

Trip Report - Project Startup Meeting
Project Title: Investigation of skin hardening and splitting disorders in sweetpotatoes
Project Funding: Hort Innovation Australia
Collaboration: Sandra Dennnien (Gatton Research Station) and Rachael Langenbaker (Bundaberg Research Station), DAF, QLD
Arthur Villordon, LSU AgCenter Sweet Potato Research Station (SPRS)

1-3 November 2019

Travel

Monroe Regional (MLU) - Dallas-Fort Worth (DFW) - Sydney Airport (SYD) - Brisbane Airport (BNE). Overnight in BNE

Monday 4 November

Travel

BNE - Bundaberg Airport (BDB)

Activities

- Introduction to BRS (Fig. 1)
- Initial meeting with research team
- Visit to Greensill Farming Group packing shed to observe splitting and skinning (Figs. 2, 3)



Figure 1. Tour of greenhouse and support facilities, BRS, QLD.



Figure 2. Research team visit to Greensill Farming Group sweetpotato packing shed, Bundaberg, QLD.

Project notes:

- ‘Beauregard’ variety storage roots do not typically split, especially for the planting/harvest dates considered
- The research team met with the management staff to discuss possible variables that might have contributed to splitting.
- The following variables were identified for possible follow-up:
 - Prolonged dry conditions followed by irrigation
 - Provision of potassium fertilizer to “restart” storage root bulking



Figure 3. Splitting seen in ‘Beauregard’ storage roots being run through the packing line, Greensill Farming Group sweetpotato packing shed, Bundaberg, QLD.

Tuesday 5 November

Activities

- Project meeting & greenhouse visits (BRS) (Fig. 4)
- Visits to Windermere Farms (Figs. 5, 6)



Figure 4. Research team checking on the status of stock plants, BRS, Bundaberg, QLD.



Figure 5. Checking on a field planted with 'Orleans' variety, Windermere Farms, Bundaberg, QLD.



Figure 6. Splitting was not observed in 'Orleans' but some grooving was reported for certain harvest dates. Possible causes were discussed for possible follow-up. Windermere

Farms, Bundaberg, QLD.

Project notes

- The grower suggested that the grooving was associated with a “second set” of storage roots following the winter phase of the crop

Wednesday 6 November

Activities

- Project meeting continued (BRS)
 - Review of nutrient solutions to be used for greenhouse trials ([link to solutions](#))
 - Review of experimental treatments to be used in Bundaberg and SPRS locations
 - Testing of nutrient solution in greenhouse

Thursday 7 November

Activities

- Project meeting wrap-up (BRS)
- Visits to Prichard Farms to observe splitting in ‘Northern Star’ variety
- Project Reference Group (PRG) meeting
 - PRG provided valuable feedback to the proposed methodology, in particular synching planting dates with known incidence of splitting at harvest
 - Varieties considered for testing: ‘Beauregard’, ‘Bellevue’, ‘Muraski’, ‘Bienville’ (Bundaberg)
 - In addition to the above varieties, ‘Georgia Jet’ and ‘Evangeline’ will be tested in SPRS
- Presentation to growers



Figure 7. Research team visit with Mike Prichard to observe splitting in ‘Northern Star.’



Figure 8a,b. Splitting observed in freshly dug 'Northern Star' variety storage root samples. Soil samples were collected to determine if nematodes were present in the field. Follow-up activities were discussed.

Friday 8 November

Travel

Travel by car from Bundaberg to Rockhampton

Activities

- Meet-up with Eric Coleman (Aus Sweetpotato Seed) for travel to Rockhampton
- Visit bedding operations in Bundaberg prior to travel to Rockhampton (Figs. 9a,b and 10)



Figure 9a. Virus-tested seed of 'Bellevue' variety being bedded in Bundaberg.



Figure 9b. Bedded seed of 'Bellevue' variety being covered in Bundaberg.



Figure 10. Figure 9a. Virus-tested seed of 'Orleans' variety being bedded in Bundaberg.

Saturday 9 November

Activities

- Tour of Aus Sweetpotato Seed facilities and seed production fields (Eric and Kristy Coleman)
- Visit Wolfenden Farms



Figure 11. Newly-built truck wash equipment at entrance to Aus Sweetpotato Seed, Rockhampton



Figure 12. View of Aus Sweetpotato Seed in storage facility.



Figure 14. 'Bellevue' variety storage root development.



Figure 15. Grooving observed in 'Orleans' storage roots. Possible causes were discussed for follow-up work.

Sunday 10 November

- Downtime

Monday 11 November

Travel

Travel from Rockhampton Airport to BNE, travel by car from BNE to Cudgen, NSW

Activities

- Visit to Prichard Farms
- Presentation to growers



Figure 16. Research team visit to Prichard Farms, Cudgen, NSW.



Figure 17. ‘Orleans’ plant beds, Prichard Farms, Cudgen, NSW.



Figure 18. Rachael Langenbaker, research project team member and experimentalist, BRS, DAF, Bundaberg, shows ‘Orleans’ storage roots samples at Prichard Farms, Cudgen, NSW.



Figure 19. ‘Orleans’ storage roots with possible nematode symptoms sampled from an

ongoing nematode study, Prichard Farms, Cudgen, NSW.

Tuesday 12 November

Travel

Travel by car from Cudgen to BNE.

Tuesday 13 November

Travel

Travel from BNE to Auckland Airport (AKL)

Appendix Table 1. Proposed experimental treatments for BRS

Cultivars	Treatments	Reps	Sampling dates	Total
Beauregard	Complete -Ca (+ 50 days) -B (+ 50 days)	5 (1 rep=1 plant/pot)	50, 140 days	30
Mursaraki	Complete -Ca (+ 50 days) -B (+ 50 days)	5	50, 140	30
Bellevue	Complete -Ca (+ 50 days) -B (+ 50 days)	5	50, 140	30
Bienville	Complete -Ca (+ 50 days) -B (+ 50 days)	5	50, 140	30

Amount and frequency of application of 0.5X concentration treatments:

- Days 1 to 5. - 224 ml morning and evening
- Days 6 to 5. - 448 ml M, W, F,
- Days 51 to ~ 140 – 448 for now for all treatments (complete, -Ca, -B). However, we will have to see how the plants respond. I have not carried out pot expts past 50 days. If the plants look like they are water stressed at any time, we will need to adjust amount and/or frequency

Appendix Table 2. Proposed experimental treatments for SPRS.

Cultivars	Treatments	Reps	Sampling dates	Notes
Georgia Jet	Possible effect of N source (NO ₃ vs NH ₄) on splitting	5	TBA	
Beauregard, Bellevue, Mursaraki, Bienville	Possible role of phosphorus availability on skinning/splitting	5	TBA	

Appendix Figures



Figure 1. Splitting and skin color variation in cv. 'Georgia Jet' storage roots subjected to different nitrogen sources (NH_4^+ vs NO_3^-). Samples observed at 40 days after planting (SPRS).



Appendix Figure 2. Splitting in 'Georgia Jet' storage roots supplied with NO_3 and observed at 40 days (SPRS).



Appendix Figure 3. General lack of splitting and skin color variation in ‘Georgia Jet’ supplied with NH₄ and observed at 40 days.

Appendix 4

Grower updates Bundaberg and Cudgen

Two successful project updates were delivered to growers in Bundaberg on the 7th of November (15 attendees) and in Cudgen (10 attendees) on the 11th of November. Presentations described the proposed trials to be conducted in Queensland and Louisiana. Prof Villordon also provided information on the latest sweetpotato research activities being undertaken in the USA. Feedback from growers in attendance at both locations suggested a high amount of interest in the presentations and great interaction and conversation.



Figure 1. Project PW18001 update for sweetpotato growers in Bundaberg.



Figure 2. Project PW18001 update for sweetpotato growers in Cudgen.