



Oil Palm at the Crossroads

The role of Plantation Intelligence to support Change, Profit and Sustainability

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Our main points

- Oil palm entering a phase of profound change
- Managers need information to support increasingly complex decisions.
- Plenty of data
 - Less analysis
- Plantation Intelligence:
 - A process to couple data to decisions....
 - ...to help the industry cope with complexity



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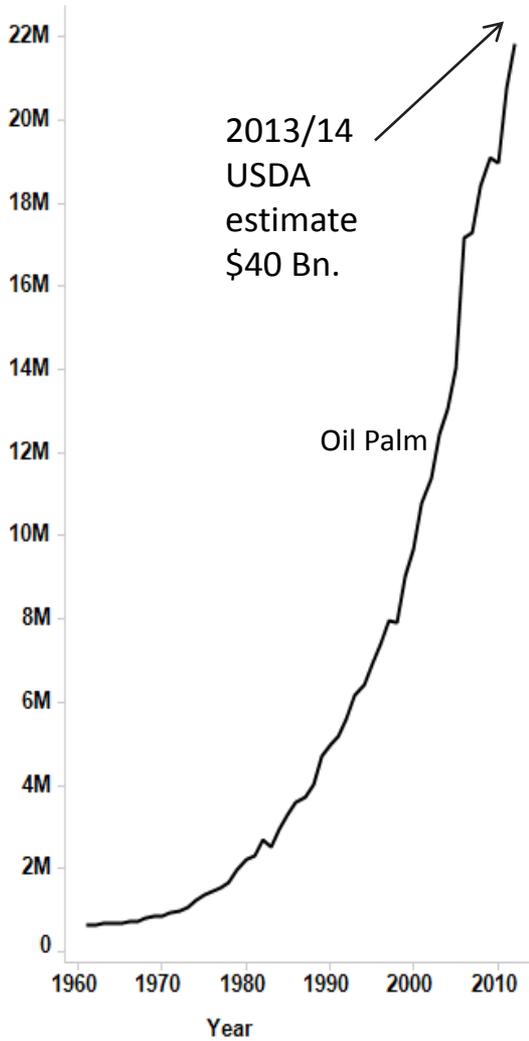


Problem or opportunity?

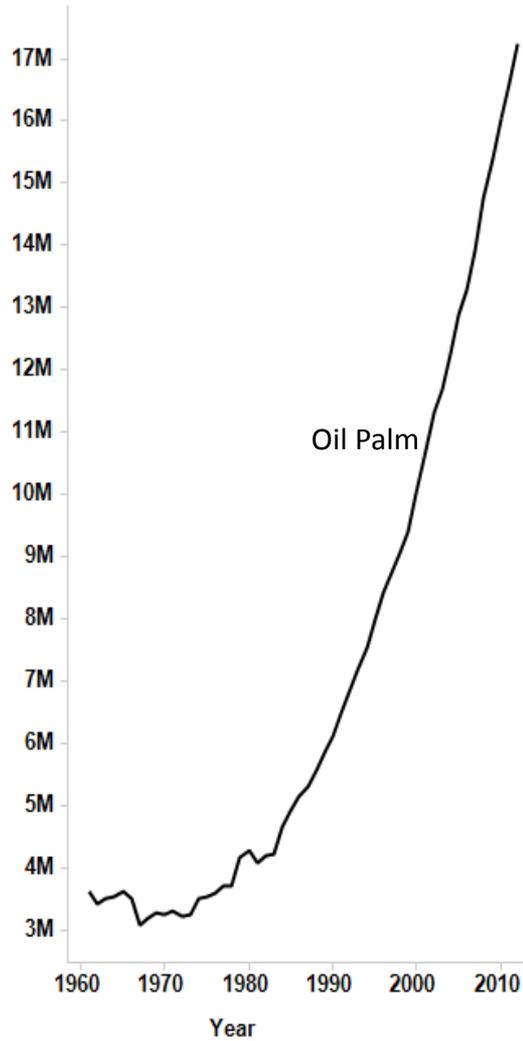
OIL PALM FACING A PHASE OF CHANGE

Spectacular growth

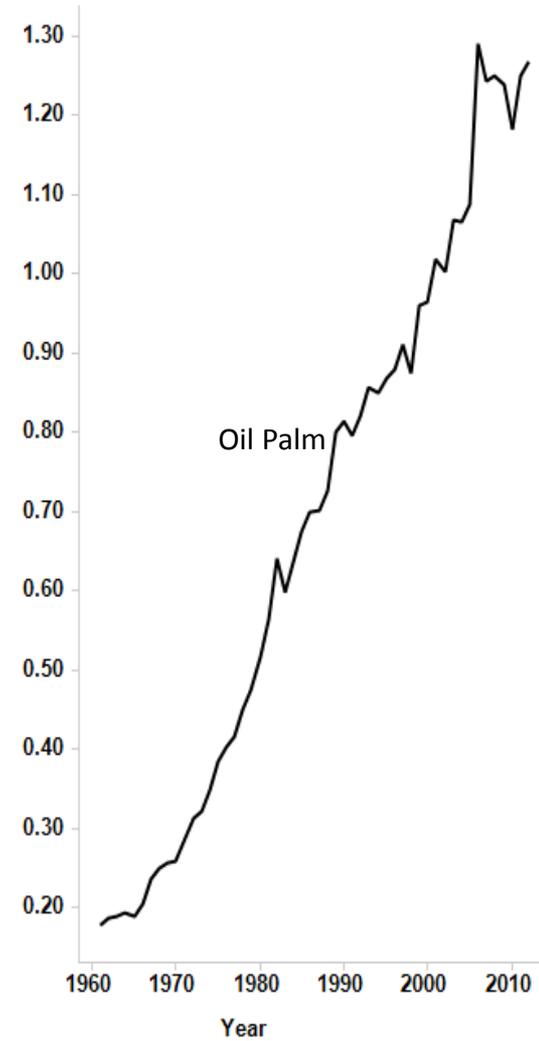
Gross value (\$000)



Area harvested (Ha)



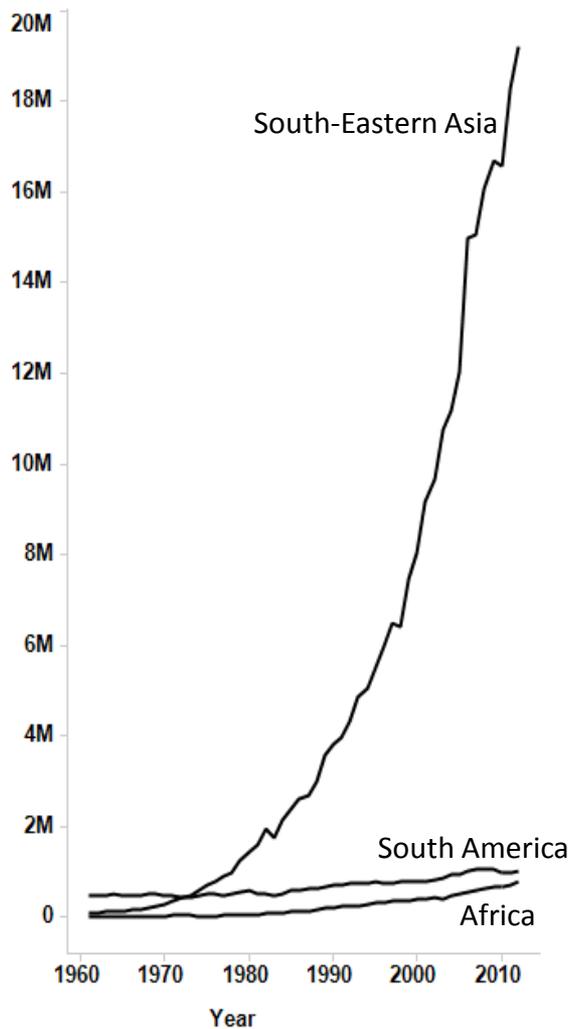
Gross value per Ha (\$000)



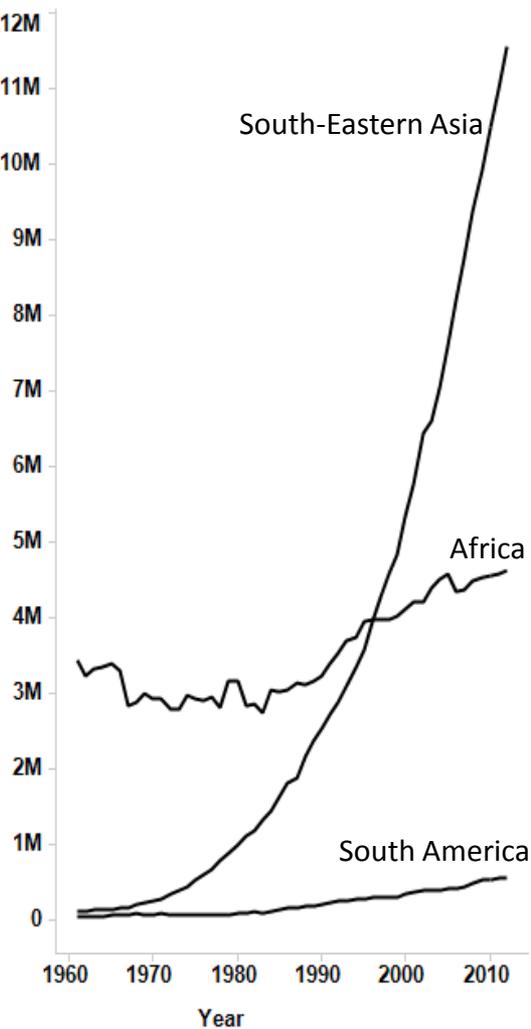
Source: FAO

S E Asia region drives growth

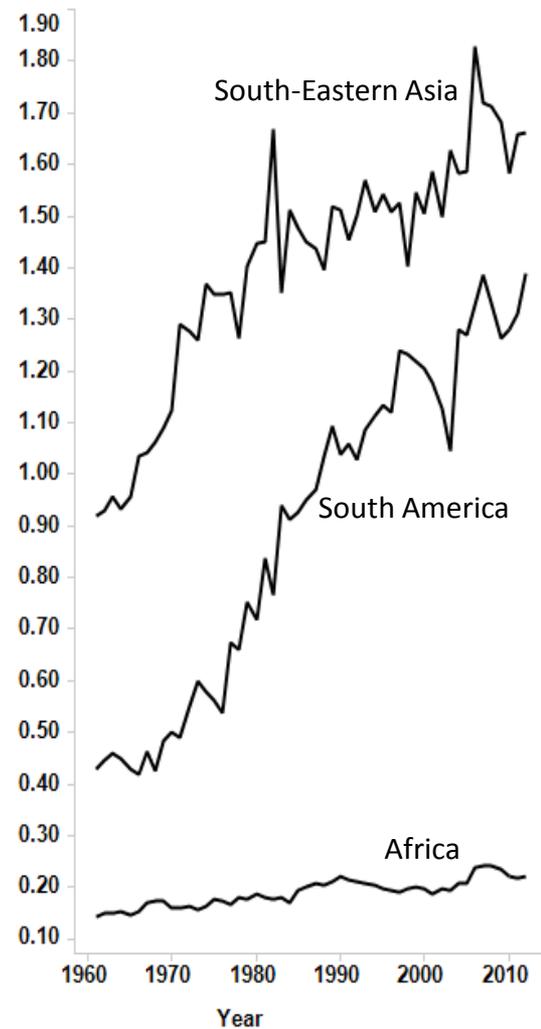
Gross value (\$000)



Area harvested (Ha)



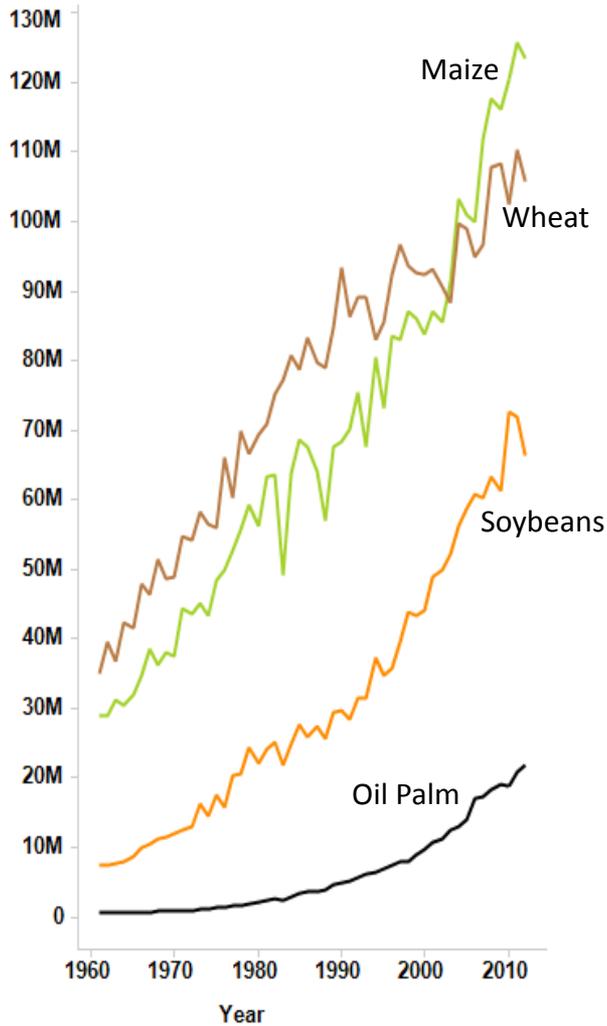
Gross value per Ha (\$000)



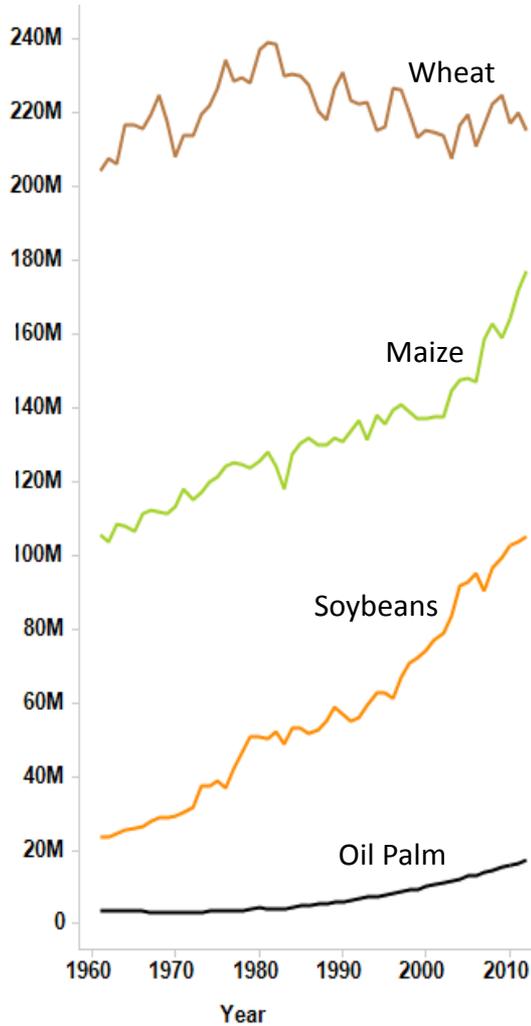
Source: FAO

Oil palm a 'new player' in global sustainability

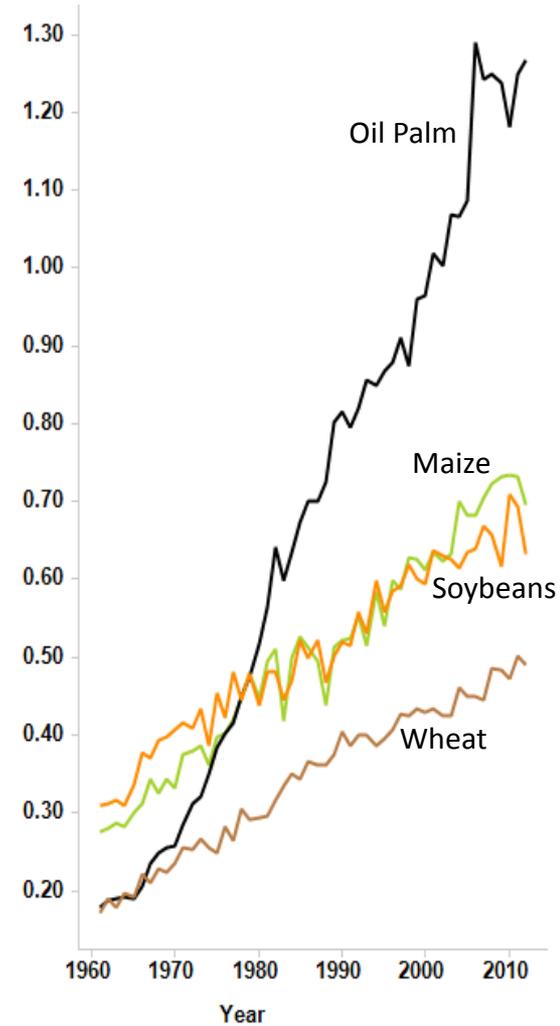
Gross value (\$000)



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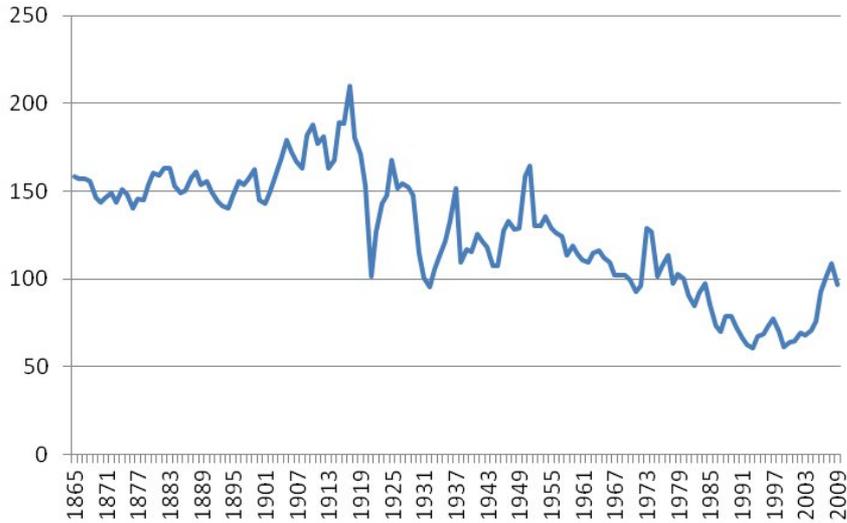


Gross value per Ha (\$000)



Source: FAO

Real value of commodities always declines over time



Source: Ocampo & Parra (2010)

Economic, environmental and social pressures will grow

Papua oil palm plans may benefit migrants more than local poor — report

Source: CIFOR (Center for International Forestry Research) - Wed, 30 Apr 2014 06:39 AM



Author: Julie Mollins

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WHAT COULD THE INDUSTRY LOOK LIKE IN 2020?

Two possible futures

Sunset?

- Increasing management difficulties
- Declining attractiveness to investors
- Declining attractiveness to employees

Sunrise?

- New management techniques
- New business opportunities
- New career opportunities

Two possible futures

Brown?

- Low eco-efficiency
- Oil palm seen as a global problem
- Oil palm wealth seen as 'exclusive'

Green?

- High eco-efficiency
- OP part of global solution
- “Inclusive oil palm – the basis of rural economies”

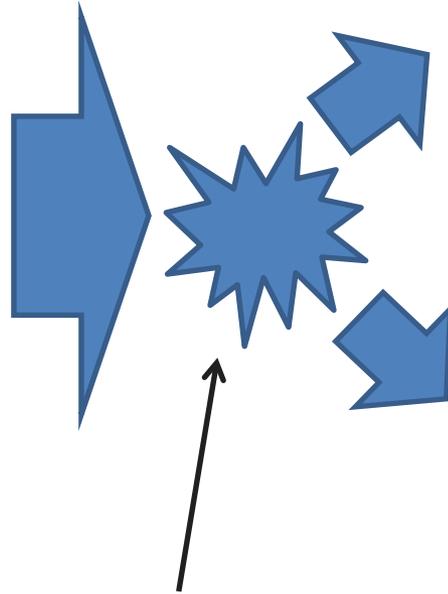
Oil palm at the crossroads

Drivers of change

Continued rapid growth

Competition for new resources

Increasing social and political pressures



Decisions taken now
will determine future
outcomes

Improved processes

Enhanced productivity

Secure return-on-investment

Improved eco-efficiency

Recognition of OP as a leading contributor to local and global food, energy and environmental security

Business-as-usual

Stagnant productivity, declining profitability

Uncertain returns-on-investment

Unimproved eco-efficiency

Grudging acceptance of OP as an unpopular necessity



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‘Drowning in data, starved of knowledge’

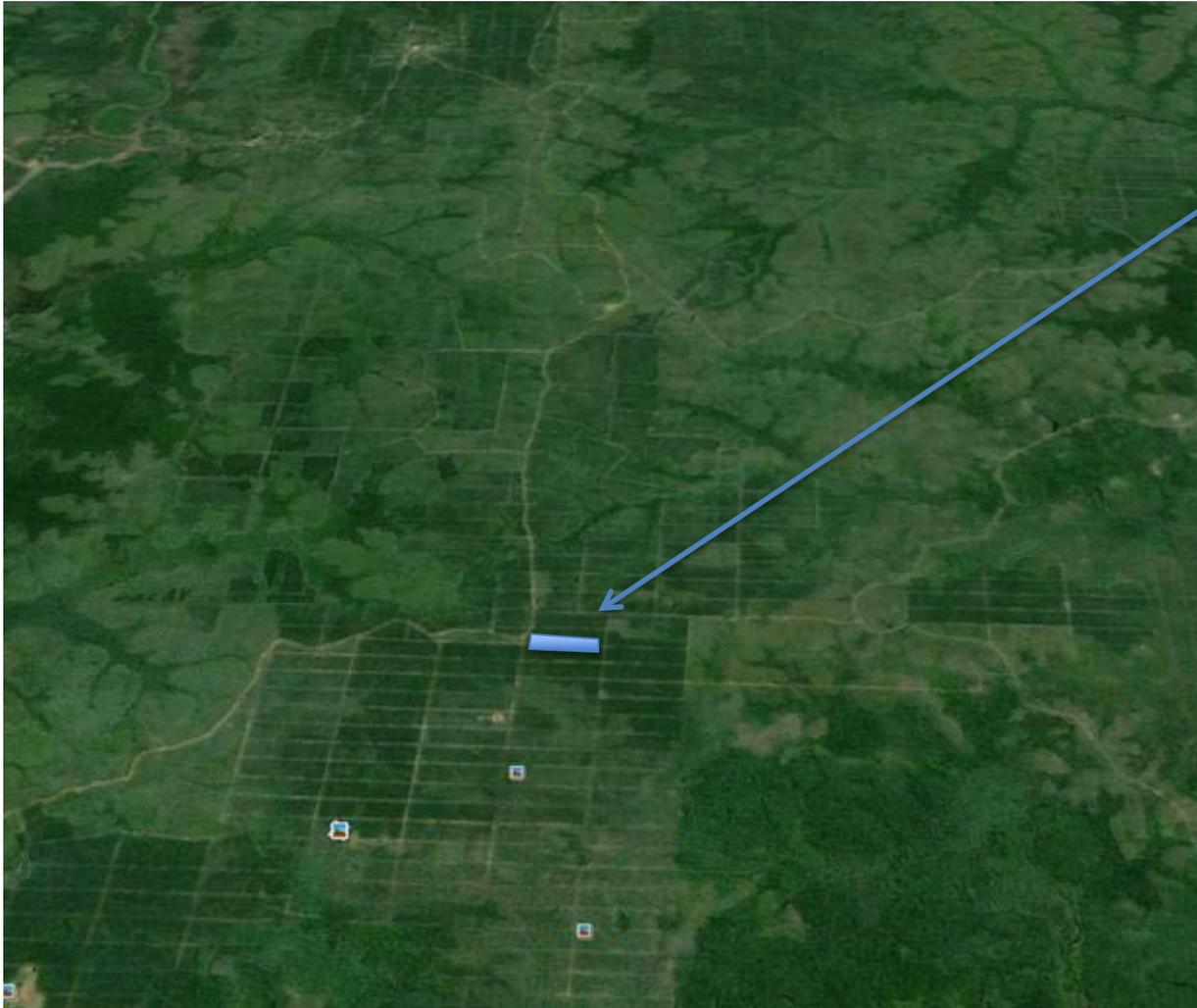
PLANTATION INTELLIGENCE: A PROCESS TO SUPPORT DECISIONS

Why is decision support needed?

- New areas, new problems
- The human brain isn't good at solving some problems
 - Even the best managers make errors.
Examples [seen in all types of business]:
 - **Fitting 'old' results to 'new' conditions**
Estimates based on experience, even if conditions are clearly different
 - **Reverting to the average**
Managers forced to ignore variation
 - Bias towards the **'number you first thought of'**
even though data shows it is inaccurate.
- ...In such cases, **evidence is essential**

Scientific evidence for decisions:

The conventional approach: Plot experimentation



- Trial plots chosen to represent what seems important
- Trials give a clear answer for a pre-defined problem...
-but leave much variation unexplained
 - weather, site, soil, pests, disease, labour... ..

Scientific evidence for decisions: Plantation intelligence approach



- Analyze data for the entire estate
- Accept variation due to **weather**, **site**, **soil**, **pests**, diseases
...
- Generate insights with managers to **complement trial results**

Plantation intelligence

Evidence to support decisions under uncertainty

What it aims to do

- Support intuition
 - "I knew it was good, but didn't realize it was *that* good!"
- Specify variations from the norm
 - "On average, the estate performs well, but about 25% remains below expectations"
- Quantify things that are hidden
 - "How does response to fertilizer vary?"
 - How productive is labour?

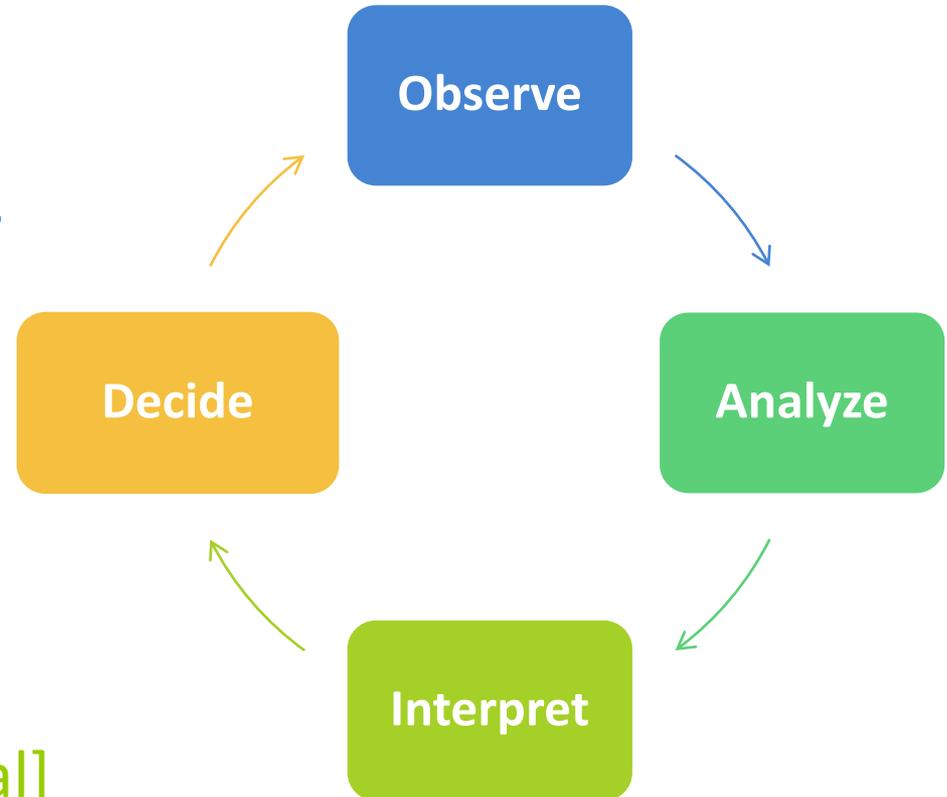
...for different types of decisions

- Strategic
 - Summaries, trends & anomalies to support investment
- Operational
 - Analysis to support block management
 - Performance
 - Profitability
 - Response to inputs
 - » Fertilizer
 - » Labour

The process



1. Engage.
2. Acquire data.
3. Clean and assemble data.
4. Filter and organize.
5. First analysis.
6. Follow-up analysis.
7. Discussion with field managers.
8. Experimentation [optional]
9. Review and decide



An example:

Do you know what value you get from fertilizer?



- Fertilizer drives growth and profitability
 - Known but highly variable
- Essential for sustainability
 - Known but unquantified
- On average, growers spend about \$500/hectare on fertilizer
 - Certain but variable
- *Return for blocks/divisions?*
 - Uncertain
- *Block-specific causes of variation?*
 - Uncertain

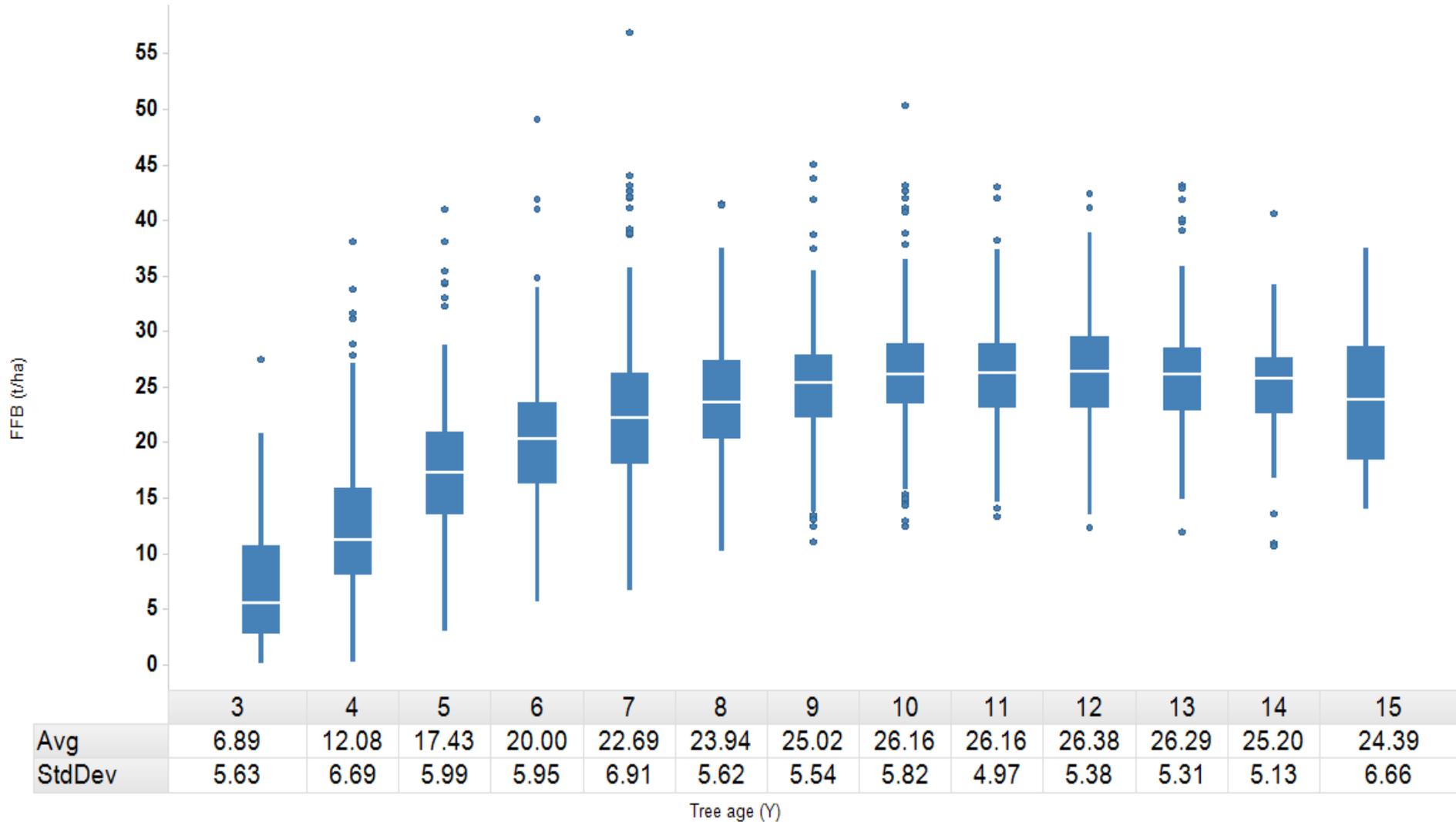
Start with basic observations...

Yield age profile



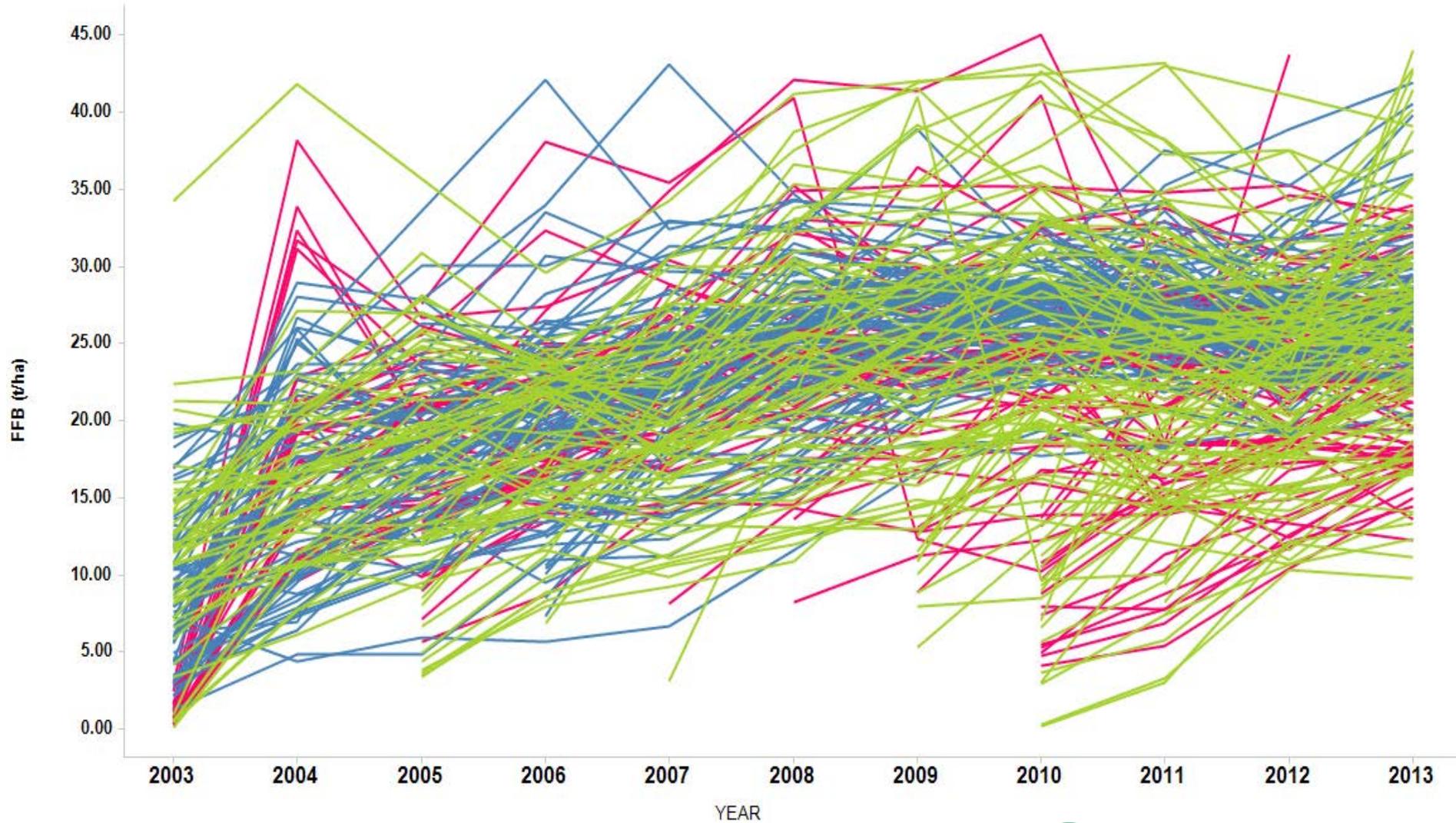
Organize data

Yield age profile



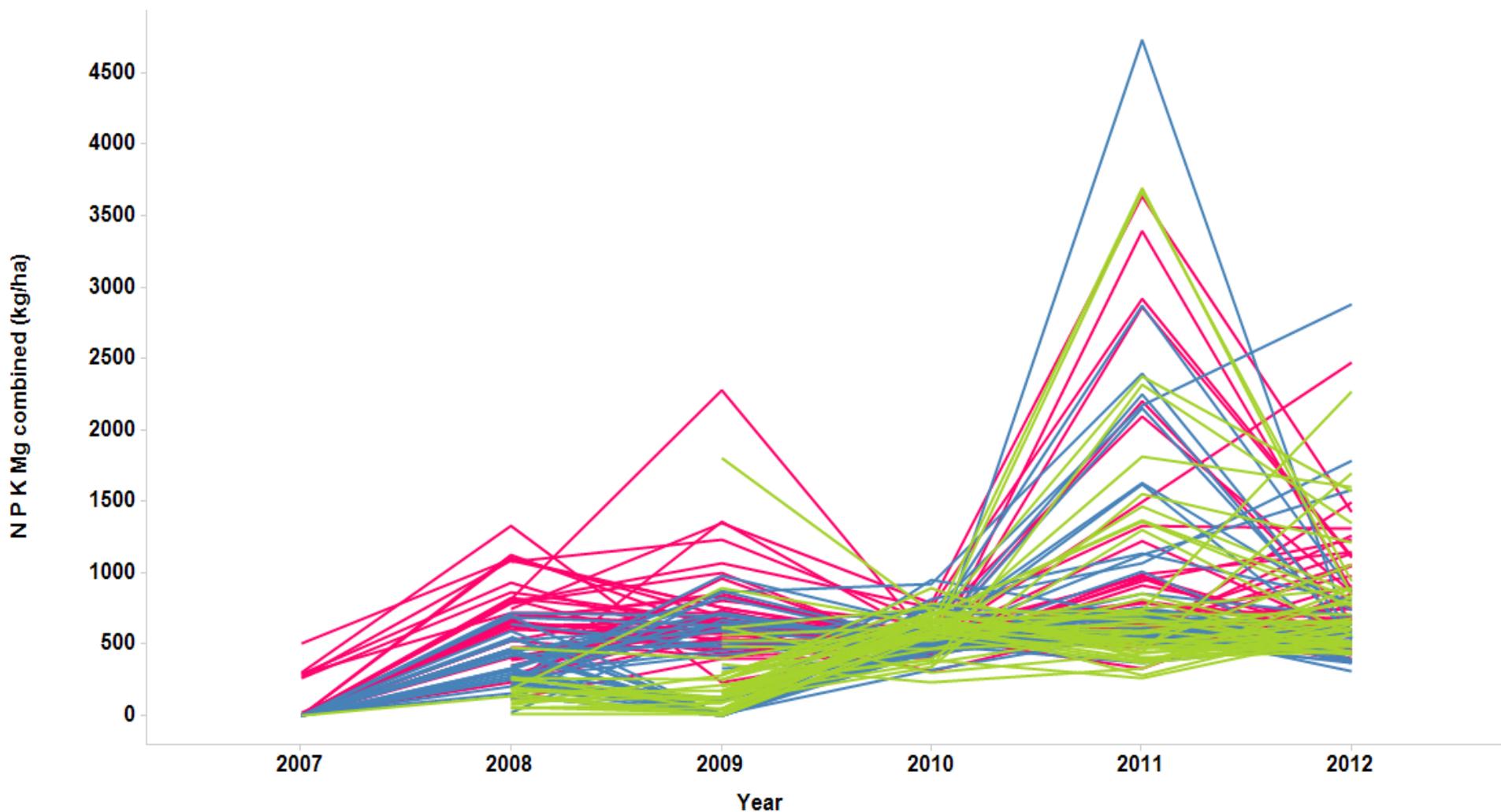
Massive variation between blocks

FFB for each block



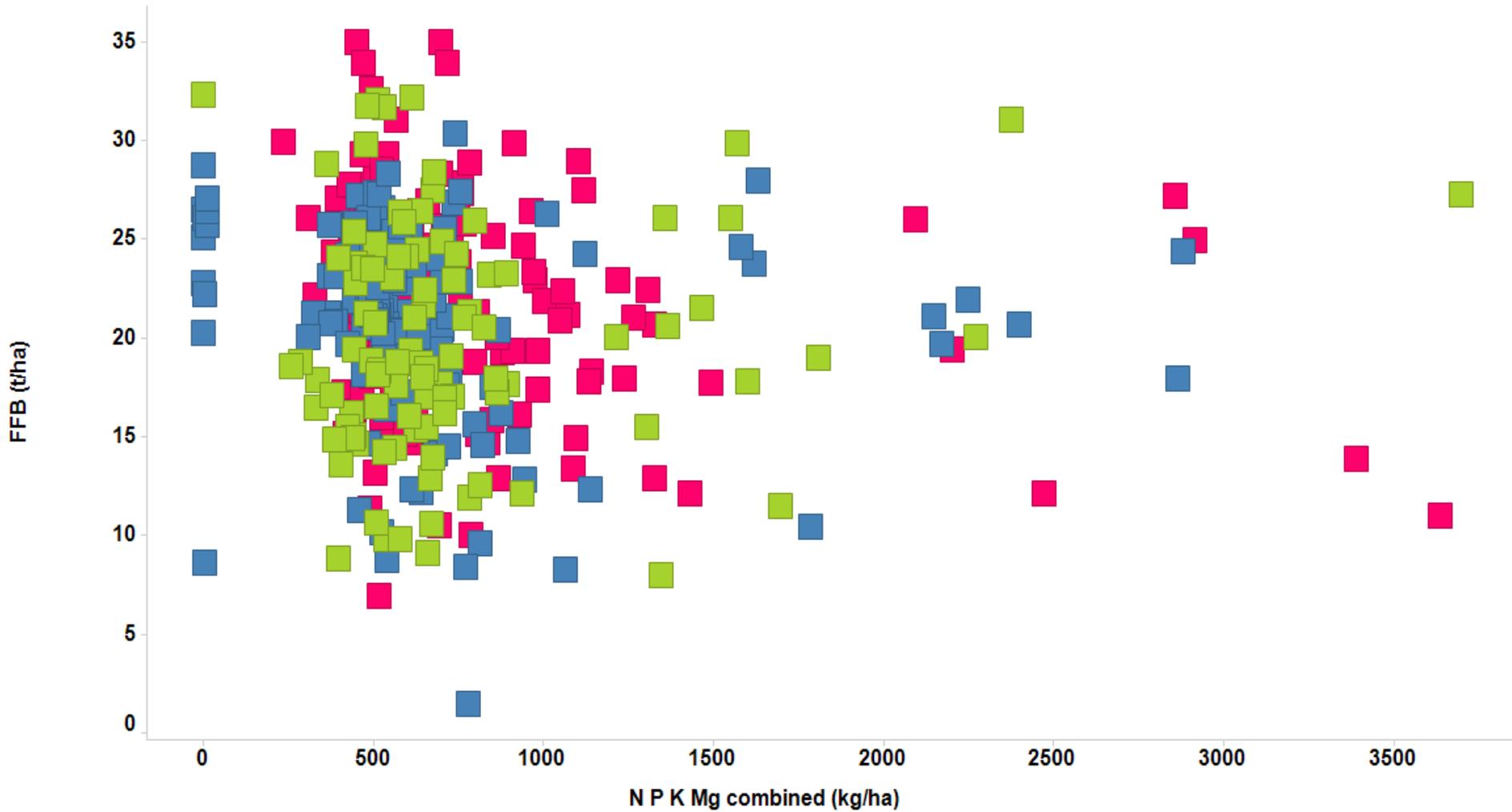
Fertilizer application varies

Total fertilizer applied to each block



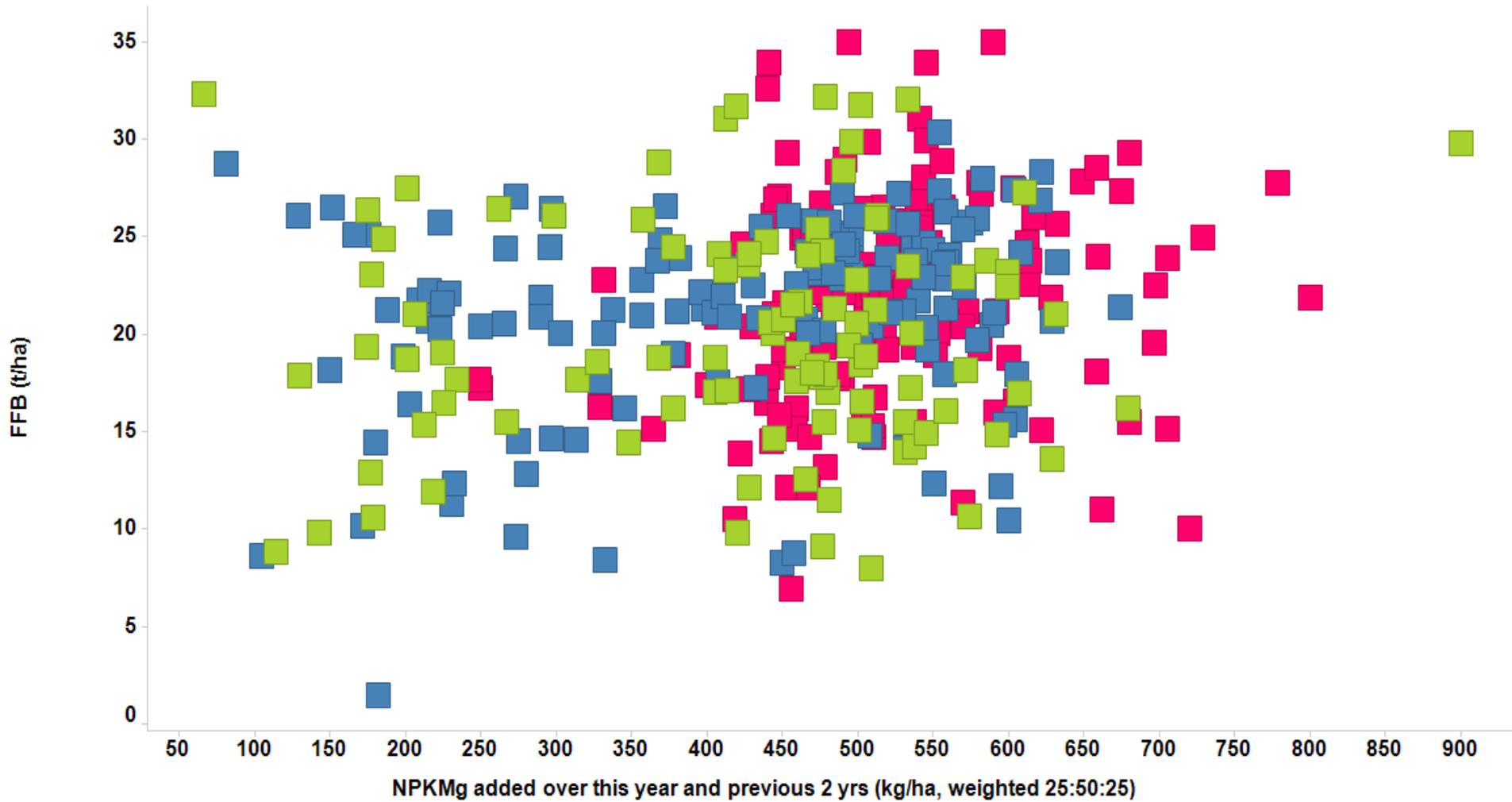
Compare FFB with fertilizer

Trees > 5 yrs old



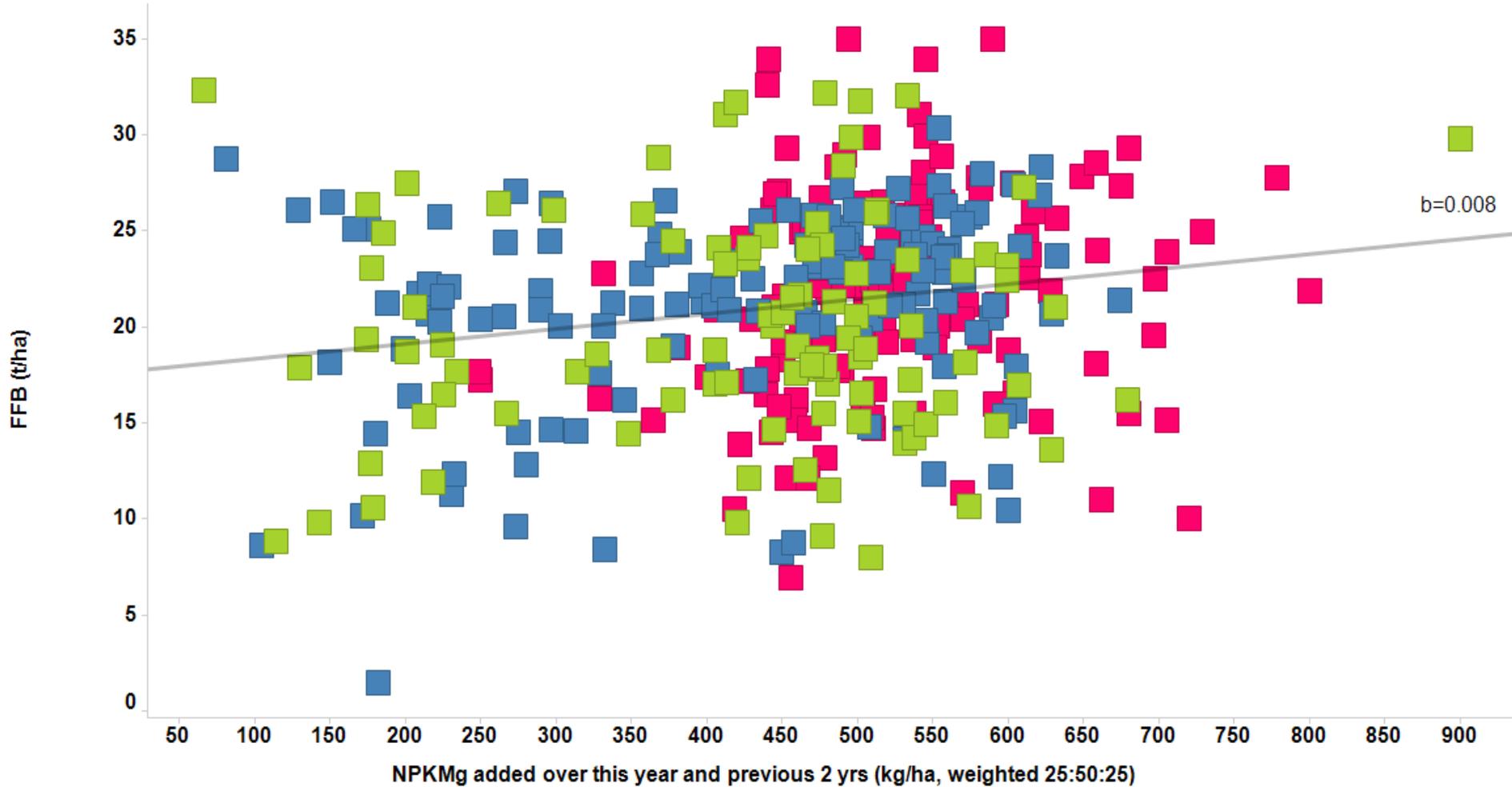
Account for time lapse

Comparing with fertilizer applied over 3 years



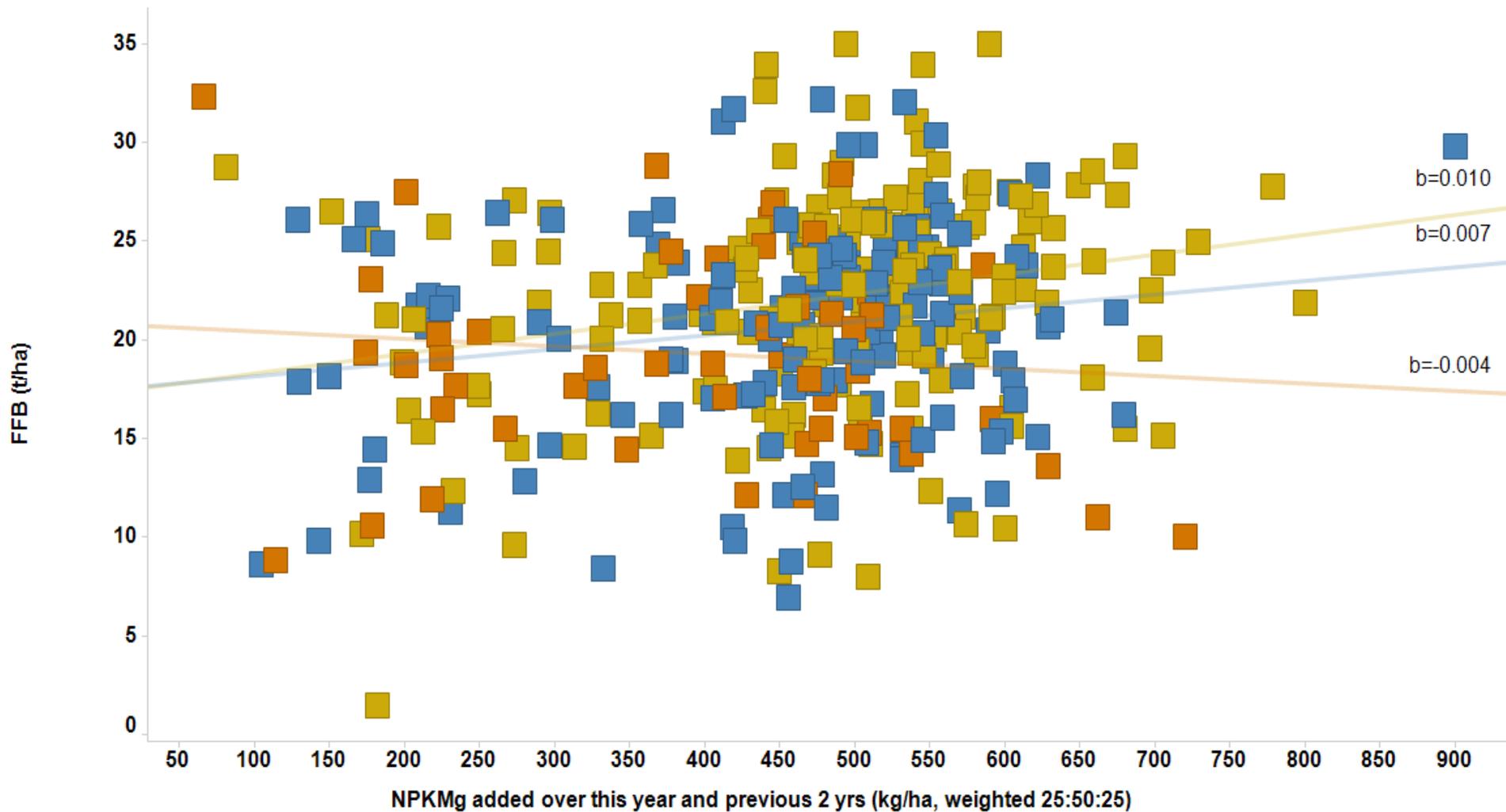
Account for time lapse

Comparing with fertilizer applied over 3 years



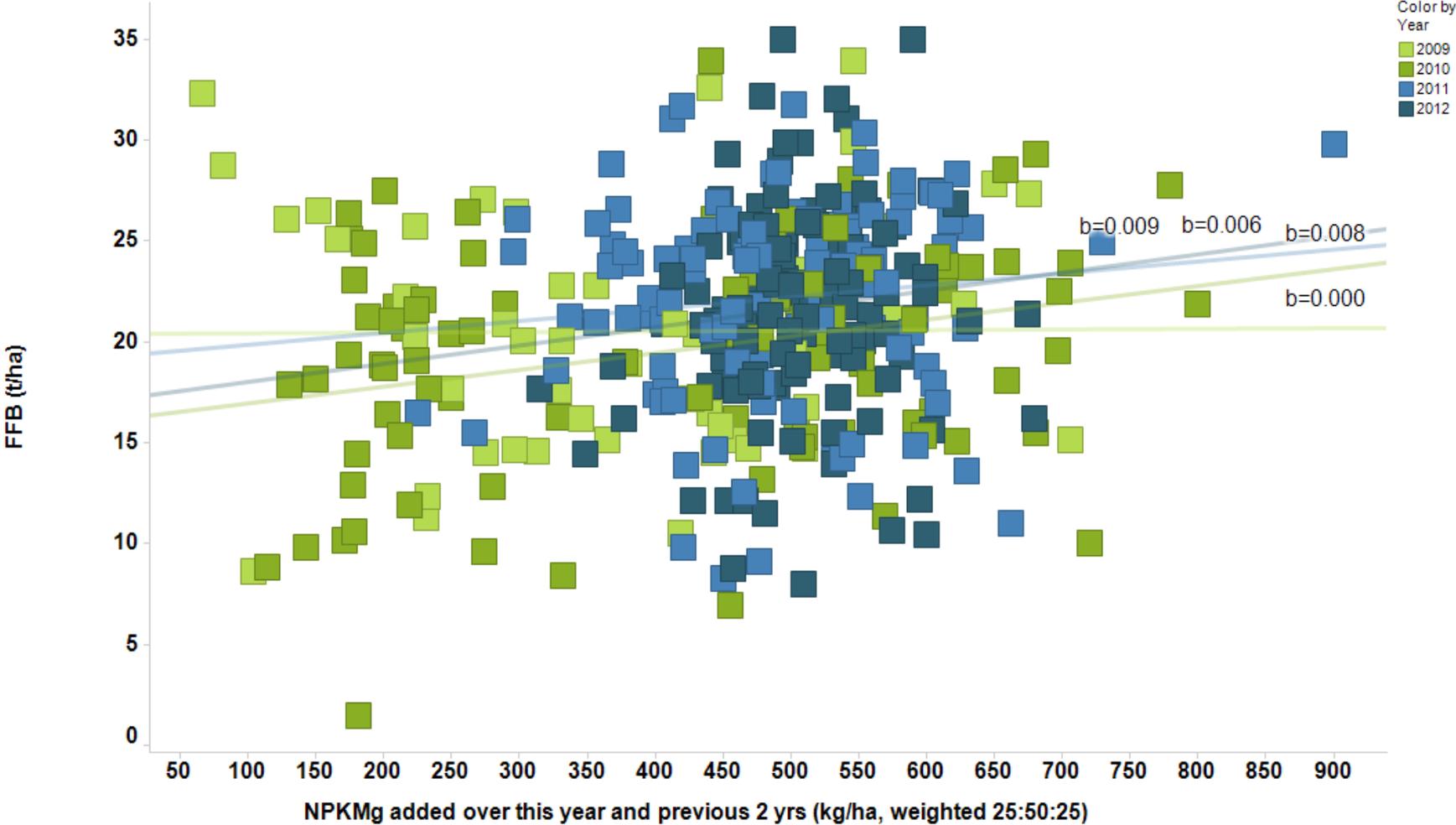
Response varies by soil

3 soil types



Response varies by year

Varies by year

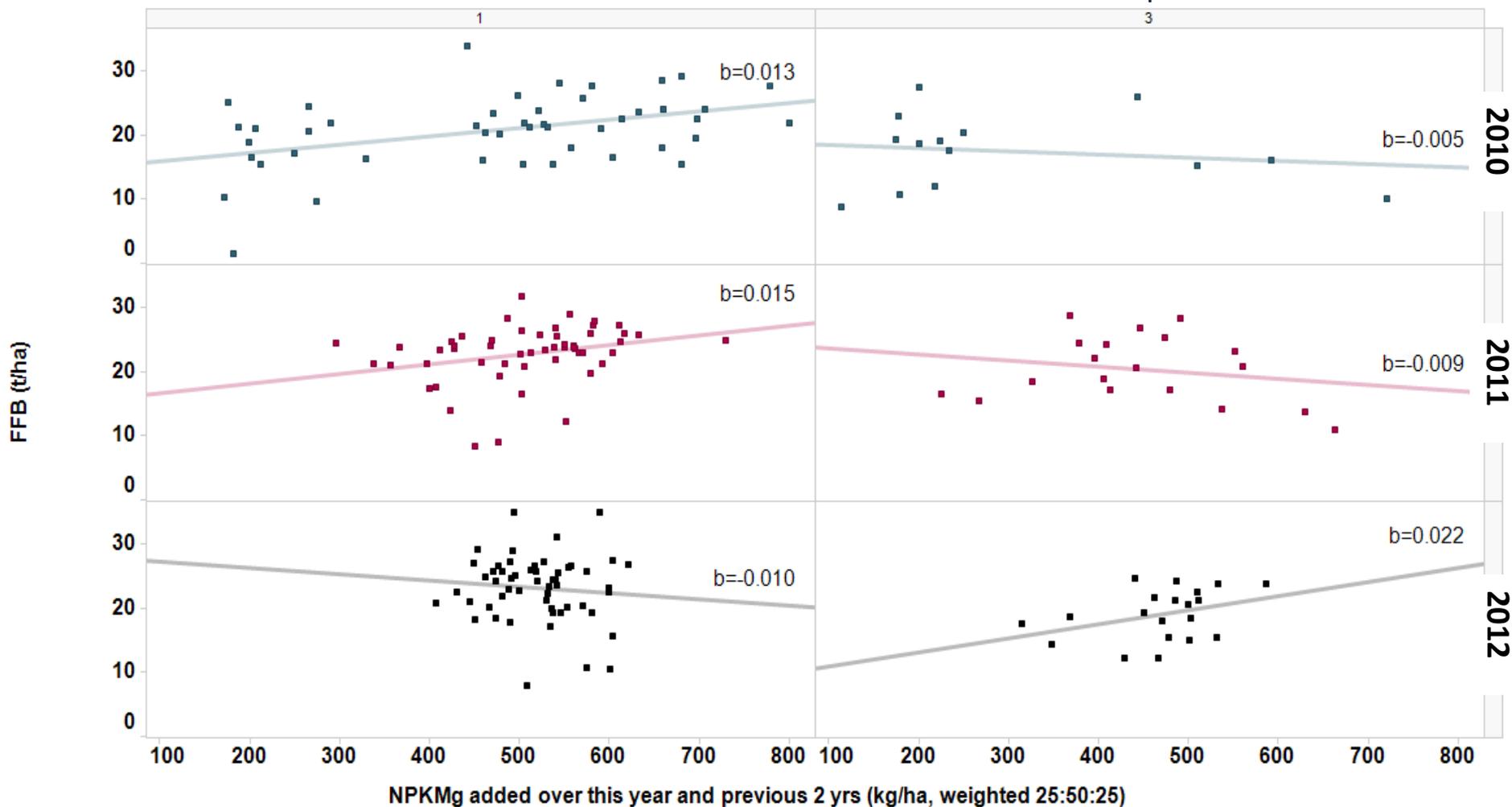


Combining soil and year

Variation by soil and year

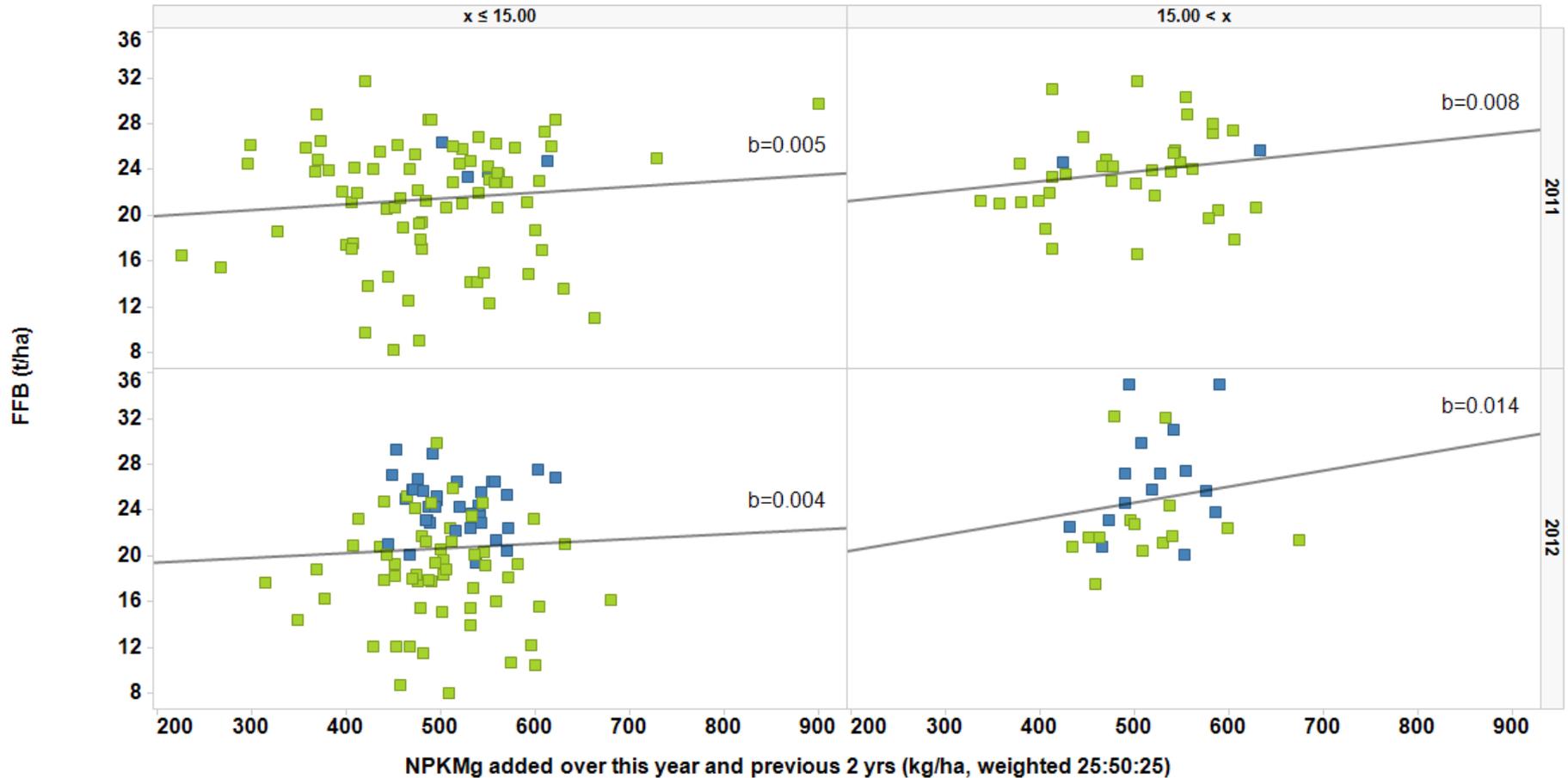
'Normal' soil

Hardpan soil



Labour affects fertilizer response

Labour effect



What happens next?

- Managers evaluate results
 - Are these consistent with what I already know?*
 - What surprises?*
 - What suspicions do they confirm?*
- Decide to change
 - Increase / decrease fertilizer rates?*
 - Change mix?*
 - Decide later*
 - Experiment to test?*
- Annual review and analysis
 - Process of continual improvement

Summary

- “Plantation Intelligence” :
Provides evidence from analysis at commercial scale
 - A kind of operations research
- **Applies science** at commercial scale
 - Making sense of complex commercial data
 - Working with managers, not providing recommendations ‘from outside’
- **Removes uncertainty** to support difficult decisions
 - Accelerates change and continuous improvement

Thank you



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