



Methane Emission from Thai Paddy Fields by using the Sensor Technique

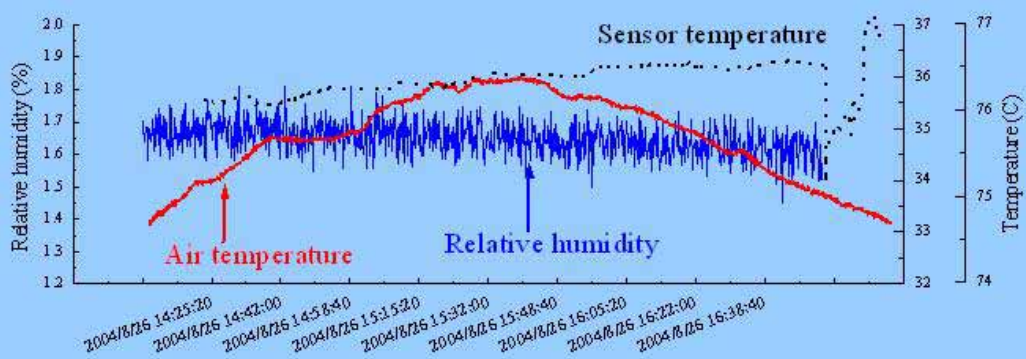
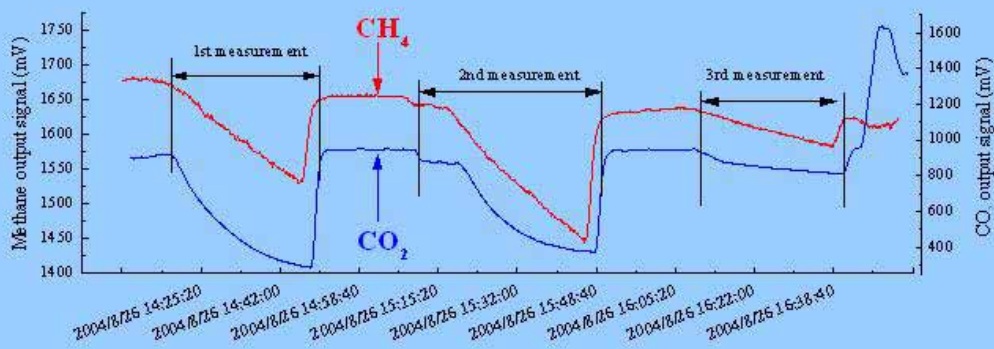
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Backgrounds

- **APN CAPaBLE GHG Inventory Project; NIES (Japan) and JGSEE (Thailand), 2004-2006**
- **2004: Training in Japan**
 - **Reported in 2nd Workshop on GHG Inventories in Asia Region (WGIA) in Shanghai**
- **2005: Measurements in Thailand paddy fields**

Portable methane sensor



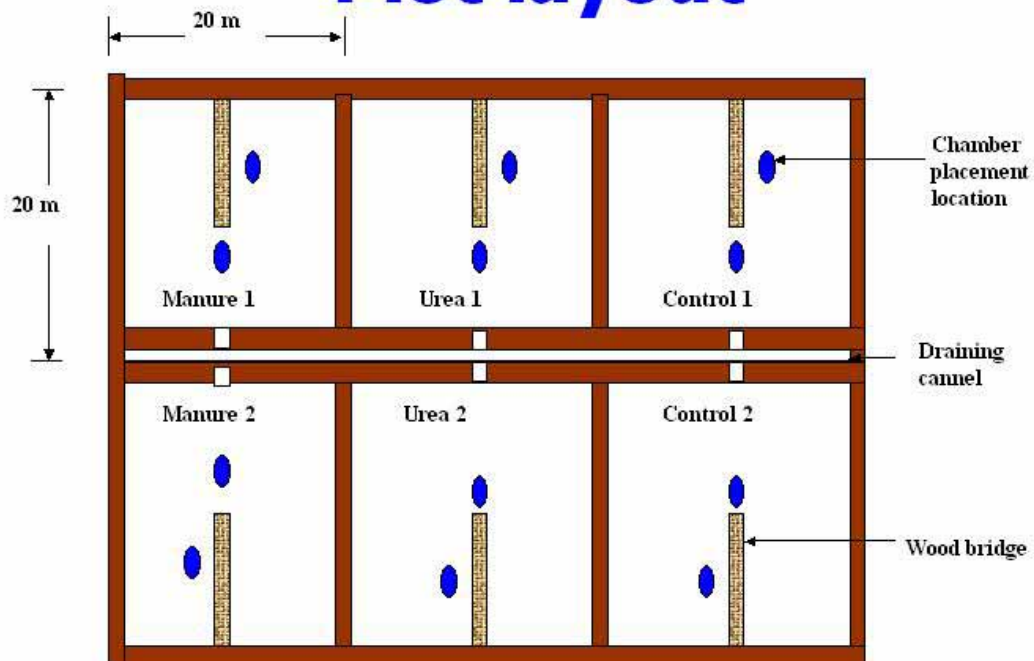
Measurements in Thailand



Experiment Designs

- **Irrigated fields**
- **Continuous flooding**
- **Treatments:**
 - **No fertilizer**
 - **Chemical fertilizer only**
 - **Manure fertilizer only**

Plot layout



- **Field preparation for rice cultivation was begun in the end of April 2005.**
- **Seeds of rice (Rachinee cultivar) were sown by hands on 22 April 2005.**
- **Chemical fertilizer (urea) was applied on 14 days after seed sowing (DAS) at the rate of 12.5 kg per plot and again on 26 DAS at the same application rate.**

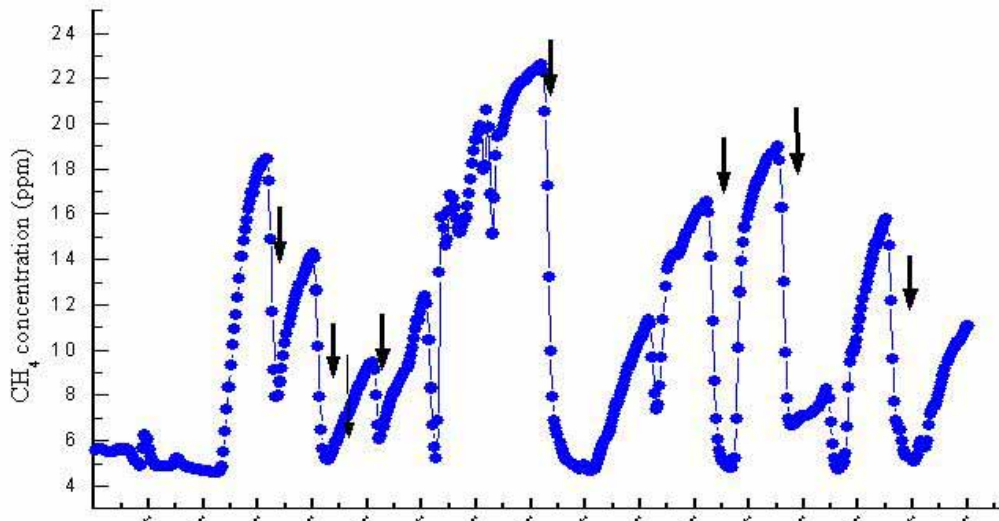
- **Farmyard manure was applied only once at the beginning of rice cultivation at the rate of 45 kg per plot.**
- **Drained water from all fields at the end of growing season on 79 DAS to facilitate harvest by farm machinery**
- **Rice in all treatments was harvested on 30 July 2005 or 99 DAS.**



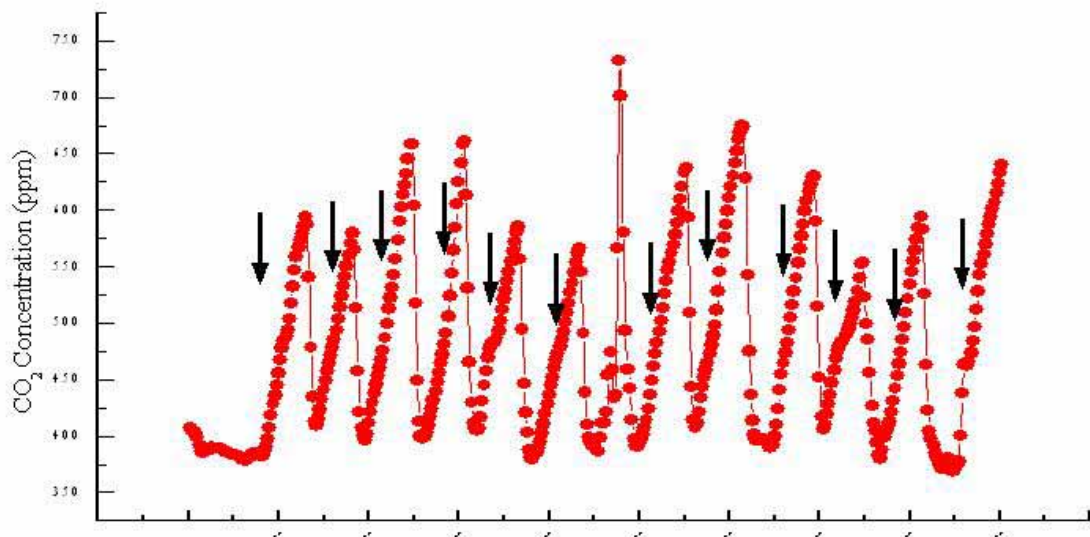


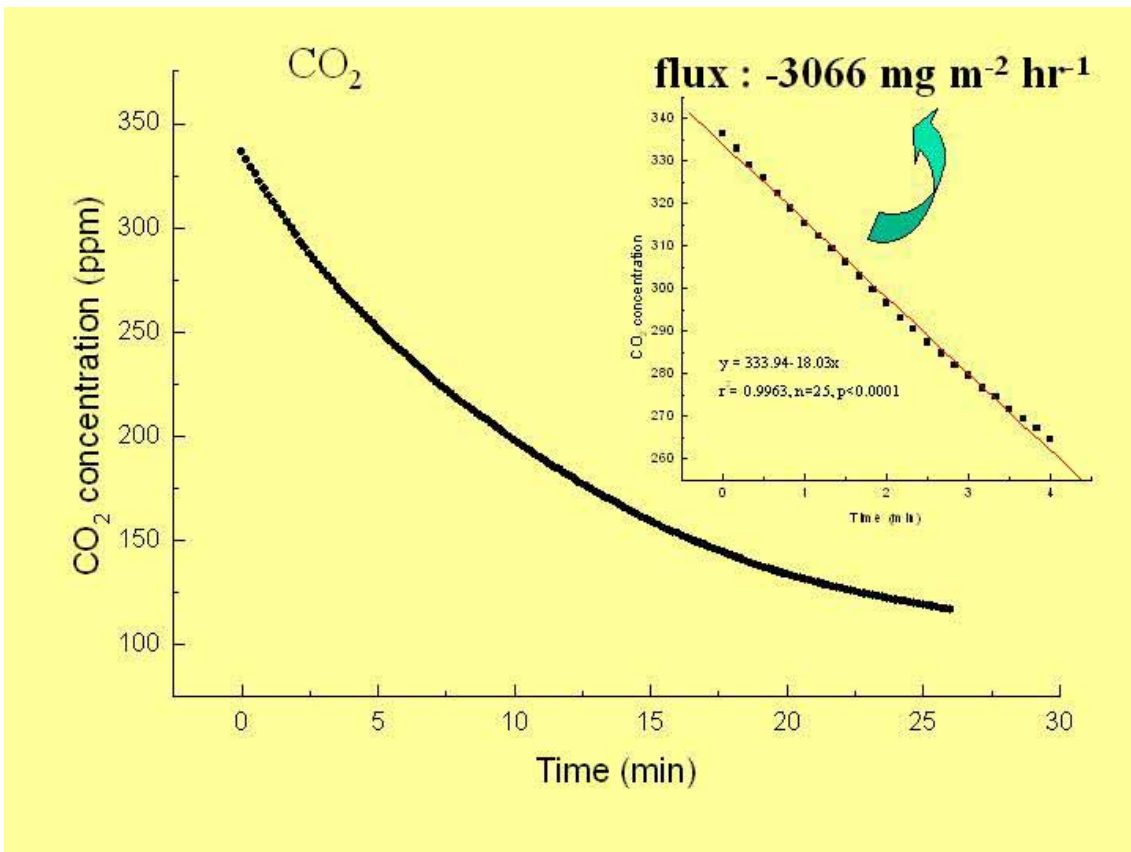
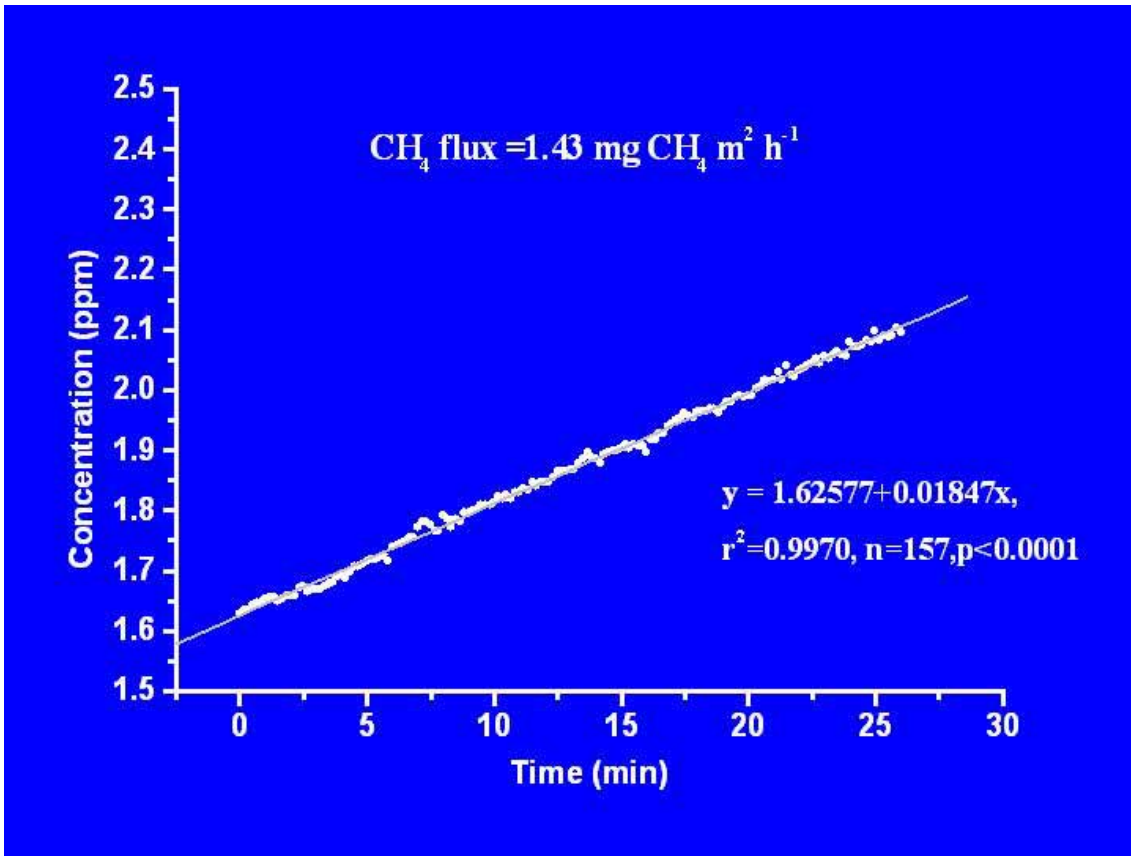


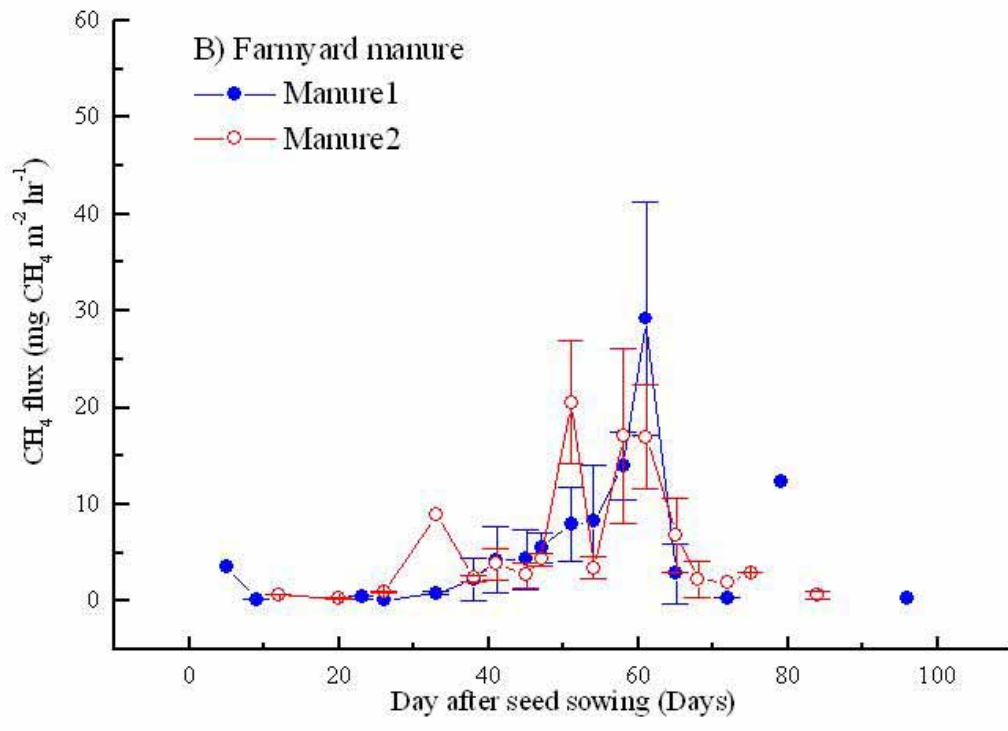
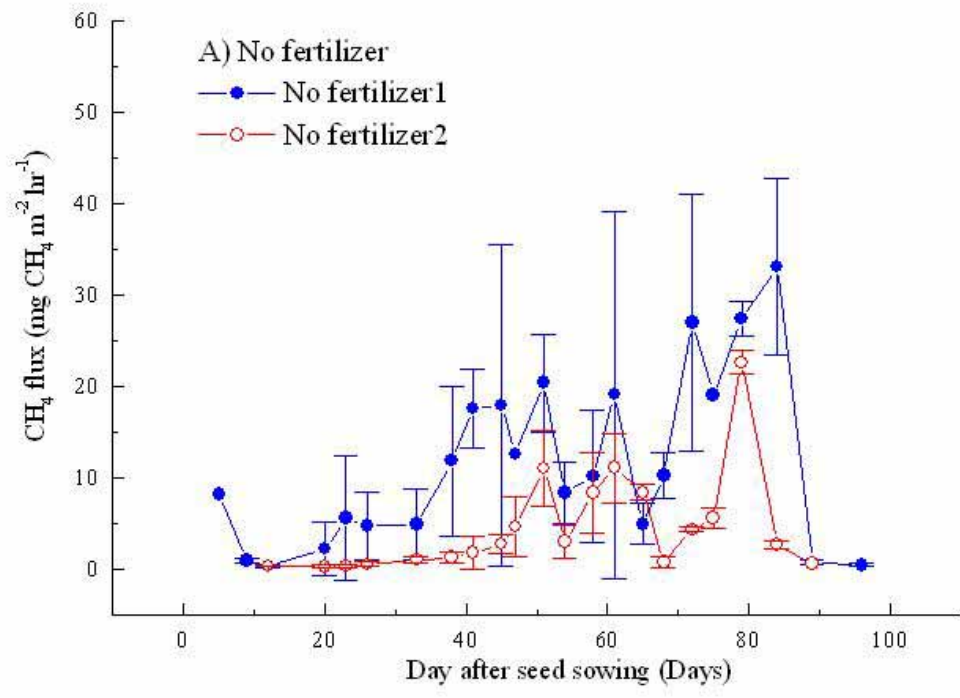
CH₄ measurements

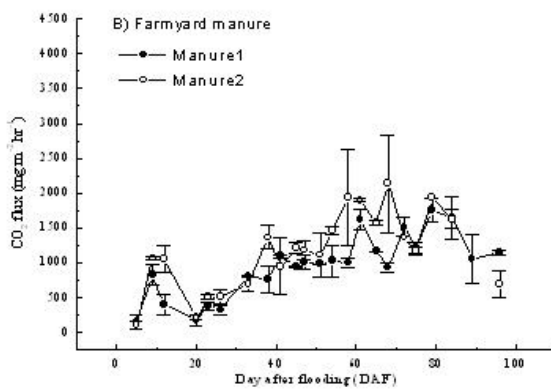
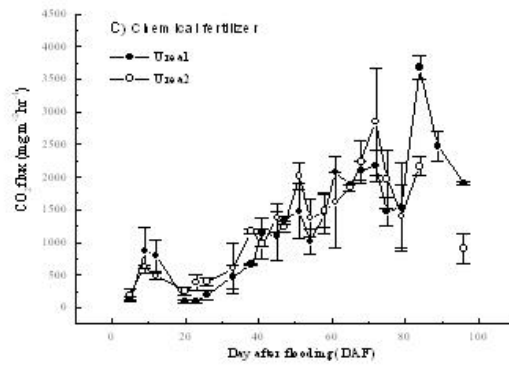
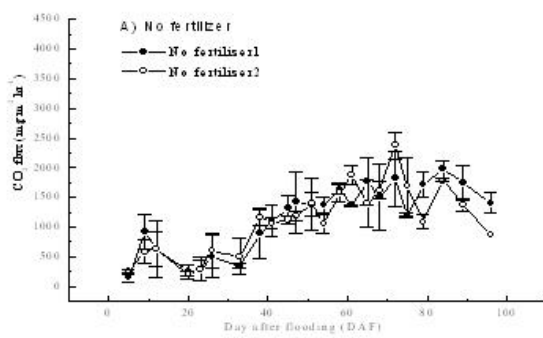
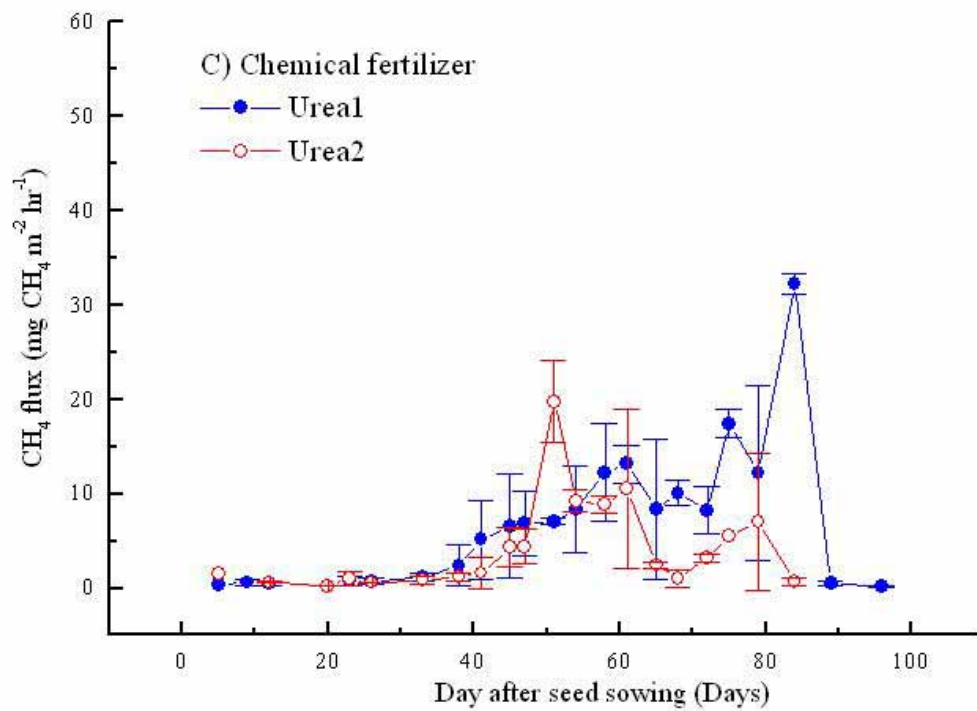


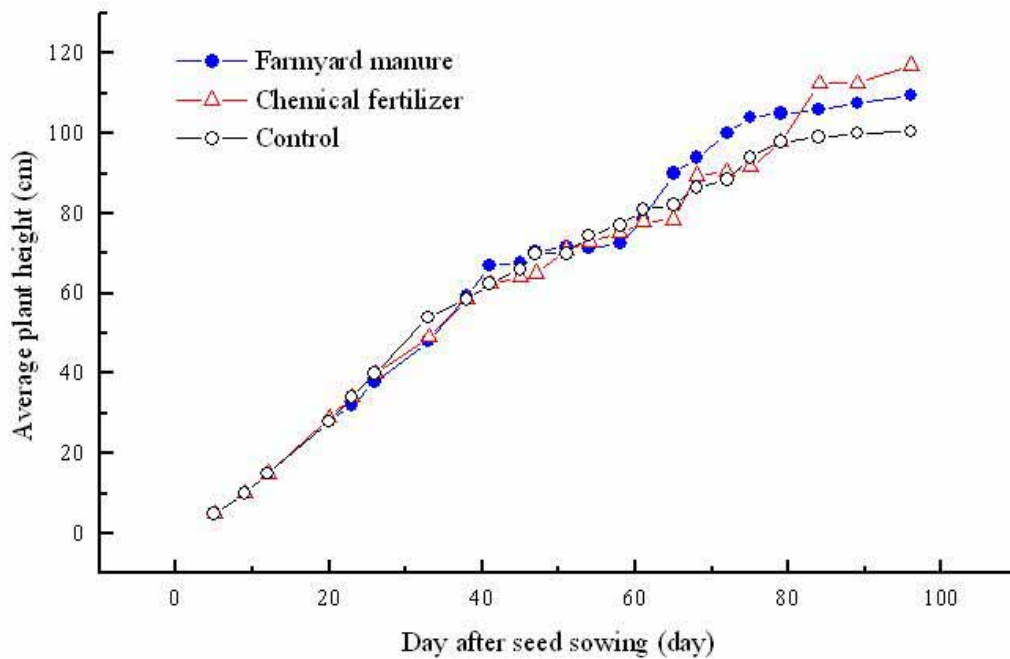
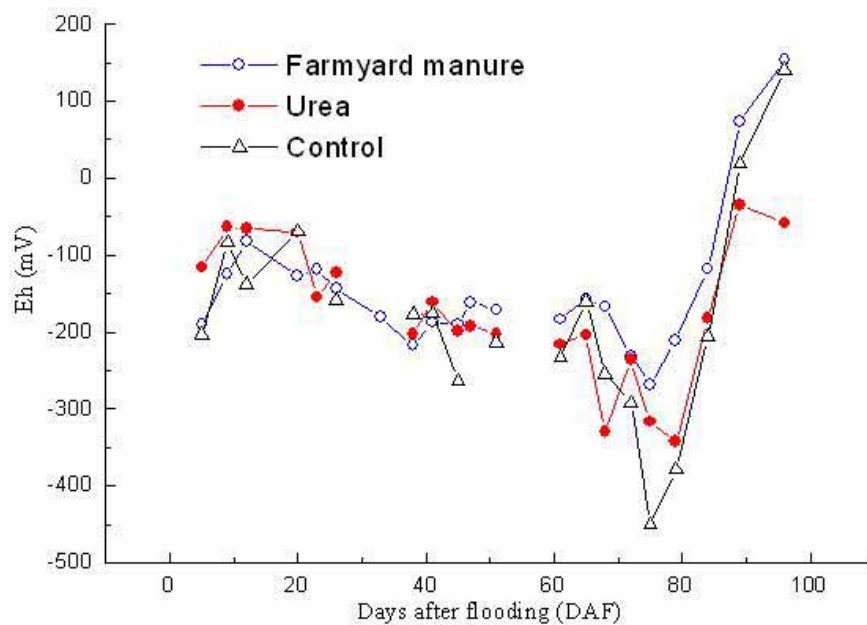
Measurement of CO₂











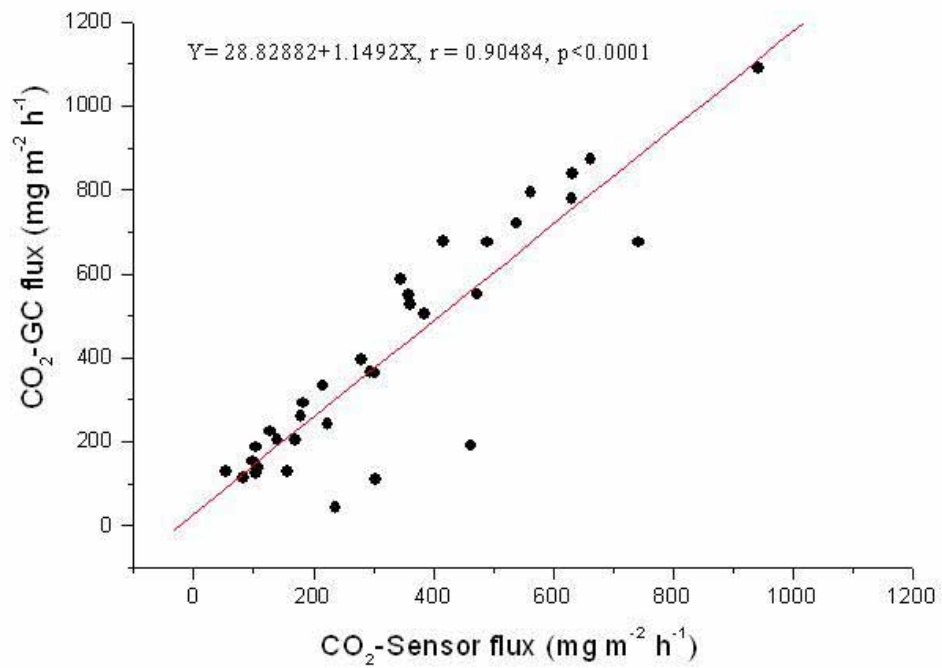
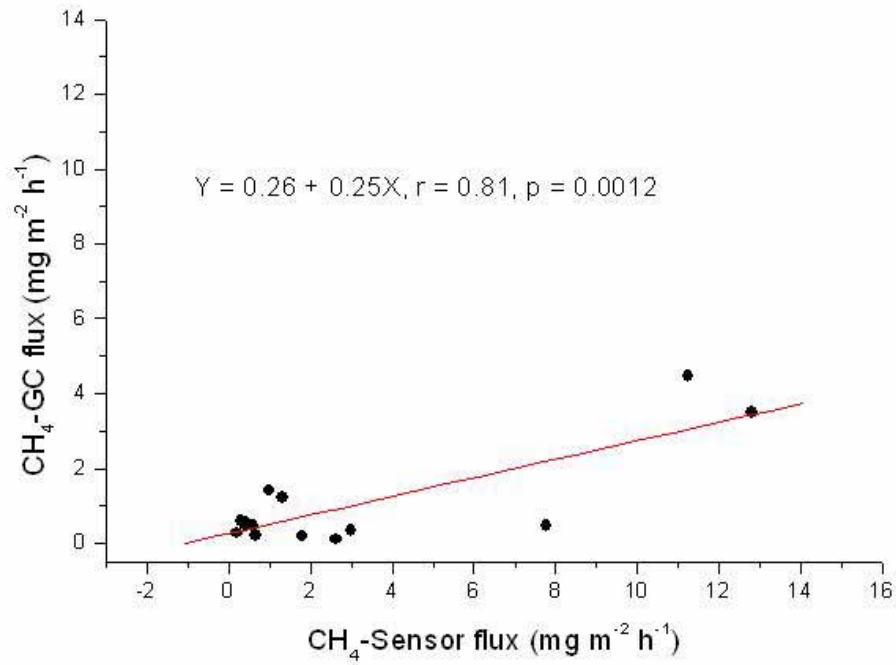
Flux Summary: first crop 2005

Treatment	CH ₄ flux	CO ₂ flux
	g/m ² /crop	
Control	8.5	2420.9
Chem.	11.0±3.6	2700.2
Manure	13.8±2.9	2308.6

Grain Yield

Treatment	Grain (ton/ha)
Control	4.3
Chem.	5.2
Manure	4.7

GC-Sensor Results-Comparison



Issues needed further investigation

- **Effects of fertilization—2nd and 3rd crops.**
- **Discrepancies in methane flux between GC and Sensor technique—need more measurement data, cross calibration**