

JEANNE KJÆR

Geological Survey of Denmark and Greenland
Øster Voldgade 10, DK-1350 Copenhagen K, Denmark

ANNETTE E. ROSENBOM

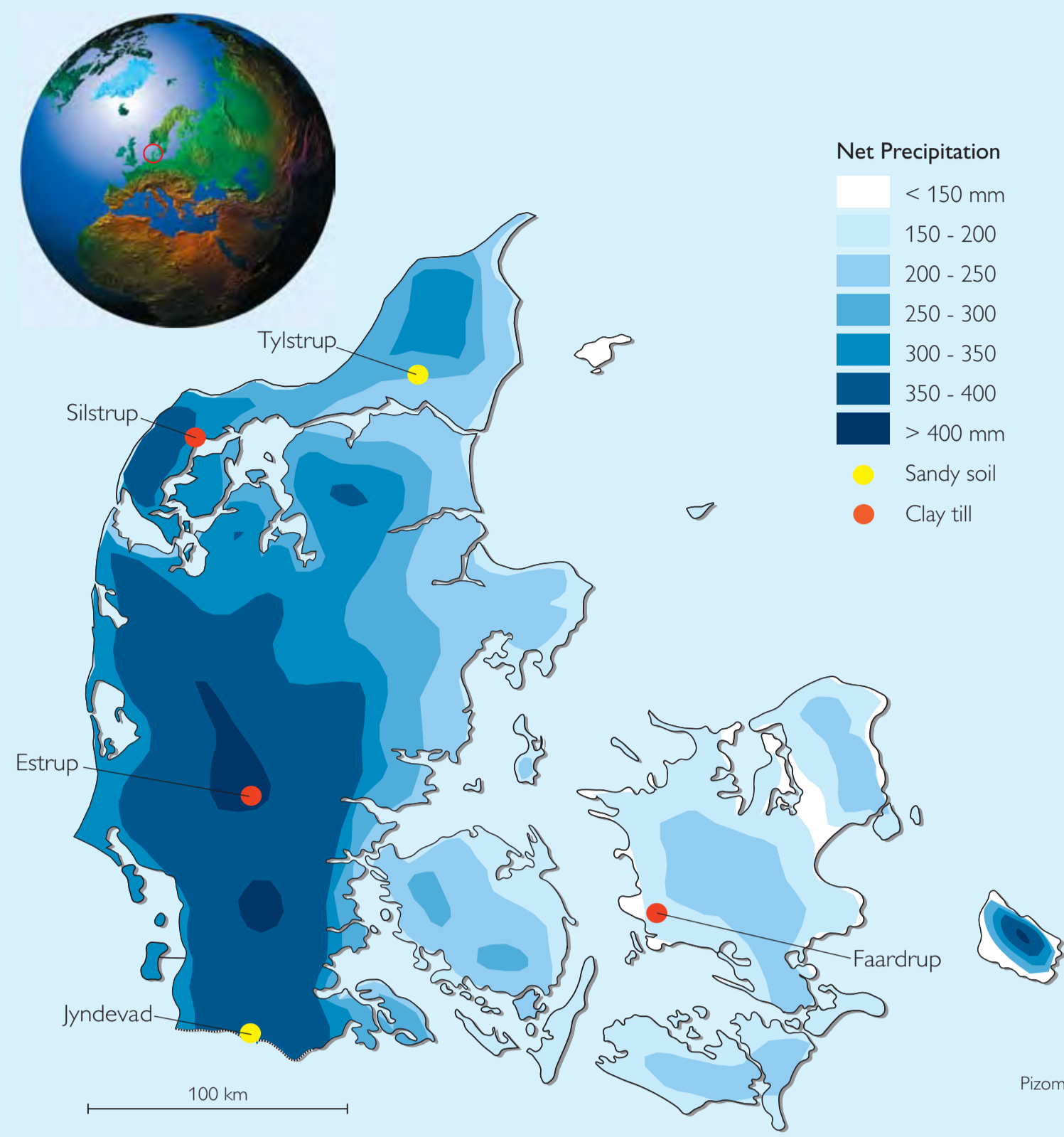
Geological Survey of Denmark and Greenland
Øster Voldgade 10, DK-1350 Copenhagen K, Denmark

RUTH GRANT

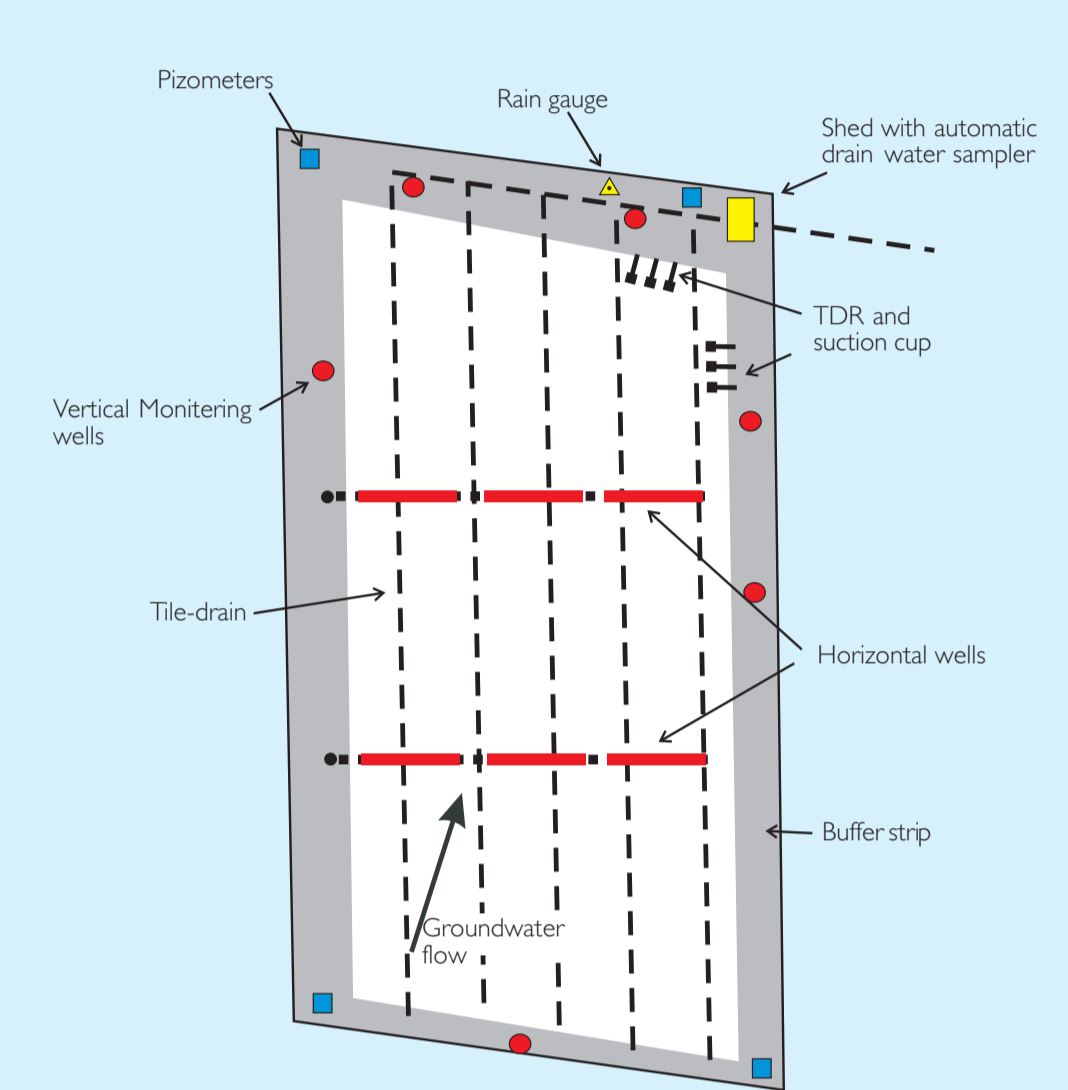
University of Aarhus
Vejlvsøvej 25, DK-8600 Silkeborg, Denmark

PREBEN OLESEN

University of Aarhus
Blichers Allé, P.O. Box 50, DK-8830 Tjele, Denmark



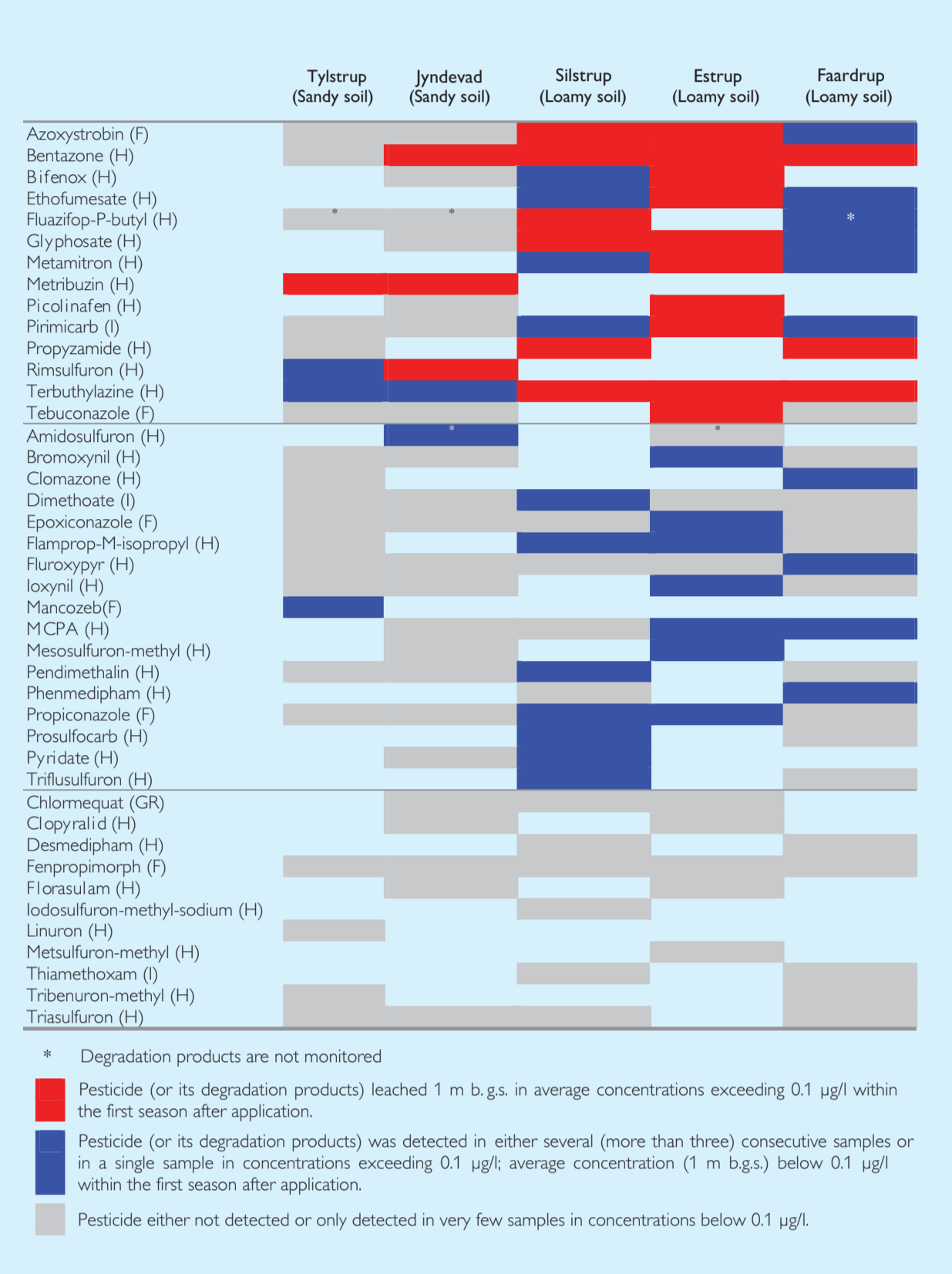
Location of the PLAP sites.



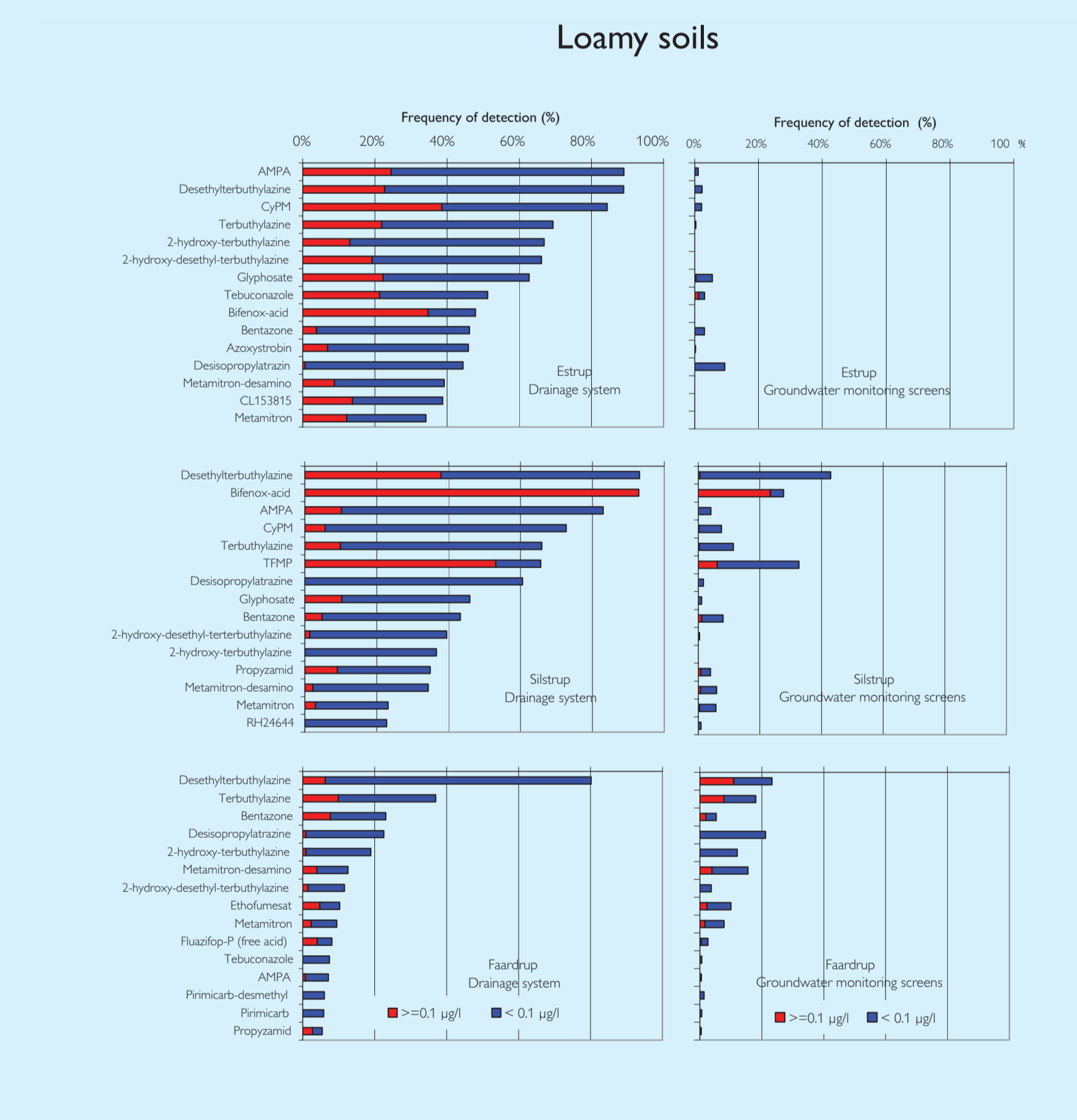
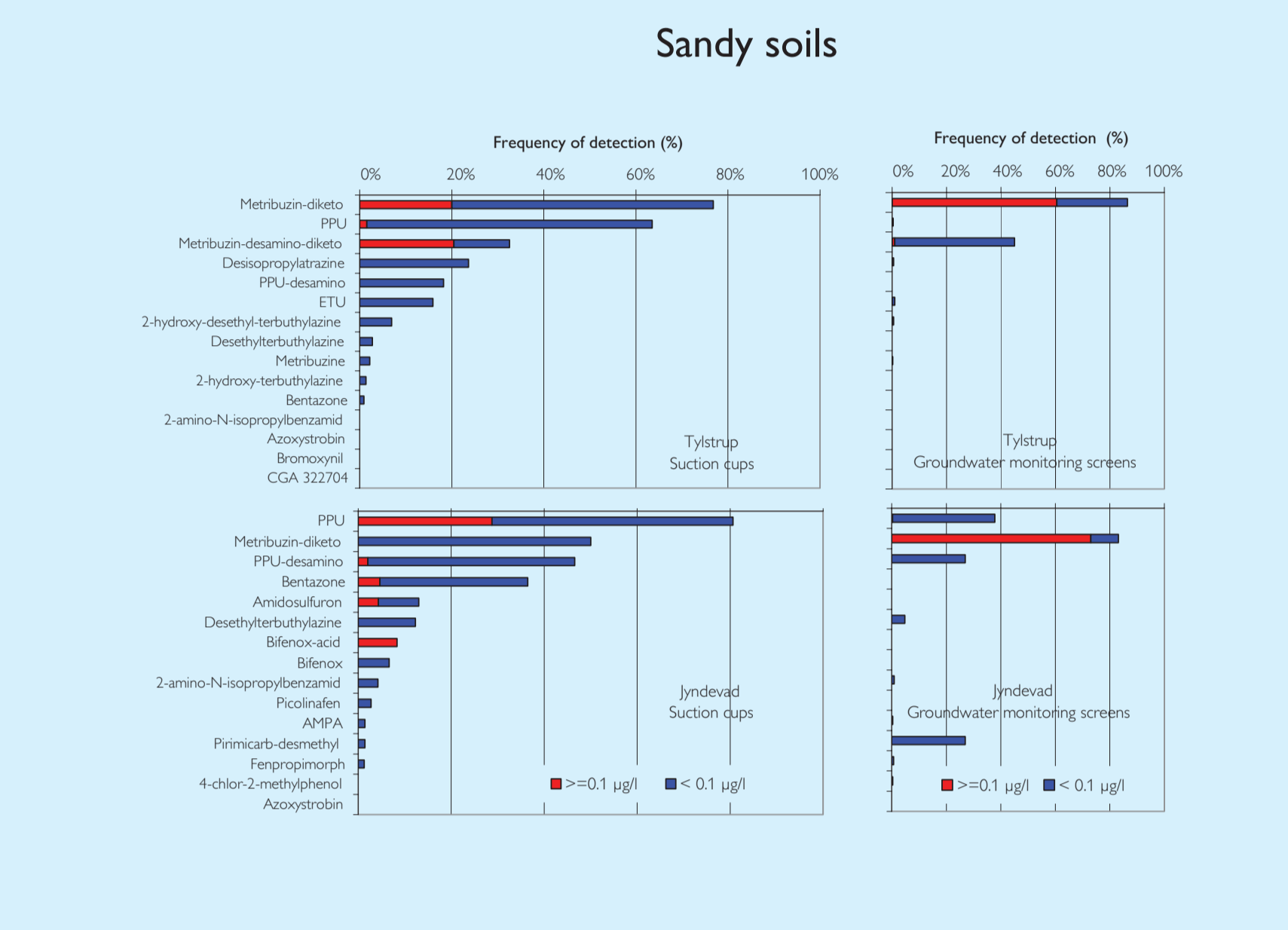
Typical layout of monitoring design at a loamy site.

INTRODUCTION

Pesticides and their degradation products have increasingly been detected in Danish groundwater during the past decades. This stresses the need for scientific based check-up of existing approval procedures and improved risk assessment tools. The Danish Pesticide Leaching Assessment Programme (PLAP), initiated in 1998, is an intensive post monitoring programme evaluating the leaching risk of pesticides under field conditions (www.pesticidvarsling.dk). The PLAP currently encompasses five test sites representative of the dominant soil types and climatic conditions prevailing in Denmark. Groundwater table at all sites is shallow, enabling rapid detection of pesticide leaching. Cultivation of the PLAP sites is in line with the local conventional agricultural practice. Pesticides are applied at maximum permitted doses and in accordance with the regulations. Pesticides or degradation products in the groundwater downstream a site can thereby be related to the current approval conditions pertaining to the individual pesticides. During 10 there have been 143 applications of pesticides and the leaching risk of 41 pesticides and 40 degradation products have been monitored. Selected monitoring results are summarised below.

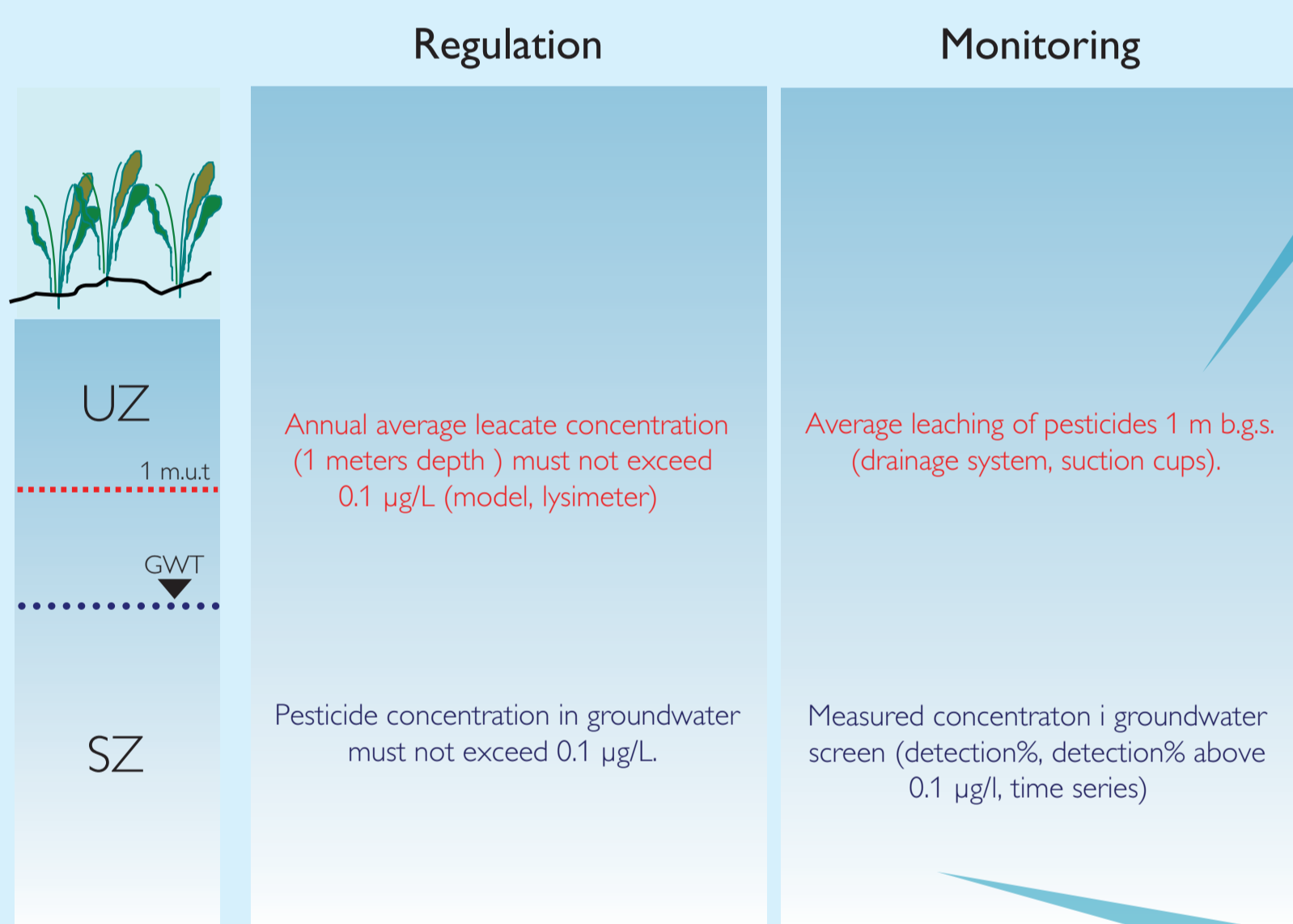


Root zone leaching (1 m b.g.s.) of pesticides or degradation products. Colours indicate degree of leaching, H (herbicide), F (fungicide), I (insecticide), GR (growth retardant). Leaching is determined as the weighted average concentration in soil water (sandy) and drainage water (loamy).



Pesticides or degradation products in groundwater samples. Colours indicate degree of leaching, H (herbicide), F (fungicide), I (insecticide), GR (growth retardant).

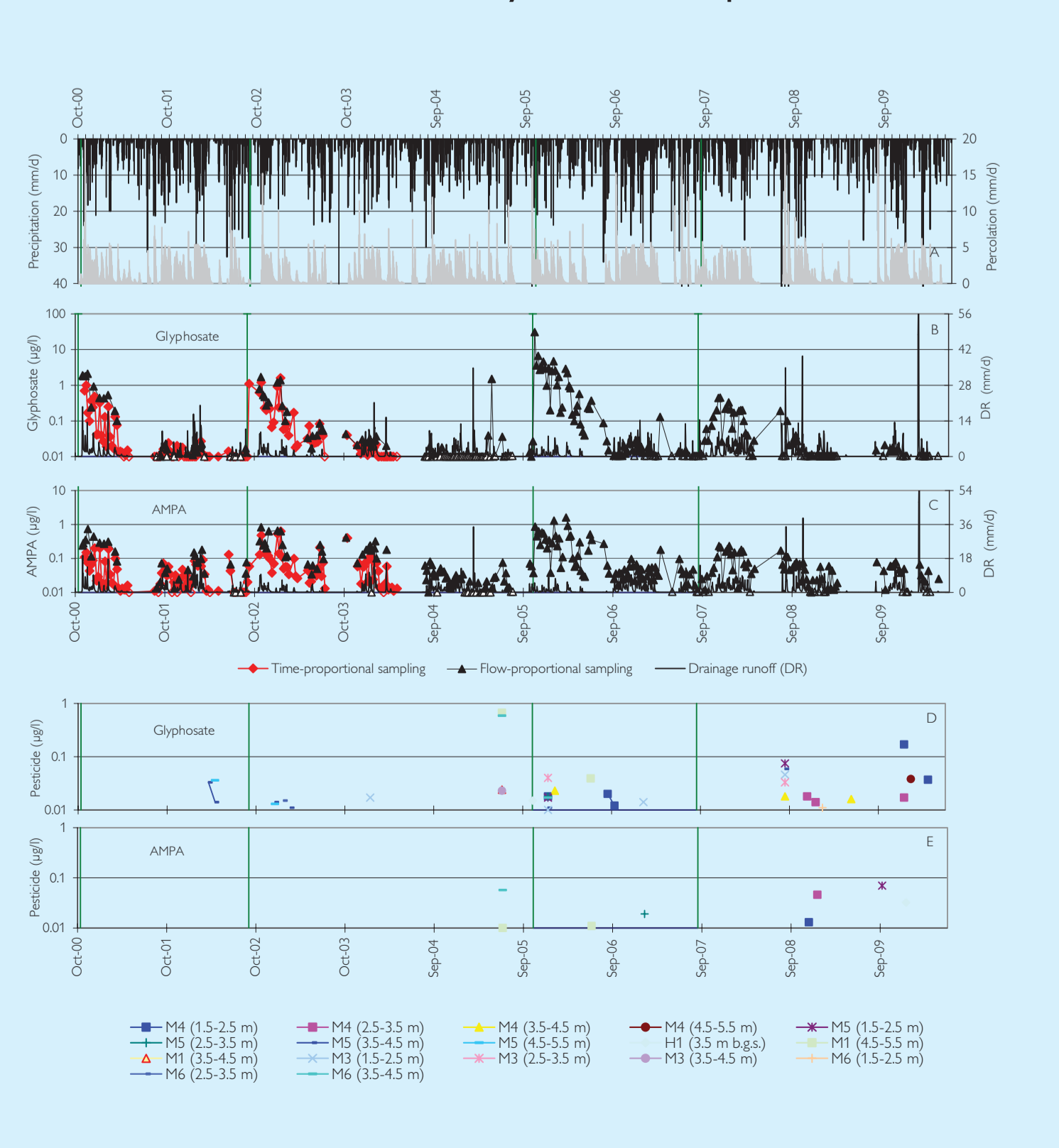
Frequency of detection in samples from Tylstrup and Jyvedvad (soil water-sandy) and Estrup, Silstrup and Faardrup (drainage water – loamy) as well as groundwater monitoring screens, of the most frequently detected 15 pesticides during the entire monitoring period. Number of analysed samples varies considerably among the different pesticides.



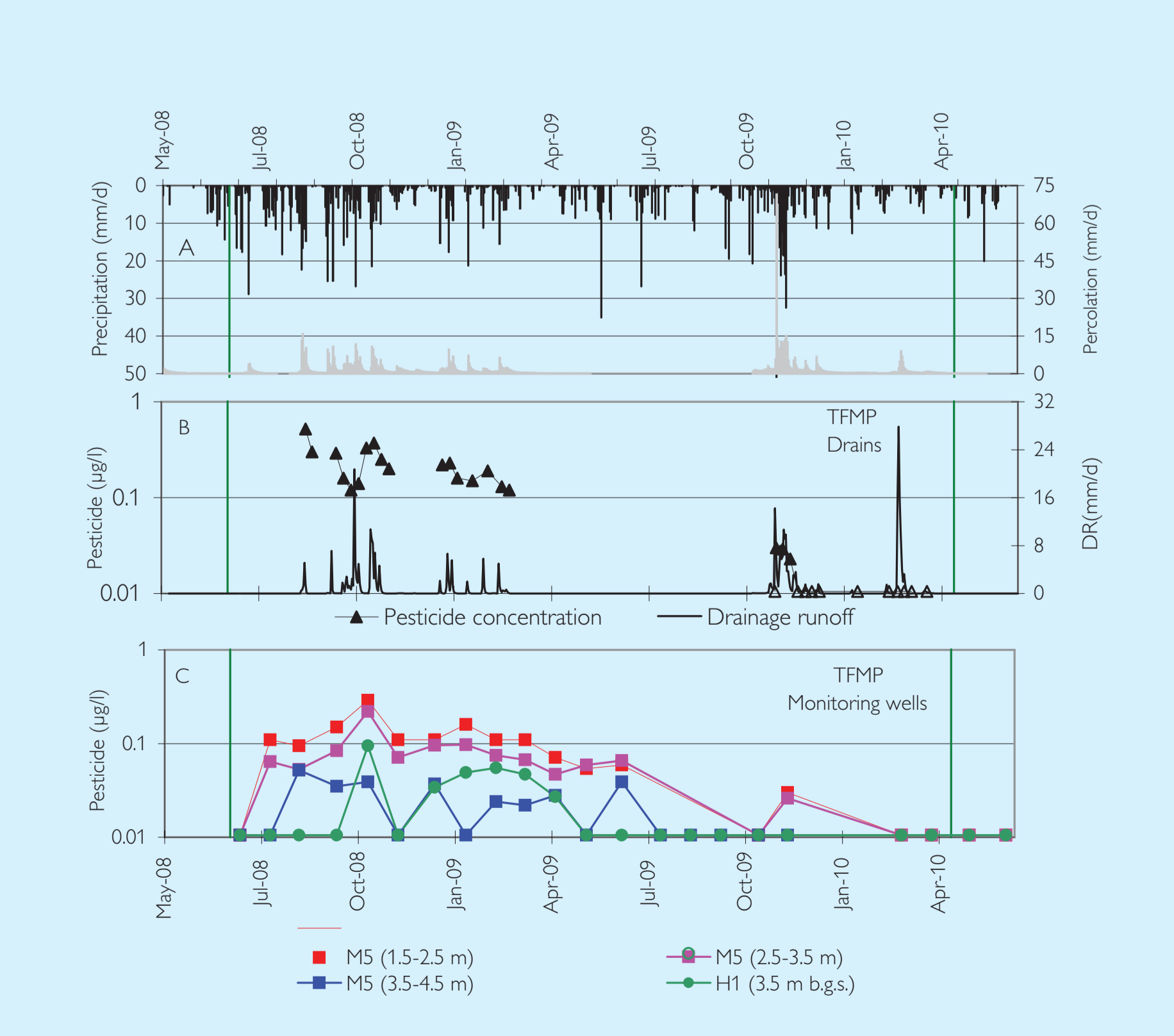
How to use monitoring data in pesticide regulation.

SELECTED MONITORING RESULTS

Leaching of a strongly sorbing pesticide from the loamy soil at Estrup



Leaching of mobile metabolite from the loamy soil at Silstrup



Precipitation and simulated percolation 0.6 m b.g.s. (A) together with the concentration of glyphosate (B) and AMPA (C) in the drainage runoff (DR, on the secondary axis). The nine-year period includes four applications of glyphosate - the green vertical lines. Open symbols are values below the detection limit of 0.01 µg/l. Detection of glyphosate and AMPA in groundwater monitoring wells is shown in D and E.

Precipitation and simulated percolation 1 m b.g.s. (A) together with the concentration of TFMP (5-(trifluoromethyl)-2-(1H)-pyridinone) a metabolite of fluzafop-P-butyl in the drainage runoff (B) and groundwater monitoring wells (C). The green vertical lines indicate the dates of fluzafop-P-butyl applications. Values below the detection limit of 0.01 µg/l are shown as 0.01 µg/l (all graphs) and further represented by open symbols in B.

Comments or questions

Please contact



Preben: preben.olsen@agrsci.dk

Jeanne: jkj@geus.dk



Annette: aer@geus.dk

