

Raspberry Breeding Consortium

Summary Annual Report 2021



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1. Introduction

This report describes the activities during year three of the RBC tranche 2019-2024, presenting results from the breeding plots at James Hutton Institute and a summary of the results from the existing on-farm trials. It also describes knowledge transfer activities undertaken throughout the year.

2. Results and Discussion

2.1. Headlines and highlights

- **Step changes proposed in the breeding programme in 2020 were implemented in 2021 for addressing the following pathogens: powdery mildew, post-harvest rots, especially *Botrytis cinerea* and two spot spider mite.**
- **Process for production of plants for trialling was amended to improve numbers of plants available to trialists and to incorporate additional requirement for tests to export material to the EU**
- **An independent trial to optimise fertigation of the new cultivars was initiated with FAST LLP in February 2022 and will be based at Brogdale, Kent**

2.2. COVID19 in 2021

The Institute continued to operate in a 'restricted access condition' throughout 2021 due to COVID19. Some restrictions were reduced during the growing season but the uncertain status meant that there were few visitors and the majority of meetings and events were online. It is hoped that normal service will be resumed in 2022.

2.3. 2021 Fruit Season and Breeding Trials

- Early winter was mild until late December then temperatures dipped to below 4°C until mid-February.
- Bud break was condensed into two weeks in early March. A continuous night frost for the first fortnight in April and high winds caused some damage in the breeding plots.
- Conditions were generally dry from March until October. Tunnels were covered in late April and the earliest floricanes started on 26th June. Floricane genotypes started cropping within a week of each and cropped in a condensed period, unlike the usual spread of spread of season in previous years.
- The primocanes started in late August and continued picking into the first week of November, as mild temperatures continued until December. This resulted in the longest raspberry season in the breeding plots so far, with nearly 20 weeks of continuous crop.
- Pest and disease pressure was high, with continuous aphids (colonising and non-colonising), raspberry beetle, severe powdery mildew but surprisingly scarce two spot spider mite.

2.4. Results and feedback of the new varieties (photos in appendix 1)

2.4.1. Skye

Skye has received the most consistent and most promising feedback during 2020 and 2021, describing the best yield potential, overall fruit quality and shelf-life and long summer season

2.4.2. Lewis

FIGURE 1 SKYE AND LEWIS DEMO PLOT: SUMMER YIELD & FRUIT SIZE 2021

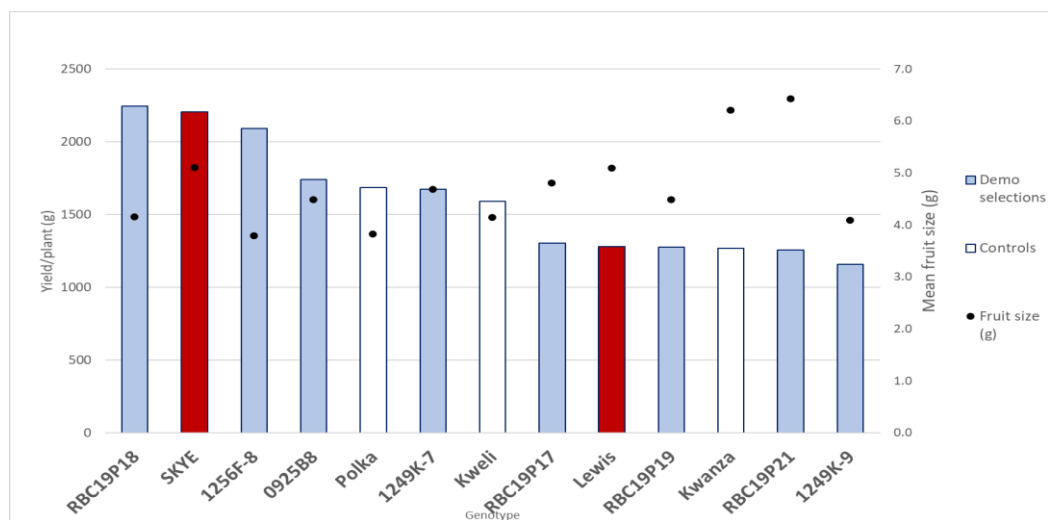


FIGURE 2 SKYE AND LEWIS DEMO PLOT: SUMMER PICKING PROFILE 2021

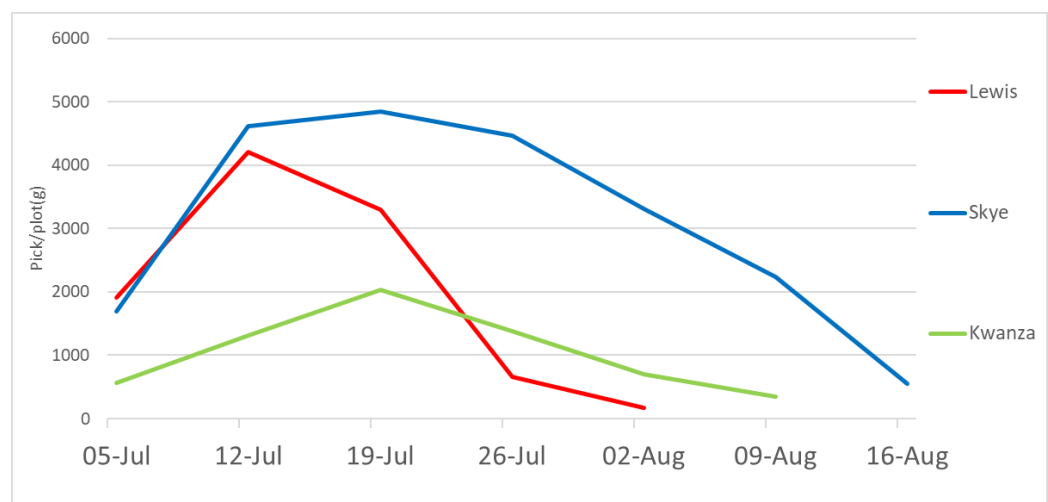


FIGURE 3 SKYE AND LEWIS DEMO: AUTUMN YIELD & FRUIT SIZE 2021

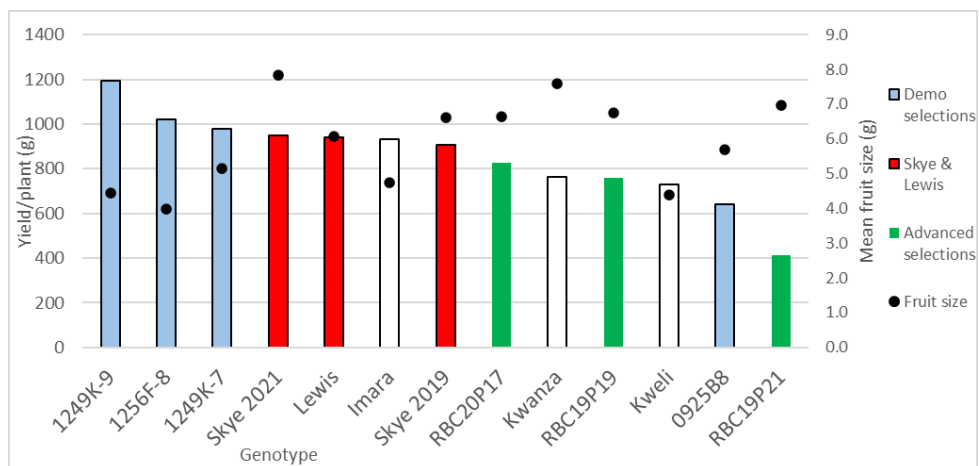
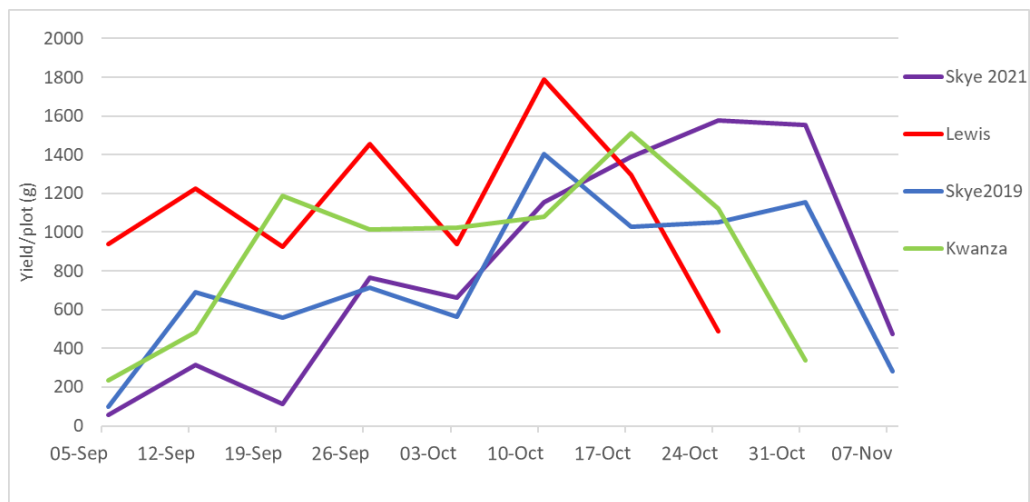
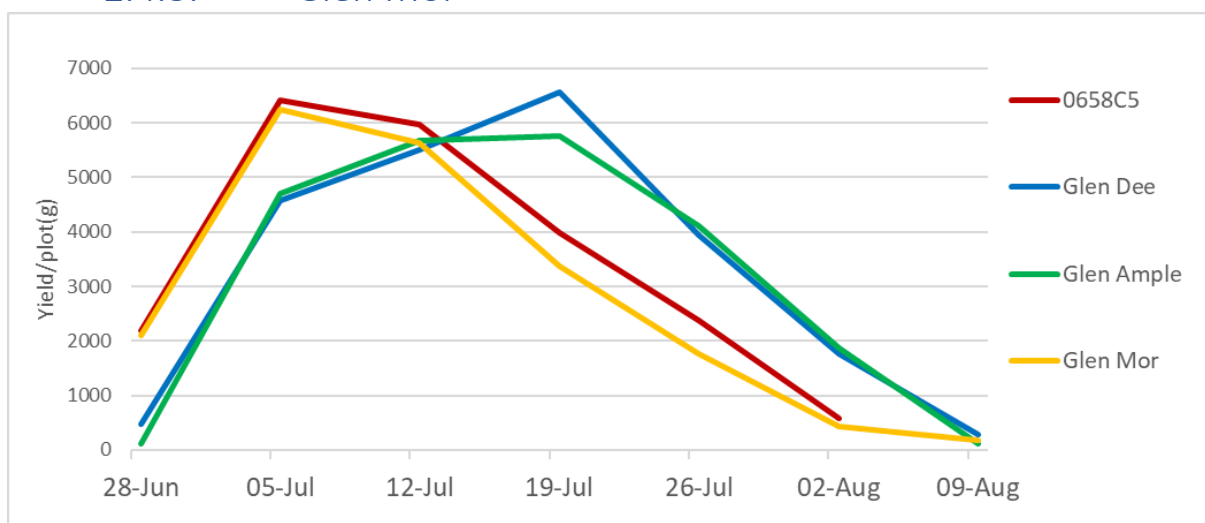


FIGURE 4 SKYE AND LEWIS DEMO PLOT: AUTUMN PICKING PROFILE 2021



2.4.3. Glen Mor



2.5. Advanced Selections Identified for On-Farm Trials

2.5.1. Selections identified in Years 1, 2 & 3

TABLE 1 ADVANCED FLORICANE SELECTIONS LONG CANE DATA, SUMMER 2021

Genotype	1st pick date	Yield/ plant (g)	Mean fruit size (g)	Mean Brix°	Comments
0658C5	29 June	2391	6.2	10.8	Reliable large size and productivity. Spinefree
RBC18F13	5 July	2069	4.8	11.1	Productive, glossy fruit, sweet with fruit/floral aroma
RBC19F25*	29 June	1700	5.8	11.8	Produces good, upright, spinefree long cane with low chill requirement
RBC19F26*	*	*	*	*	Plots establishing in 2021, fruit in 2022
RBC19F27	29 June	1643	4.1	11.9	Produces good spinefree long cane with low chill requirement. Fruit deplugs easily
RBC20F33*	*	*	*	*	Plots establishing in 2021, fruit in 2022
Skye (long cane)	5 July	2205	5.3	13.4	
Glen Ample	2 July	2223	4.8	10.0	
Glen Dee	2 July	2313	5.2	10.3	

*Rub118b marker for *Phytophthora* resistance

FIGURE 5 DEMO PLOT: ADVANCED SELECTIONS SUMMER CROP 2021

TABLE 2 ADVANCED PRIMOCANE SELECTIONS, AUTUMN 2021

Genotype	1st pick date	Yield/ plant (g)	Mean fruit size (g)	Mean Brix°	Comments
RBC19P19	14 Sept	908	6.8	9.1	Large attractive fruit with a late autumn start
RBC19P17	6 Sept	828	6.8	10.7	Bright colour ~Kwanza, large fruit, juicy and sweet. Fruit is easy to deplug
Skye (2021)	6 Sept	969	7.8	10.9	
Kwanza	6 Sept	765	7.8	10.8	

2.6. Fruit Tasting

Distribution of fruit for tasting at events and meetings was difficult during the 2021 season since many remained virtual. However, Laura Paterson, JHL's Marketing Manager, implemented a plan involving the distribution of individual samples for staff to take home and record video footage of their family members tasting and comparing four different genotypes, providing blind, unbiased feedback on the cultivars and selections.

Distribution of samples to retailers was also problematic with a lack of staff to deliver and engage retail technologists and buyers.

2.6.1. Fruit for the Future

Fruit for the Future was planned as a physical meeting, unfortunately footfall was very low since the event coincided with a spike in COVID numbers in Dundee. However, individually packed samples of four genotypes were offered as a 'takeaway tasting' with an online scoring system, evaluating appearance, firmness and flavour. Feedback was received from 26 tasters. Glen Mor was the firmest and had the best appearance and was equal with Glen Dee for 'likability' and Glen Dee was the preferred genotype overall (Figures 8 & 9).

FIGURE 6 FFF LIKABILITY OF TASTING SAMPLES

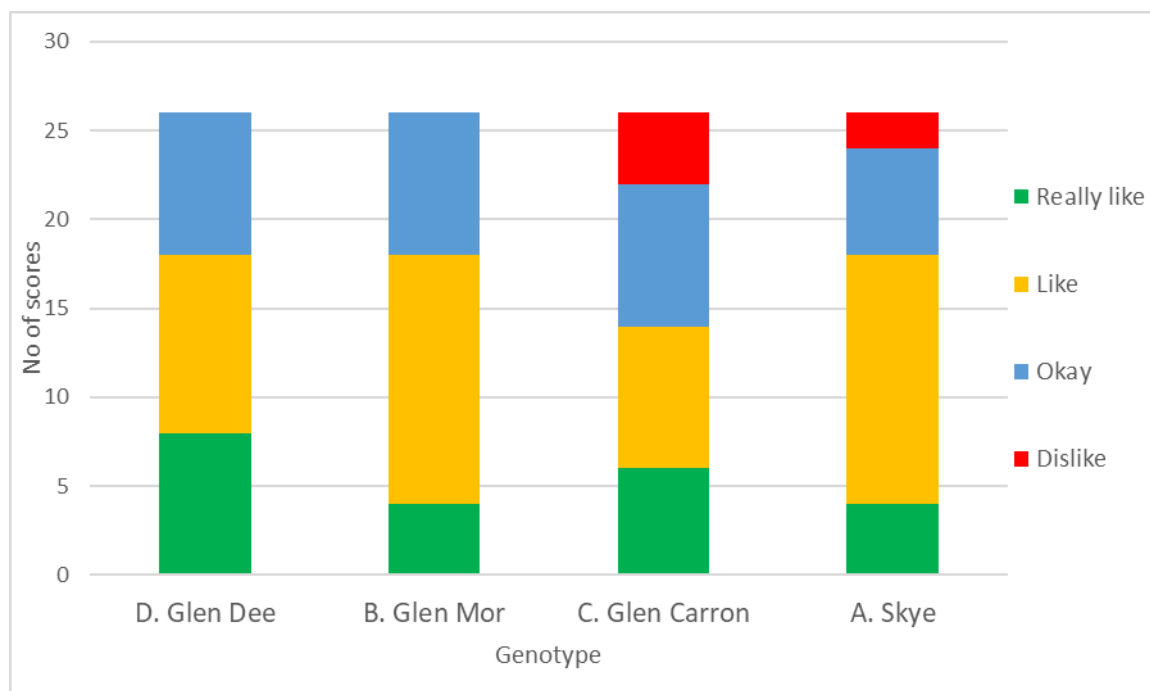
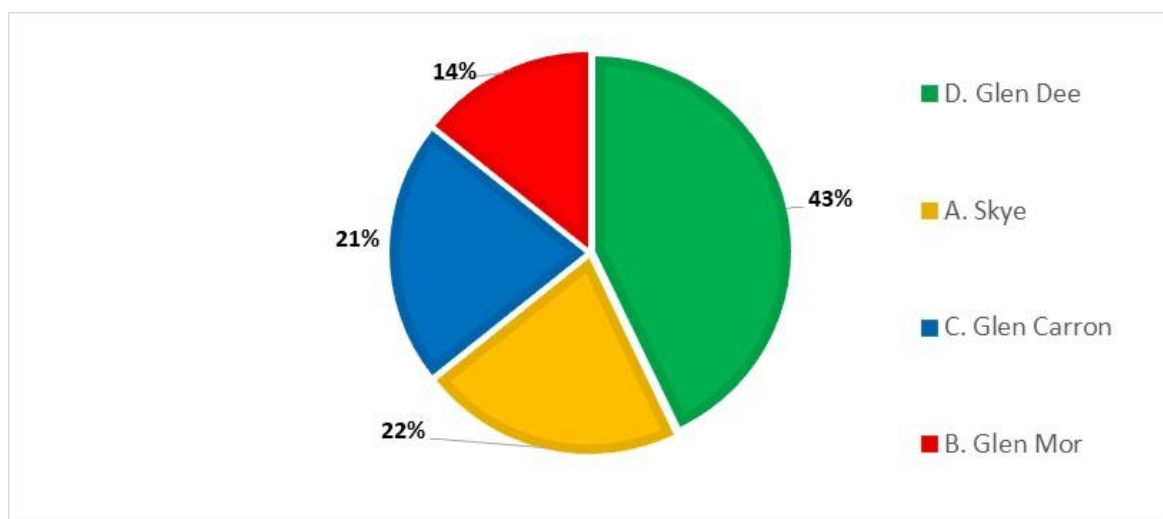


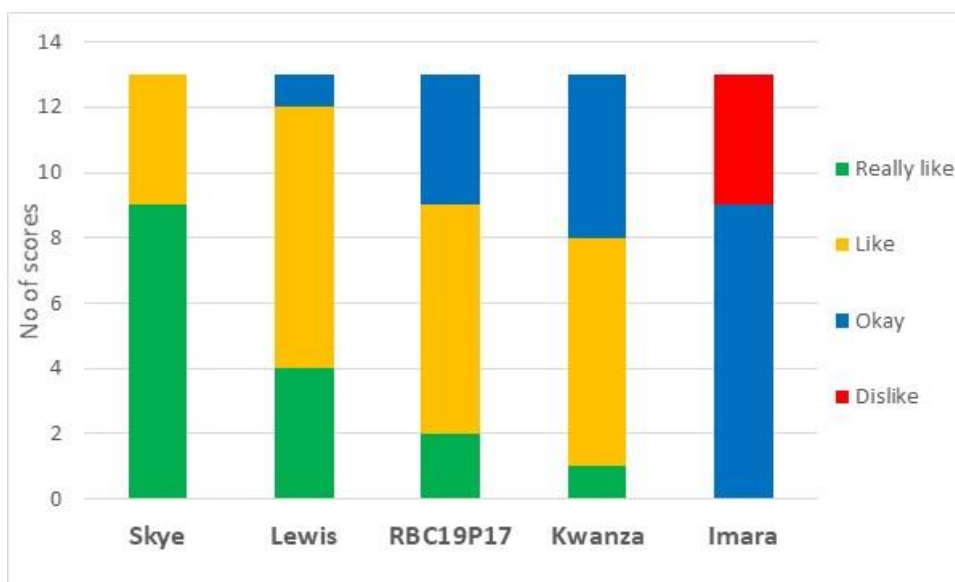
FIGURE 7 FFF PREFERRED GENOTYPE OF TASTING SAMPLES



2.6.2. Primocane Tasting

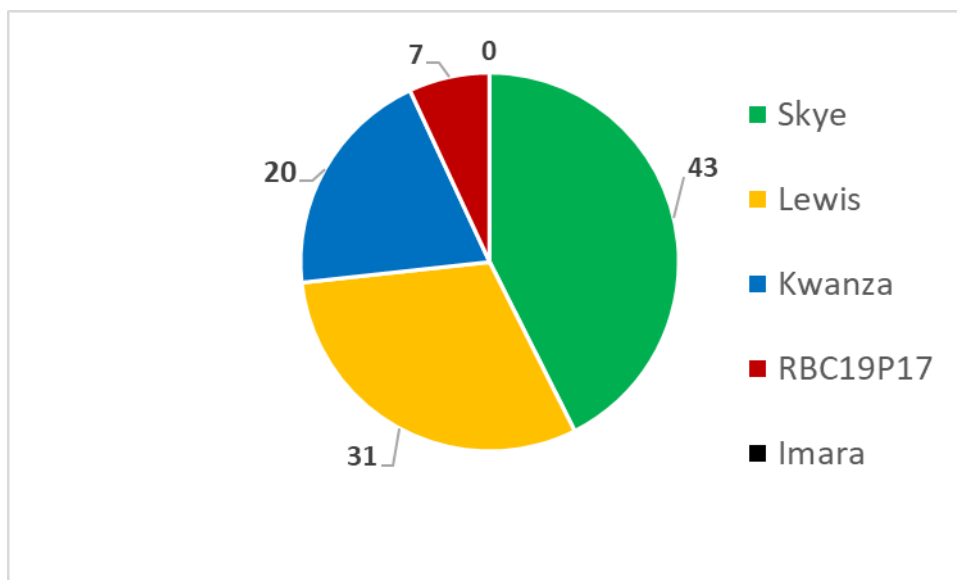
Tasting samples were evaluated by JHI staff in the autumn. Feedback is found in Figures 10 & 11). Skye and Lewis were popular for flavour and Skye stood out overall for flavour, size and appearance.

FIGURE 8 LIKEABILITY OF TASTING SAMPLES IN AUTUMN 2021



Video footage of Skye and Lewis by staff and family members can be found here: [Tasting Lewis Primocane September 21 - YouTube](#).

FIGURE 11 PREFERRED TASTING SAMPLES IN AUTUMN 2021



3. Knowledge Transfer

3.1. Conferences and events

- Fruit for the Future, JHI, 15th July 2021
- Fruit Focus, 21st July 2021
- Finland Grower Conference, 23rd November 2021
- Soft Fruit GIN Workshop 8th December 2021
- TEAGASC Grower Conference, 22nd February 2022
- Robust Rubus Launch, 10th March 2022

3.2. Visits to Trials

- East Seaton Farm, Arbroath, Angus Soft Fruits, 20th May 2021
- East Seaton Farm, Arbroath, Angus Soft Fruits, 24th June 2021
- Leadketty Farm, Dunning, 20th July 2021

4. Appendix I: Photos

Summer Crop 2021			
			
Glen Mor, July 2021		Glen Carron, June 2021	
			
Glen Dee, July 2021		Glen Carron	Glen Mor

0658C5



0658C5, July 2021



RBC19F26, Berry Gardens, Kent, July 2021

Primocane Crop 2021



Lewis, Genson, September 2021



Lewis, Berry Gardens, August 2021



Skye, November 2021



Skye, October 2021



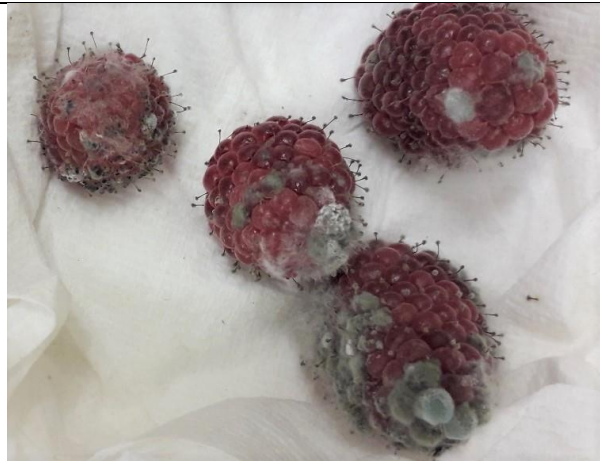
RBC19P19, September



RBC19P17, September



Post-harvest rot bench test: *Rhizopus*



Post-harvest rot bench test: *Botrytis*