Is Gold3 bud rot a thing?

Kabir MS, Parry BE, Neththikumara V, Tyson JL, Scott P, McKenzie C, Beresford RM

Psa R&D Update
Mount Maunganui; 9 September 2020

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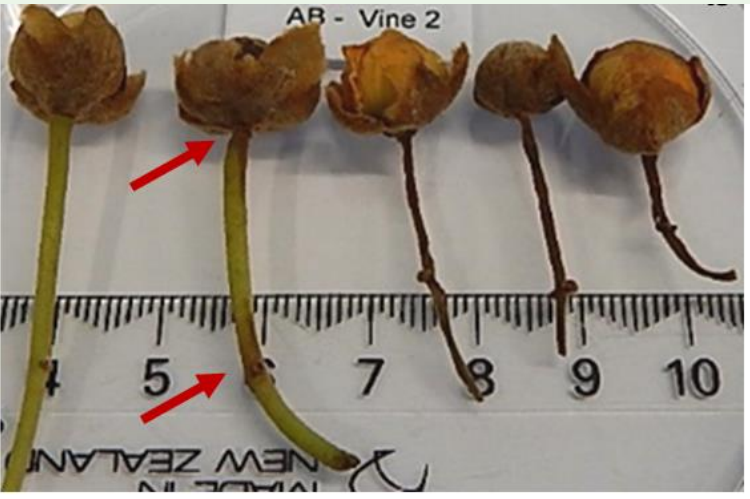
Background of Gold3 bud rot



- Gold3 (*Actinidia chinensis* var. *chinensis* ‘Zesy002’) growers have experienced this problem since 2016
- Symptoms-
  - **Stalks** of flowers develop a **brown necrosis**
  - Flower **bud development stops** and buds become **orange** in colour
  - Flower buds eventually drop
- Usually appears at the **end of October**
- Associated with **Psa** (*Pseudomonas syringae* pv. *actinidiae*)
- About **29% incidence** in 2018 (in an experimental site) with a final production of **13,000 trays/ha**
- Extent of problem and epidemiology not studied
- Progress report of 2 year project

Aims

a) Determine the **growth stage** at which Psa is **present on/in** the buds, including **dissecting flower buds** to **track infection** through the buds

b) Assess bud rot **incidence and progression** of symptoms

c) Determine the effect that the **timing of flower thinning** has on bud rot

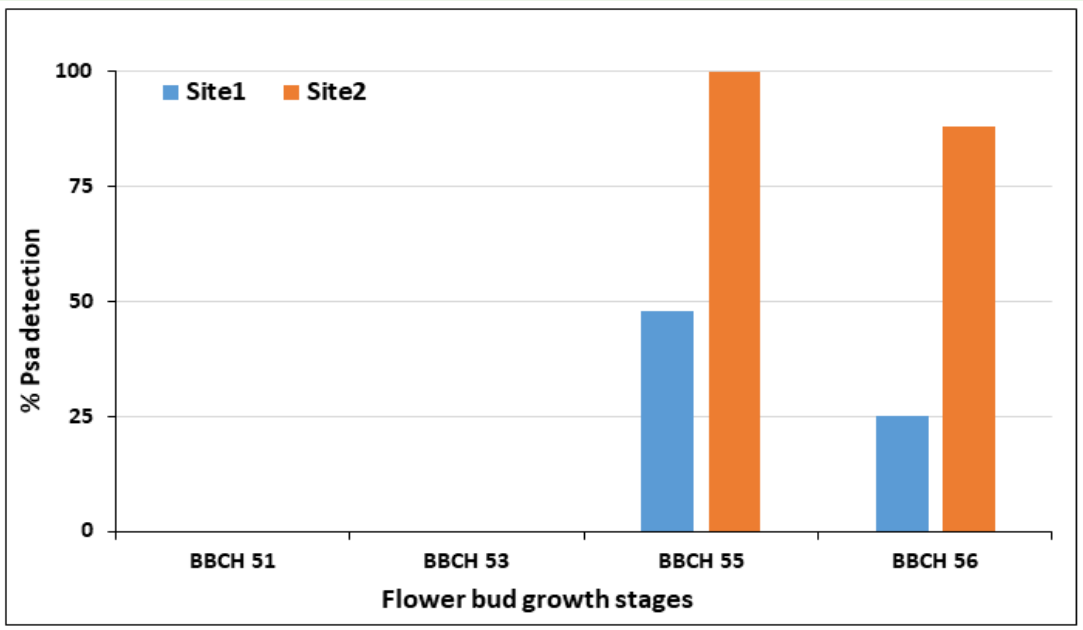
Materials and Methods

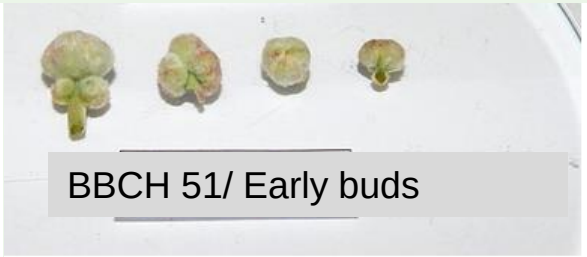
- Experiment conducted in two commercial and one research site in the Bay of Plenty (BOP)
- History of this type of bud rot incidence
- Monitored buds of 15 vines for incidence (only on Gold3-’Bounty71’)
- Bud samples collected, processed (bacterial isolation, DNA extraction and qPCR) to detect Psa

Results

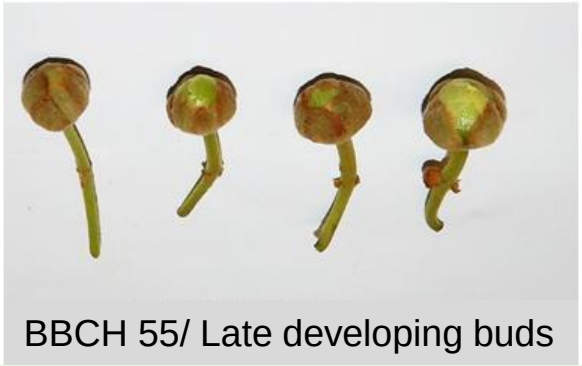
a) Psa detection and symptom development

When was Psa detected on flower buds?




BBCH 51/ Early buds


BBCH 53/ Developing buds


BBCH 55/ Late developing buds


BBCH 56/ Developed buds

- **Psa** was **first detected** on flower buds when the **sepals began to separate** (~5 weeks after bud burst)
- These results indicate that **protection measures** needed **prior to this growth stage**

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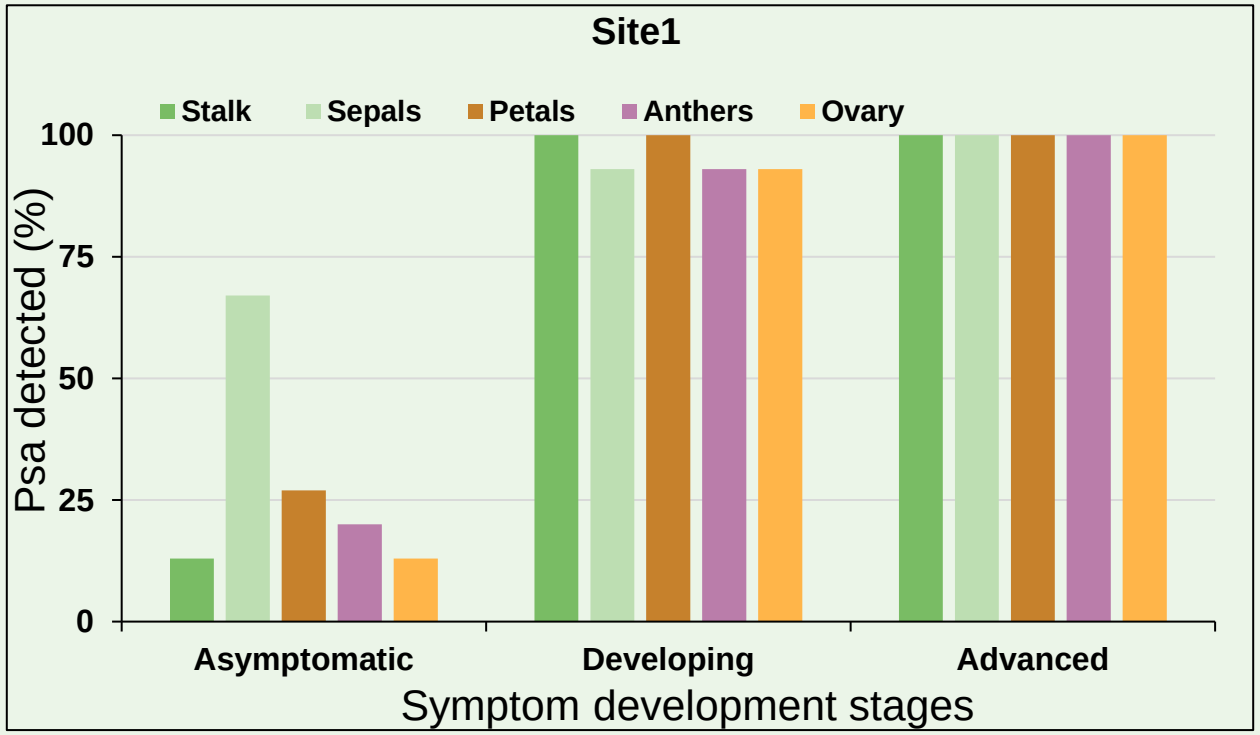
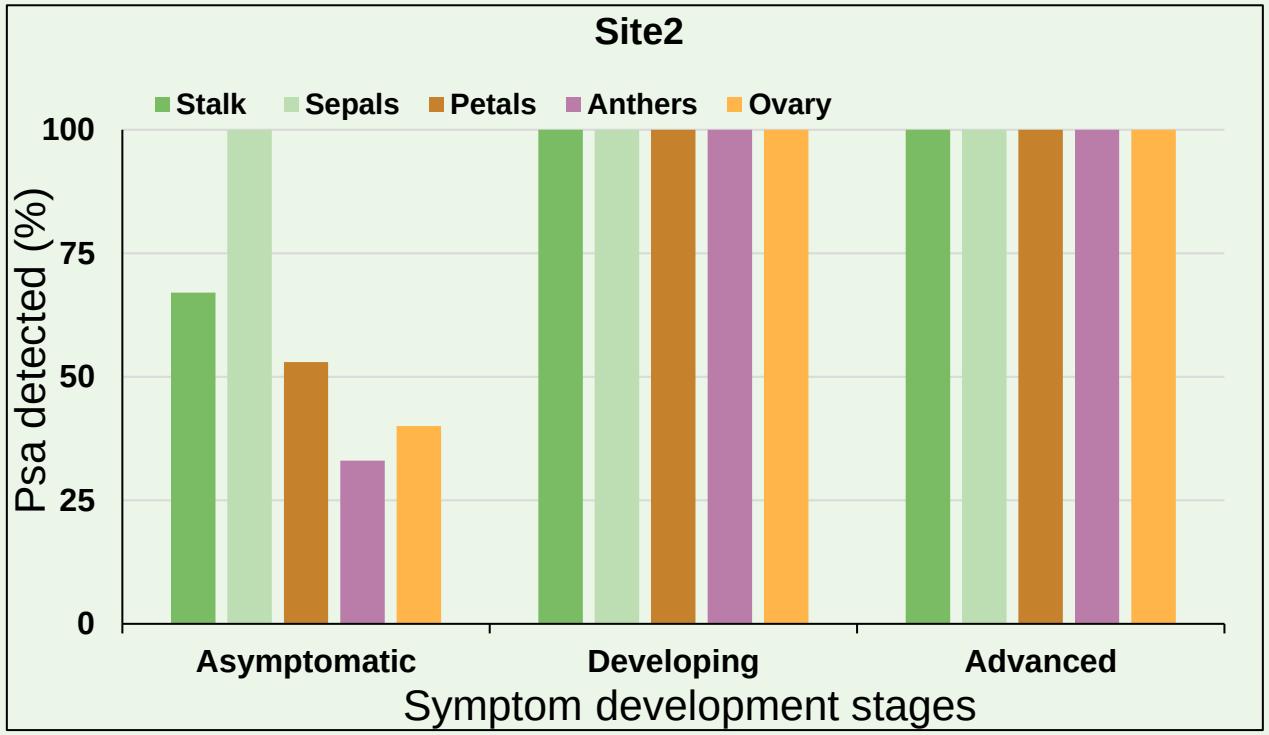
a) Psa detection and symptom development (cont.)

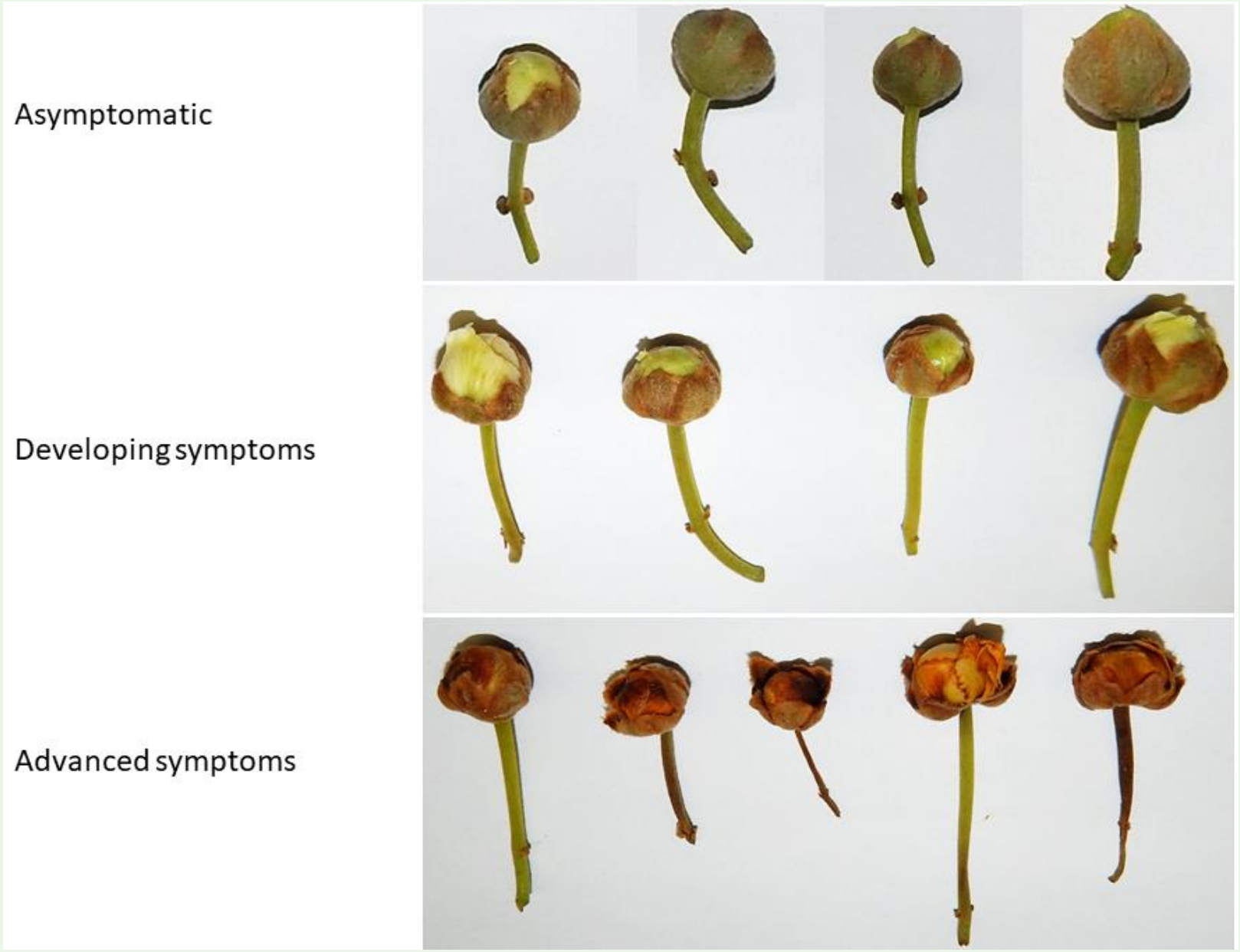
How does Psa spread throughout the flower buds?





- Psa is **moving from external** (sepals) **to internal** (petals, anthers and ovary) parts of the bud
- This pattern of movement was **previously identified in green-fleshed** cultivars

a) Psa detection and symptom development (cont.)



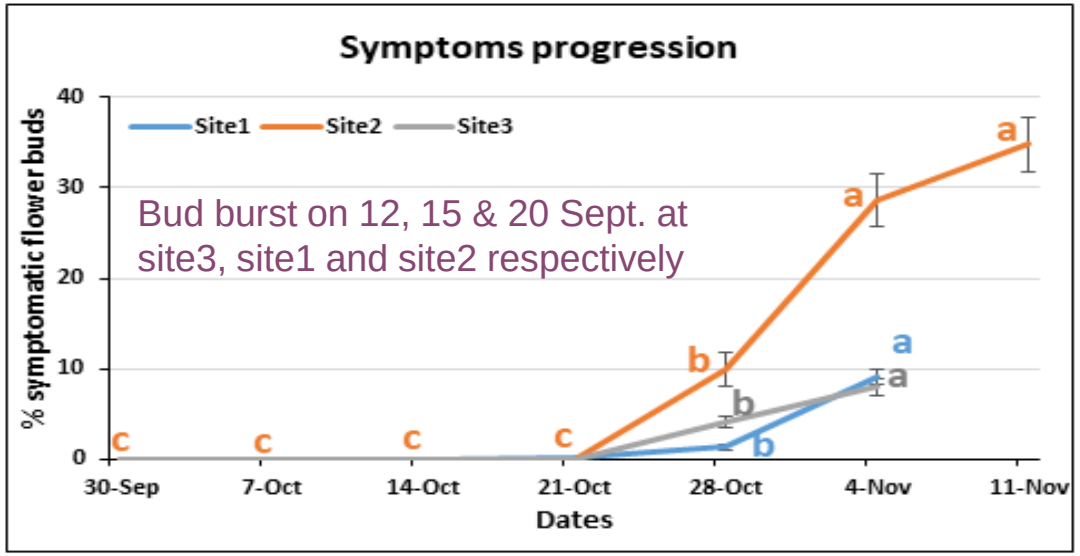
Close view of representative buds

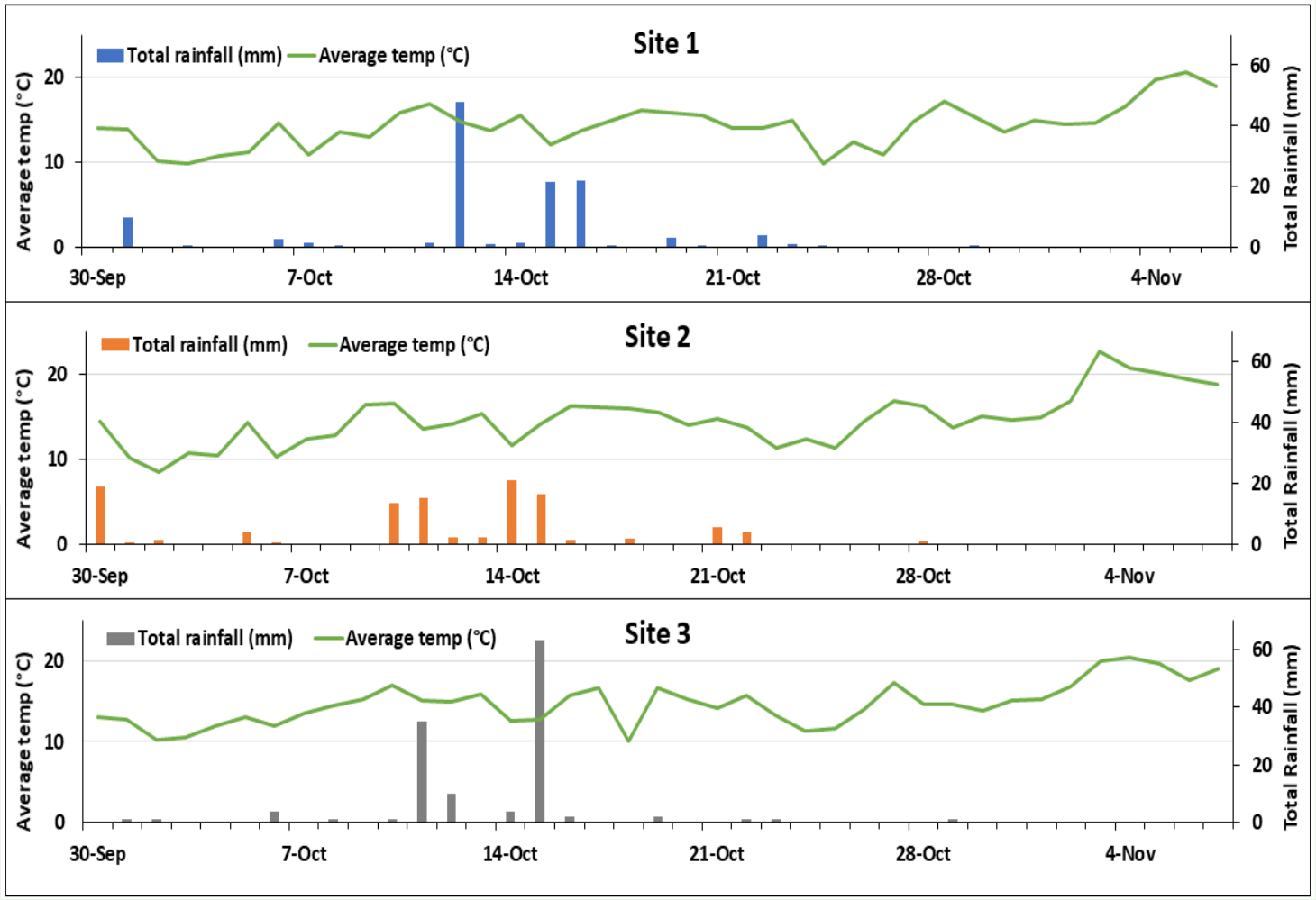
a) Psa detection and symptom development (cont.)

Field images of bud rot. Arrows indicate asymptomatic (yellow), developing (white) and advanced symptoms (red) respectively.

Results

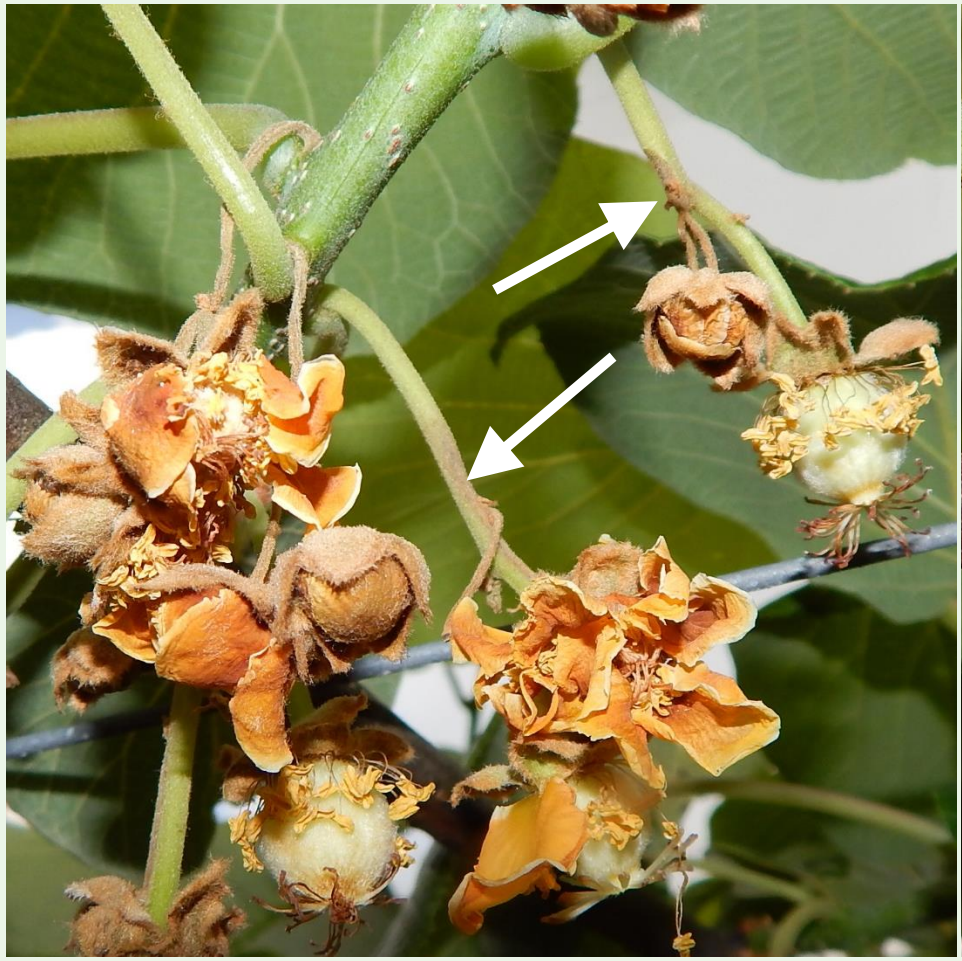
b) Assessments of bud rot incidence and symptom progression





- Symptoms began in the **week beginning 21 October** 2019 at all three sites
- Incidence increased. The final percentage of symptomatic buds ranged between **8 and 35%.**
- **Rainfall** prior to this week along with **Psa inoculum** and **tissue susceptibility** might be a cause

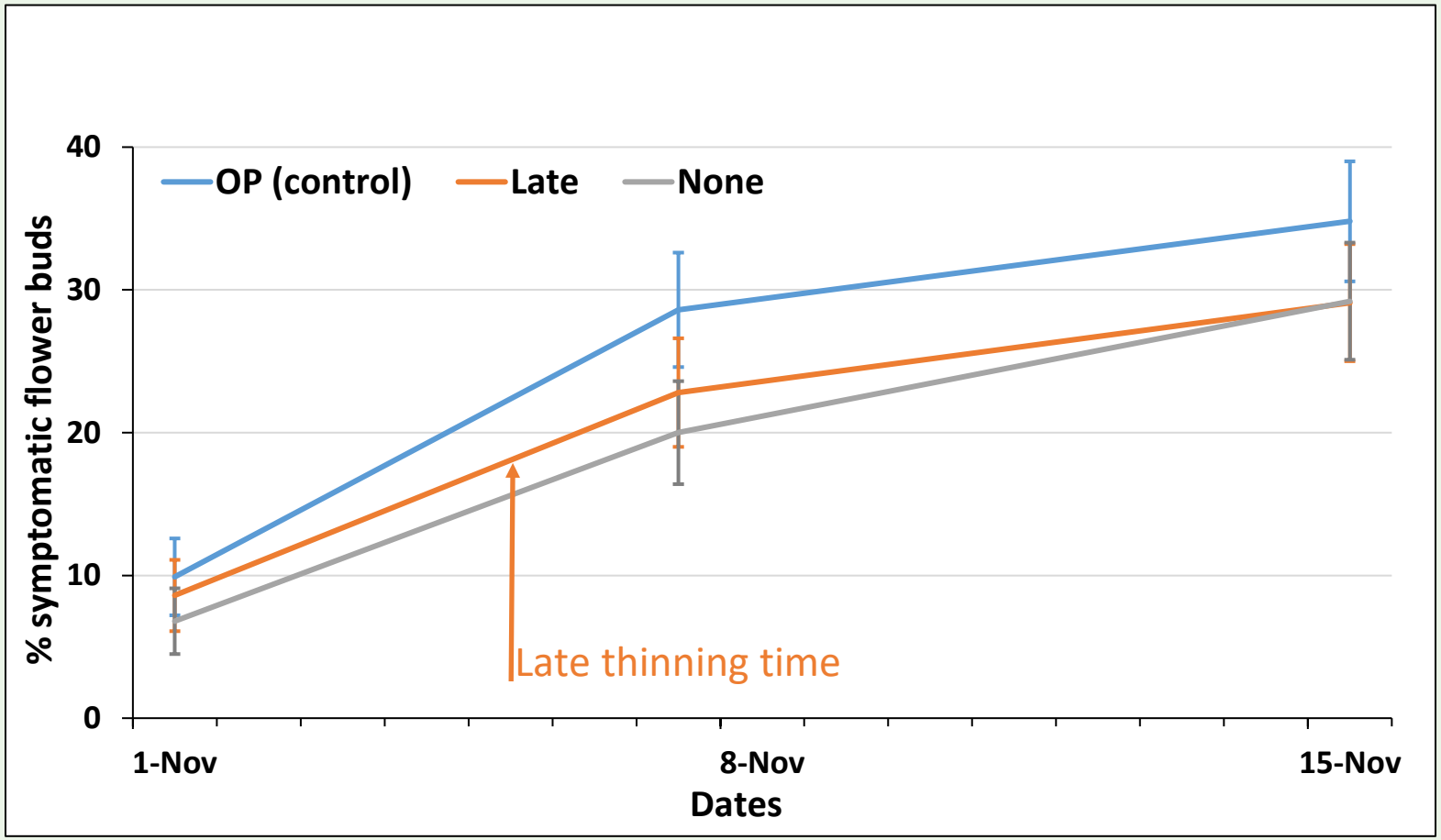
b) Assess bud rot incidence and progression of symptoms (cont.)



- Symptoms **continue to develop** even after flowering
- **Pedicel necrosis** and **termination of fruitlet**

Results

c) The effect of timing of flower thinning



Note: 'OP' indicates orchard practice (thinned on 26 Oct 2019), 'None' indicates no thinning

- **Late thinning reduced** bud rot by **6%** but not statistically significant in this year
- Even though the result was not statistically significant, this result indicates that the thinning wounds are an **infection point** for Psa in bud rot
- It may be that **small increments** from a variety of angles could control this successfully e.g. **spray** at the appropriate time, **thin** a little bit **later**, use a different rootstock

Summary

- **Psa detected** at BBCH55 (when **sepals start to separate**), suggesting that protection measures need to be prior to this
- **Psa moves** from **external tissues to internal**; sepals are infected first
- **Bud rot varies** site to site (range 8–35%); **inoculum load** and **rainfall** seem to be the **driving forces**
- **Late thinning** slightly **reduced bud rot**

Acknowledgements

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Thank you

Shahjahan.Kabir@plantandfood.co.nz

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