



Improving smallholder farmer incomes through strategic market development in mango supply chains in southern Vietnam

**Annual Workshop
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Activity 2.1 Fertiliser management & input cost reduction study

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Implementing Agency



Funding Agency



Australian Government
Australian Centre for
International Agricultural Research

Aim & objective

Activity 2.1


- ▶ Fruit productivity & quality improvements through on-farm innovations

Focus

- ▶ Design, develop & implement interventions to improve productivity & fruit quality outcomes on-farm

Research questions

- ▶ What on-farm innovations are likely to generate the most significant impacts to reduce losses, increase productivity & quality outputs that will improve returns directly related to smallholder incomes?
- ▶ What improved GAP, plant nutrition, disease & pest management models have the greatest potential to reduce the negative effects of agrochemical use for farmers, the environment, & the end consumer whilst being able to produce an affordable quality fruit?
- ▶ What innovations have the most cost-effective & positive impacts on productivity, losses, quality & harvest timing, leading to improved price & farmer income?

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- ▶ Current nutritional applications on farm exceed the crop requirements, leading to:
 - ▶ increased nutritional related disorders (e.g. internal breakdown) & susceptibility to post-harvest disease
 - ▶ significant impact on the cost of production
 - ▶ increased nitrous oxide production (a major greenhouse gas) & potentially nutrient run-off into the MRD
 - ▶ Introducing nutritional program based on plant requirements (crop removal & phenological cycle)
 - ▶ reduce internal disorders
 - ▶ improve resistance to disease
 - ▶ improve profitability
 - ▶ reduce greenhouse gas emission & nutrient run-off

- ▶ Capacity Development

Orchard nutritional management (phenological cycle & crop removal)

- ▶ analyse current nutrition programs on selected sites (timing, rates, products & costs)
- ▶ development of a new program based on crop removal & phenological cycle.

- ▶ Trial new nutrition programs on selected sites:

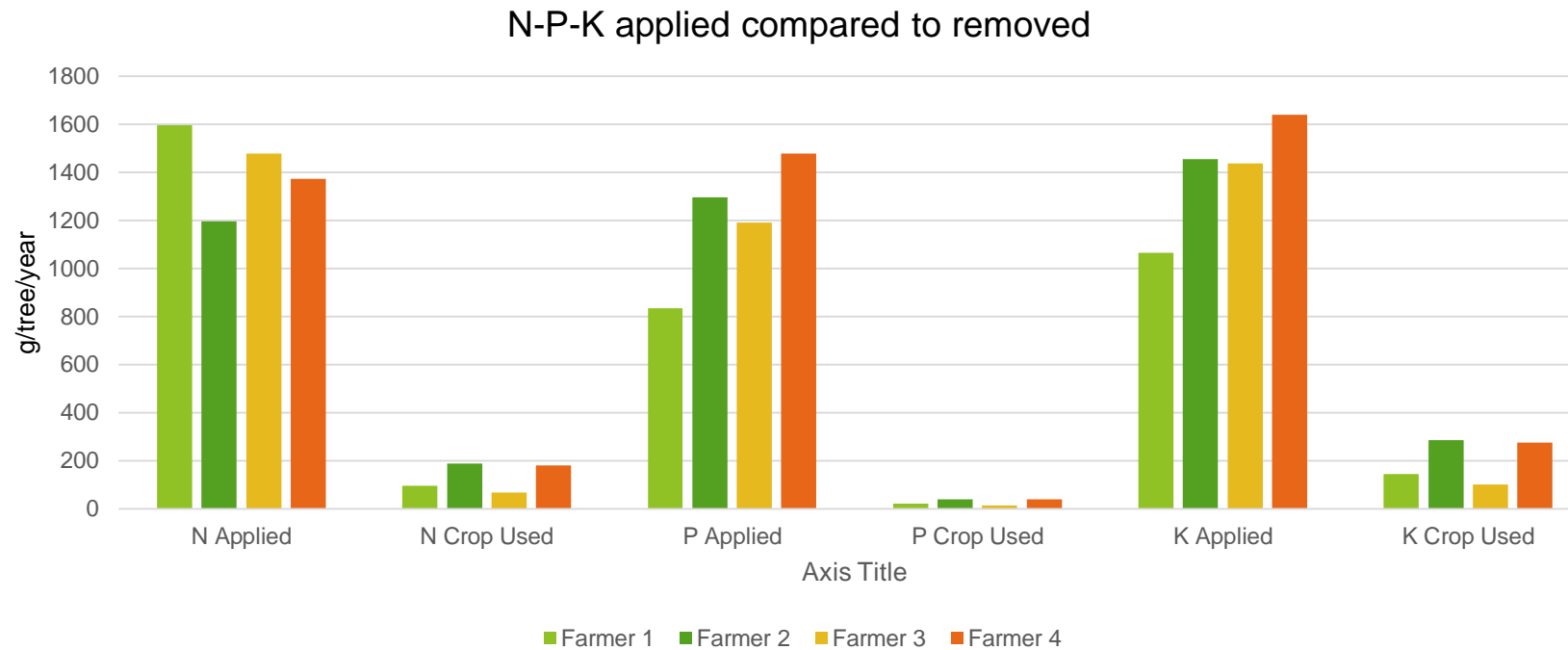
- ▶ verifying information with soil & mineral leaf analysis.
- ▶ measuring internal fruit quality & disease susceptibility.

- ▶ Cost model development for nutritional program



- ▶ Initial analysis of existing programs indicate excessive fertiliser applications. Between 5 to 10 times required amounts are being applied.
- ▶ Lab analysis has indicated a potential issue with the quality of results, a follow-up comparison of lab results is being sought.
- ▶ Trial nutritional plan developed & being implemented at 4 sites.
- ▶ Cost model being developed.

Analysis of current practices

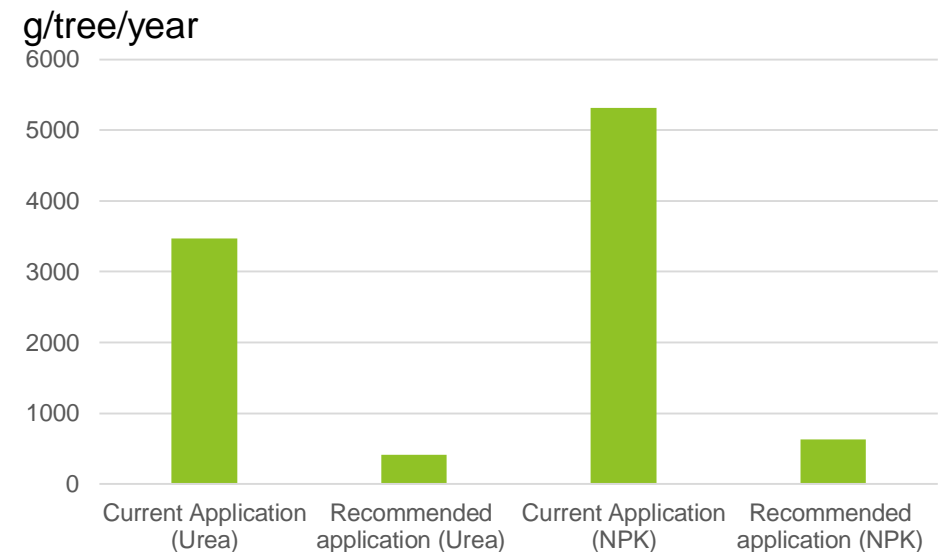
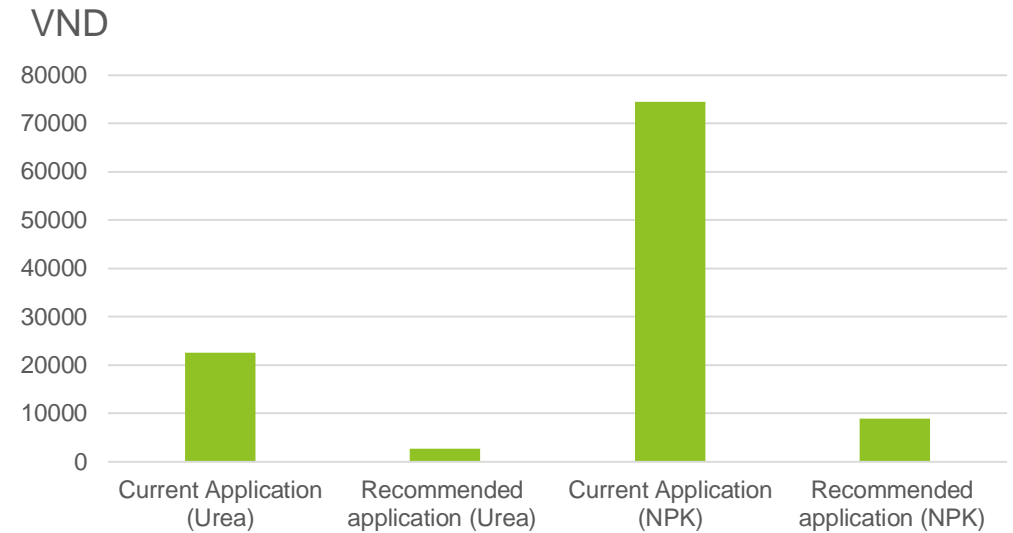


- ▶ Analysis of 4 sites has shown applications of NPK are up to 4X what is currently removed by the crop each season
- ▶ Additional fertiliser is being lost in the system
- ▶ Calculations have not taken into account the natural recycling of nutrients

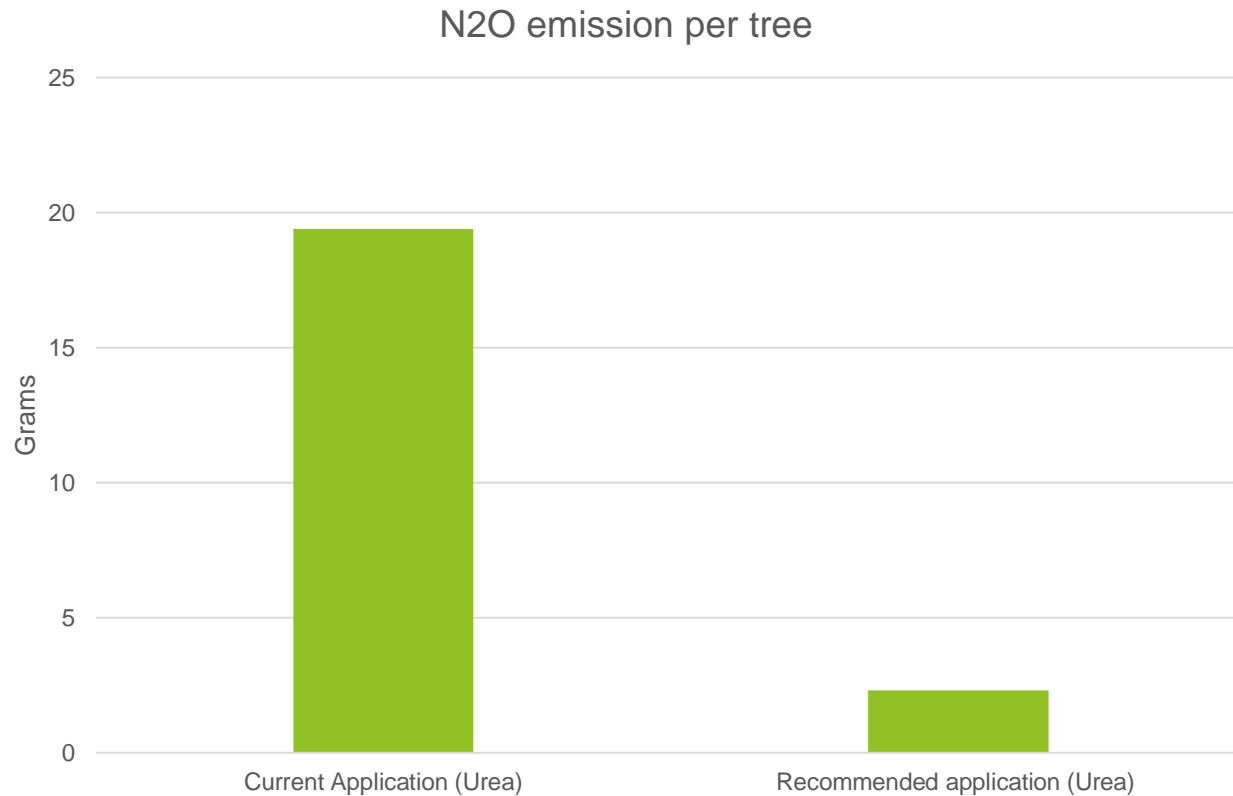


- ▶ Current applications of Urea and NPK costing farms an extra VND20,000 and VND65,000/tree, respectively, above recommended applications
- ▶ Current use of Urea and NPK is approximately 3000g/tree/year and 4500g/tree/year, respectively, above recommended applications

Nitrogen costing & use



Environmental cost



- ▶ Excessive applications of Urea that are not used by the plant end up in the environment
- ▶ For Urea this is usually through volatilisation in the form of nitrous oxide (N₂O), which is a major greenhouse gas 300X more potent than CO₂

Outputs & outcomes

Outputs

- ▶ Nutrition model plan developed
- ▶ Adapted for individual sites
- ▶ Cost model developed - indicating profitability

Outcomes

Changes in orchard nutrition will deliver:

- ▶ improvements in internal fruit quality
- ▶ reduced susceptibility to post-harvest disease
- ▶ reduced nitrous oxide emissions
- ▶ reduced nutrient run-off