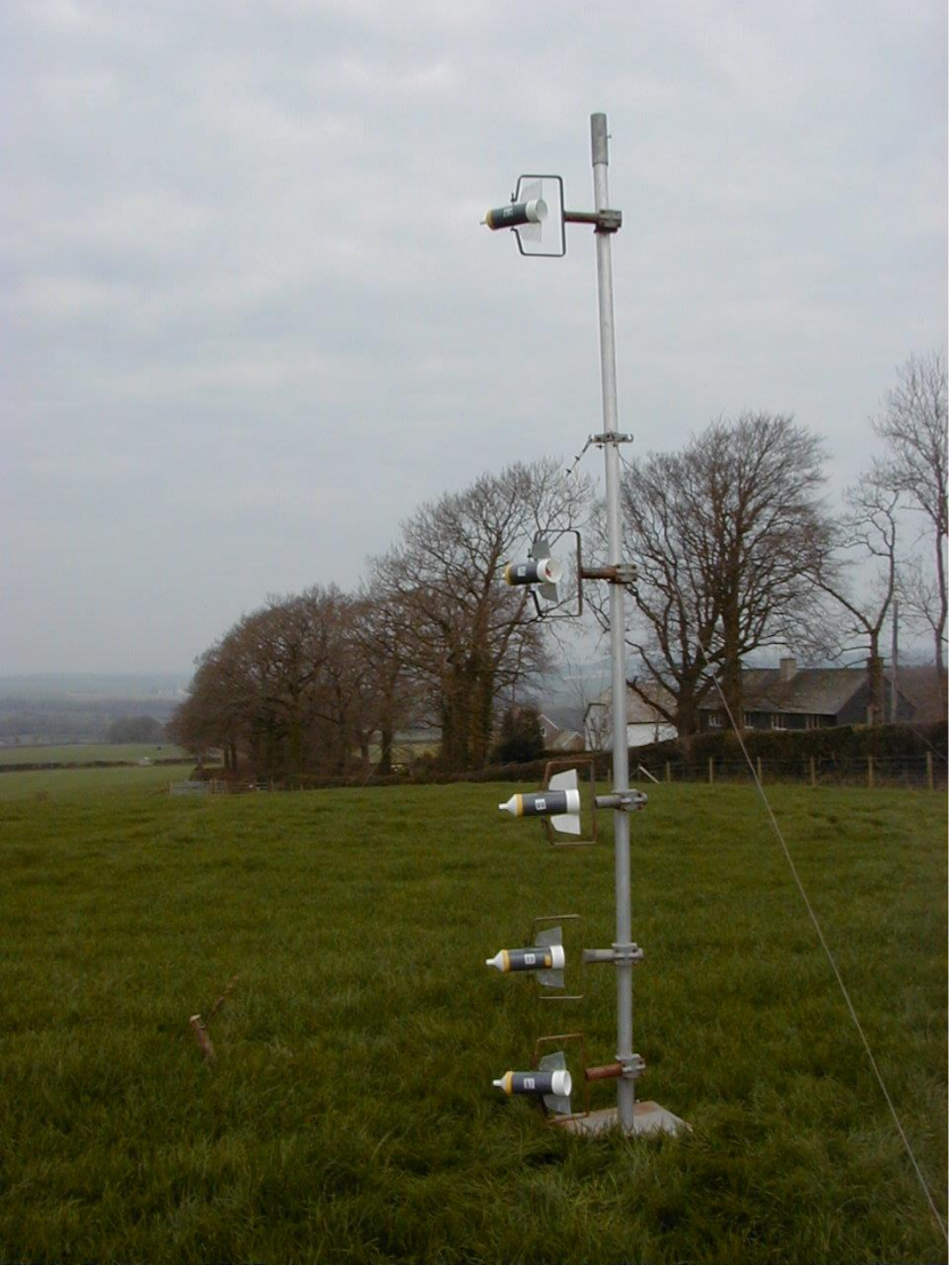
Slide & image from Tom Misselbrook (RRes)

Micrometeorological technique

Mass balance – Integrated Horizontal Flux (IHF)



Flux from treated area = $(IHF_{dw} - IHF_{uw}) / x$



Slide & photos from Tom Misselbrook (RRes)

Micrometeorological Mass Balance (IHF) technique

Passive flux samplers mounted on a mast

Passive flux samplers – “shuttles”

Slide & photos from Tom Misselbrook (RRes)

- **Shuttles always point into wind**
- **Designed to allow a flow of air through the shuttle**
- **Large stainless steel surface area coated with oxalic acid traps NH_3 in airflow**
- **Shuttles changed daily (time-average flux) and the shuttles capped and discharged with distilled water**
- **NH_3 emission measurements typically made for 3 weeks after urea application (in UK)**

Ammonia emissions – LIVESTOCK BUILDINGS

Slide & photos from Tom Misselbrook (RRes)

Ferm tube

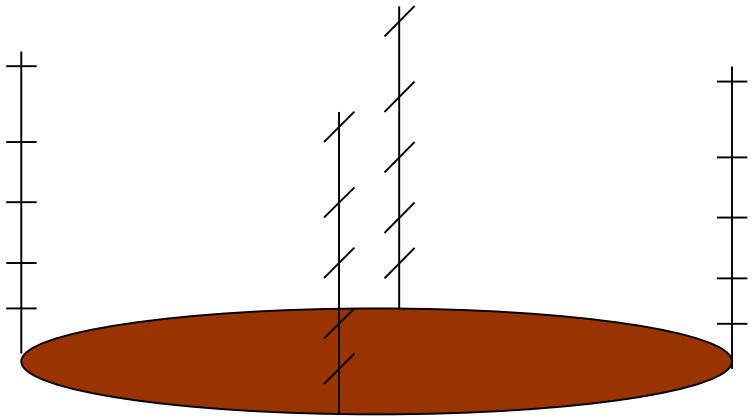
– acid impregnated filter paper ('inlet' and 'outlet')
- critical orifice

Ammonia emissions – SLURRY / MANURE STORES

Slide & photos from Tom Misselbrook (RRes)

Micrometeorological technique

Perimeter profile method – measure inward and outward fluxes at several heights around the perimeter of a treated circular plot



Nitrogen and Phosphorus leaching

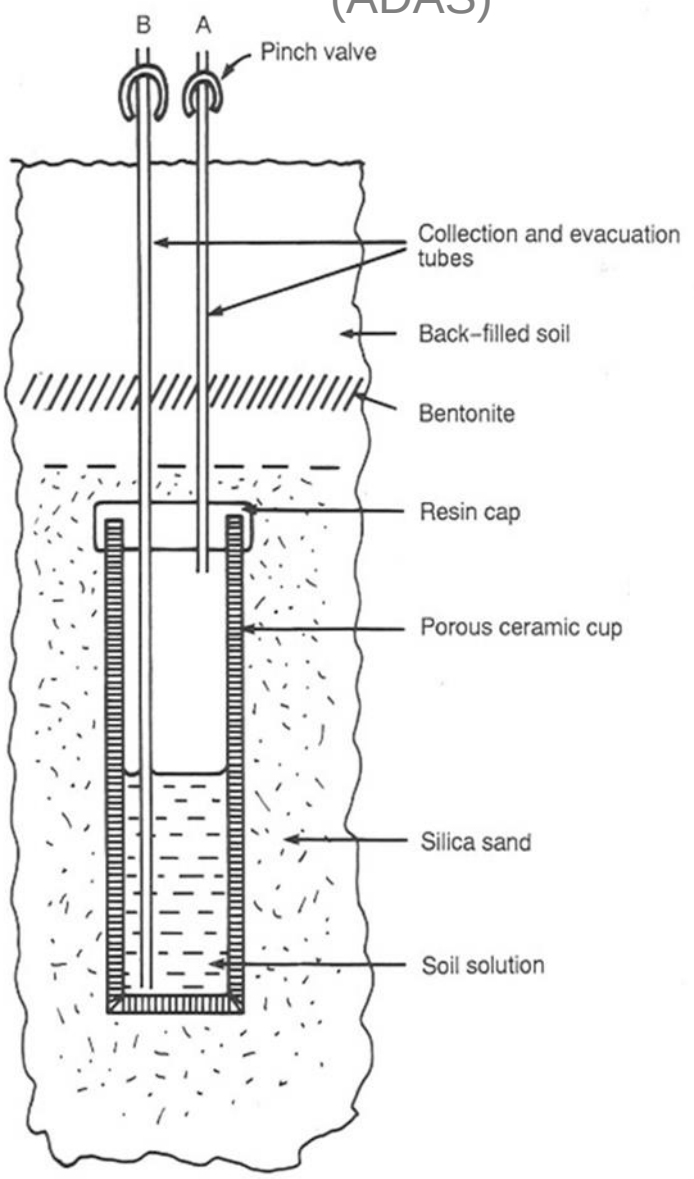
Slide & photo from John Williams (ADAS)

- Periodic measurements of nitrate, ammonium and phosphate concentrations in soil water below the rooting zone throughout the drainage season
- Samples typically collected (in UK) every 2 weeks (or every 25 mm of drainage) 8-10 times per drainage season
- Estimates of drainage volume needed (based on rainfall and estimates of evapotranspiration)

Installation

Slide & image from John Williams (ADAS)

- An auger (usually 50mm diameter) is used to make the installation hole (30^{o})
- A slurry of fine silica sand is poured into the hole before the ceramic cup is pushed into the bottom
- The silica sand ensures continuous capillary contact between the cup and the soil.
- Bentonite clay seals the hole to prevent water moving preferentially from the soil surface



Deployment

Slide & photos from John Williams (ADAS)

After installation the sample tubes are protected against damage

Typically 5 porous pots are used on 24 m x 5 m plot to account for soil heterogeneity

The porous cups are put under vacuum for c.30 minutes

Porous pots only work when soils are at or close to field capacity and drainage is occurring

Water is collected in sample vials and kept refrigerated before analysis