

# Strategic Research Programme 2016 -2021

Economic and Societal Impacts of  
RESAS Funded Soft Fruit Research



Scottish Government  
Riaghaltas na h-Alba  
gov.scot

SEFARI 

# RESAS Funding Supports Long Term Skills and Capacity



'Glen' raspberries



'Ben' blackcurrants

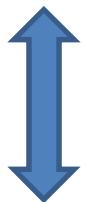
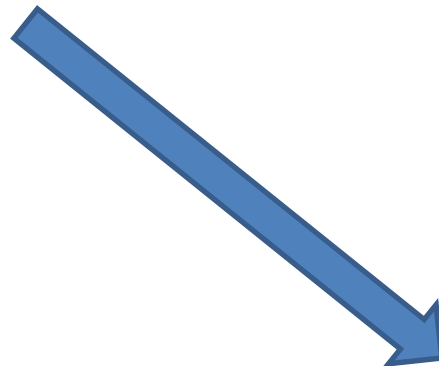


Physiologists  
Geneticists  
Molecular biologists  
Statisticians  
Field biologists  
Biochemists  
Pathologists

Growers  
Processors  
Agronomists  
Levy boards  
Government  
Consumers  
Retailers

Germplasm  
Populations  
Genomic information  
Field plots  
Polytunnels  
Controlled environments  
Analytical facilities

Cultivars  
Management systems  
Novel crops  
New products  
P&D Management



# RESAS Funding Supports Long Term Skills and Capacity



Over £4.5M in external funding for fruit related research during the present strategic research programme

Oct 2015 – Apr 2019: Improving yield stability in the UK **blueberry** crop. Innovate UK £1.49M (JHI, JHL, Soil Essentials, M&S, Castleton Farms, Thomas Thomson Ltd, S&A Produce Ltd., Delta T Devices, AHDB)

Jan 2018 – Mar 2019: Feasibility of developing a novel breeding methodology to improve **raspberry** flavour. Innovate UK £333K (JHI, JHL, BioSS, S&A Produce Ltd., Total World Fresh, Delytics Ltd.)

Oct 2018 – Sep 2020: Plant sensing to determine environmental impact on **cherry** fruit development. Innovate UK £495K (JHI, JHL, BioSS, Thomas Thomson Ltd., Berry Gardens, Castleton Farms, Mothive)

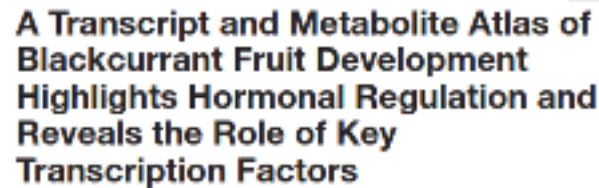
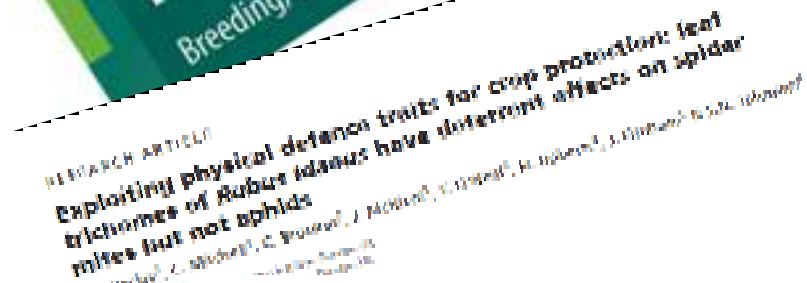
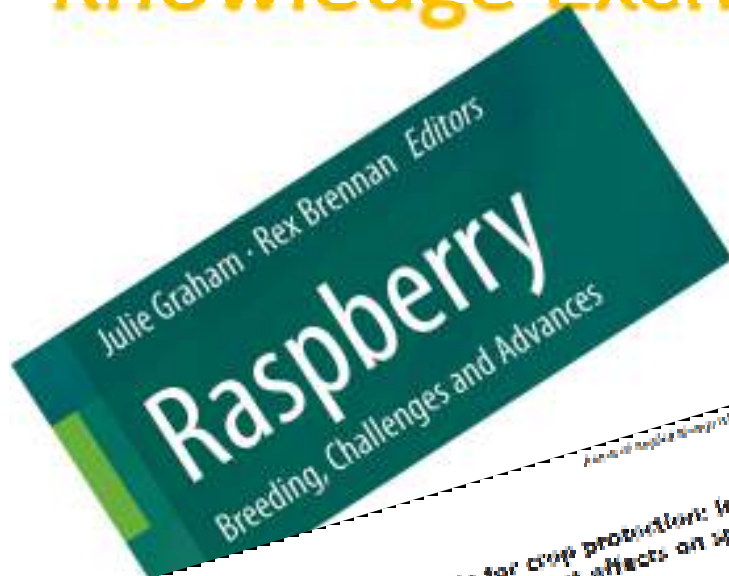
Apr 2016 – Jul 2019: Improving **strawberry** functional properties by manipulation of the physical growing environment. Innovate UK (KTP) £181K (JHI, PJ Stirling Farms)

Mar 2019 – Feb 2022: Developing the Scottish **honeyberry** industry. Innovate UK (KTP) £180K (JHI, Scottish Honeyberries Ltd.)

Innovate UK

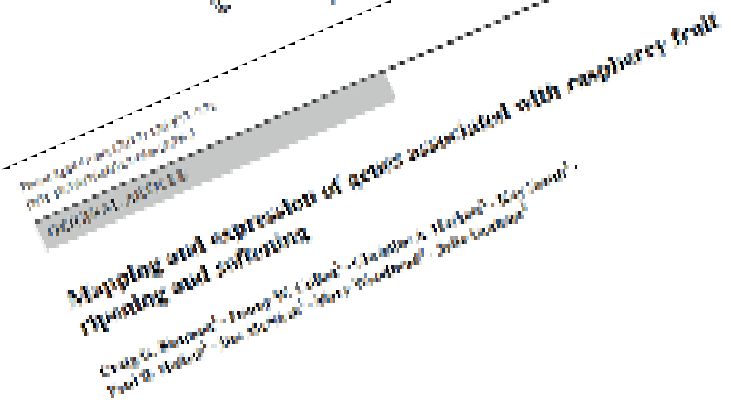
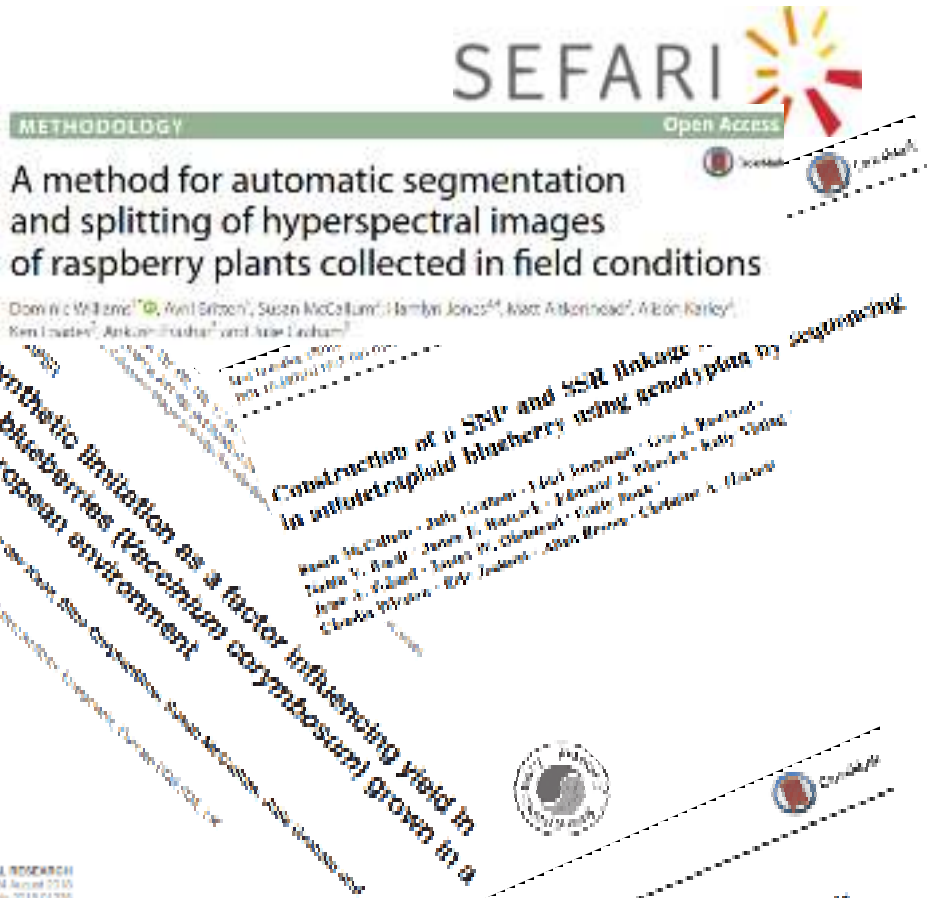


# Knowledge Exchange



Dorota A. Jamet<sup>1</sup>, Jerry Martel<sup>1</sup>, Danny W. Cullen<sup>1</sup>, Sandra L. Gordon<sup>1</sup>, Susan R. Verrill<sup>1</sup>, Linda Milne<sup>1</sup>, Peter E. Hrdy<sup>1</sup>, J. William Alwood<sup>1</sup>, Rex M. Brenman<sup>1</sup> and Robert D. Hancock<sup>2</sup>

<sup>1</sup> James Arthur Smith, *Quaker, United Kingdom*; <sup>2</sup> Colleen Malschke-Schneier, *The James Miller Institute, Quaker, United Kingdom*; <sup>3</sup> International and Comparative Studies, *The James Miller Institute, Quaker, United Kingdom*; <sup>4</sup> International and Comparative Studies, *The James Miller Institute, Quaker, United Kingdom*.





# Knowledge Exchange



On the trail to an improved raspberry

**RP 0416** – D1 membership promoted programme  
 Term: April 2016 to March 2017  
 Project leader: Helen Jennings, AHDB Horticulture  
**RP 0416** – Raspberry national breeding programme  
 Term: March 2018 to March 2021  
 Project leader: Helen Jennings, AHDB

## Understanding the causes of crumbly fruit in raspberry

**RP 0416** – D1 membership promoted programme  
 Term: April 2016 to March 2017  
 Project leader: Helen Jennings, AHDB Horticulture

A condition known as crumbly fruit occurs in a number of raspberry varieties. It is a genetic trait and is not a disease. It is caused by a mutation in the gene that controls the production of pectin, a substance that gives fruit its structure. In some varieties, the pectin is produced in a way that makes the fruit soft and crumbly. This is a desirable trait for some varieties, but it can be a problem for others. The condition is caused by a mutation in the gene that controls the production of pectin, a substance that gives fruit its structure. In some varieties, the pectin is produced in a way that makes the fruit soft and crumbly. This is a desirable trait for some varieties, but it can be a problem for others.

**The project**  
 The project aims to understand the causes of crumbly fruit in raspberry and to develop strategies to improve the quality of the fruit. The project will involve a range of activities, including field trials, laboratory work, and data analysis.

to an improved trait in the production of a raspberry variety. The project will involve a range of activities, including field trials, laboratory work, and data analysis.

**Results**  
 The project has identified a number of key factors that contribute to the development of crumbly fruit in raspberry. These include the genetic background of the variety, the growing conditions, and the age of the fruit. The project has also identified a number of strategies that can be used to improve the quality of the fruit, including the use of specific varieties, the use of specific growing conditions, and the use of specific harvesting techniques.

The project has also identified a number of key factors that contribute to the development of crumbly fruit in raspberry. These include the genetic background of the variety, the growing conditions, and the age of the fruit. The project has also identified a number of strategies that can be used to improve the quality of the fruit, including the use of specific varieties, the use of specific growing conditions, and the use of specific harvesting techniques.



# Knowledge Exchange



Home | About Us | Our | **Case Studies** | Expertise | Blog | Strategic Gateway | Events | News | Site Search

## Innovation: The Nutrients for Growing a UK Blueberry

**Scottish blueberries to help in fight against diabetes**



**Research aims to maintain rise in Scottish blueberry production**

5 January 2017, by Gavin McEwan

Scotland's environment secretary Roseanna Cunningham has backed research at the James Hutton Institute aimed at boosting blueberry production north of the border.

**New technology helps scientists create blueberry plants more suited to Scottish climate**

Researchers at the James Hutton Institute in Dundee are using cutting-edge plant breeding technology to help the superfruit thrive in Scotland.

Due to the...  
...growth...  
...improves...  
...address...  
...Scotland...  
...are able to...  
...growth...

# Examples of Impact



## Enhancing Yield Stability in Blueberry

- UK blueberry market value ~£340M
- Only 5% met by home grown fruit
- Multiple retailers keen to supply more UK grown fruit
- Massive potential for expansion of UK market
- Key barriers:
  - Crop establishment
  - Yield instability

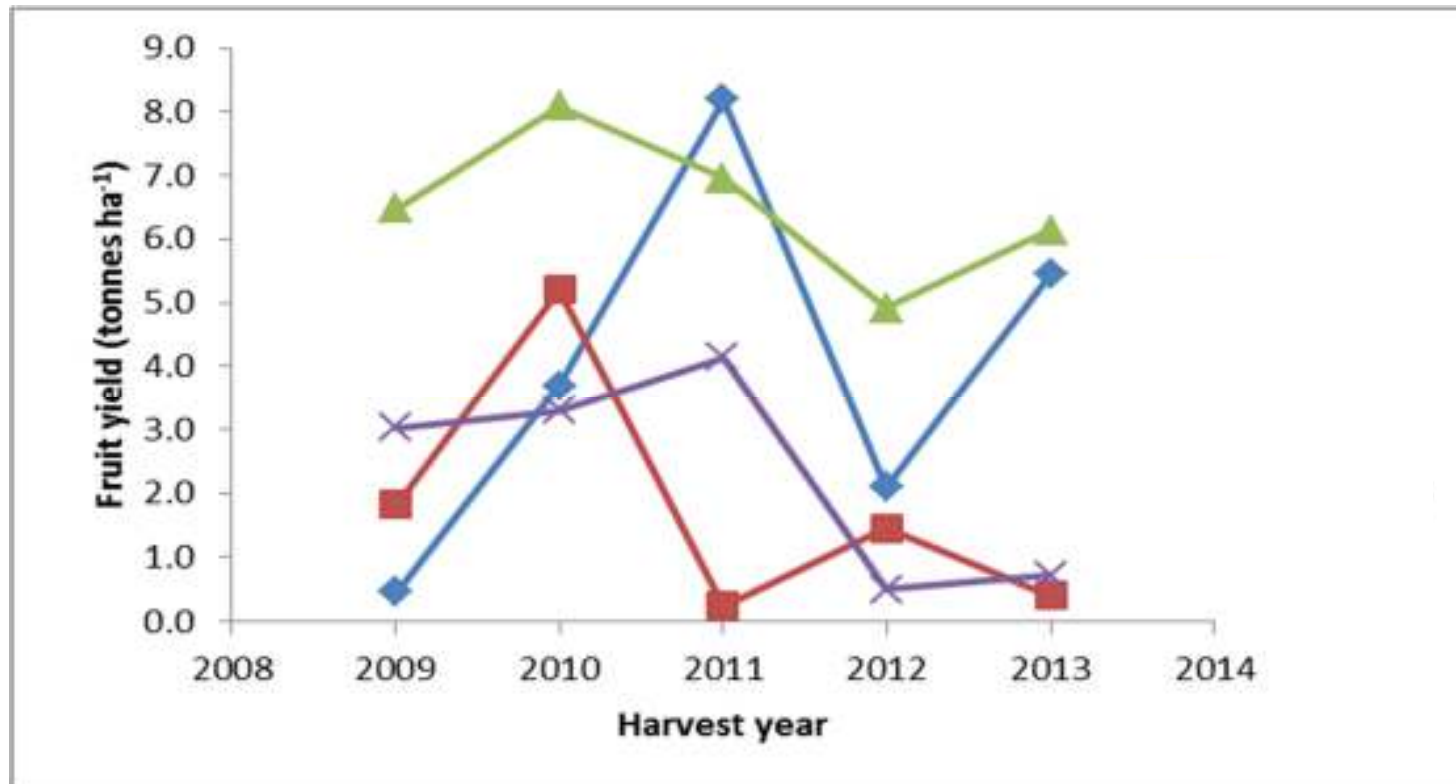




# Examples of Impact

## Enhancing Yield Stability in Blueberry

Value lost  
£8000 ha<sup>-1</sup> ↔

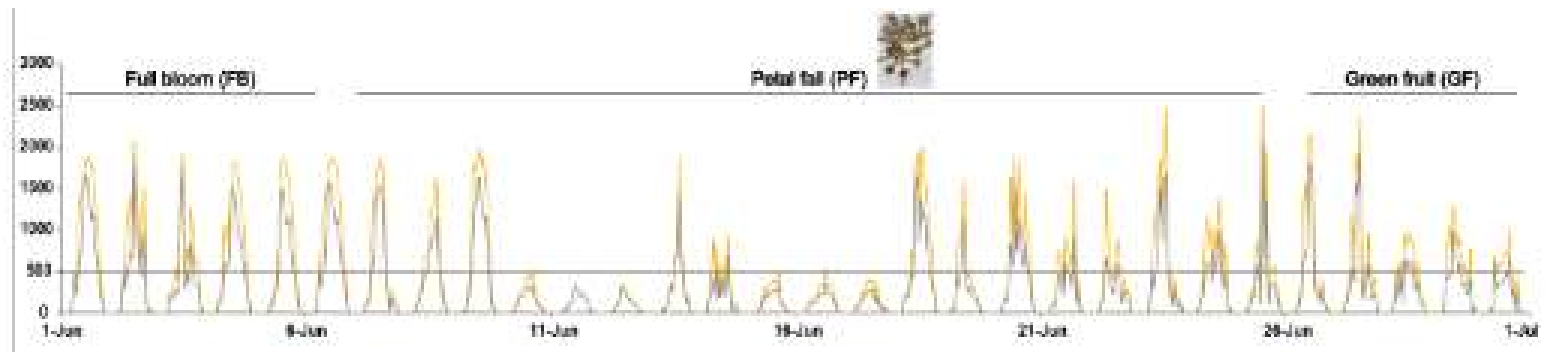
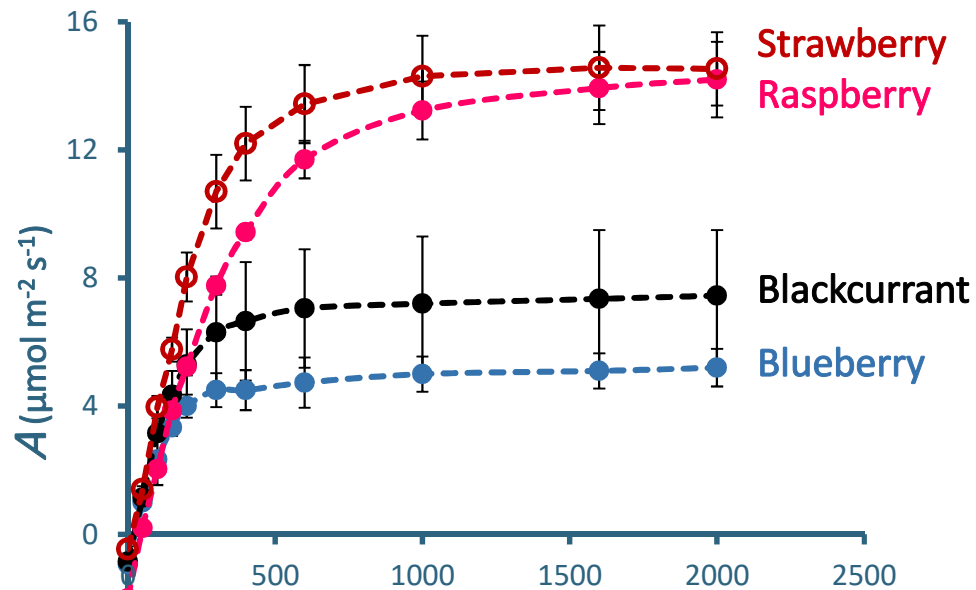


- Yield instability results from ‘catastrophic’ environmental events
  - Frost damage
  - Pests and disease
- Yield instability results from ‘subtle’ environmental limitations



# Examples of Impact

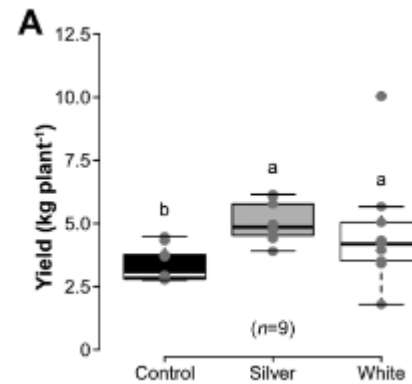
## Enhancing Yield Stability in Blueberry



# Examples of Impact



## Enhancing Yield Stability in Blueberry



~50% increase in fruit yield



# Examples of Impact



## Enhancing Yield Stability in Blueberry

- Increased crop value of ~£15K per hectare per annum
- Full scale application grower holdings in 2019
- Expect further uptake in coming years
- Key breeding targets for improved yield and yield stability identified
- Exploitation via blueberry breeding consortium





# Examples of Impact



## Improving Dormancy Break in Blackcurrant

- UK blackcurrant production is almost exclusively for Ribena
- Value at farm gate ~£10M (Ribena ~£140M)
- Biggest threat to UK production is uneven bud break caused by milder winters





- [illegible]

# Future Impact

- A key challenge is stability of productivity under a changing climate
  - Cherry June drop
  - Bud break
  - Crumbly fruit disorder
  - Blueberry yield instability
- Complex phenotypes controlled by multiple genes interacting with environment
- RESAS funds appropriate mix of skills to tackle these industry issues



# Thank you



## SEFARI – Scottish Environment, Food and Agriculture Research Institutes

SEFARI is the collective of six world-leading Scottish Research Institutes working on Environment, Food, Agriculture, Land Use, Rural Economy, Communities, Animal and Plant Disease, Biodiversity, Nutrition and a lot more – check out our blog and Twitter feeds to stay up to date!



- [www.sefari.scot](http://www.sefari.scot)
- [@SEFARIs Scot](https://twitter.com/SEFARIs Scot)
- [info@sefari.scot](mailto:info@sefari.scot)



Scottish Government  
Riaghaltas na h-Alba  
[gov.scot](http://gov.scot)