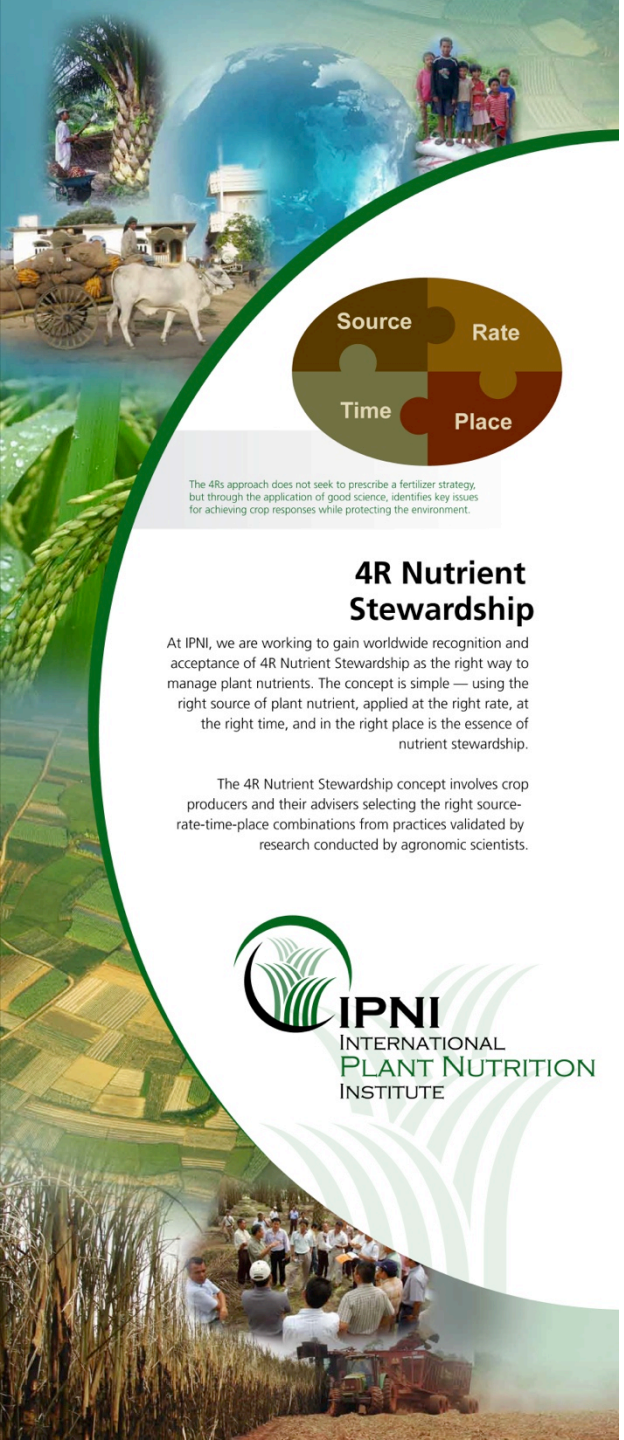
INTERNATIONAL PLANT NUTRITION INSTITUTE

New Planting & Replanting Techniques

for Oil Palms

MOSTA Oil Palm Best Practices Workshop 2012
Good Agricultural Practices & Sustainable Management Systems in Oil Palm
27 – 29 August 2012, Sandakan, Sabah, Malaysia

Chris Donough - Consultant, IPNI Southeast Asia Program



IPNI thanks MOSTA Workshop 2012 organizers for the opportunity to speak at this event.

Concepts and ideas presented were inspired by many discussions & interactions, including with project partners of IPNI in Malaysia & Indonesia:

- *IJM Plantations Berhad*
- *Wilmar International Ltd*

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New Planting & Replanting Techniques

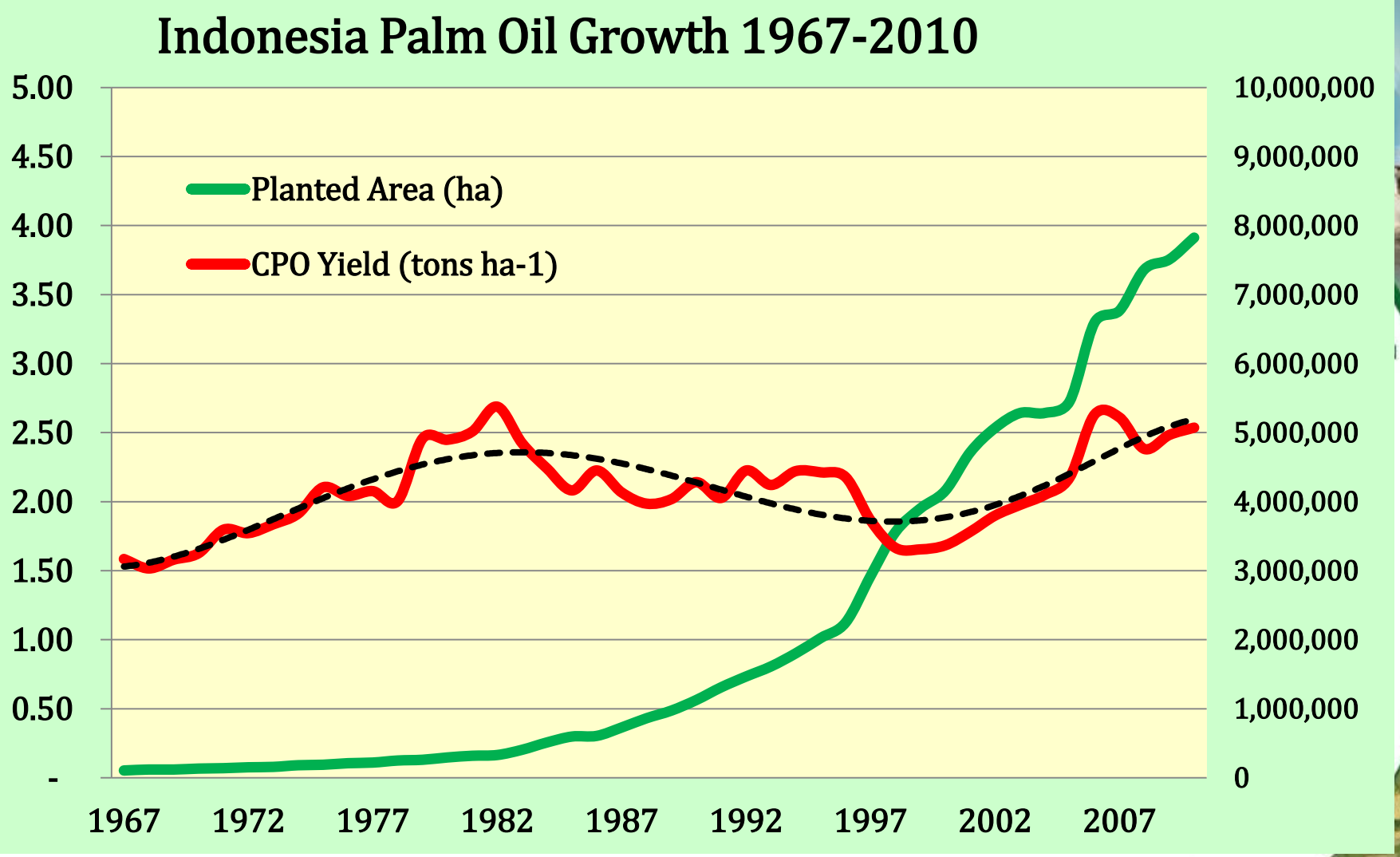
Introduction

New Planting

Replanting

Nurseries

IPNI's All-stages BMP projects

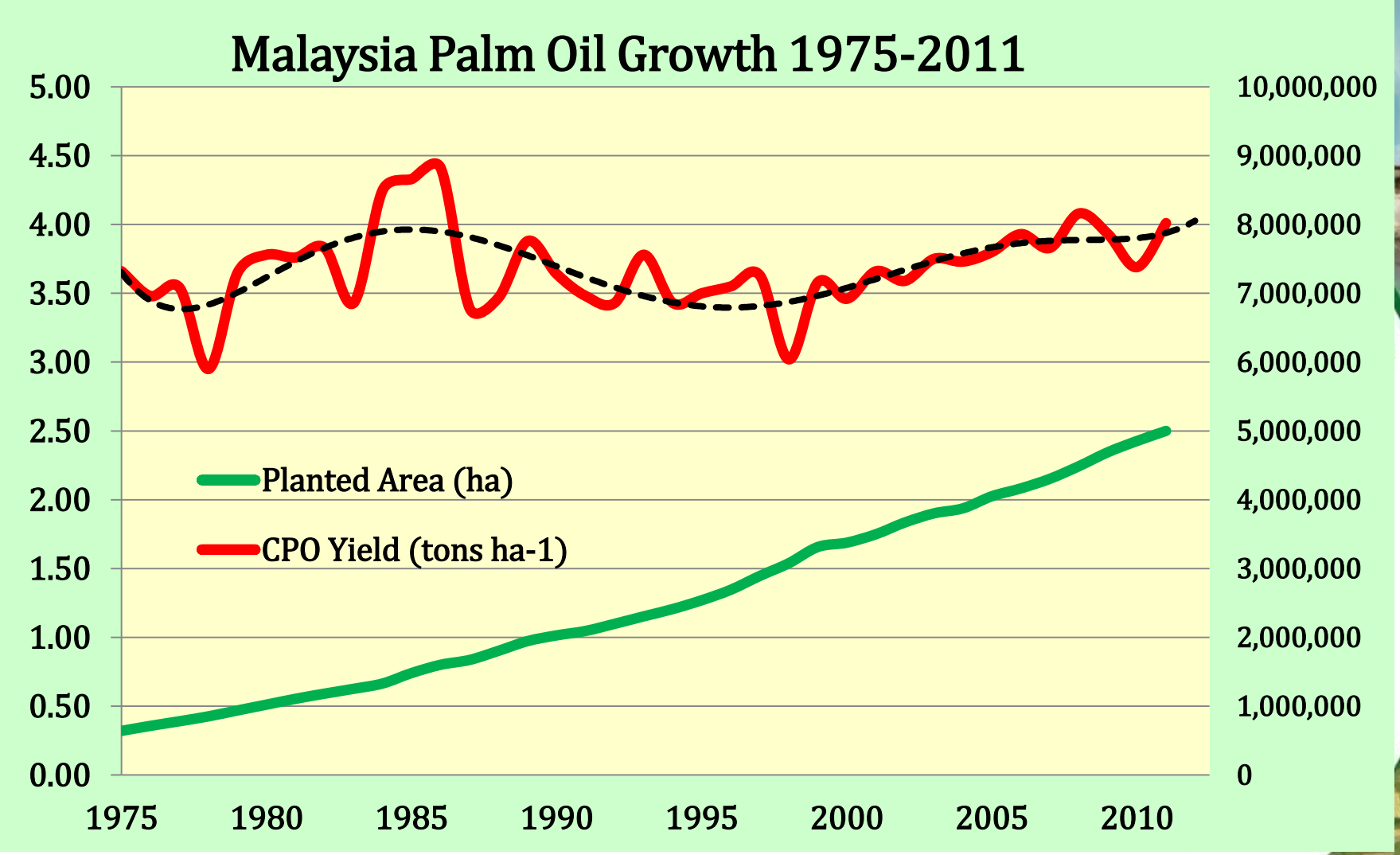


Plantations Development in Indonesia : Strategies & Prospects

Edi Suhardi (Head of Sustainability, PT Agro Harapan Lestari)

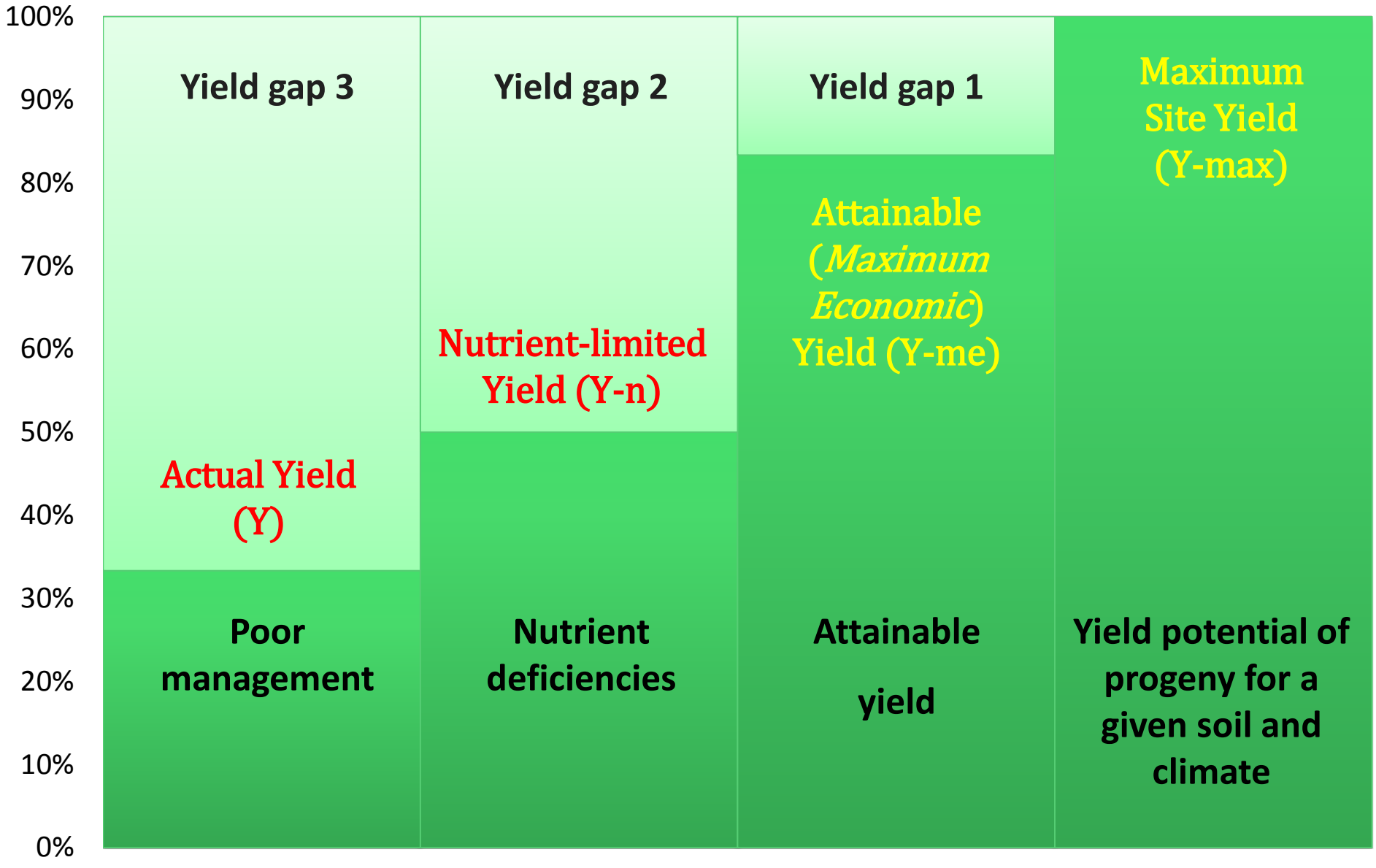
ISP International Planters' Conference 2012

- Recent review of Indonesia scenario



- Slower growth trajectory
- Stagnant yields (FFB, oil) and OER

Concepts: *Yield Gap*



Source: Fairhurst et al., 2006

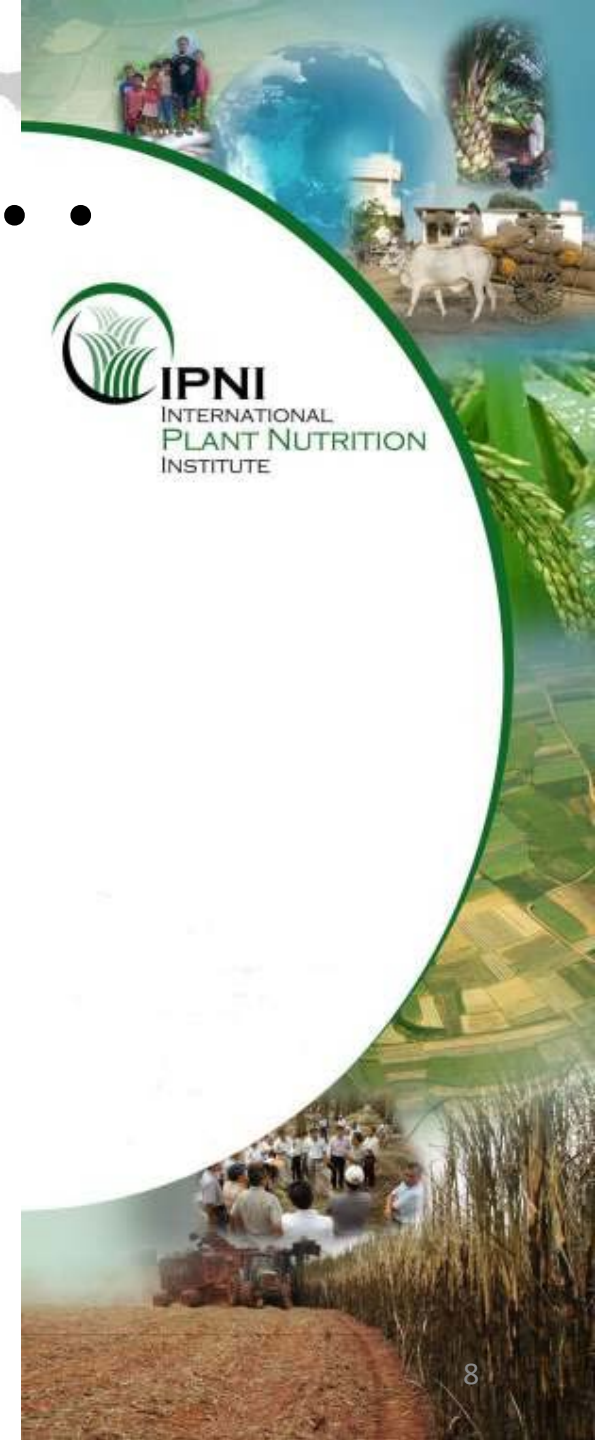
Yield Gap 1

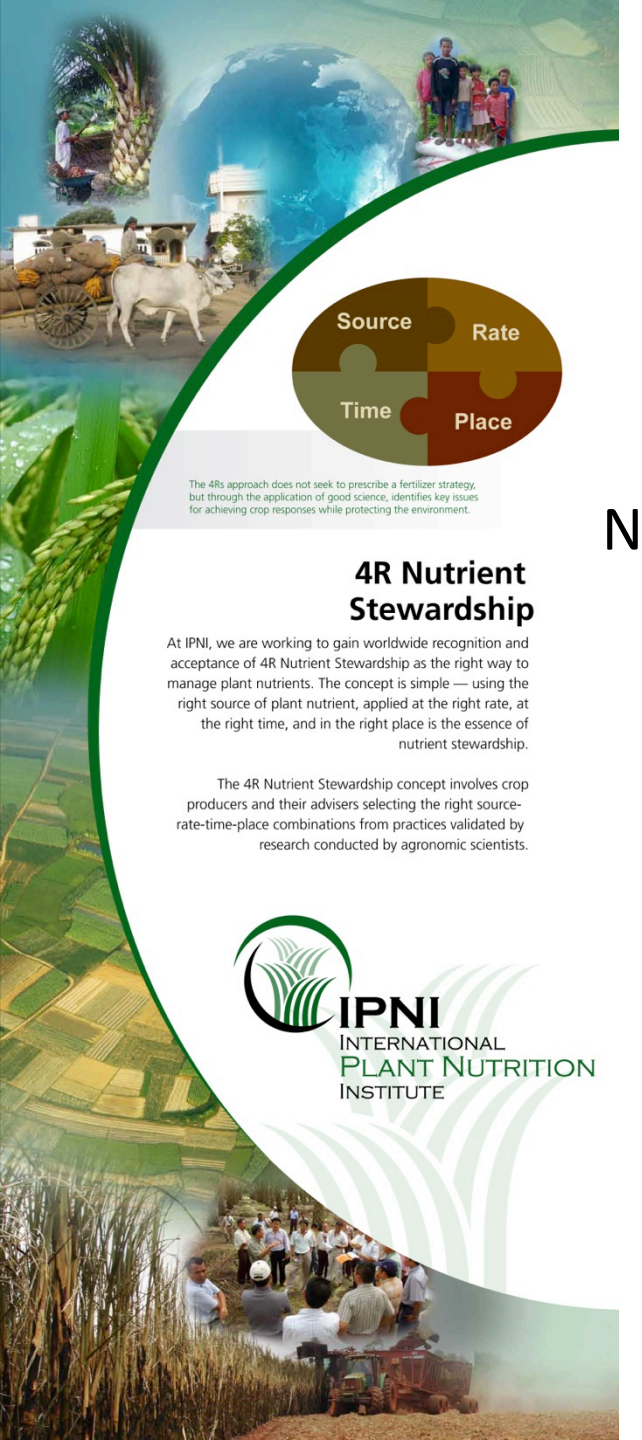
- Permanent soil damage (*land clearing, lack of cover plants*)
- Imperfect stand of palms due to:
  - *Unsuitable density, lining errors*
  - *Poor nursery selection*
  - *Failure to remove and replace unproductive palms*
  - *Loss of palms due to pests and diseases*
- Poor upkeep /Sub-optimal management during the immature palm growth phase

- ***Attainable maximum economic yield (Y-me) is fixed for the duration of the palm stand!***

Closing Yield Gap 1 . . .

- **Limited & small windows of opportunity for correction**
  - *New planting*
  - *1st crop conversion*
  - *Replanting*
- **Yield Gap 1 key areas**
  - *Planting material*
  - *Nursery management*
  - *Land preparation*
  - *Field planting*
  - *Immature management*





Closing Yield Gap 1 . . .

Not all practices may close YG1 – examples:

- Practices to shorten non-productive period (*underplanting, APM*)
- Practices to reduce labour input (*use of CRF / SRF, reduced frequency of application, pocketing, single application under plastic mulch, non-legume cover*)
- if not done well, may ↑ YG1?

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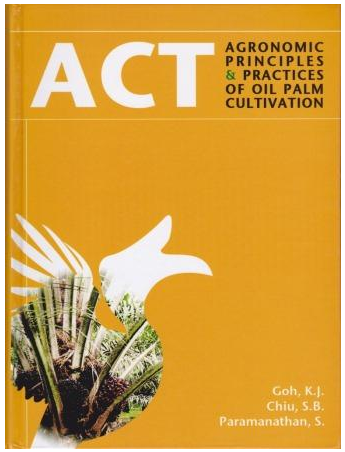
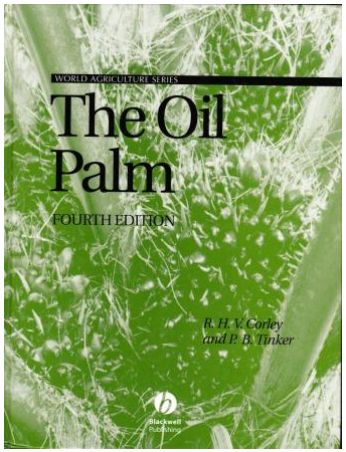
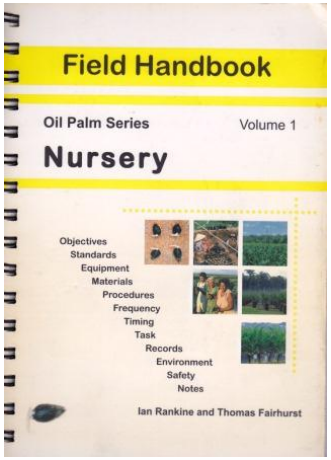
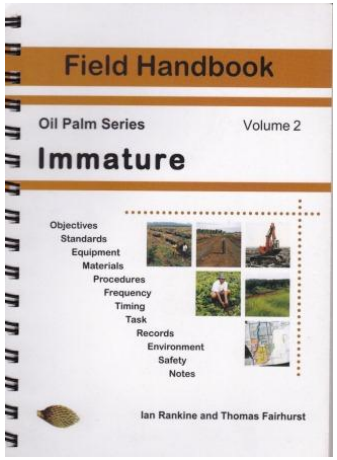
Info sources . . .









New Planting & Replanting Techniques

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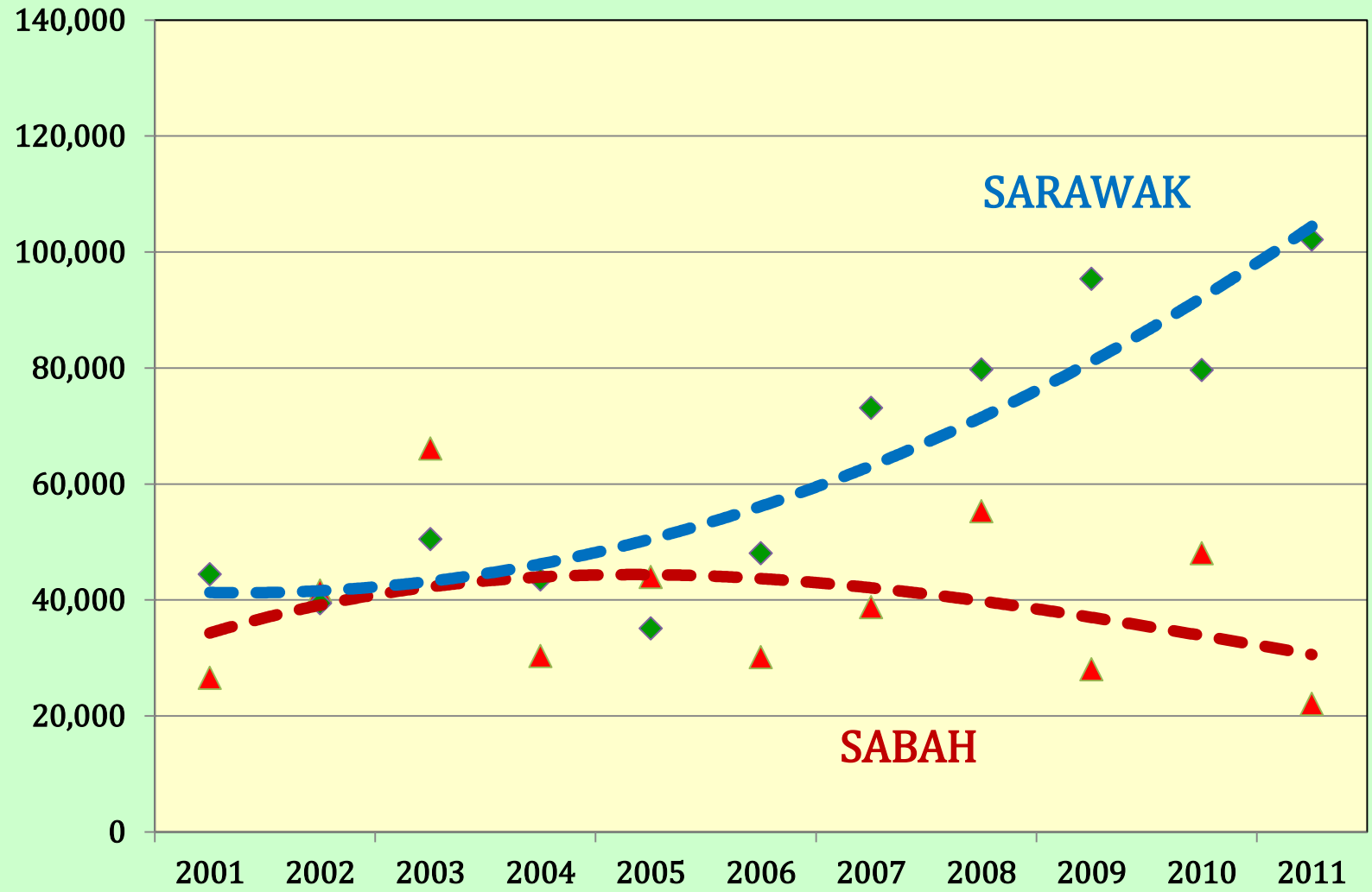
IPNI's All-stages BMP projects

New Planting s - Sabah & Sarawak 2001 to 2011



New Planting . . .

Ideal

- Previous speaker (Param) – survey & assess land
- Plan based on survey & assessment
- EIA
- RSPO considerations

Reality

- Speed of work critical – *especially in Indonesia*
- Quality of work is secondary

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New Planting . . .

Key considerations

- **Soil type** – soil conservation issues
- **Terrain** – erosion, drainage & water management issues
- **Blocking & transport system**
- **In-field access** – machine-enabled?
- Plant **spacing**
- **Legumes**
- **Mulching with EFB** - use tractors & grabbers? – better productivity, lower cost?

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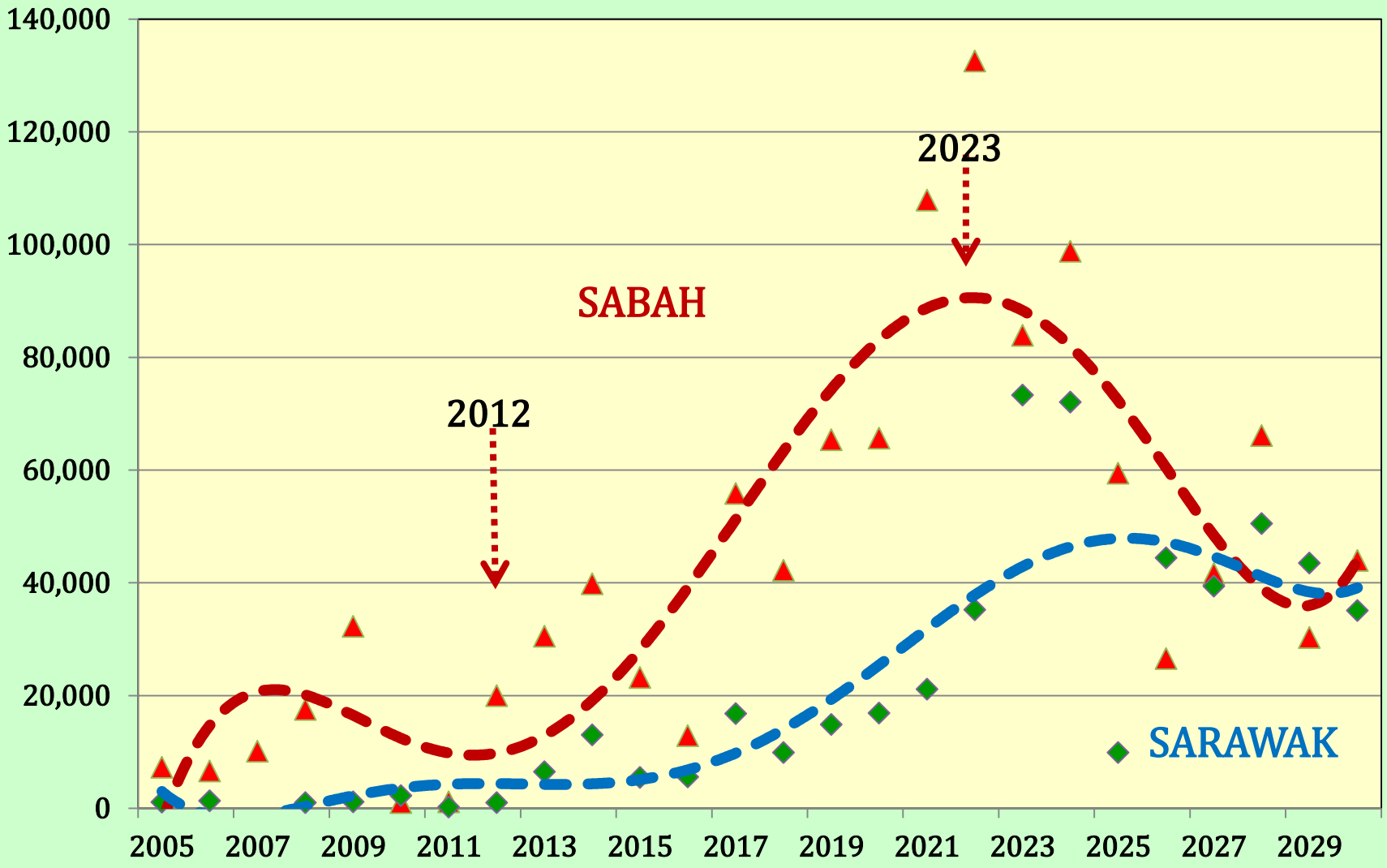
Replanting trend - Sabah & Sarawak up to 2030



Replanting . . .

Where do all the nutrients go?

Corley – The Planter, March 2009

Biomass harvesting . . .

See –

- *Khairuddin et al (2012) ISP Int'l Planters Conf*

General practices . . .

See –

- *Ooi et al – The Planter, Oct 2004*
- *Sim et al – The Planter, Nov 2008*
- *Othman & Hoong - The Planter, Feb 2011*
- *Ooi – in ACT book, 2011*

Replanting . . .

Ganoderma

- *Ike Virdiana et al, PIPOC 2011 – recent work in North Sumatra*
- *Flood et al – The Planter, July 2011*
- *Goh – in ACT book 2011*

Management Practices . . .

Many articles – examples :

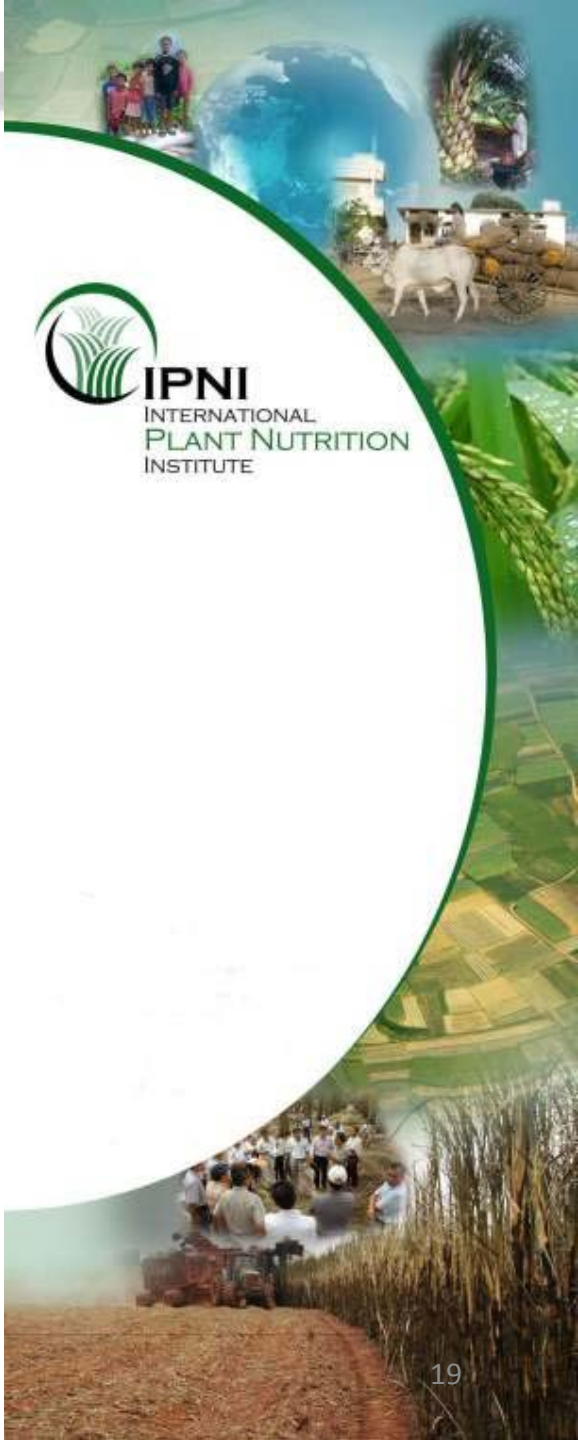
- *Chung – The Planter, Dec 2005, May 2011*
- *Hoong – The Planter, May 2007*
- *Khairuddin & Tey – The Planter, July 2008*

Treatment . . .

- *Lim & Ho , PIPOC 2011 – use of organic acids & lipid ester*

Malaysia scenario . . .

- Labour supply
- Tall palm harvesting
- Mechanization
- Productivity – palms & people



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Malaysia considerations . . .

- High density planting, shorter crop cycle
  - *Nazeeb et al, PIPOC 2007*
  - *Palat et al, The Planter April 2012*
- Preparation to mechanize
  - *land, palms & people*
- Future organization of operations

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Nursery . . .

Pot trays

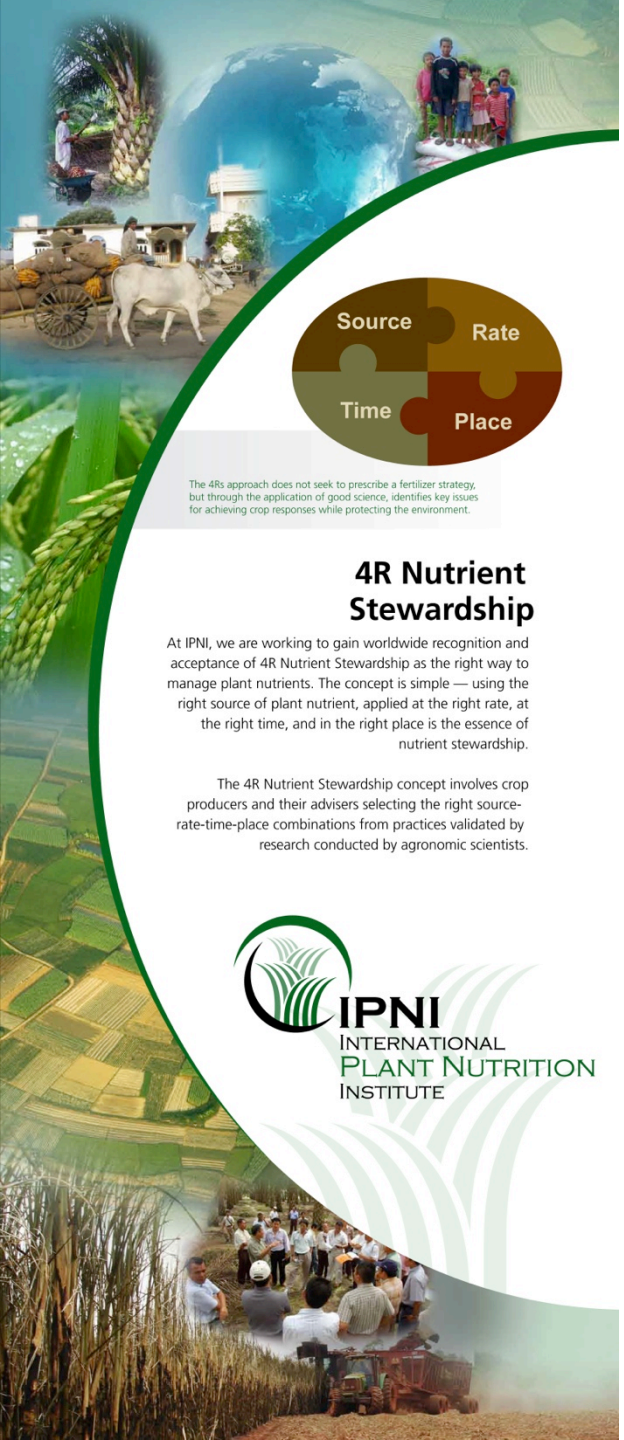
- *Save space*
- *Save soil*
- *Can be away from replant site*
- *Less transplant shock*
- *Can ensure uniformity to main nursery*

Nursery . . .

Drip irrigation – worth re-visiting?

– *Lim & Ho (1993)*

- *Save water*
- *Better seedling growth & uniformity*



Nursery . . .

White bags?

- *Lower soil temperature*
- *Combine with drip irrigation*
  - *↑ effectiveness of SRF ?*

- MPOB CoP – help or hindrance?

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Nursery . . .

Stringent culling & selection

See –

Mohaimi & Shaharuddin (2011) PIPOC
FFB yield reduction of abnormal palms

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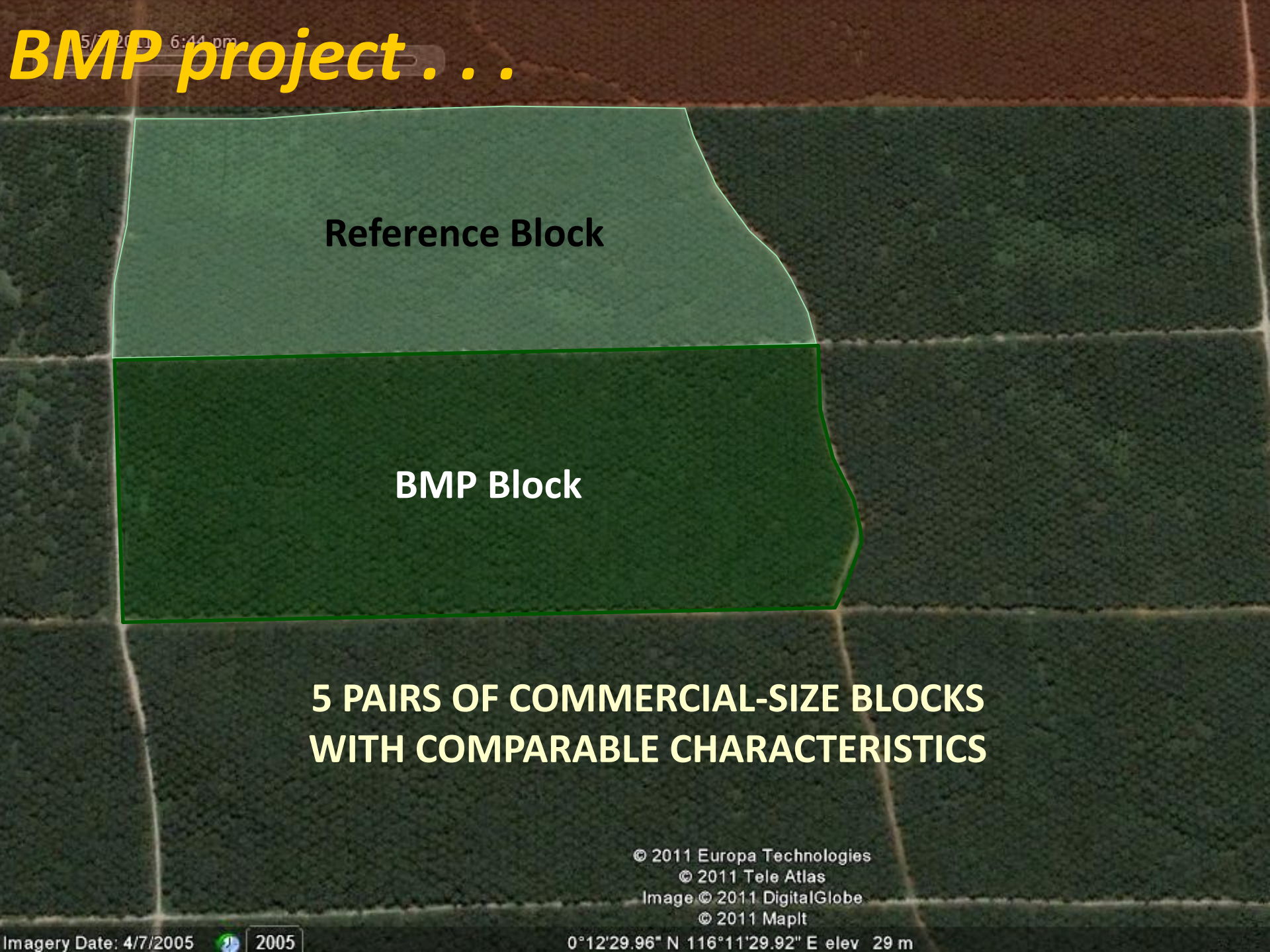
BMP project . . .


Reference Block
BMP Block
5 PAIRS OF COMMERCIAL-SIZE BLOCKS
WITH COMPARABLE CHARACTERISTICS
© 2011 Europa Technologies
© 2011 Tele Atlas
Image © 2011 DigitalGlobe
© 2011 MapIt
Imagery Date: 4/7/2005
2005
0°12'29.96" N 116°11'29.92" E elev 29 m

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BMP priorities for closing Yield Gap 1

- **Priority 1 – Maximize genetic yield potential**
  - *Good planting material*
  - *Good nursery management*
  - *Stringent selection for field planting*
  - *Canopy management (throughout life cycle)*
  - *Crop recovery management (mature stage)*

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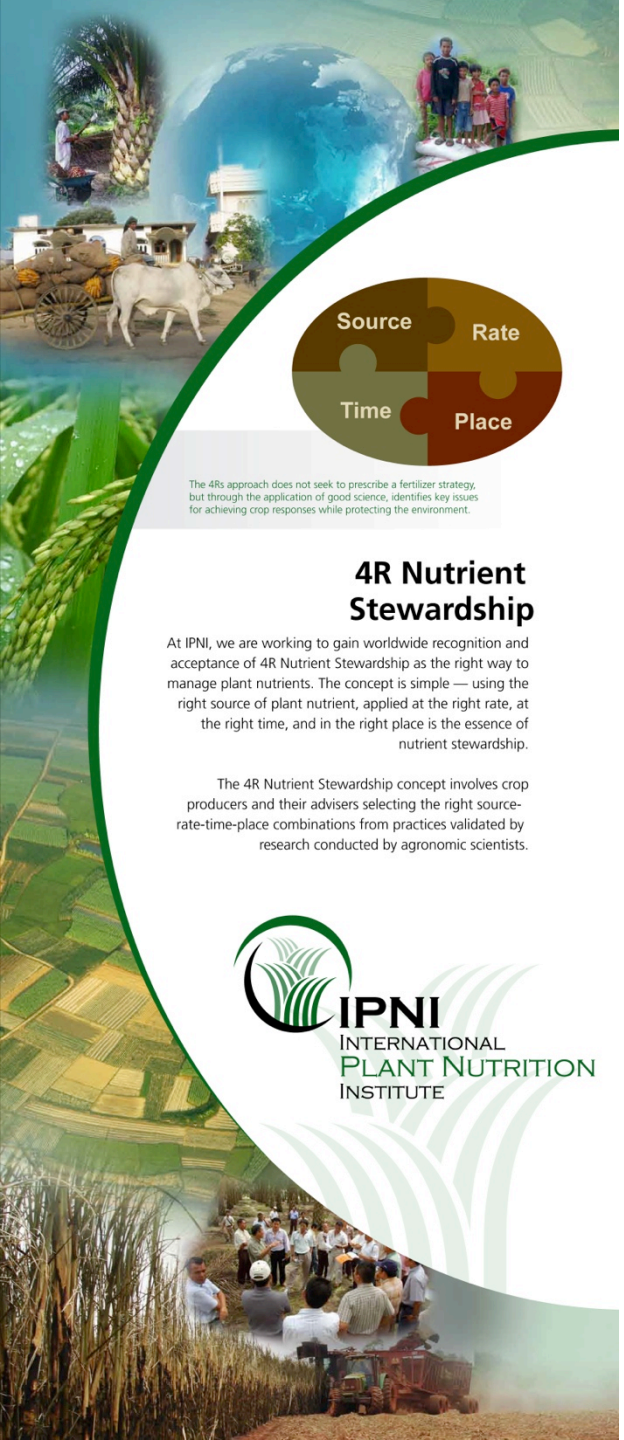
BMP priorities for closing Yield Gap 1

- **Priority 2 – Maximize land conservation**
  - *Proper land assessment & appropriate blocking*
  - *Zero burning*
  - *Soil & water management & conservation*
  - *LCC establishment & utilization of crop residues*
  - *Palm nutrient management*



BMP priorities for closing Yield Gap 1

- **Priority 3 – Maximize productive palm stand**
  - *Appropriate palm spacing*
  - *Timely supplying & replacement of poor palms*
  - *Good P&D management*

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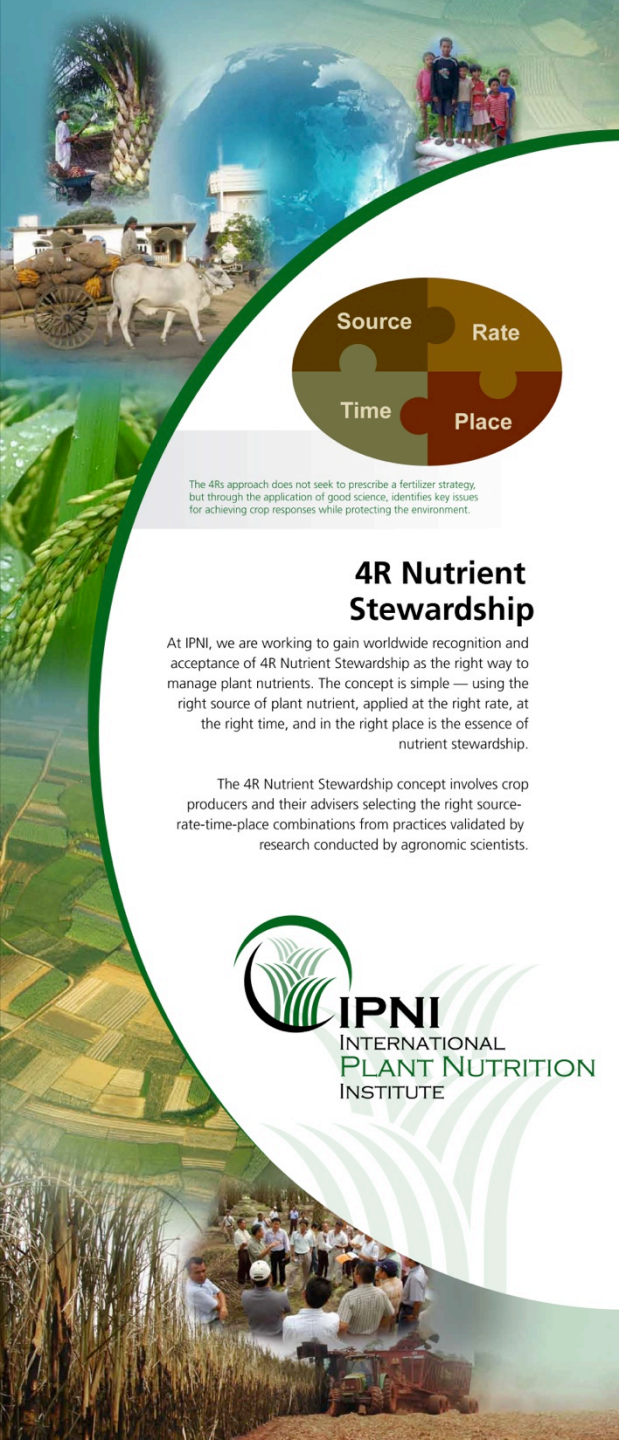

BMP priorities for closing Yield Gap 1

- **Priority 4 – Maximize immature palm growth**
  - *Field accessibilty for immature palm management*
  - *Timely & adequate palm nutrition*
  - *Timely ablation*

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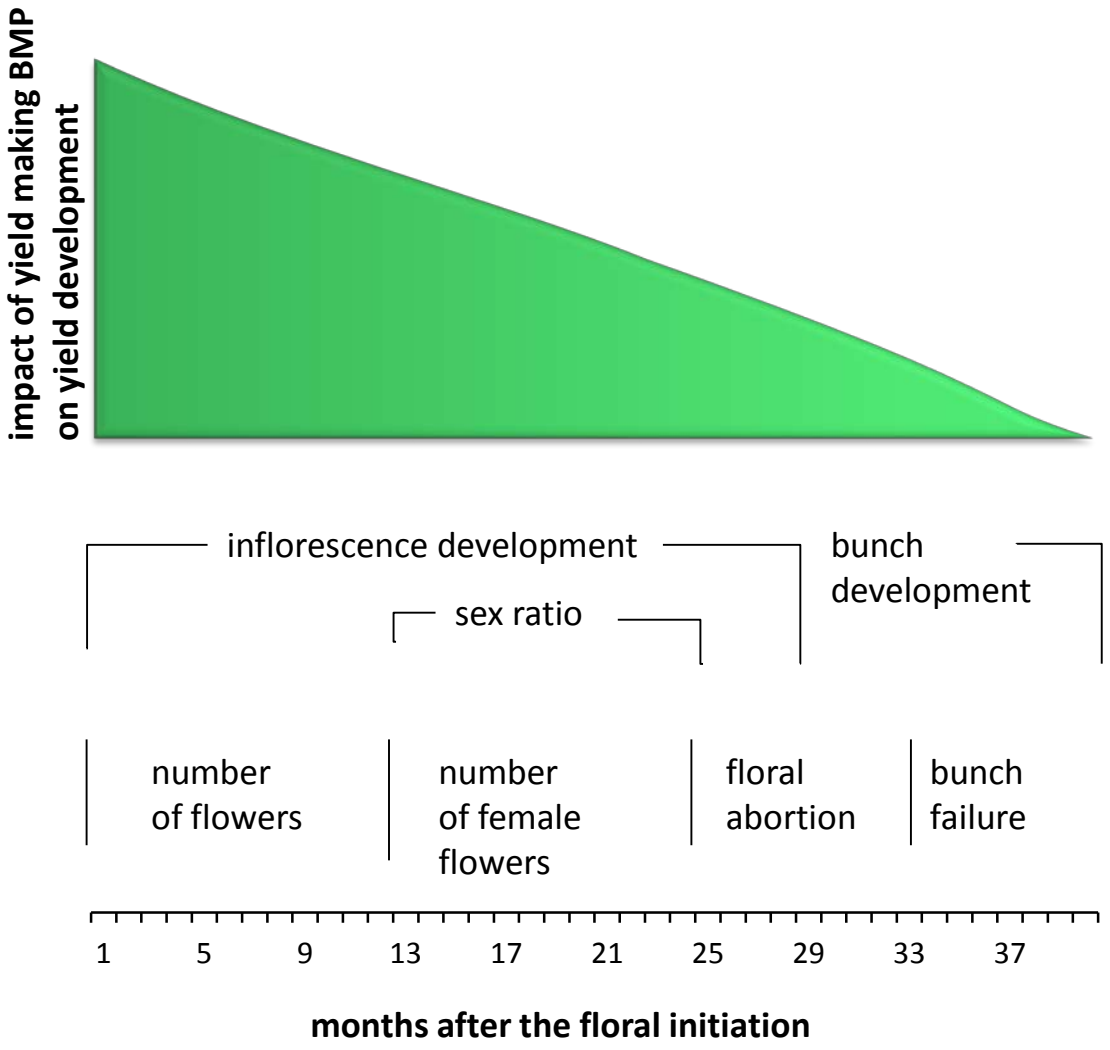
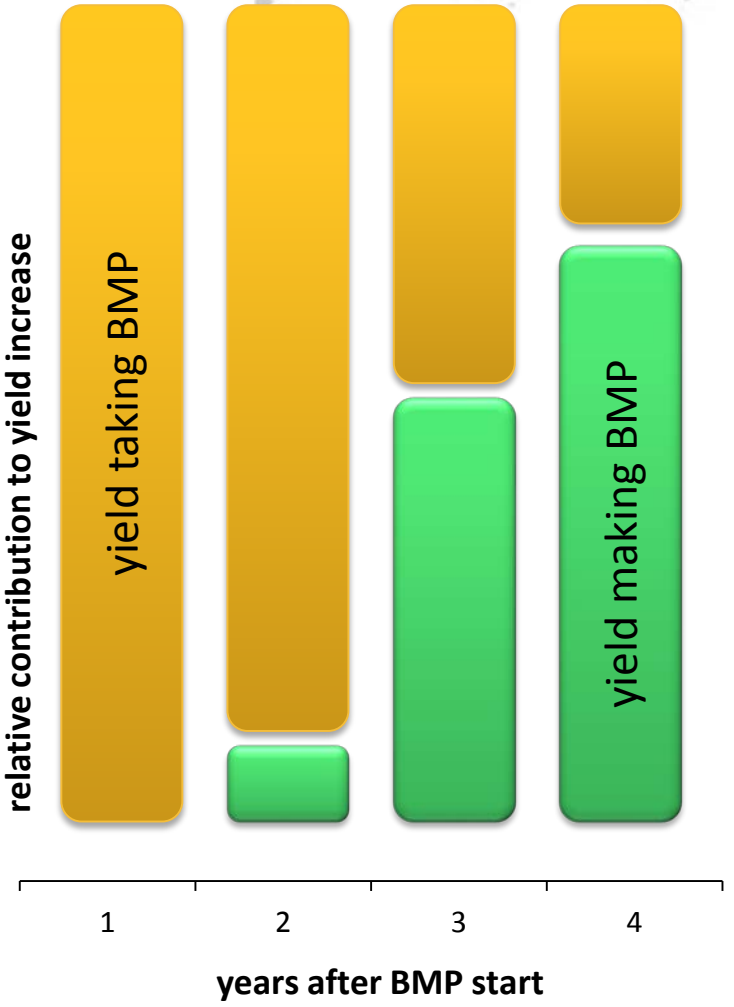
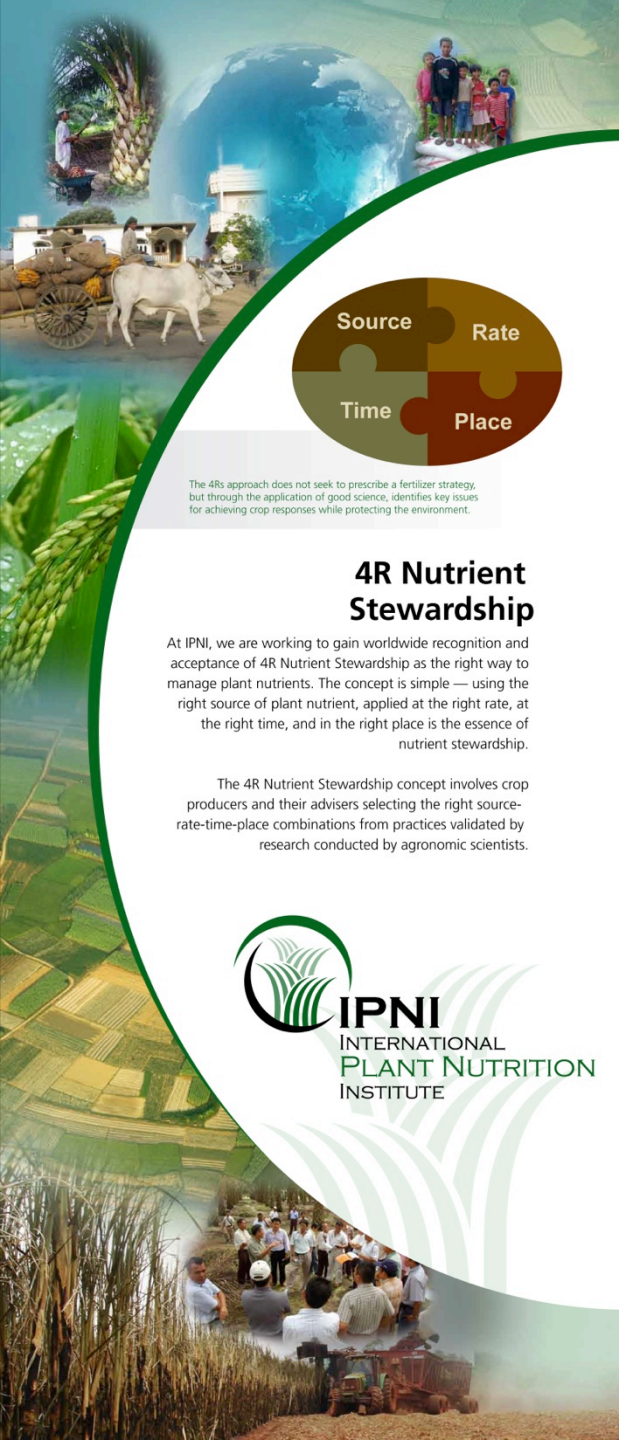
	Crop recovery	Canopy management	Nutrient management
Yield making		• Optimal plant density • Sufficient fronds for high productivity • Removing abnormal unproductive palms • In filling in unplanted and selective thinning in dense areas	• Systematic spreading of pruned fronds • Eradication of woody plants • EFB mulching • 4R management of fertilizers • Monitoring of plant nutrient status
Yield taking	• Harvest interval 7d • MRS 1 LF before harvest • Harvest audits • Accessibility • Clean circles, platforms	• Monitoring and management of pests and diseases • Removal of unproductive fronds	

Conceptualized relationship **yield making / taking** BMP – FFB Yield







Thank you for your attention,

I am honoured to answer your questions here, or

you may contact me at

crdonough@gmail.com

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