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Alarm Evaluation of the bbe Algae Toximeter in The Netherlands

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Kiel, 1-3 July, 2008

Introduction

- Principle
- Performance Characteristics
- Case Study - May-June 2006 in River Meuse: Diuron
- Case Study - Sept. 2006 in River Meuse: Terbutryn
- Sensitivity

Principle

- Excitation of chlorophyll-a molecules
- Normally 2 % of energy is emitted as fluorescence
- Disturbance of photosynthesis process leads to increased fluorescence

Performance Characteristics

- Based on the ISO for online sensors
- Essential for the acceptance of biological monitoring systems

Reference number of working document: ISO/TC 147/WG 2 N 29

Date: 2001-07-25

Reference number of document: ISO/DIS 15839

Committee identification: ISO/TC 147/WG 2

Secretariat: AFNOR

Water Quality – On-line Sensors/Analysing Equipment for Water – Specifications and Performance Tests

Titre — Titre — Partie n: Titre de la partie

Performance Characteristics Standard based on:

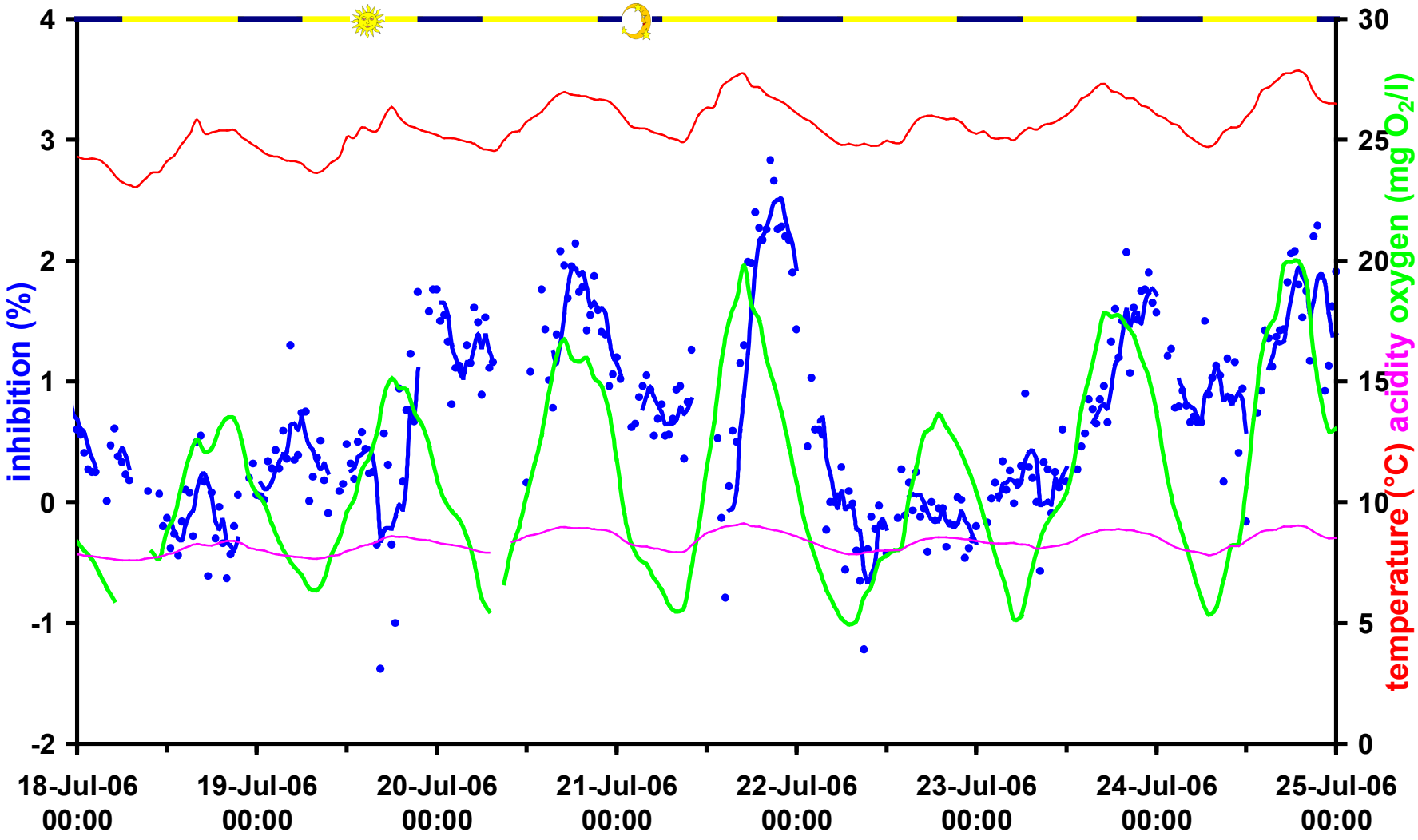
Laboratory tests

Performance Characteristic	Unit	Result according to ISO 15839	
Response^{+}time, Response^{-}time			
Delay^{+}time, Delay^{-}time			
Rise time, Fall time			
Linearity (tested range)			
Coefficient of variation	%		
Limit of detection (LOD)			
Limit of quantification (LOQ)			
Repeatability			
Lowest detectable change (LDC)			
Trueness			
Short term drift	%		
Day-to-day repeatability			
Memory effect		if yes the value	
Interference caused by: interferent 1			
Interference caused by: interferent 2			
Environmental conditions (lower/upper) 1		if yes the value	if yes the value
Environmental conditions (lower/upper) 2		if yes the value	if yes the value

Field tests

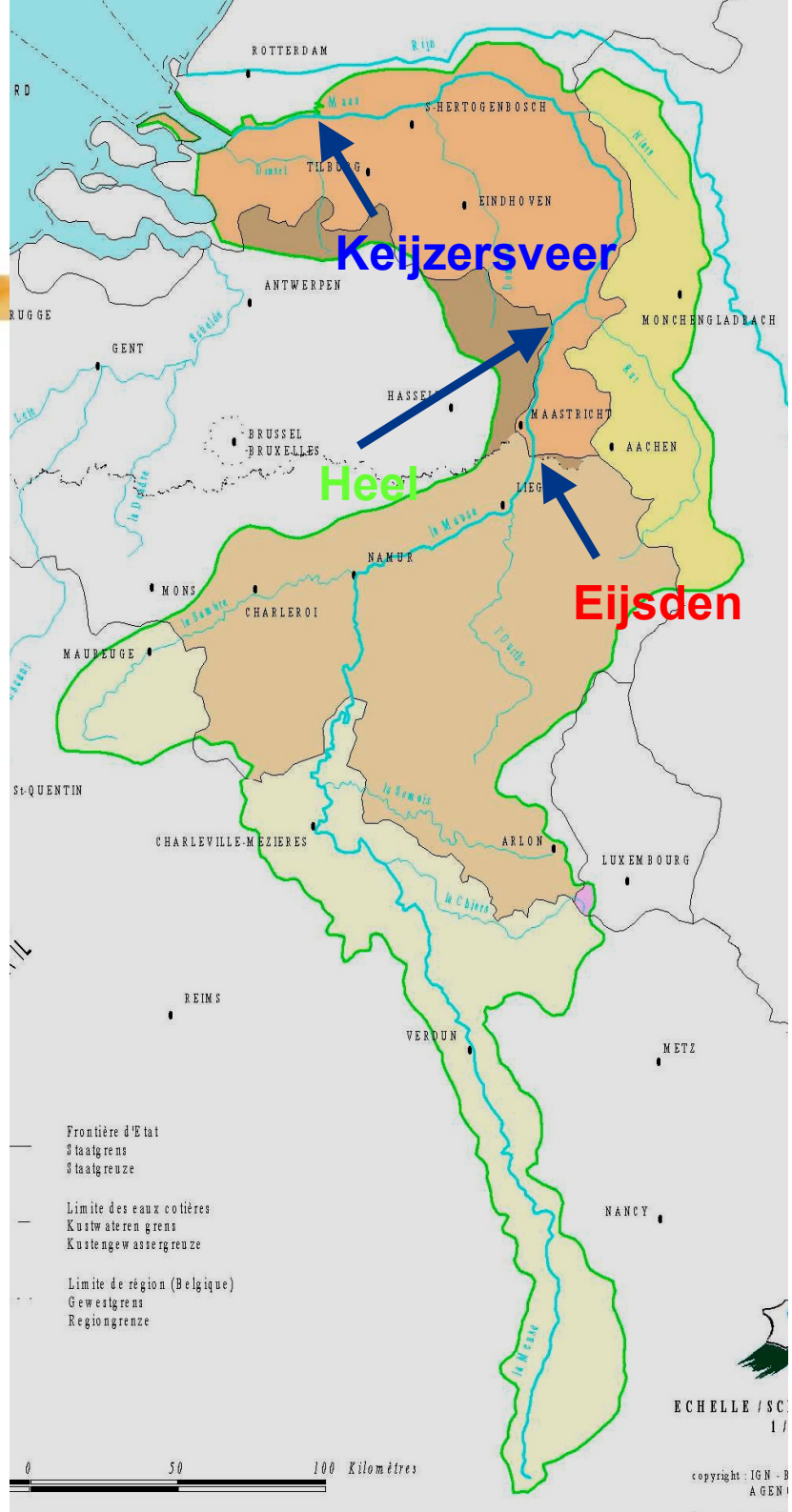
Performance Characteristic	Unit	Result according to ISO 15839	
Response^{+}time, Response^{-}time			
Delay^{+}time, Delay^{-}time			
Rise time, Fall time			
Trueness based on (relative/absolute) differences			
Long term drift	%		
Availability, Up-time	%		

Performance Characteristics: Matrix Effects

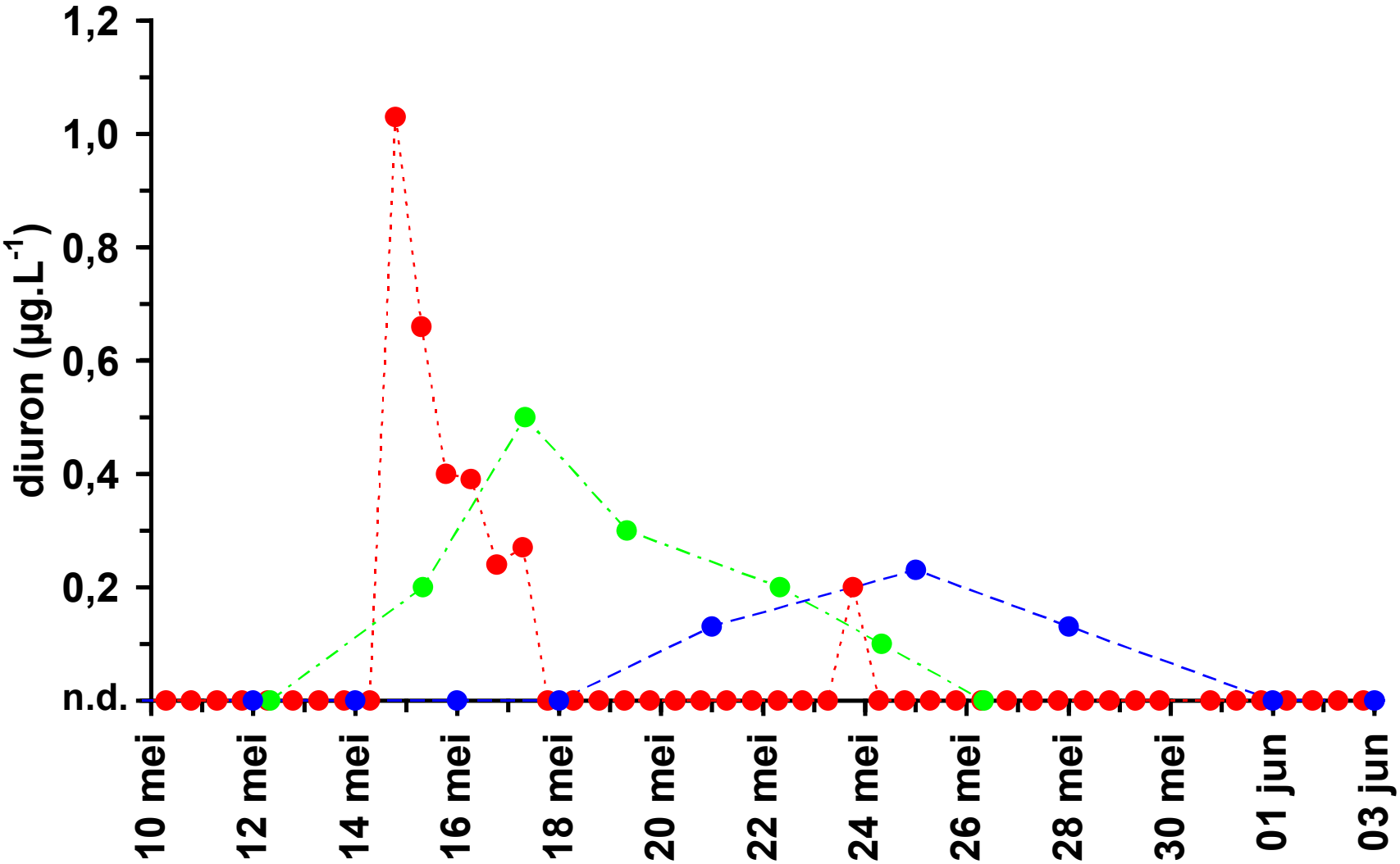


Diuron in River Meuse

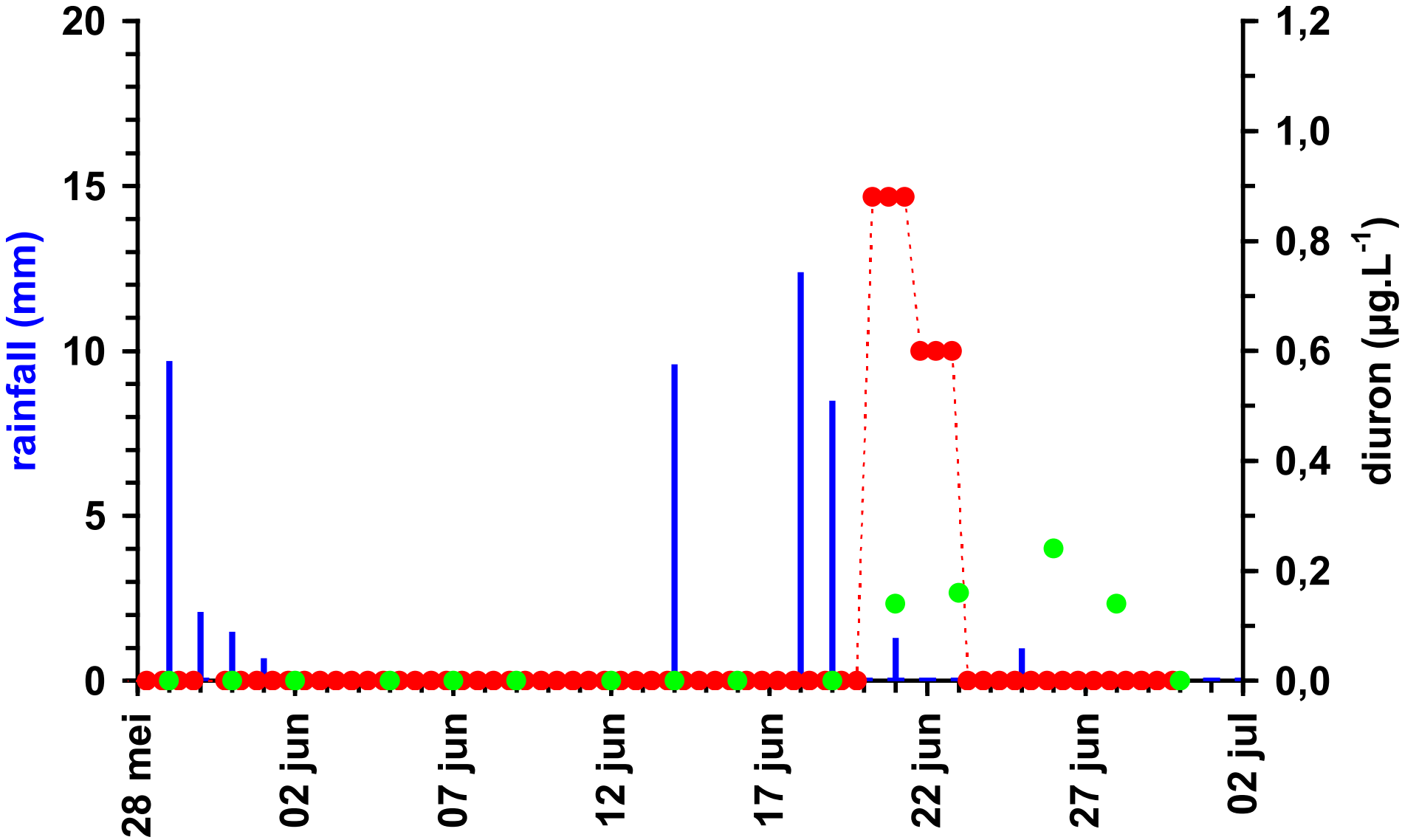
- **Persistent herbicide: $t_{1/2}$ = 4 months**
- **Peaks - May 2006:**
  - **Eijsden: max. 1.03 µg/L; 2.5 days**
  - **Keijzersveer: max. 0.23 µg/L; 7 days**
- **June: max. 0.88 µg/L in Eijsden**



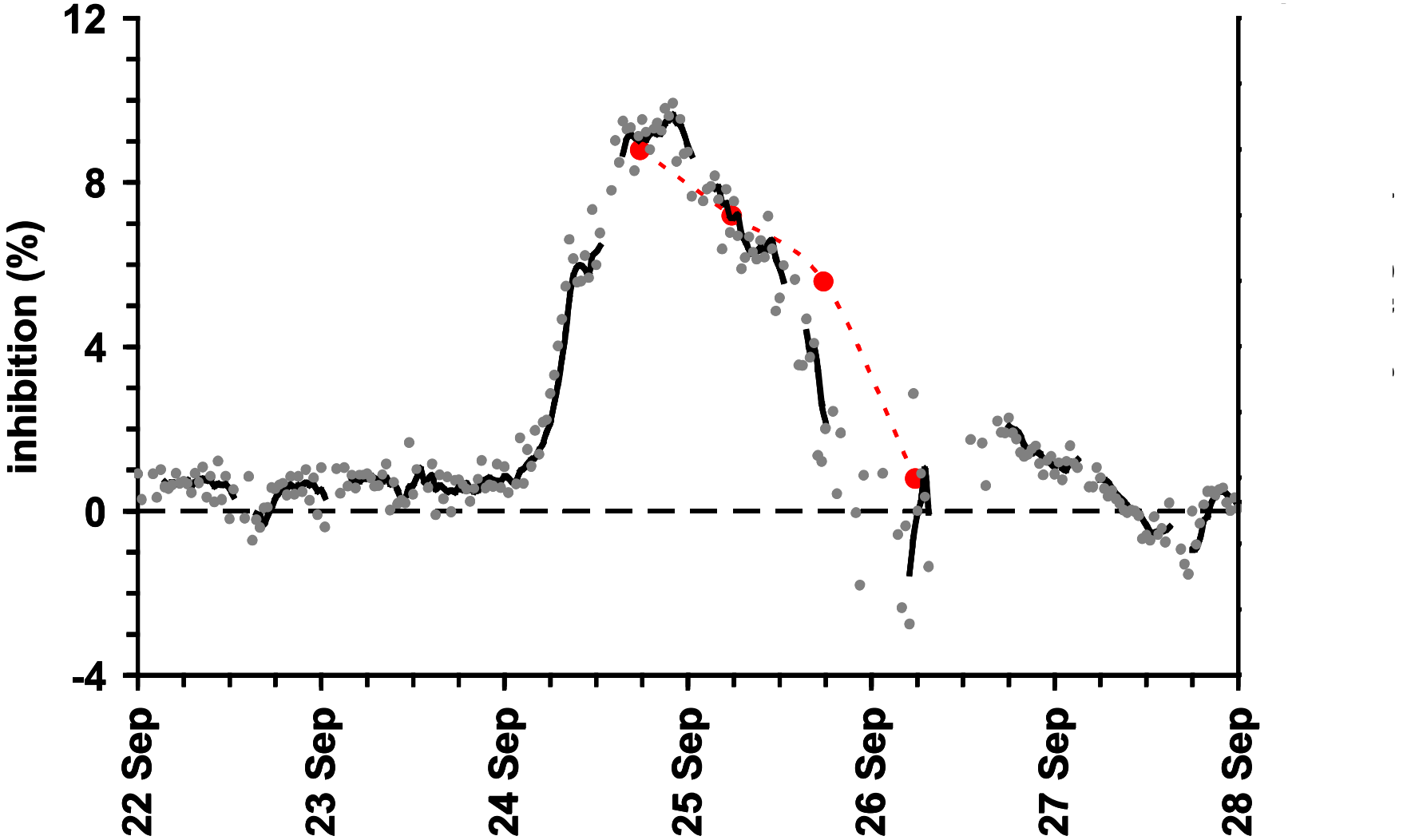
Diuron in May-June 2006



Diuron Levels and Rainfall



Alarm Event on 24th September, 2006



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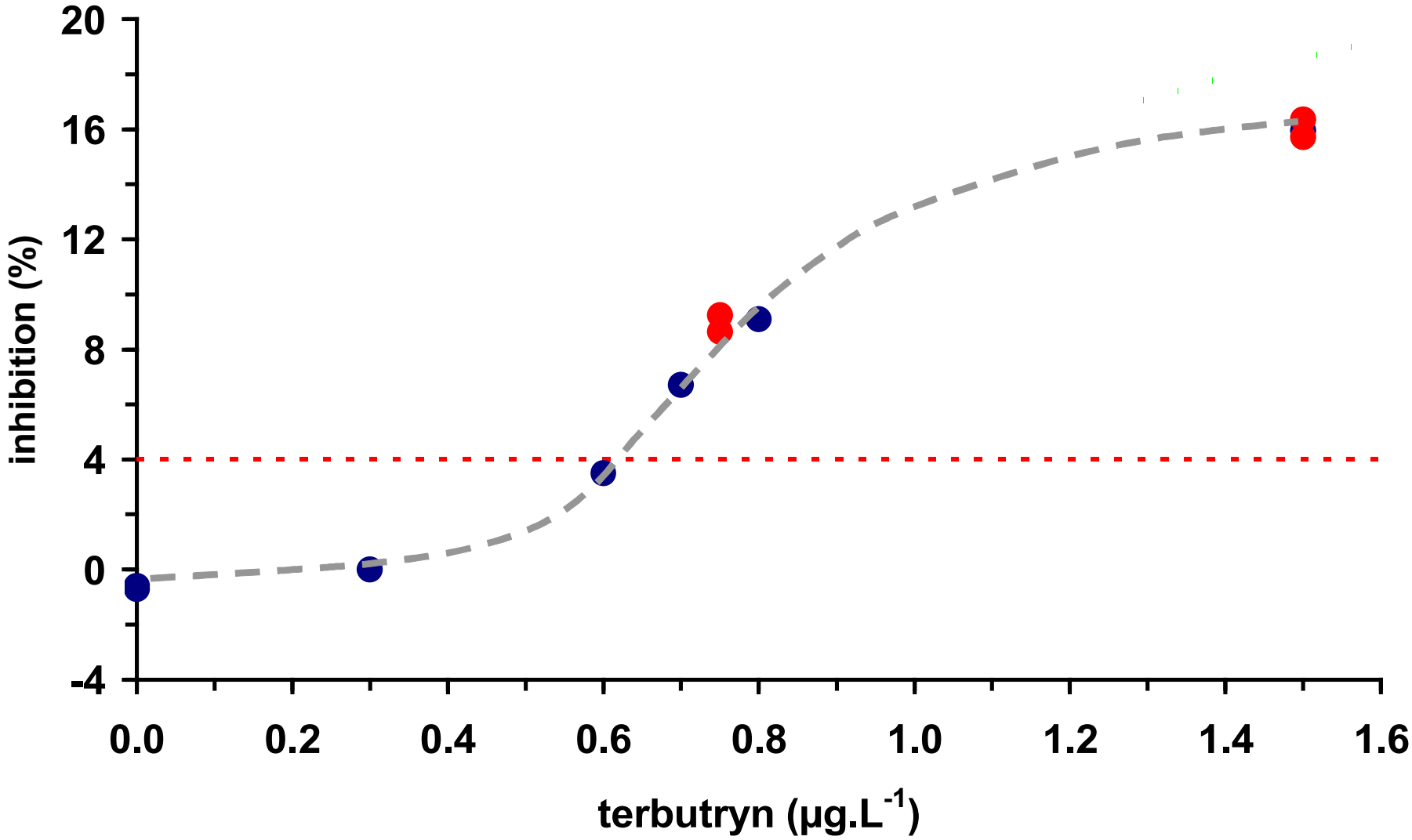
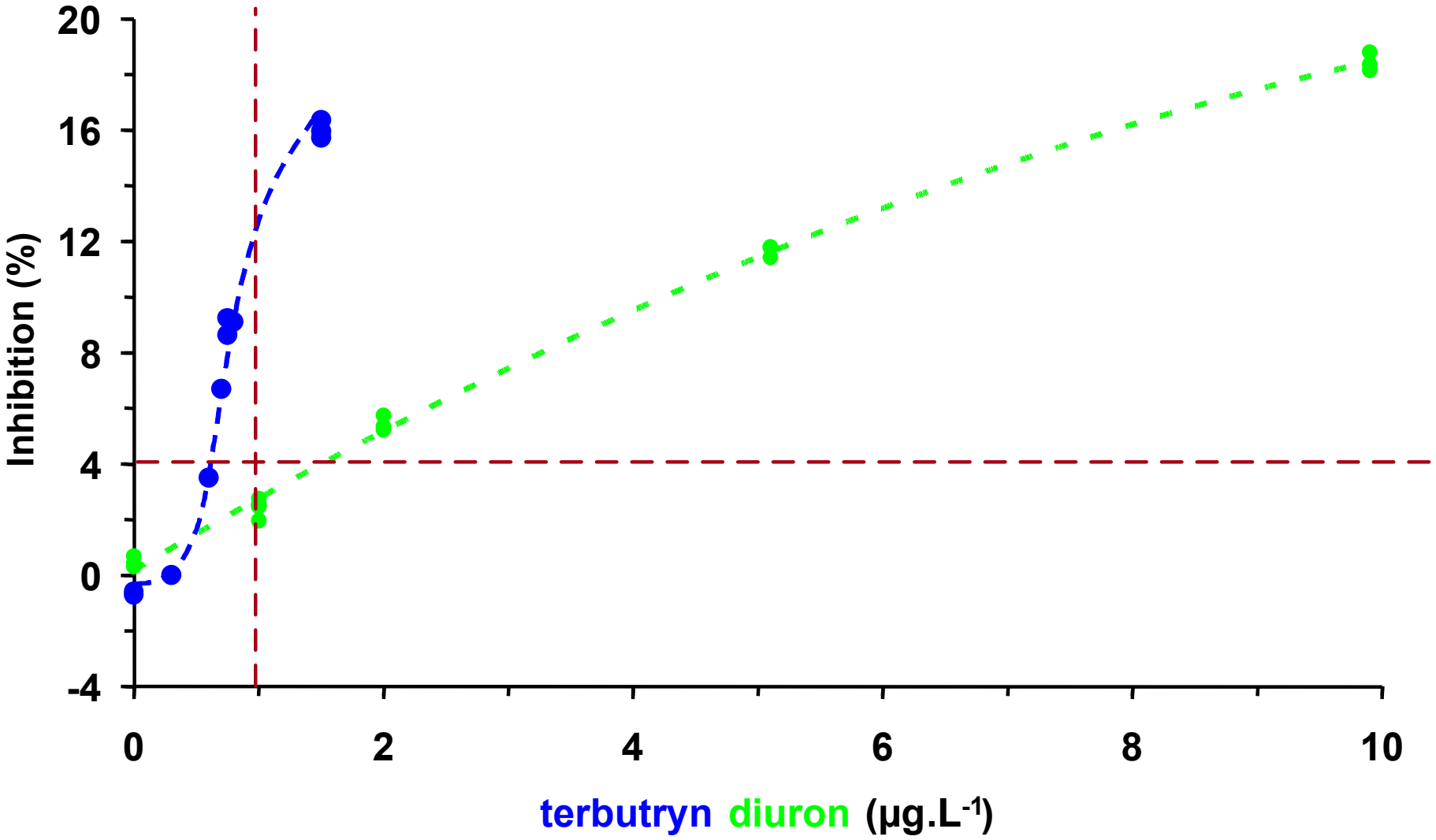
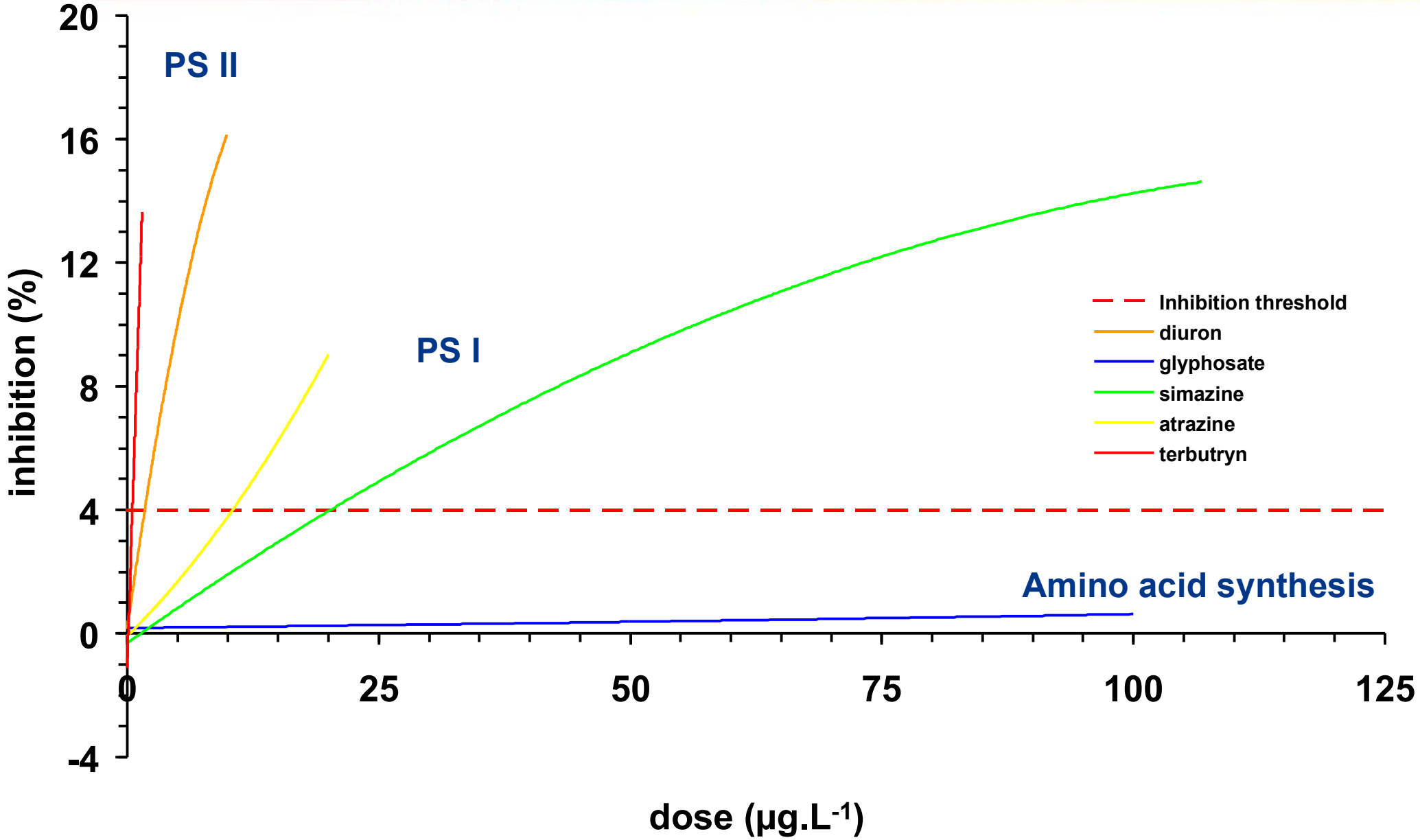


Alarm Event on 24th September, 2006



Standardised Sensitivity
Comparison of Different Herbicides



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Thank you for your attention

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