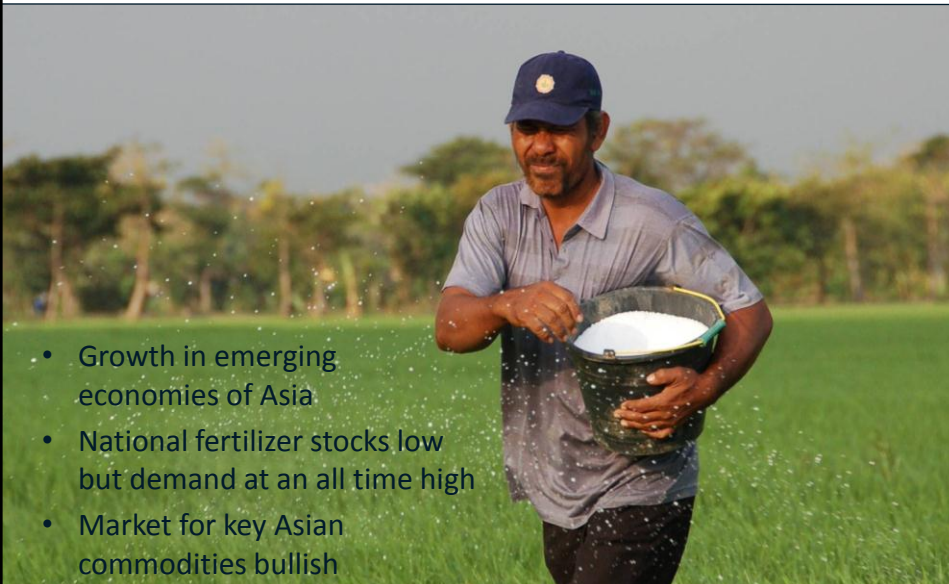# Nutrient Intelligence -

Obtaining and interpreting crop production data to improve fertilizer industry performance

IFA CROSSROADS
ASIA – PACIFIC 2011
Sanya, P.R. China
2 – 4 November 2011

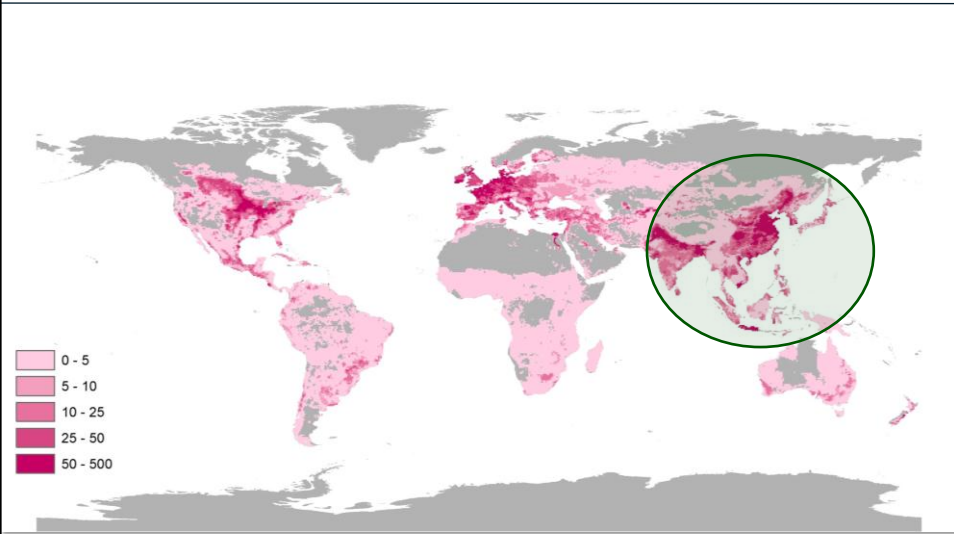|	
Thomas Oberthür	**IPNI Southeast Asia Program**
Simon E. Cook	IPNI Southeast Asia Program
Julie M. Pasuquin	Scientist IPNI Southeast Asia Program
Kaushik Majumdar	Director IPNI South Asia Program

Things look good for IFA Members

- Growth in emerging economies of Asia
- National fertilizer stocks low but demand at an all time high
- Market for key Asian commodities bullish

Global Fertilizer N Use (kg ha^{-1})

Legend:
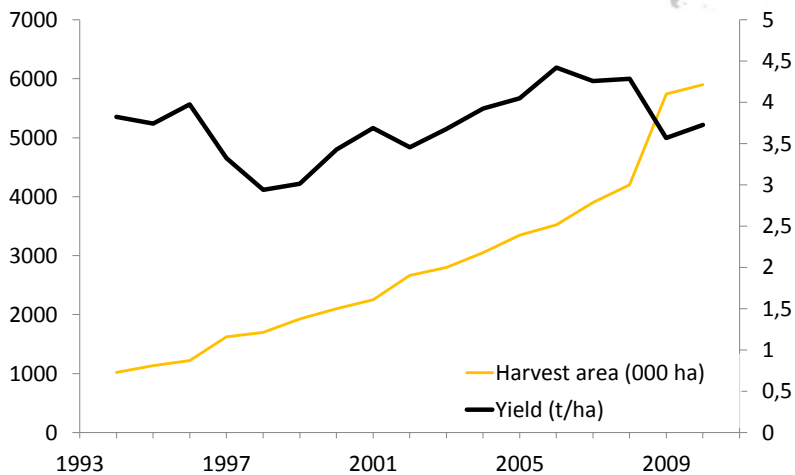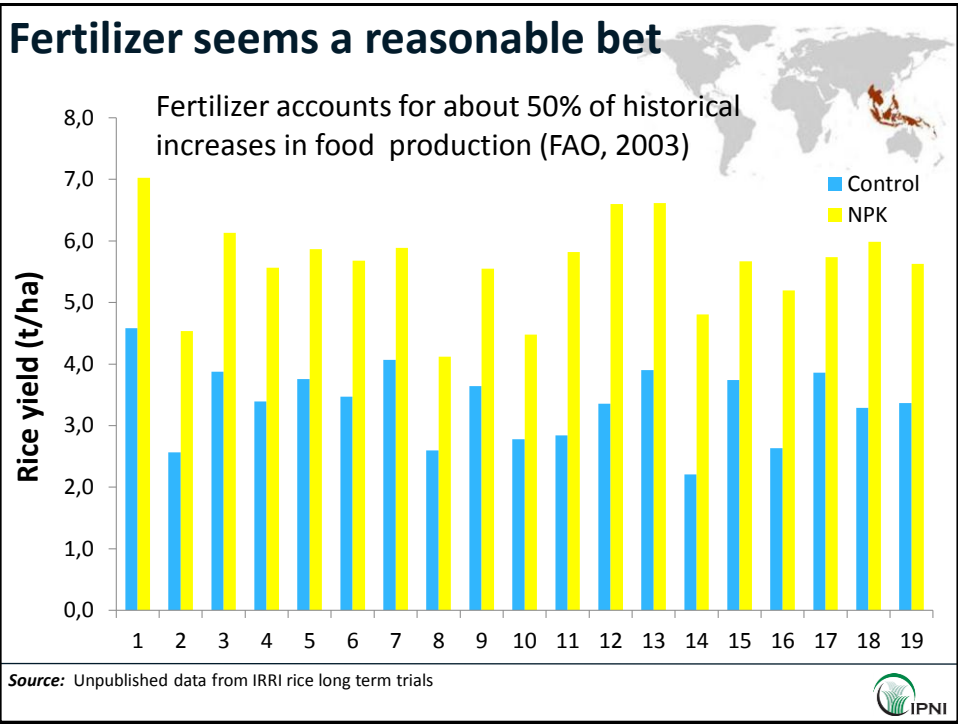- 0 - 5
- 5 - 10
- 10 - 25
- 25 - 50
- 50 - 500

Source: Potter et al. 2010. Characterizing the Spatial Patterns of Global Fertilizer Application and Manure Production. Earth Interactions. Vol 14

IPNI

Sustainable intensification: fertilizer are key

Oil Palm, Indonesia: Expansion of area cannot continue. To maintain production increase over 2010 area, yield gain needs to be nearly 0.2 t/ha a year. Currently they are 0.035 t/ha!

- Harvest area (000 ha)
- Yield (t/ha)

IPNI

Fertilizer seems a reasonable bet

Fertilizer accounts for about 50% of historical increases in food production (FAO, 2003)

Source: Unpublished data from IRRI rice long term trials

How is fertilizer used?

Who actually uses it? Where?
How does the crop respond?
How profitable is it?
How profitable could it be?

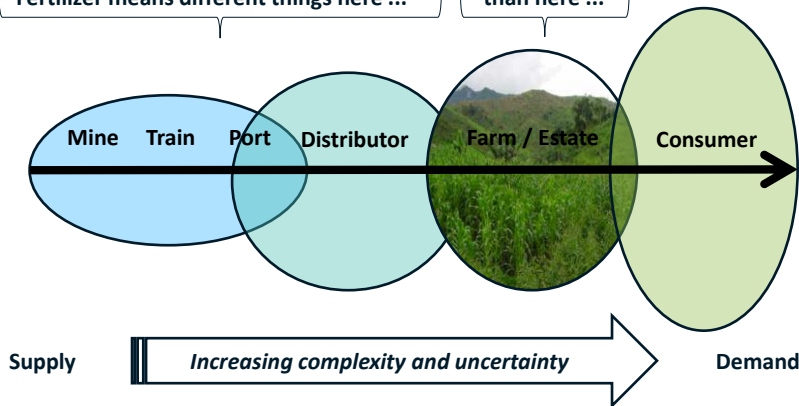# Complexity – spatial temporal uncertainty

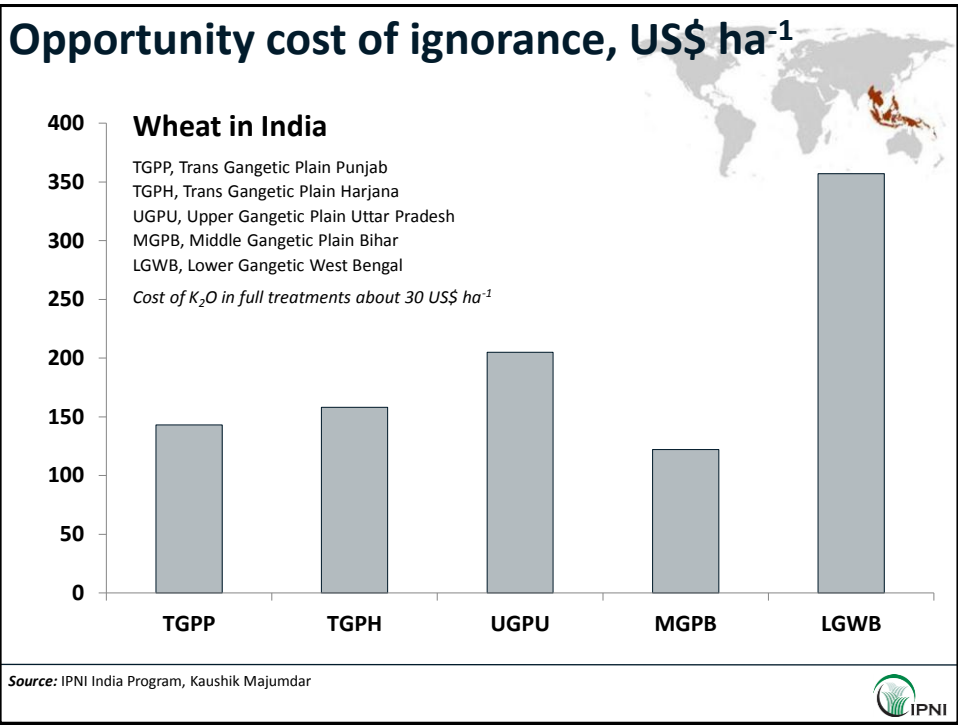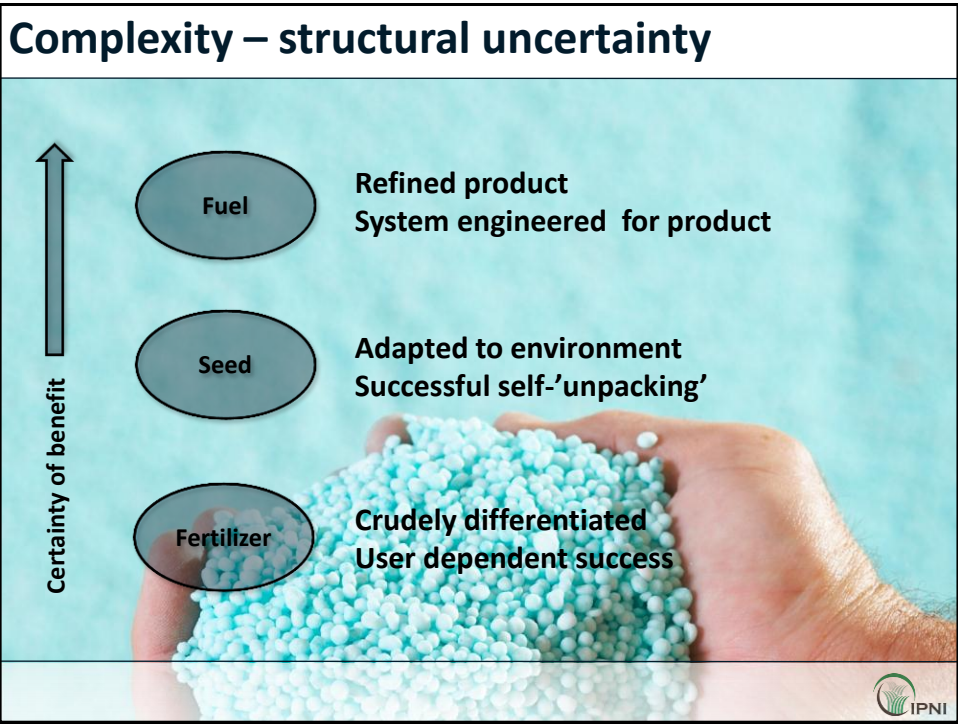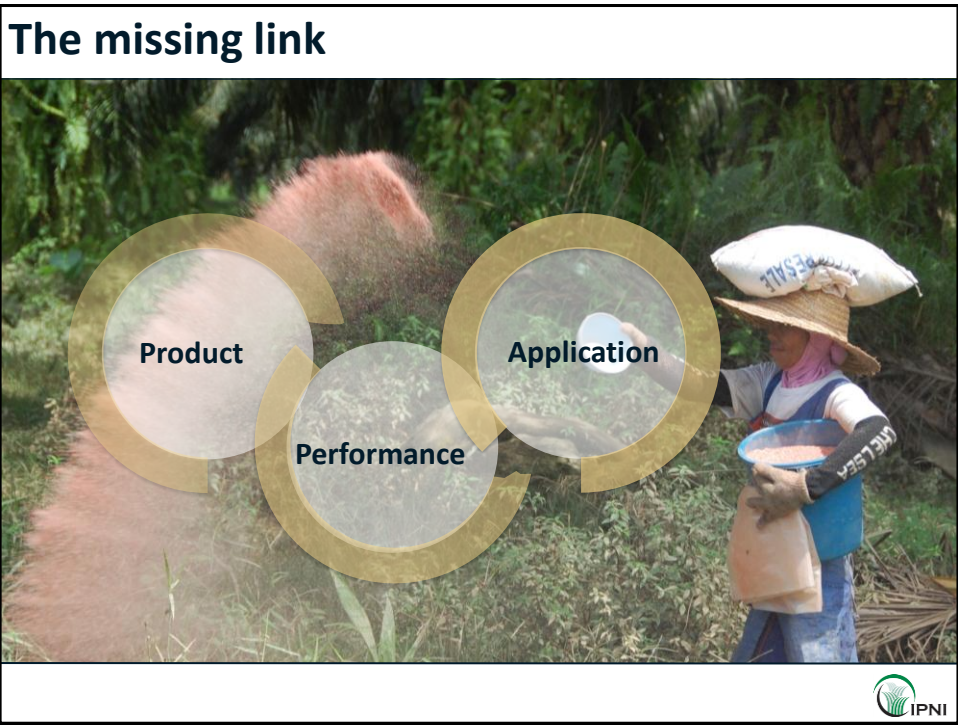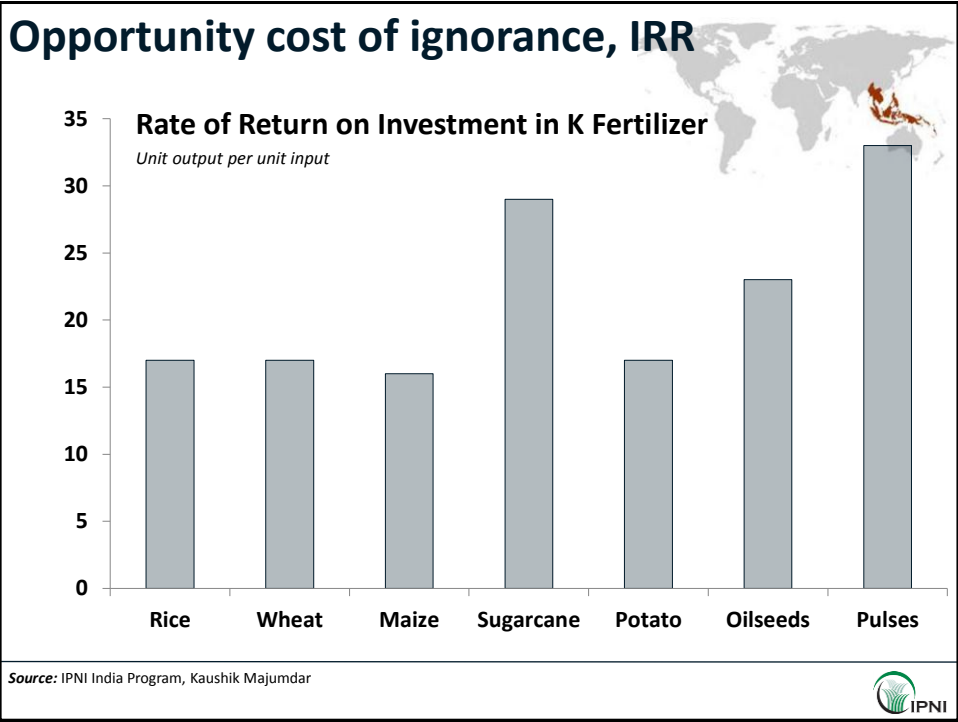**Fertilizers works differently here and there, today and tomorrow**

Complexity – translational uncertainty

Fertilizer means different things here ...   than here ...

Mine   Train   Port   Distributor   Farm / Estate   Consumer

Supply   *Increasing complexity and uncertainty*   Demand

Complexity – structural uncertainty

Certainty of benefit ↑

Fuel
Refined product
System engineered for product

Seed
Adapted to environment
Successful self-'unpacking'

Fertilizer
Crudely differentiated
User dependent success

IPNI

Opportunity cost of ignorance, US$ ha^{-1}

Wheat in India

TGPP, Trans Gangetic Plain Punjab
TGPH, Trans Gangetic Plain Harjana
UGPU, Upper Gangetic Plain Uttar Pradesh
MGPB, Middle Gangetic Plain Bihar
LGWB, Lower Gangetic West Bengal

Cost of K$_2$O in full treatments about 30 US$ ha^{-1}

Source: IPNI India Program, Kaushik Majumdar

IPNI

Opportunity cost of ignorance, IRR

Rate of Return on Investment in K Fertilizer
Unit output per unit input

Source: IPNI India Program, Kaushik Majumdar

The missing link

The missing link

Product
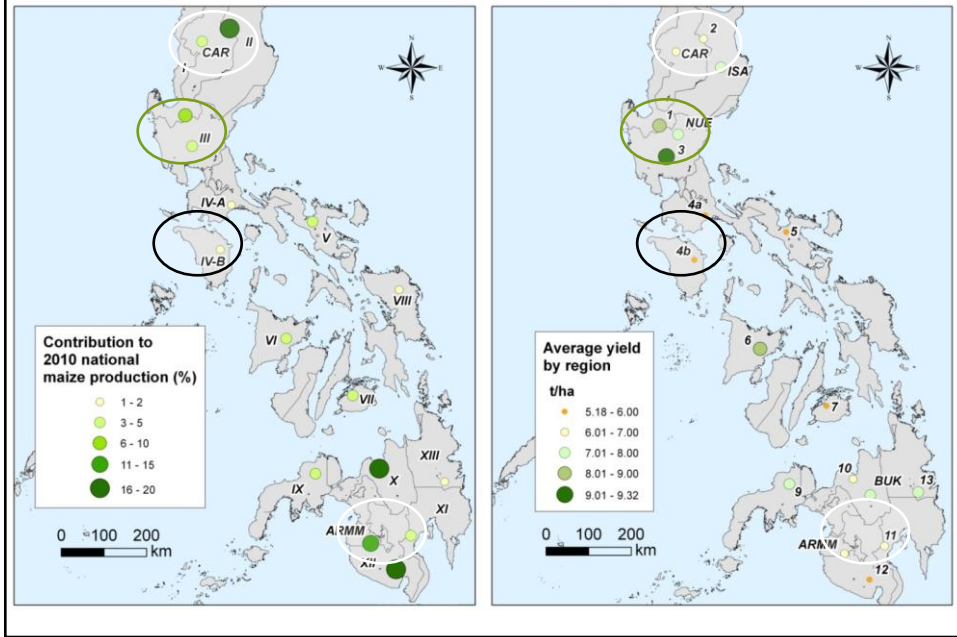
Performance

Application

Nutrient Intelligence Concept

Nutrient intelligence (NI) is information to support decisions about fertilizer use and marketing under variable and hence uncertain conditions. It is produced by analyzing the performance of crops and fertilizers within a geographic region and season(s)
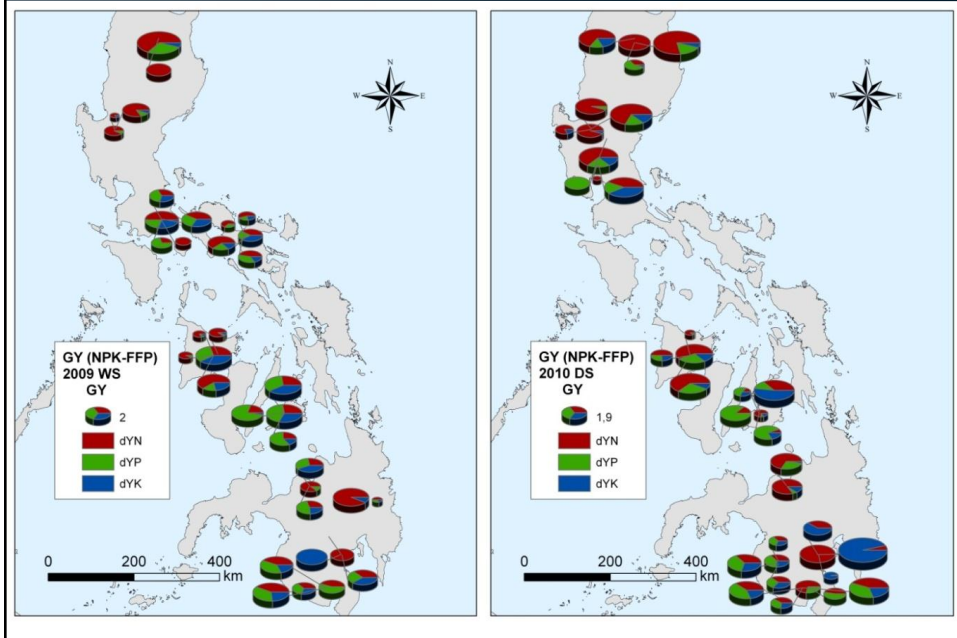
The outcome of such analyses is adaptive **input** management by agribusiness, growers and their supporting organizations that contributes to profitable and sustainable production and marketing systems
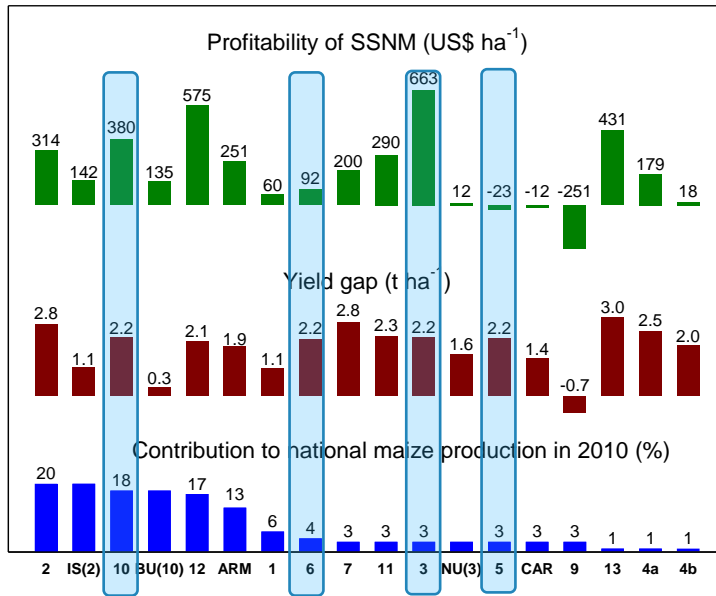
Prospecting for high gain areas

Performance variation, yield gap & fertilizer
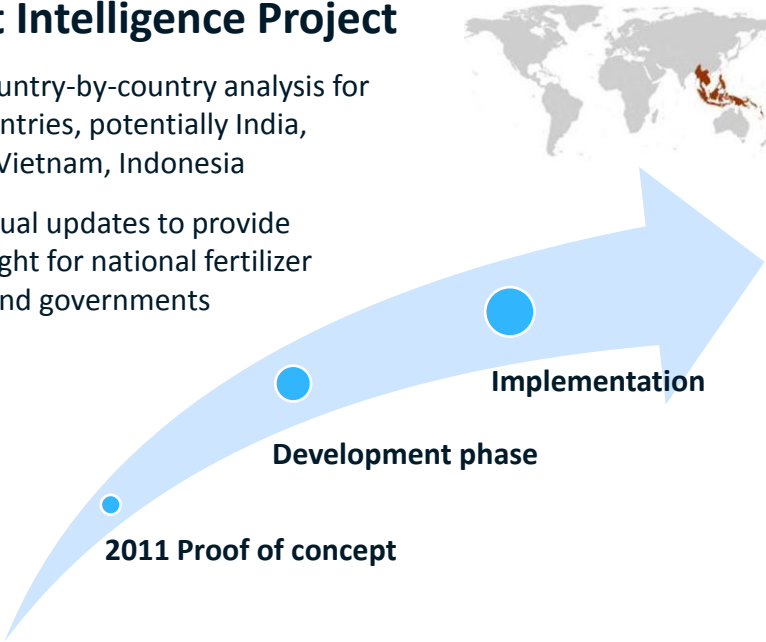
Profit gap ≠ yield gap

Profitability of SSNM (US$ ha^{-1})

Yield gap (t ha^{-1})

Contribution to national maize production in 2010 (%)

The missing link – pilot to implementation

Product

Application

Performance

Nutrient Intelligence Project

Purpose: Country-by-country analysis for selected countries, potentially India, Philippines, Vietnam, Indonesia

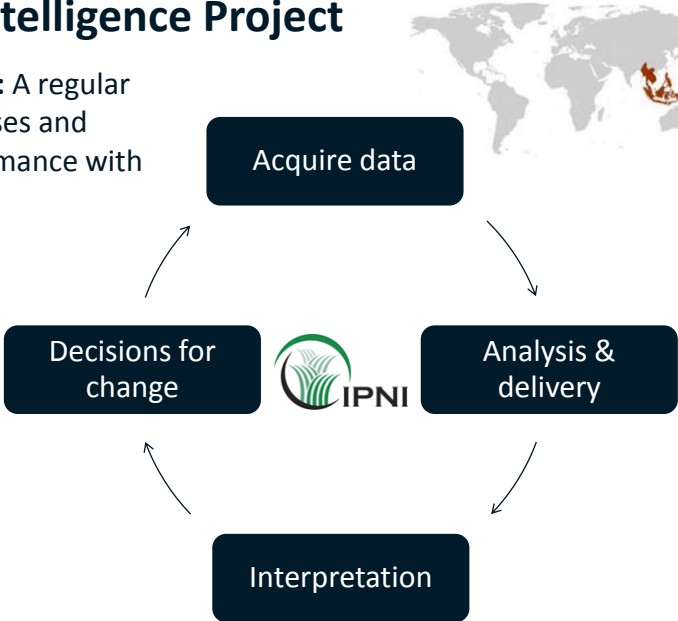**Output:** Annual updates to provide strategic insight for national fertilizer companies and governments

Implementation

Development phase

2011 Proof of concept

Nutrient Intelligence Project

Implementation: A regular process of analyses and review of performance with partners

Acquire data

Decisions for change

Analysis & delivery

Interpretation

Nutrient Intelligence Project

Delivery: Includes learning dialogue with partners and dashboard type information provision

Source: http://dashboardspy.wordpress.com

Summary

- **Outlook generally good for fertilizer**

- **Intensification is a regional imperative**

- **And fertilizer an important factor**

- **General benefits known but uncertainty about performance**

- **Intelligence helps to reduce uncertainty**

- **IPNI develops with partners a supply chain integrated process**

- **Performance benchmarking becomes routine**