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Canopy Management and Light Relations in the Small Tree High Productivity Initiative

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11 AMIA Conference, Bowen

2-5 May 2017

Acknowledgement

This project is an initiative of the Queensland Government

We are especially grateful to Horticulture Innovation Australia and the various associated industries and Mango growers in the Mareeba Dimbulah Region for their support for this initiative.



Introduction

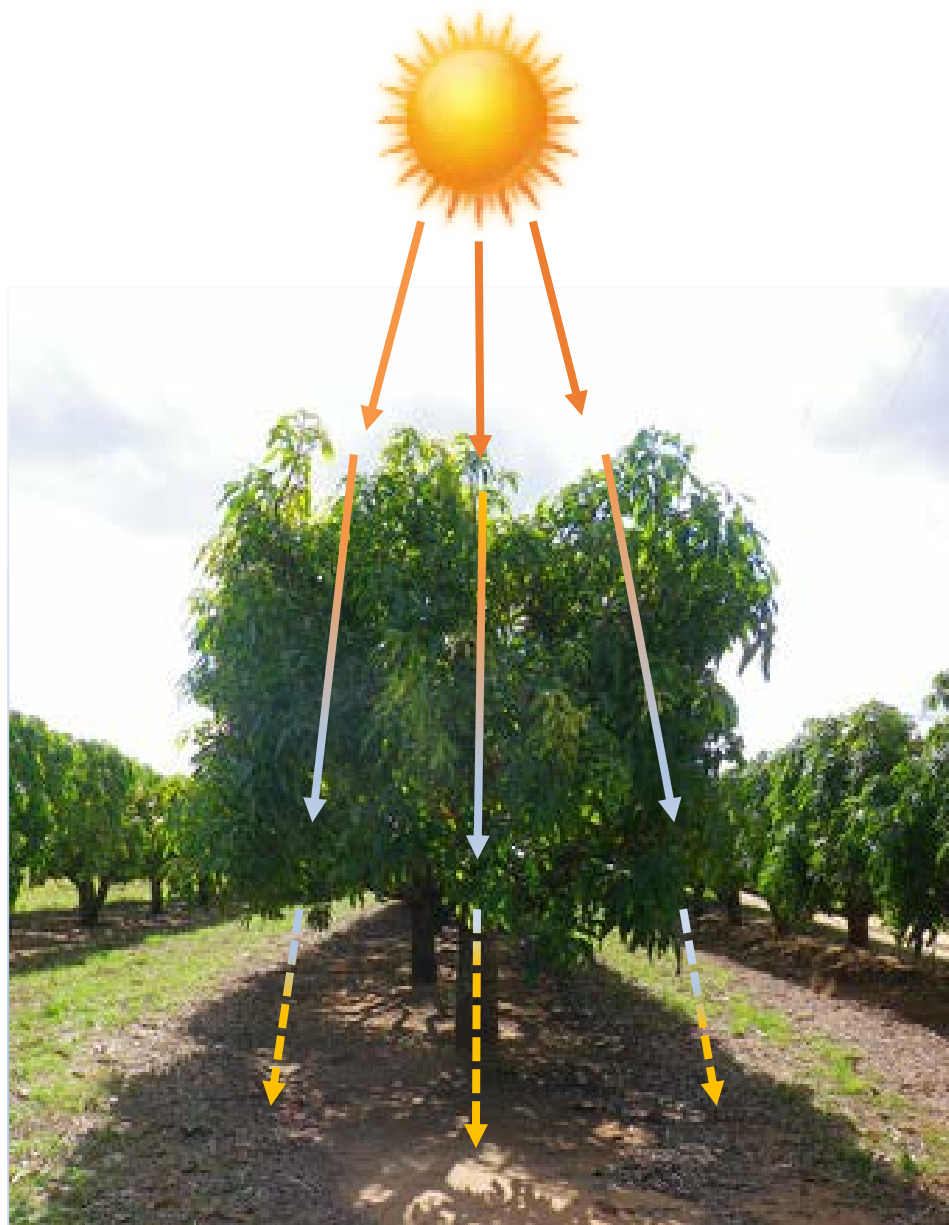
- Studies of light interception provide a basis for practical management of orchard canopies i.e. tree size, spacing and yield interactions;
- Orchard light interception changes with season, planting density, inter-row tree spacing, leaf arrangement and training systems
- Optimum is ~70%-80% in apples (Single-row)



Introduction

Light relations include two components:

1. Light interception- Light that is **intercepted** by the canopy
2. Light distribution - Light that is **transmitted** through the canopy.



Aims of the research

- To investigate light relations in mango orchards
- To develop an understanding between orchard light relations, canopy volume and yield using different experiments



Experiment 1- Baseline (conventional orchards)



2



8



13



27

Tree Age (years)

Experiment 2- Planting systems

3 varieties: 1243, Keitt and Calypso



Low (208 tree)

Medium (418 tree)

High (1250 tree)



Conventional

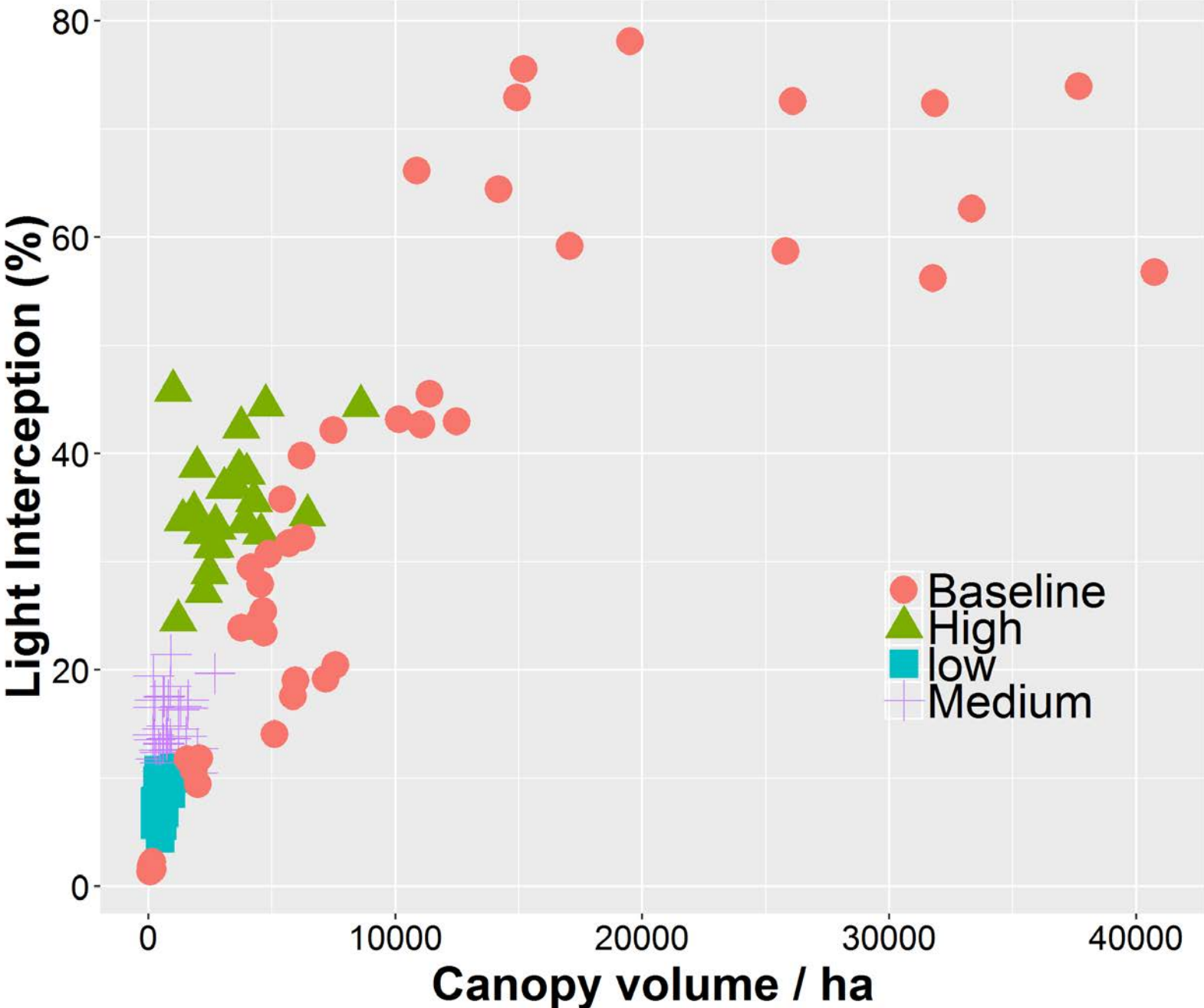


**Single leader
Conventional**

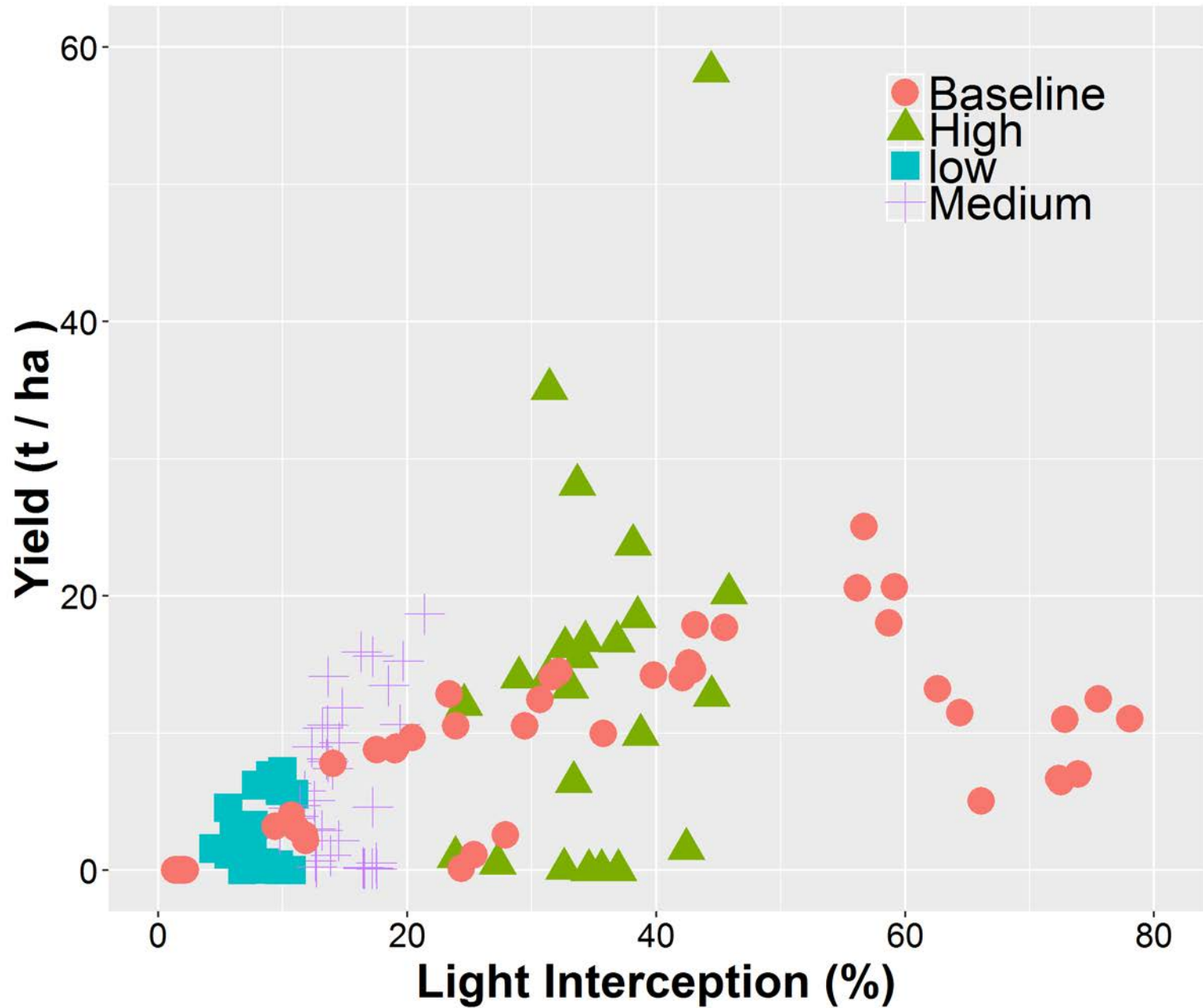


**Single leader trellis
Conventional**

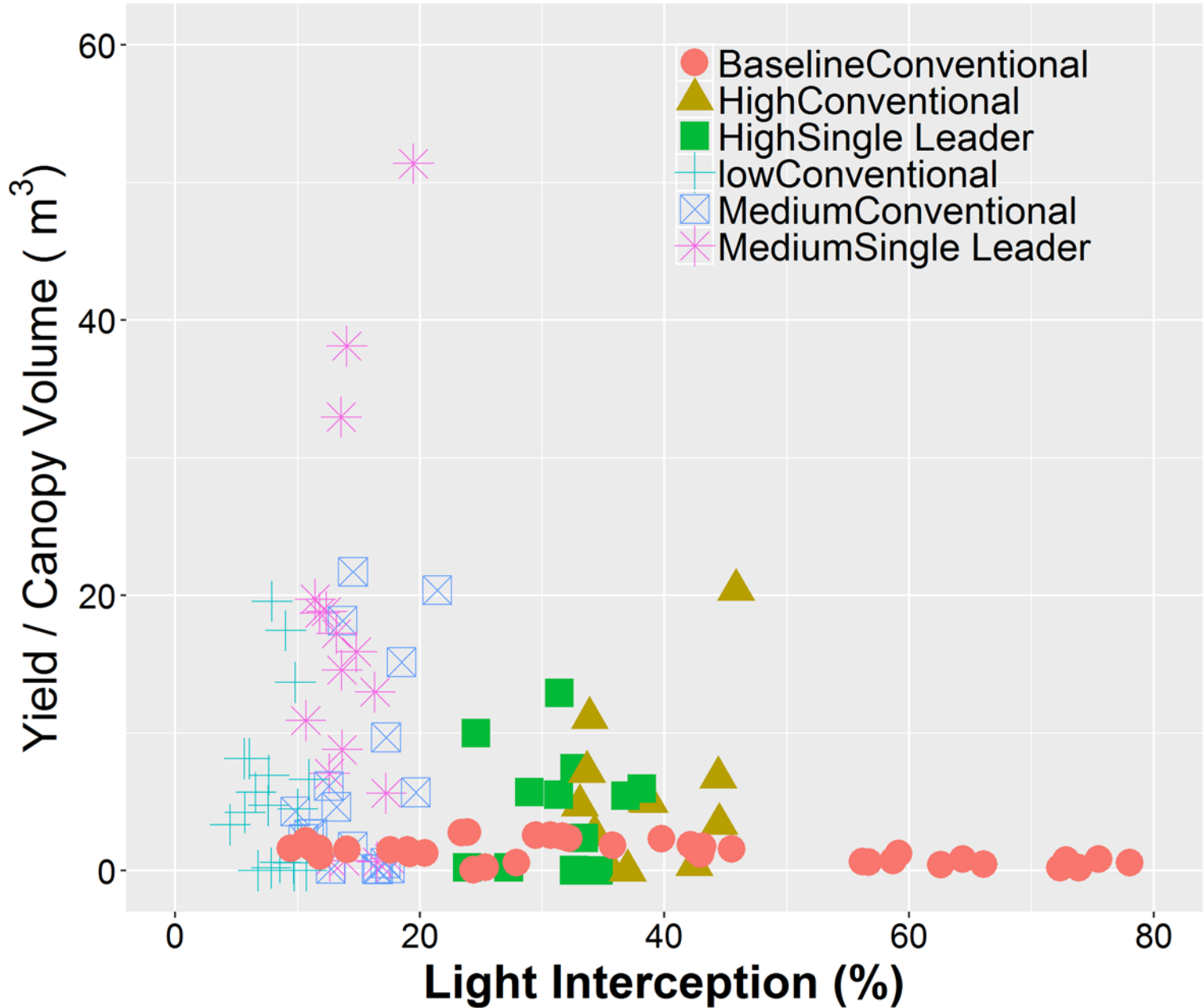
Results



Results

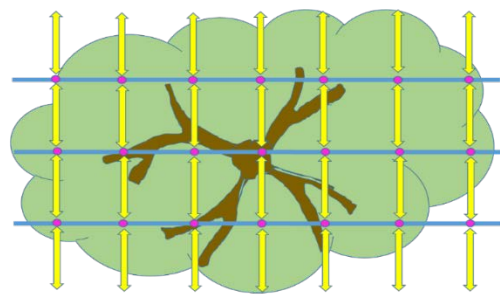
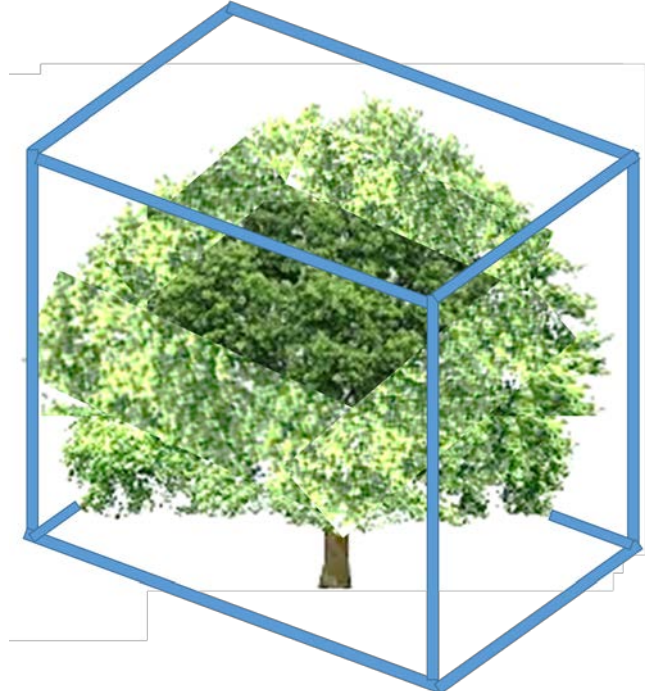
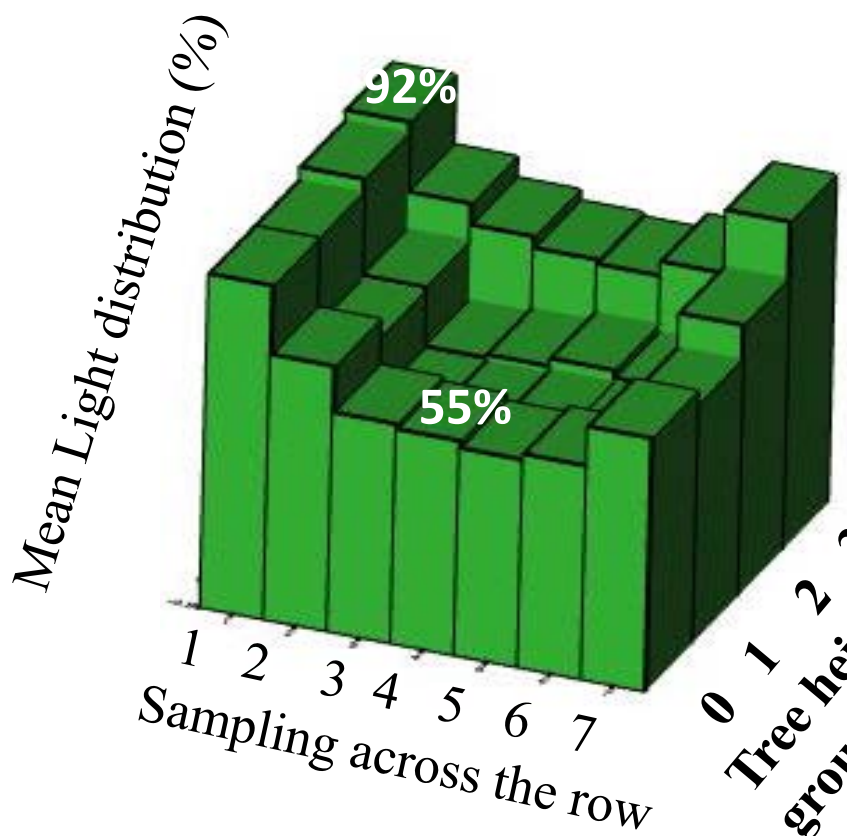


Results

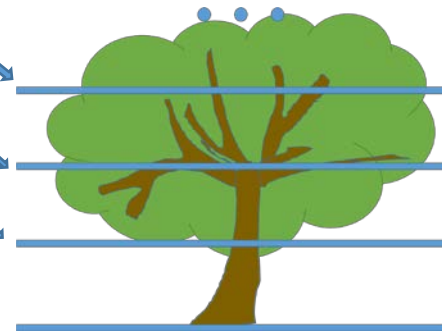


Experiment 3 - Light distribution

Light measures in baseline study



Tree height above ground



Conclusions

- **Increasing tree density can increase canopy volume per ha and light interception leading to increase yield per hectare.**
- **Combining training systems with planting density, we have potential lift productivity compared to conventional orchards of similar age.**
- **The light distribution study showed a big variation in light distribution within the tree which may be contributing to fruit quality variability.**

