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International Affairs

# UK and horticulture



**Tim Benton**

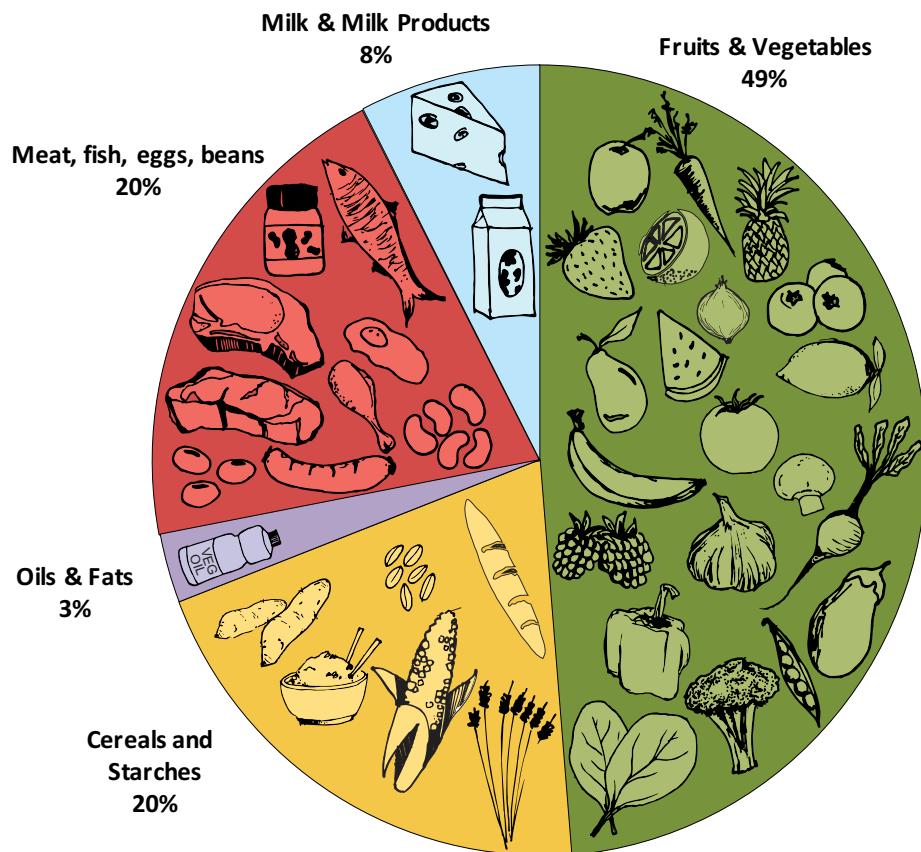
*University of Leeds and Royal  
Institute of International Affairs,  
Chatham House*

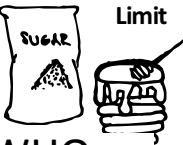
[t.g.benton@leeds.ac.uk](mailto:t.g.benton@leeds.ac.uk)

[tbenton@chathamhouse.org](mailto:tbenton@chathamhouse.org)

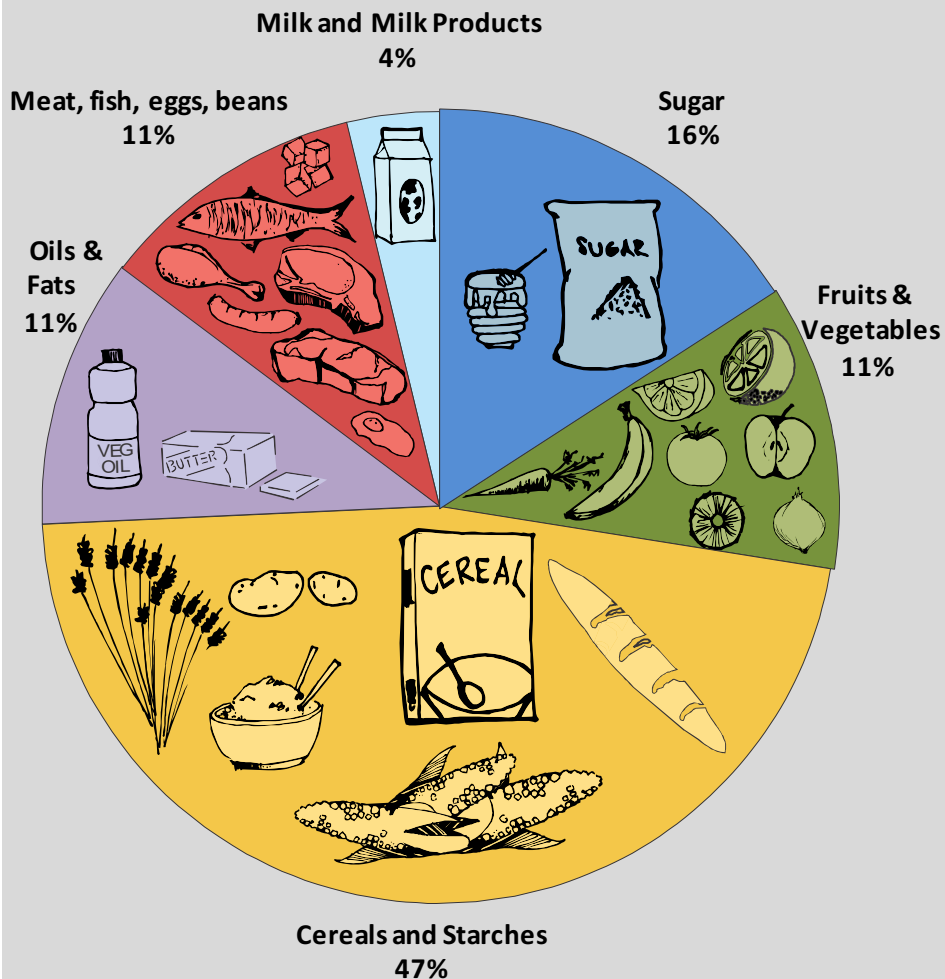
 [@timgbenton](https://twitter.com/timbenton)

## What we should be eating (Harvard's Healthy Eating Plate Model)




  
 Limit  
 WHO < 5%

## What we are actually producing (According to 2011 FAO)



Evan Fraser, Guelph, FBS analysis, 2015



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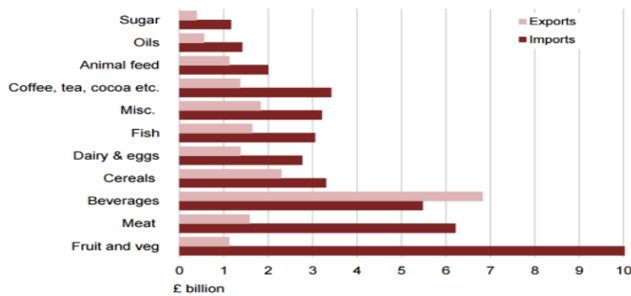
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# BREXIT

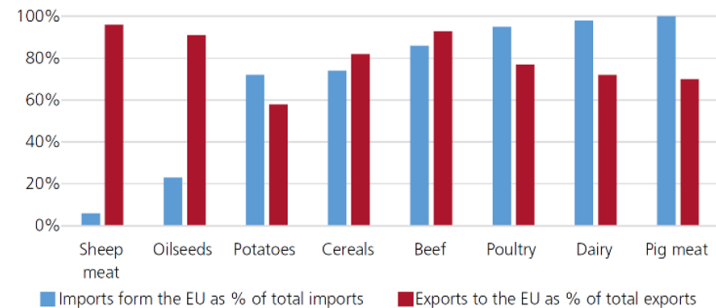






Defra Food Stats Pocketbook 2016

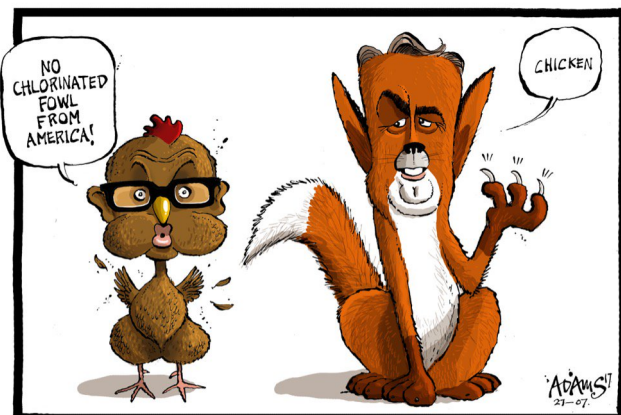
Figure 1: Trade with the EU as percentage of total trade for key agricultural commodities



Source: Agriculture & Horticulture Development Board, Brexit: implications for agriculture and trade (January 2017): <http://rescue.ahdb.org.uk/brexit/documents/SAOSBrexit26Jan17.pdf> [accessed 21 April 2017]

# Food imports

- If not EU then where?
- What comes with it?
  - “food standards” e.g. pathogen reduction treatments (PRTs)
  - Quality/reliability
  - Price
  - Impacts on livelihoods
  - Impacts on environment
- How does it compare to UK-grown food and expectations





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RESOURCE  
TRADE  
.EARTH

DATA STORIES ABOUT

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Exporter  
ALL COUNTRIES

Importer  
UNITED KINGDOM

Commodity  
AGRICULTURAL PRODUCTS

Year  
2015

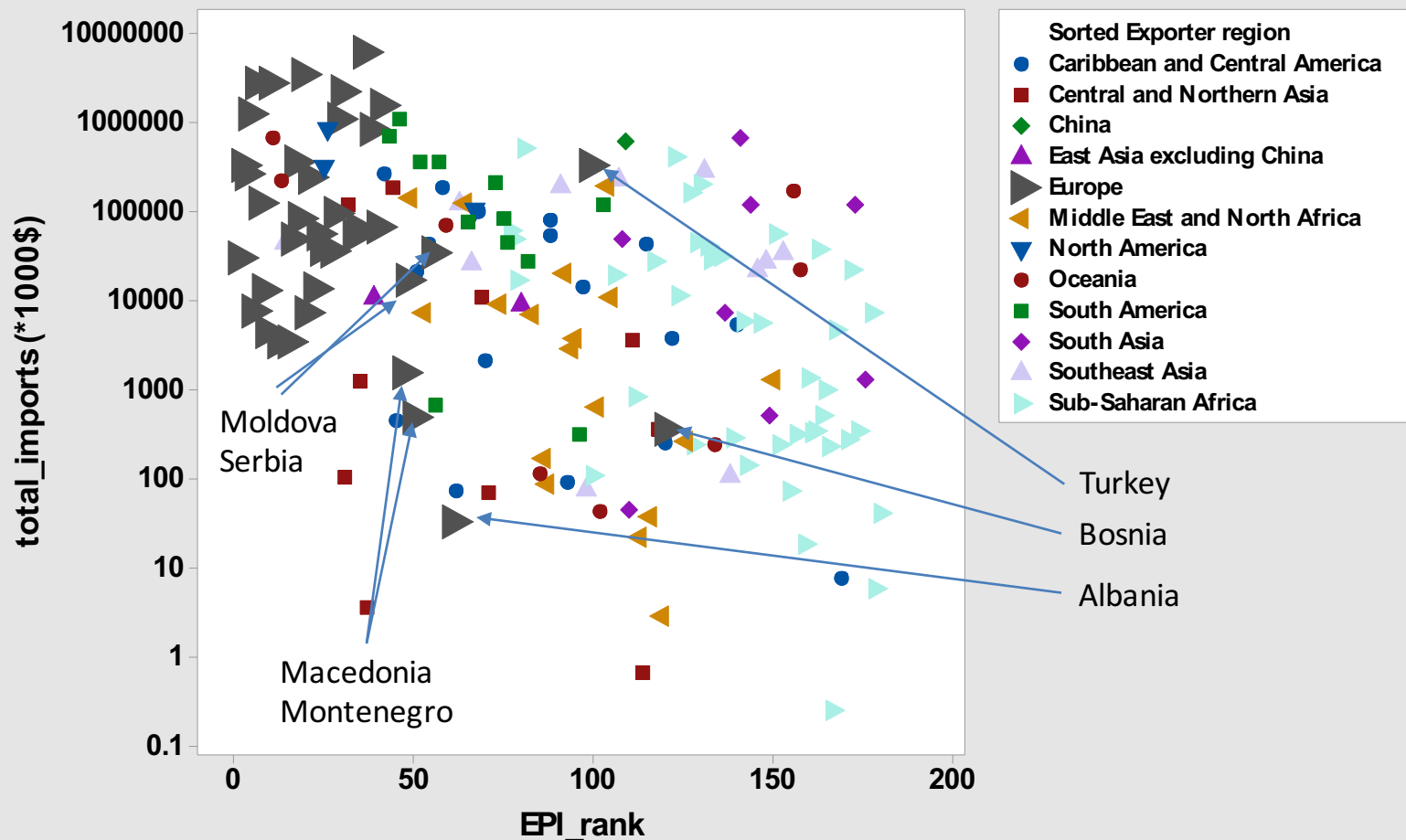
Units  
☒ Value (US \$)  
☐ Weight

Share





## Imports vs multimetric environmental assessment





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# **WHAT ARE WE DOING RE F&V SUPPLY CHAINS?**



# Public funding (searchable at <https://gtr.ukri.org/>)

A	B	C	F	N	O	P	Q
	ProjectRef	LeadROName	PISurname	Title	StartDate	EndDate	AwardPou
BBSRC	1940795	University of East Anglia		Disease-resistant superfoods that benefit the environment (RIDOUT_J17ICASE)	01/10/2017	30/09/2021	0
BBSRC	BB/R0020	University of Bristol	Franklin	Integration of UV-B and temperature signalling in plants	19/05/2018	18/05/2021	417397
BBSRC	BB/R0215	Earlham Institute	Patron	17-ERACoBioTech - SUSPHIRE - Sustainable Bioproduction of Pheromones for Insect Pest Control in Agriculture	09/04/2018	08/04/2021	395316
BBSRC	BB/R0057	NERC Centre for Ecology and Hydrology	Norton	Sustainable economic and ecological grazing systems - learning from innovative practitioners	03/01/2018	02/01/2021	630863
BBSRC	BB/P0051	National Inst of Agricultural Botany	Else	16AGRITECHCAT5: Using stress pre-conditioning, novel sensors and AMF to improve yields, resilience and sustainability	01/03/2017	31/07/2020	497966
Innovate U	132743	Arid Agritech Limited	Unknown	Pesticide free global horticulture (via smart light controlling crop cover technology) (PURELIGHT)	01/04/2017	31/03/2020	773764
Innovate U	132746	Ixscient Limited	Walker	Laser Lighting for Algae growth and Water for the World (LIGHTWAY)	01/04/2017	31/03/2020	608875
BBSRC	BB/M0178	John Innes Centre	Penfield	Exploiting seed coat properties to improve uniformity and resilience in Brassica seed vigour	01/09/2015	31/12/2019	434871
BBSRC	1653649	Lancaster University		Reducing pesticide inputs and improving crop production under environmental stress by using seed treatments to protect crops	01/10/2015	30/12/2019	0
BBSRC	BB/P0232	University of Leeds	Kunin	VOICES: Valuing Orchard and Integrated Crop Ecosystem Services	01/05/2017	31/10/2019	602831
Innovate U	103546	Wells Plastics Limited	Ogden	High Deflection Temperature BioBased Polymers for Horticulture and Food Service Applications (HDTBioPol)	01/10/2017	30/09/2019	551427
EPSRC	1808887	University of Reading		Investigating the Impact of Plants on Indoor Air Quality: a Multi-scale Cross-disciplinary Approach	01/10/2016	30/09/2019	0
BBSRC	1644829	University of Warwick		Exploiting new sources of broad-spectrum resistance to Turnip mosaic virus in brassicas (ExBSR)	05/10/2015	30/09/2019	0
BBSRC	1653788	Lancaster University		IMPROVING ENERGY EFFICIENCY IN PROTECTED CROPPING BY EXPLOITING PLANT RESPONSES TO STRESS	01/10/2015	30/09/2019	0
BBSRC	BB/M0179	University of Exeter	Moger	Exploiting seed coat properties to improve uniformity and resilience in brassica vigour	01/07/2015	30/06/2019	277969
Innovate U	133608	Phytoform Labs Ltd	Kral	Developing high yield herb varieties with gene editing	01/06/2018	31/05/2019	69773
Innovate U	133609	Evolve Growing Solutions Ltd	Prieto	RIPE (Rapid Installation Process for ETFE) demonstrating the benefits of utilising advanced ETFE glazing materials	01/06/2018	31/05/2019	69981
Innovate U	102133	G.H. Dean & Co. Limited	Day	Sustainable Intensification of UK plum production.	01/02/2015	30/04/2019	387114
BBSRC	BB/M0281	National Inst of Agricultural Botany	Cross	Sustainable Intensification of UK plum production	01/02/2016	30/04/2019	574687
Innovate U	132848	Micropropagation Services (E.M.S.)	Wright	Sphagnum Farming UK - A Sustainable Alternative to Peat in Growing Media	01/01/2018	31/03/2019	145839
Innovate U	102526	innovate UK	JONES	Third Generation Polyethylene Greenhouse Cladding Materials	01/06/2016	31/03/2019	223462
NERC	NE/L01033	University of the West of England	McEwen	DEVELOPING A DROUGHT NARRATIVE RESOURCE IN A MULTI-STAKEHOLDER DECISION-MAKING UTILITY	01/04/2014	31/03/2019	1642669
NERC	NE/L01023	Loughborough University	Wilson	DEVELOPING A DROUGHT NARRATIVE RESOURCE IN A MULTI-STAKEHOLDER DECISION-MAKING UTILITY	01/09/2014	31/03/2019	376381
NERC	NE/L01033	University of Warwick	Garde-Hansen	DEVELOPING A DROUGHT NARRATIVE RESOURCE IN A MULTI-STAKEHOLDER DECISION-MAKING UTILITY	01/04/2014	31/03/2019	38517
BBSRC	BB/R0216	Manchester Metropolitan University	Caporn	ISCF WAVE 1 AGRI TECH: Sphagnum Farming UK - A Sustainable Alternative to Peat in Growing Media	01/01/2018	31/03/2019	167445
BBSRC	BB/R0216	University of East London	Lindsay	ISCF WAVE 1 AGRI TECH - Sphagnum Farming UK - a sustainable alternative to peat in growing media	01/01/2018	31/03/2019	73082
NERC	NE/L01023	NERC Centre for Ecology and Hydrology	Ragab	Developing a drought narrative resource as a multi-stakeholder decision making utility in drought risk management	01/04/2014	31/03/2019	1256748
NERC	NE/L01043	University of Sheffield	McGuinness	DEVELOPING A DROUGHT NARRATIVE RESOURCE IN A MULTI-STAKEHOLDER DECISION-MAKING UTILITY	01/04/2014	31/03/2019	312257
NERC	NE/N0056	University of Aberdeen	Feliciano	Understanding Socio-Economics in the Adoption of Sustainable Agricultural Practices	01/08/2015	28/02/2019	101473
BBSRC	BB/N0098	Earlham Institute	Clark	OctoSEQ- Sequencing the octoploid strawberry	01/07/2016	31/12/2018	400192
BBSRC	BB/M0177	University of Reading	Wagstaff	A genetic approach to improving post-harvest quality	01/06/2015	31/12/2018	357399
NERC	NE/L01023	University of Dundee	Black	Developing a drought narrative resource in a multi-stakeholder decision-making tool for drought risk management	01/04/2014	31/12/2018	73009
BBSRC	BB/N0066	National Inst of Agricultural Botany	Harrison	OctoSEQ- Sequencing the octoploid strawberry	01/04/2016	31/12/2018	249520
BBSRC	BB/K0186	University of East Anglia	Kamoun	IDRIS- Improving Disease Resistance In Strawberry	15/11/2013	14/11/2018	39430
BBSRC	BB/L01954	Cranfield University	Thompson	Understanding the Genetic Basis of Traits for Rootstock Improvement in Vegetable Crops	15/09/2014	14/09/2018	253445
BBSRC	BB/L01963	University of Nottingham	Seymour	Understanding the Genetic Basis of Traits for Rootstock Improvement in Vegetable Crops	15/09/2014	14/09/2018	255950
Innovate U	101911	Hockley International Limited	Patel	Biotechnology for Anti-Weeds (BAW)	01/09/2014	31/08/2018	384004
Innovate U	103319	Experior Micro Technologies Ltd	Thorpe	Intelligent LED Lighting System for Maximised Crop Yield and Reduced Energy Use	01/06/2017	31/08/2018	74331
BBSRC	BB/M0177	Harper Adams University	Monaghan	A genetic approach to improving post-harvest quality	04/05/2015	31/08/2018	320829
BBSRC	BB/K0170	National Inst of Agricultural Botany	Harrison	IDRIS- Improving Disease Resistance In Strawberry	01/02/2016	31/07/2018	358975
NERC	NE/M0070	Harper Adams University	Vickers	Facilitating knowledge exchange to help the horticultural sector meet global challenges	20/10/2014	29/06/2018	105954
NERC	NE/L01023	University of Exeter	Staddon	Trialling a drought narrative resource as a multi-stakeholder decision-making tool in drought risk management	01/04/2014	29/06/2018	105411
NERC	NE/M0206	Cranfield University	Deeks	Cranfield/EMR Horticultural KE Fellowship	05/01/2015	04/06/2018	223937
BBSRC	BB/M0177	University of Warwick	Barker	A genetic approach to improving post-harvest quality	01/06/2015	31/05/2018	129078
BBSRC	BB/P0048	University of Strathclyde	Marshall	16AGRITECHCAT5: Feasibility of a Hyper Spectral Crop Camera (HCC) for agriculture optimisation	01/07/2016	28/02/2018	67947





# Universities and colleges



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## Latest News



### New Raspberry Demonstration Tunnels

23rd July 2018

James Hutton Limited launched new raspberry demonstration tunnels at Fruit for the Future, the James Hutton Institute's annual soft fruit-themed event, on Thursday 19 July 2018. The tunnels were officially opened by Kirstene Hair, MP for Angus.



### Hutton potato varieties approved for export to Kenya

3rd July 2018

Two potato varieties bred at the James Hutton Institute in Dundee have been recommended for release in Kenya thanks to the concerted efforts of AHDB, SASA, Seeds2B Africa - part of the Syngenta Foundation - and James Hutton Limited.





# Independent research institutes



## stockbridge technology centre

Providing information, innovation, technology and education to a 'growing' industry



Stockbridge  
Technology  
Centre



Commercial  
Services



Applied  
Research and  
Development



Environmental  
Sustainability



Education,  
Skills and  
Outreach



News and  
Events from  
the industry!



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Click here  
to visit stockbridge online  
the place to find out what's  
going on in and around the  
horticulture industry, who is  
doing what, where and when!

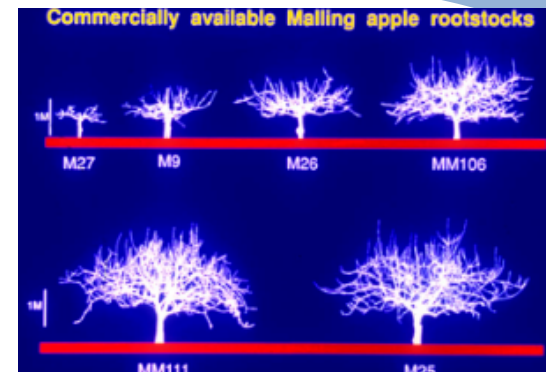
Automated Margin Design  
Click here

### Latest News

For the latest news and events click here  
Sign up to our RSS feed click here

#### New glasshouse @ STC

We're delighted to see our new CHAP  
glasshouse complex making the  
horticultural sector - Well done to all involved!



Welcome to NIAB EMR  
science for environment,  
food & horticulture

#### Our People

[View](#)

#### Our Events

[View](#)

#### Training

[View](#)

### Research Focus



Pollination

[View](#)

### Latest News

Horticultural crops to benefit from improved  
resistance to bacterial infections



NIAB EMR searches for non-native stink bug in  
fruit crops



NEWS: NIAB EMR has been named as a LEAF  
(Linking Environment and Farming) Innovation  
Centre



[View all](#)

### Next Event

#### Fruit Focus

25 JUL  
2018

[Attend](#)

### Twitter [Follow @NIABEMR](#)

VACANCY: Scientific Assistant (fixed  
term for one year). A varied lab  
tech role, split between field/glass  
work and...  
<https://t.co/XQ33uUwexO>

Graham Caspell keeping his tour  
group under cover whilst  
introducing the NIAB EMR Concept  
Pear Orchard at...  
<https://t.co/Y7CA30sinP>



## NIAB EMR – Science in the Garden of England

We are a major organisation in the UK for innovation and research on horticultural crops and plants and their interactions with the environment. Our research on perennial fruit crops is known internationally and we are a significant source of pride regionally.

NIAB EMR delivers knowledge, products and services that benefit public and private customers.

NIAB EMR is part of the [NIAB](#) group.






# Levy board











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## New Crop Walkers' Guides

Sweetcorn, Pea and Bean, Cucurbits and Outdoor Leafy Salads - out now

[Download now >](#)

## Register

for an AHDB Horticulture web account, and customise your homepage view.

☒ Protected Edibles☐ Field Vegetables☐ Bulbs and outdoor flowers☐ Protected Crops☐ Soft Fruit☒ Tree Fruit

Choose which sector you'd like to keep up-to-date with and reset your selection as often as you like.

[Sign Up](#)

[Previous](#)[Next](#)

## News

[more news >](#)

### AHDB teacher survey reveals mounting pressure on workload and time

26/07/2018 | 10.47

1276 teachers responded to AHDB Teacher Research survey conducted by

## Latest projects & publications

[more >](#)

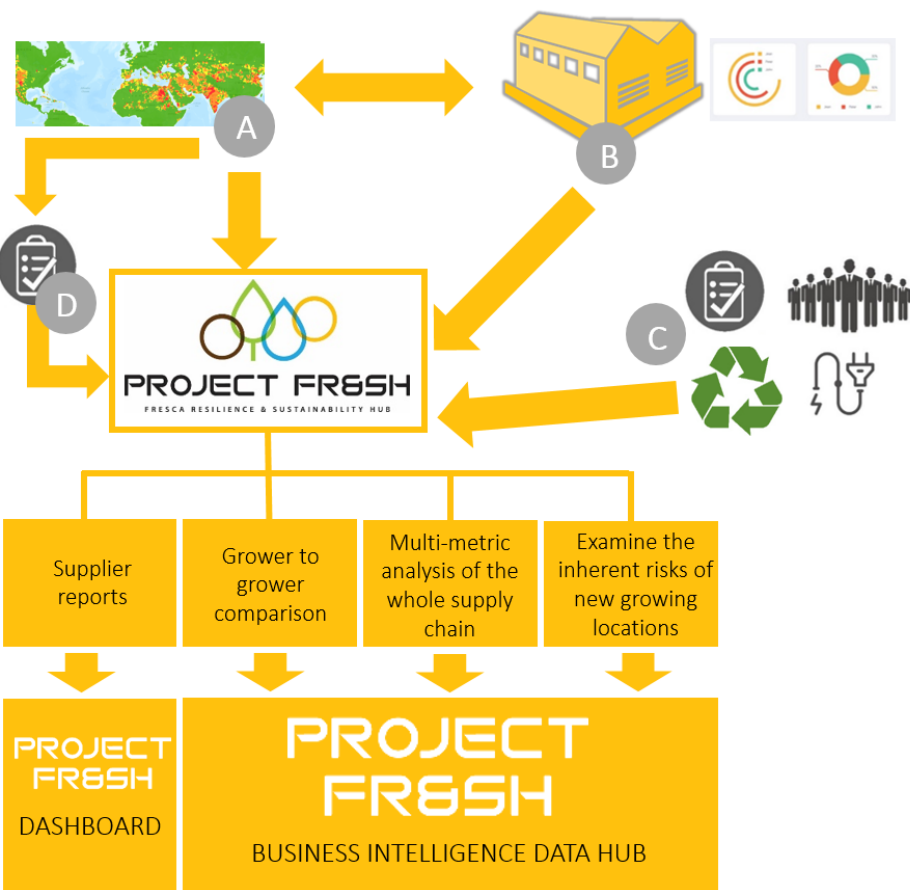


**CP 177 - Developing tools for precision horticulture: Manipulating growth rates at the**

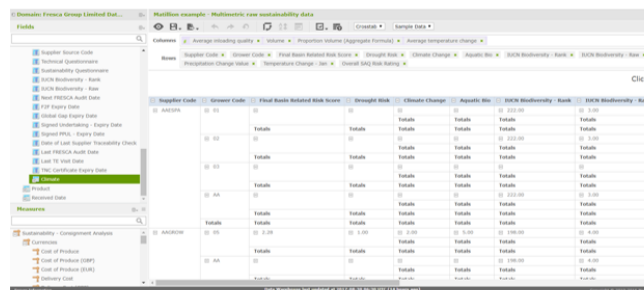
**Resilience:** Business focused

**Sustainability:** Using environmental, social and business metrics

**Hub :** Creating a large central database



# Industry

The screenshot shows a complex data table with multiple columns and rows. The columns include Supplier Code, Grower Code, and various risk scores. The rows represent different suppliers and growers, with data points for various metrics.

Supplier Code	Grower Code	Fixed Basic Related Risk Score	Strategic Risk	Climate Change	Agentic Risk	Water Resilience - Risk	Soil Resilience - Risk
001	001	0.00	0.00	0.00	0.00	0.00	0.00
002	002	0.00	0.00	0.00	0.00	0.00	0.00
003	003	0.00	0.00	0.00	0.00	0.00	0.00
004	004	0.00	0.00	0.00	0.00	0.00	0.00
005	005	0.00	0.00	0.00	0.00	0.00	0.00
006	006	0.00	0.00	0.00	0.00	0.00	0.00
007	007	0.00	0.00	0.00	0.00	0.00	0.00
008	008	0.00	0.00	0.00	0.00	0.00	0.00
009	009	0.00	0.00	0.00	0.00	0.00	0.00
010	010	0.00	0.00	0.00	0.00	0.00	0.00





# GFS resilience programme

## Thematic priorities

There are three overlapping thematic priorities in the programme:

- 1. Optimising the productivity, resilience and sustainability of agricultural systems and landscapes**  
At the core of this theme is understanding the relationship and trade-offs between resilience, sustainability to deliver production systems balancing the provision of food with other ecosystem services. This will help address the challenge of feeding a growing population sustainably; ensuring improved environmental, social and economic outcomes.
- 2. Optimising resilience of food supply chains both locally and globally**  
This theme is focused on understanding the economic, environmental, biological and social factors affecting the food supply chain, and the interplay between these, to increase resilience of the food system at a local-to-global level.
- 3. Influencing food choice for health, sustainability and resilience at the individual and household level**  
Central to this theme is understanding the drivers behind food choices and how these impact on the wider food system and production, in order to identify interventions that result in provision of nutritious and sustainable food in more resilient and equitable ways.

<https://www.foodsecurity.ac.uk/research/food-system-resilience/>

## Bananas at a crossroads



📅 10 May 2018

👤 Dan Bebber

Bananas, the UK's favourite fruit, appear at first glance to be among our most reliable and resilient fresh produce. They are stocked in every supermarket on every day of the year, and their price seldom varies by more than a few pence per kilo. But beneath this apparently smooth and steady supply lies a complex international network affected by extreme weather, plant disease, social and political shifts, and the looming threat of climate change.

The reliability of banana availability to UK consumers, despite a plethora of diverse threats, and the fact that only one variety of banana is internationally traded (the Cavendish), makes the banana supply chain a fascinating system to study in the context of the resilience of food systems. Will



<https://www.foodsecurity.ac.uk/blog/bananas-at-a-crossroads/>

SYNTHESIS REPORT

Extreme weather and resilience  
of the global food system

# Resilience thinking

- Resilience and ecology →  
resilience and food (+ financial,  
+ climate) systems (May,  
Beddington, Godfray, Benton)

Foreign &  
Commonwealth  
Office

UK Science  
& Innovation  
Network



SYNTHESIS REPORT

Environmental tipping points and food  
system dynamics: Main Report



Committee on  
Climate Change

Independent advice to government on building a low-carbon economy and  
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[Home](#) > [Tackling climate change](#) > [Preparing for climate change](#) > UK Climate Change Risk Assessment 2017 Evidence Report

## UK Climate Change Risk Assessment 2017 Evidence Report

The [Adaptation Sub-Committee](#)'s UK Climate Change Risk Assessment Evidence  
Report sets out the priority climate change risks and opportunities for the UK.

The UK Government's 2017 assessment of UK climate risk is [available here](#).





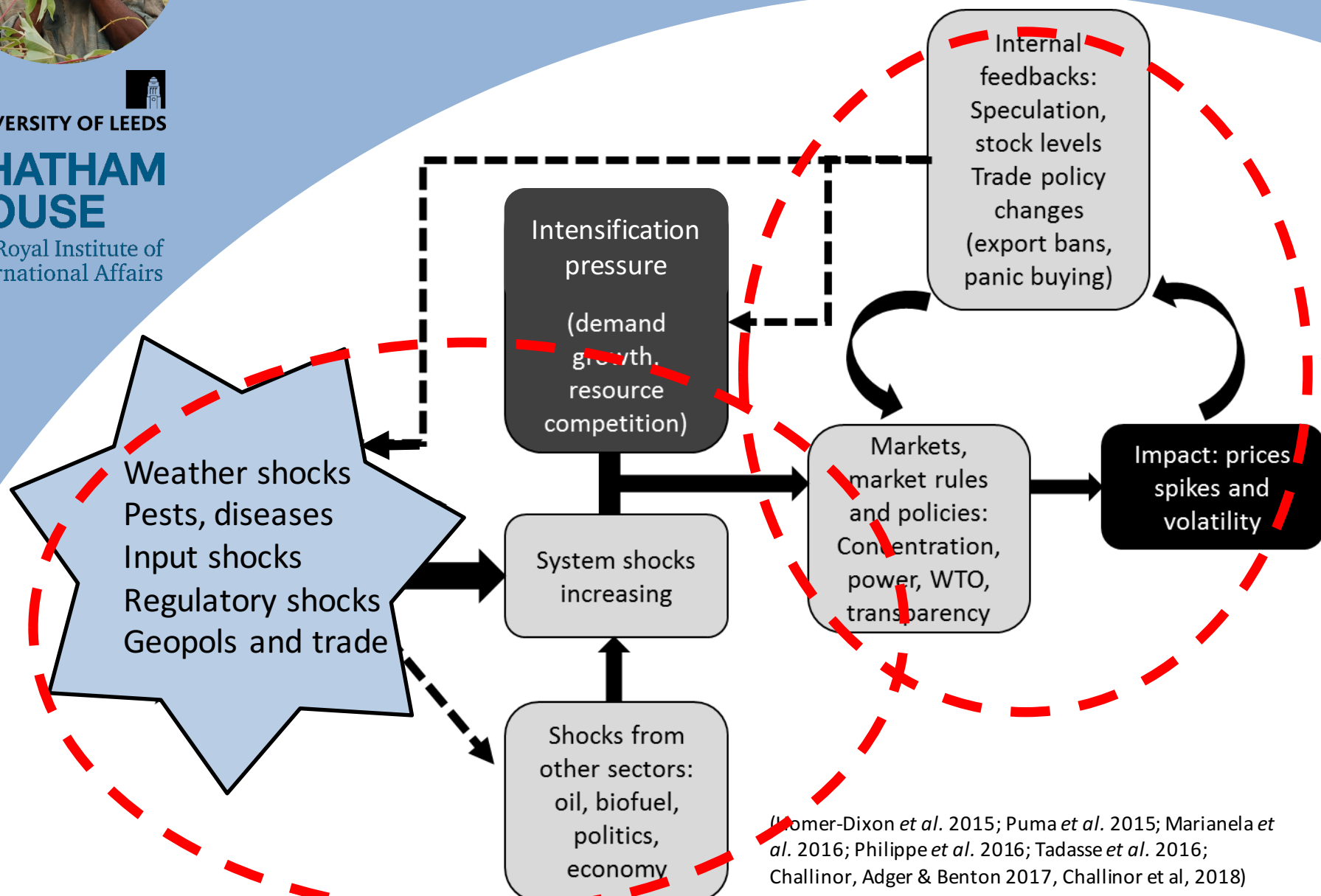
# Food system resilience depends on many factors



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(Loomer-Dixon *et al.* 2015; Puma *et al.* 2015; Marianela *et al.* 2016; Philippe *et al.* 2016; Tadasse *et al.* 2016; Challinor, Adger & Benton 2017, Challinor *et al.*, 2018)





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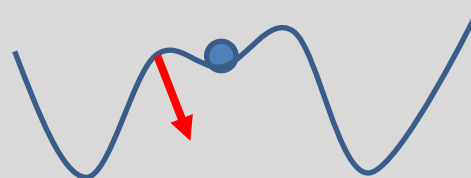
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*The system as a  
whole is very  
resilient to  
transformation  
to a “better”  
state*

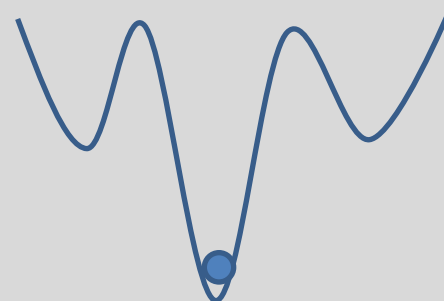
# Resilience is not a normative concept

## Food system functioning



*worse current better*

**Food system governance**  
(WTO, ag policies, market  
forces and concentration)



*worse current better*



# Summary



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- Brexit is focussing minds on food supply chains; F&V especially
- The UK recognises the importance of F&V (some discussions about moving to “preventative health care in future” and need for better diets)
  - But is not doing enough...
- There is strong recognition of resilience as a key concept
  - But mainly as “normative resilience”



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# Thank you!

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 @timgbenton