

A SOIL NITROGEN TEST for AERIALY SOWN RICE

Project 2101

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BACKGROUND

Potential yield ~ 18 t ha⁻¹.

N limits yield the most.

High N status yield penalties.

Pre-flood N - twice as efficient as TDN.

No strategic N test available.

Goal - half a bag i.e. 30 kg N ha⁻¹.



SOIL NITROGEN TEST EQUATION

$$\text{Plant N Uptake} = \text{SNS} + (\% \text{NFR} * \text{NFA})$$

where; SNS = Soil N Supply
NFR = N Fertiliser Recovery
NFA = N Fertiliser Applied pre-flood.

Q. How measure SNS?

A. plant N uptake from control plots.

**Assumption: plant demand = soil supply



Soil N Test Protocol

Aerially sown.

Semi-dwarfs.

Soil samples; 0-10 cm, <2mm

NIR analysis; ~20g

Calibrated against "Rice N Uptake"

**Assumption: no sub-soil influence.



HARVEST DRY MATTER (HDM)

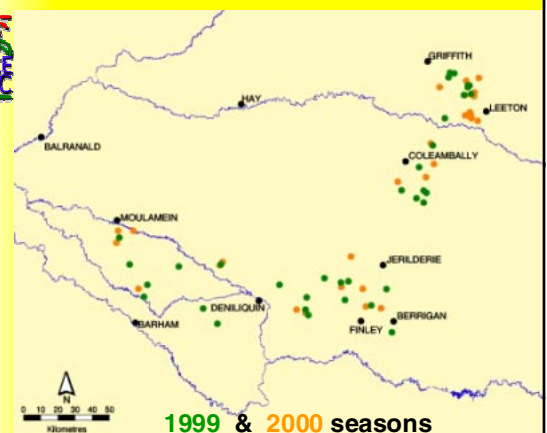
Best measure of Yield Potential

Highly correlated with N yield

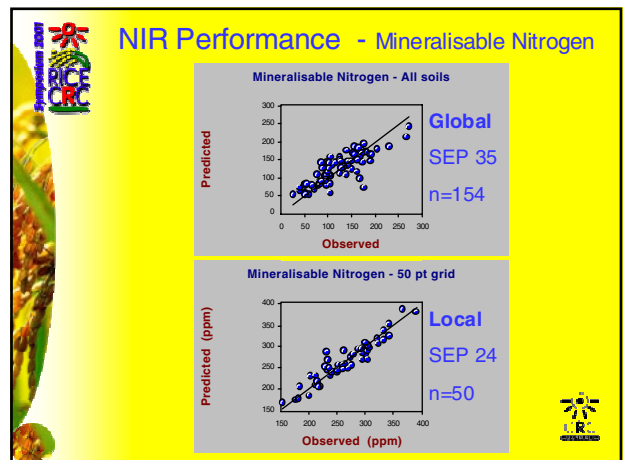
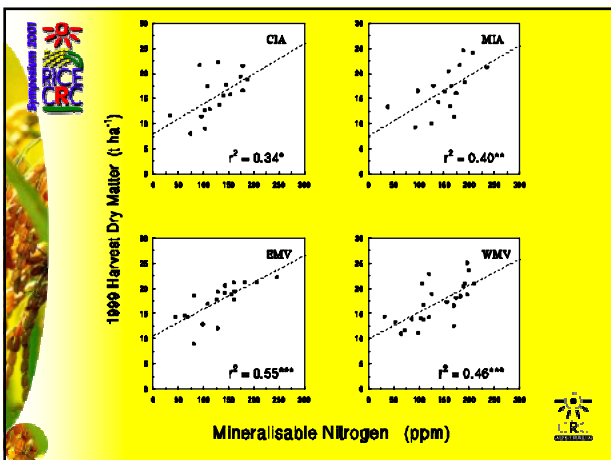
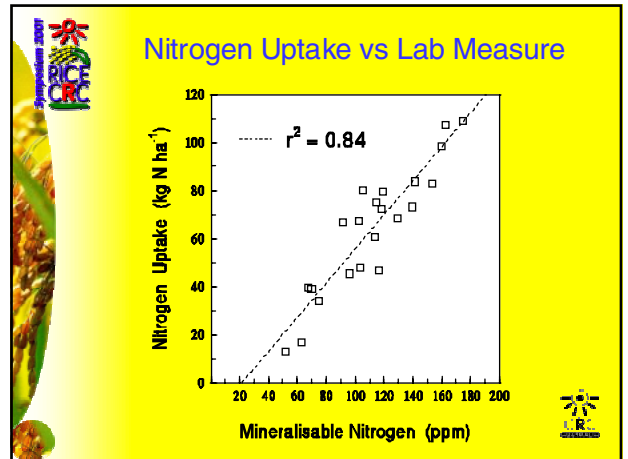
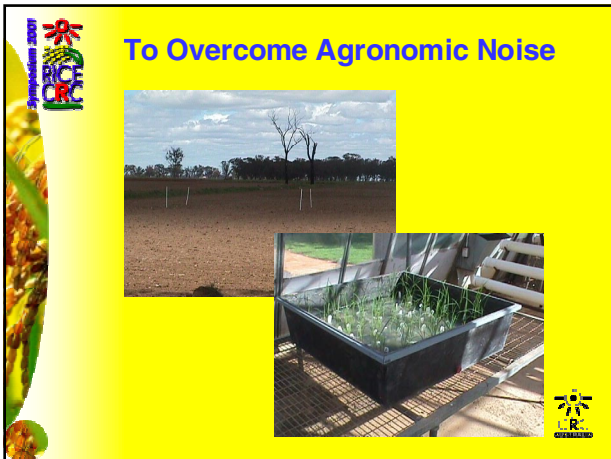
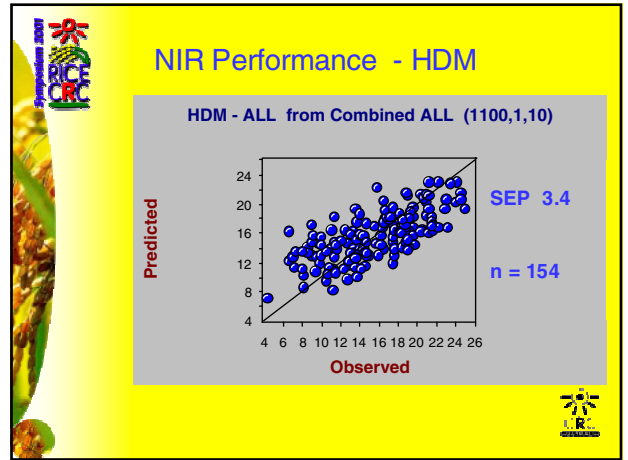
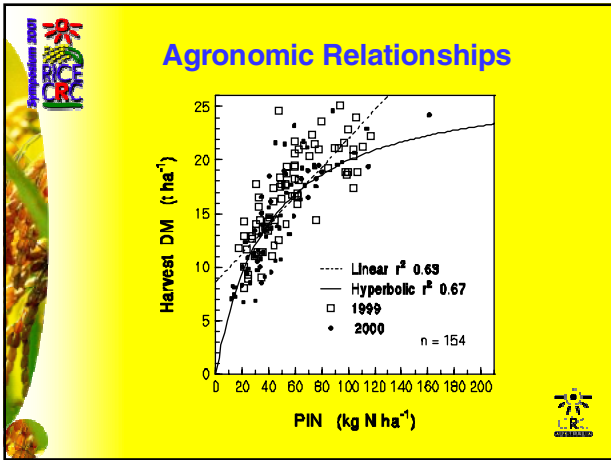
A more reliable measure of N yield

Nutrient limited measure?

** Highly correlated with PIN



1999 & 2000 seasons



NIRS Calibration Data ?

Field
or
Laboratory

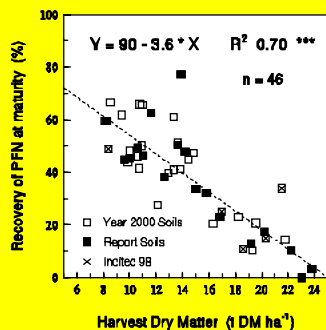


FERTILISER RECOVERY

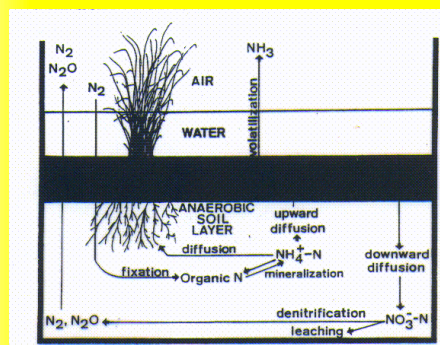
1. Estimating Recovery (Agronomic)
2. Measuring Recovery (N-15 Isotope)
3. Improving Recovery (Management)



Nitrogen Fertiliser Recovery



Nitrification in Flooded Rice ?



NIRS Commercial Test

Possible triad of NIRS calibrations;

1. Agronomic 4 categories
2. Incubation 8 categories
3. Early Release ? categories



Future Work

1. Field vs Glasshouse Productivity.
2. Mineral nutrition.
3. Within paddock variation.

