Report of a Workshop on

Protecting Genetic Diversity of Scotland's Potatoes

at the

James Hutton Institute, Invergowrie, Dundee

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Photograph courtesy of John Marshall

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Summary

Potatoes are one of the most important crops in Scotland, providing a buoyant export market and an important dietary staple. There is increasing pressure on the potato sector to compete with other popular staples, (e.g. rice, pasta) and provide varieties that suit the demands for processed products (e.g. chips, crisps)

The research that we are undertaking aims to explore some of the complexities of the potato sector to ensure that it is best placed to take advantage of opportunities, manage risks and create resilience.

In this workshop we were interested in the views and experience of non-commercial potato enthusiasts. We used a participatory and collaborative approach to encourage discussion about the resilience of the Scottish food system, how it connects with food security and whether "grass roots" growers could play a role in enhancing food security.

Participants were asked to discuss the concepts of food system resilience in the context of Scotland and its link to food security. The main points addressed in the discussion related to:

1. the need to specifically address the different dimensions as they call for specific analysis, expertise from the actors involved in the food system and solutions;

2. the impact of the disconnect between people and their food that is strongly intertwined with increased security and safety measures when it comes to food and that results in:(i) loss of skills and knowledge, (ii) people shifting food habits away from potatoes and (iii) substitution with alternative staples;

3. the environmental consequences of food production systems and the importance of including them in the debate about resilience.

Following this discussion the facilitator highlighted the 4 dimensions in the definition of food security with particular reference to potatoes:

- Availability of potatoes (production, stocks...)
- Accessibility to potatoes (purchasing power, market infrastructures, the capacity to access food...)
- Utilization (safe potatoes that can contribute to a healthy diet)
- Stability of the three dimensions (weather variability, price fluctuations, economic factors, political factors...)

Three of the four dimensions were then used as prompts in a concept mapping exercise where participants were asked to generate statements based on the following sentences:

- 1. To make potatoes varieties available to people in Scotland, we need ..."
- 2. To make potatoes contribute to nutritious diets of people in Scotland, we need ..."
- 3. To encourage people to use potatoes in healthy diets we need..."

The statements covered many aspects and areas of food security which were discussed along with the stability of the other three dimensions in plenary. For example, people felt there was a need to increase education about potatoes and fresh food in general and that the disconnect between growers, consumers and supermarkets should be addressed. The full table of all the statements generated can be found in Appendix 1.

The facilitators then edited the statements removing duplicates and discarding any that weren't relevant to the focus of the next exercise. Those remaining were used for a sorting and ranking exercise where participants were given the edited list of statements and asked to group them in a way that seemed obvious to them. A full list of the statements can be found in Appendix 2.

Sorting the statements helps to identify an individual's view of the interrelationships between the different concepts. Data from this exercise will be analysed using a statistical technique and specialized software to identify patterns in the data.

Following the sorting exercise participants were then asked to rank the statements to indicate their perception of the importance of a statement relative to the other statements. This ranking together

with the results of the sorting exercise means an in depth statistical analysis known as 'concept mapping' can be performed. Concept maps can be used to communicate complex concepts helping to organise and structure ideas and assist in in further understanding of the information gathered. The results will be reported separately following analysis.

Introduction

Scotland's natural resources are vital national assets. Potatoes, in particular, have long been important in terms of the national diet, the economy of both our farms and food industry, and the cultural and gastronomic life of Scotland's people. It is one of Scotland's most important crops providing both a nutritional staple and a buoyant export market. A rich diversity of different varieties has been cultivated in Scotland over the centuries after arriving from the New World during the age of exploration. This varietal diversity has been developed to respond to different environmental and agronomic challenges as well as to the national palette. In more recent times the emergence of processing has created new demands for raw products that lend themselves to production processes. The research that we are undertaking within the RESAS strategic research program funded by the Scottish Government aims to explore some of the complexities of the sector to ensure that it is best placed in take advantage of opportunities, manage risks and create resilience.

In a previous workshop "Report of the workshop exploring the genetic diversity of potatoes for enhanced resilience of the potato sector" we invited stakeholders from policy, science and industry to help us to understand the challenges that the potato sector faces in terms of genetic diversity.

In this workshop we were interested in the views and experience of potato enthusiasts (community allotment groups, gardeners, potato day organisers...) with the focus on potatoes as an important national staple food. We used a participatory and collaborative approach to encourage discussion about the resilience of the Scottish food system, how it connects with food security and whether "grass roots" growers could play a role in enhancing food security.

13 enthusiastic participants attended, many travelling a considerable distance to Dundee. By way of an introduction they were asked to describe their background and interest in potatoes. The purpose of this exercise was twofold: it acted as an icebreaker and gave the group a sense of who was present as well as enabling the facilitators to characterise the group and later contextualise the information gathered during the workshop.

The panel composed by the participants had a wide range of expertise and interests along the "from patch to plate" continuum. They were all involved in promoting potatoes, either as individuals or as representatives of a wider group advocating the range of environmental, societal and economic benefits deriving from people growing their own food (education, health, upskilling, knowledge sharing, conservation of seeds and plants, good food, eco-system and biodiversity enhancement, open-air community celebration, social inclusiveness¹...).

¹ Environmental, social and economic benefits derived from the information participants provided during the workshop and complemented by organisation mission statements available on the websites of the different organisations that were mentioned:

⁻ Scottish Allotments and Gardens Society: <u>http://www.sags.org.uk/</u>

⁻ Royal Caledonian Horticultural Society (The Caley): <u>https://thecaley.org.uk/</u>

As can be seen from the following list, their interests were wide and varied:

- Representative from the Royal Caledonian Horticultural Society Members (The Caley). The Caley has a demonstration allotment and links with many individuals interested in growing potatoes.
- Lifetime involvement in seed potatoes/ now retired but still involved in potatoes as a hobby.
- Retired gardener/ allotment holder / member of National Vegetable Society/ exhibitor and grows for home consumption
- Secretary of Scottish Allotments and Gardens Society for 30 years
- Member of Tarland allotments / on the board of "The Seed Box" (Horticultural and Outdoor Therapy Centre on Deeside) / works with adults with learning difficulties
- Vice-chair of Tarland development group /involved in "Seed swap" and Tarland allotments.
- Outgoing treasurer of an Aberdeen allotment group/ potato grower for own consumption
- "Wears many hats" / 70 years growing potatoes / assessor for Scotland in Bloom
- Involved with the work in the local community and Cove in Bloom.
- Worked for seed potato firm/ has an art degree / teaches cooking / particularly interested in potatoes as a medium for art and cookery
- Retired gardener / "eats lots of potatoes"
- Agronomist / economist / fruit tree grower/ family grew potatoes/ aunt has potato named after her/ doesn't grow potatoes themselves but interested in the workshop
- Landscape architect/ secretary of Linlithgow Allotments/ grows lots of potatoes



Workshop Activities

Photograph courtesy of John Marshall

Food Security and Food System Resilience

The purpose of this exercise was to discuss the concepts of food system resilience and its link to food security. In a recent study, Tendall et al. (2015)² defined Food System Resilience as *"the capacity over time of a food system and its units at multiple levels (production, transport, processing and consumption), to provide sufficient, appropriate and accessible food to all, in the face of various and even unforeseen disturbances (climatic events, political disturbances, market disturbance...)"*.

In order to contextualise Food System Resilience in the context of Scotland, we discussed the definition of Food System Resilience as well as the definition of food security with the participants; *Food security exists when all people, at all times, have physical and economic access to sufficient,*

The Seed Box: <u>http://www.theseedbox.org.uk/</u>

² Tendall, D. M., J. Joerin, B. Kopainsky, P. Edwards, A. Shreck, Q. B. Le, P. Kruetli, M. Grant and J. Six (2015). "Food system resilience: Defining the concept." <u>Global Food Security</u> **6**: 17-23.

safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 1996, 2008).

The Food System, in this instance, encompassed all those activities involved in the production, processing, transport and consumption of food with particular emphasis on potatoes.

Participants were asked to comment on the definitions, including anything they felt was missing. We recorded any observations based on participants own experience.

The main points addressed in the discussion related to:

- the need to specifically discuss each dimension of food security (Availability, Accessibility, Utilization and Stability of the three other dimensions over time) and identify/ assess ways to guarantee them;
- the impact of the disconnect between people and their food that is strongly intertwined with increased security and safety measures when it comes to food and that results in: (i) loss of skills and knowledge, (ii) people shifting food habits away from potatoes and (iii) substitution with other staples;
- the environmental consequences of food production systems and the importance of including them in the debate about resilience.



Participants had a number of comments regarding Food System Resilience and Food Security:

- There is a need to focus on multiple issues particularly social, economic and political. Participants thought that there is a disconnect in food system resilience and alluded to people from other countries living in Scotland eating the staples they are familiar with (rice/pasta) and not appreciating the benefits of cheap, locally produced potatoes.
- There is a need to contextualise [the definition] for Scotland
- Food System Resilience should include an environmental aspect to ensure consideration is given to the question of food miles and the use of artificial fertilizer.
- The dilemma isn't a lack of food but a lack of accessibility, money and knowledge. People, particularly children, don't know where their food comes from despite access to freely available information. They see potatoes in terms of chips and crisps and don't understand the health benefits of boiled or baked potatoes.
- The 'grow your own' sector could have a significant influence on Food Security and there is a growing interest in fresh food production by individuals. However a lack of knowledge, accessible land and a heightened paranoia about dirt means options either aren't available or food is wasted. People don't know how to deal with dirty produce so won't use it.
- There is a growing enthusiasm in schools to educate children about food and food security and many schools are encouraging pupils to grow seeds and potatoes. Potatoes fit well into

the school curriculum as they can be planted in spring and are ready for harvest following the summer holidays. One pupil, on seeing the potatoes produced from a single plant was delighted when the number of potatoes exactly matched the number of pupils in the class! Unfortunately uptake by schools is variable and seems dependant on enthusiastic individuals taking the initiative.

Following the discussion the facilitator highlighted the 4 dimensions in the definition of food security with particular reference to potatoes:

- Availability of potatoes (production, stocks...)
- Accessibility to potatoes (purchasing power, market infrastructures, the capacity to access food...)
- Utilization (safe potatoes that can contribute to a healthy diet)
- *Stability* of the three dimensions (weather variability, price fluctuations, economic factors, political factors...)

Those four dimensions were subsequently used as prompt sentences in the following Concept Mapping exercise. Covering the four dimensions in the Concept Mapping exercise both allowed participants to operationalize them in the context of Scotland and to ensure that they covered the widest range of alternatives.

Concept Mapping 1:

A concept map is a diagram that depicts suggested relationships between concepts. Concept maps are used to stimulate the generation of ideas, and are believed to aid creativity. Although they are often personalized and idiosyncratic, concept maps can be used to communicate complex concepts helping to organise and structure ideas and assist in in further understanding of the information gathered.

Statement generation

The participants were split into 3 random groups and, with a facilitator in each group, were asked to generate statements based on the following sentences:

1. To make potatoes varieties available to people in Scotland, we need ..."

2. To make potatoes contribute to nutritious diets of people in Scotland, we need ..."

3. To encourage people to <u>use</u> potatoes in healthy diets we need..."

The statements generated were recorded on large post-it notes and displayed on the wall to be discussed in plenary.

During the small group discussions 80 statements were generated. Another 23 were added in plenary.

The statements covered many aspects and areas of Food Security, the dominant themes (in no particular order) are listed below.

We need:

- increased education about potatoes and food in general, particularly in schools,
- to develop a more holistic approach to the cultivation and promotion of potatoes
- to find ways of encouraging new entrants into farming
- to highlight the health benefits of potatoes
- to address the disconnect between supermarkets, consumers and farmers
- to encourage the interest of politicians in potatoes
- to focus on grass-roots solutions (community groups /allotments / individual growers...)
- to help people to help themselves

The full table of all the statements generated can be found in Appendix 1.

Discussion of statements in plenary



In plenary participants discussed the statements and added more to those generated by their groups (see Appendix 1). They were also asked to consider the 4th dimension of the Food Security statement, the *Stability* of availability, accessibility and utilization.

During the discussion there was a strong feeling in the group that increased education for all ages was paramount, particularly with regard to the

availability of different varieties of potatoes, their versatility and their health benefits. It was suggested that potatoes should be included in the "5-a-day" promotion, but that this would require reinforcing the "potatoes are healthy" message.

Participants felt the potato industry (including non-commercial growers) should emulate the huge advances in the coffee sector where multiple varieties and types of coffee are now easily accessible. This would increase the requirement for different varieties and may result in an increase in people growing their own potatoes. However there was a feeling that quantity could only really be produced commercially.

There was some discussion about how to turn the "Disconnect" to "Connect". Participants felt that they weren't in a position to supply answers but suggested that if politicians were encouraged to become more involved with the farming sector in general and the potato industry in particular then changes could take place.

Most of the people present at the workshop were involved in interacting with the wider community, either through training or organising 'potato days', 'seed swap' or through agricultural or horticultural shows and suggested an increase in events highlighting potatoes.

The James Hutton Institute organises an annual Potatoes in Practice (PiPs) event where enthusiasts can meet and discuss all things potato. One participant suggested a similar event for children, a "young PiPs". The facilitators will take that idea forward to the Hutton for further consideration.

Concept mapping 2

Sorting statements

During lunch participants were treated to a fascinating talk about Commonwealth Potato Collection by its manager, Gaynor Mackenzie. The Commonwealth Potato Collection is the UK's gene bank of landrace and wild potatoes held in trust by the James Hutton Institute with the support of the Scottish Government. The collection is one of a network of international potato gene banks. The collection comprises around 1500 accessions of about 80 wild and cultivated potato species. Each accession traces back to a handful of berries or tubers from potato plants in South or Central America, gathered from the wild or obtained from a grower at a market. Such genetic resources are priceless, comprising the basic resource for the improvement and adaptation of the world's fourth most important food crop, the potato.

During the talk the facilitators edited the statements generated previously, removing duplicates and discarding any that weren't relevant to the focus of the next exercise. This reduced 103 statements to a more manageable 40 which were randomly entered into a table and printed before being used for sorting and ranking.

Participants were given a statement checklist and a statement sorting sheet (examples below) and were asked to group statements in a way that seemed obvious to them whilst bearing in mind that:

- a single group must not contain all statements,
- all statements must be used
- no statement was to be in more than one group
- each group should have at least one statement.

If participants felt that there was an obvious name for the group they were to add that too. The statement checklist was used to ensure all statements were used and no statement was used more than once.

A full list of the 40 statements can be found in Appendix 2.

Figure 1 Statements 1-7 of the sorting checklist

Statement	#
Challenge the whole modern supply chain model	1
Gardeners to rise up the profile of potatoes	2
Promote regional food	3
Educate people about growing	4
Solve the disconnect between consumers and farmers/farm produce	5

Educate people about use

Incorporate allotments in planning

Figure 2 Statement sorting sheet

ME .	
Record below the ide separating the numbe	ntifying number of each statement in this grou rs with commas.
	nts in a way that seems obvious to you. If you ame for the group, that's great, if not, just er
All statements CANNO	T be in a single group
Each group must have	MORE THAN ONE statement
No statement can be	in more than one group
Group title	Farming
Record below the ide separating the numbe	
	Aricy change
	ntifying number of each statement in this grou
1,3,10	, 19, 20, 24, 7
Group title	Education
Record below the ide separating the numbe	ntifying number of each statement in this group rs with commas
	-17,23,38,39,29

Sorting things into different piles is a common human activity often undertaken to organize complexity and this statement sorting is the same idea. The resulting piles help identify each individuals view of the interrelationships between the different concepts. Data from this exercise will be analysed using a statistical technique and specialized software to identify patterns in the data. We will explore how different people associate or cluster the various food and nutrition related challenges.

6 7

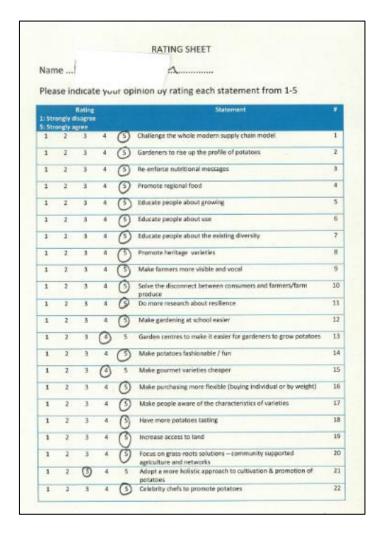
Concept Mapping 3

Ranking Statements

The next exercise was designed to allow participants to rank the statements on a Likert Scale where 1 is strongly disagree and 5 is strongly agree.

The rating or ranking task addresses each person's perception of the importance of an item relative to the other items. This is done after the sorting because experience suggests that it otherwise unduly influences the sorting task. Together with the results of the sorting an in depth statistical analysis, 'concept mapping' will be performed.

Figure 3 Statement Ranking Sheet



Feedback

Participants were encouraged to complete feedback forms to help facilitators measure the success of the workshop. Their comments were wholly positive (except for a request for better pens and more vegetarian food) and they said that they felt the workshop was worthwhile. They were pleased to have the opportunity to be consulted and included in the research. They enjoyed networking and sharing and understanding each other's views and found it useful to gain an insight to the potato industry and the research being carried out. In many cases they said they could take the knowledge and information gained back to other interested parties.

They all expressed an interest in being involved in future studies and were keen to keep in touch with each other following the event.

Next steps

The information collected at this workshop along with that compiled in the previous activities we have conducted so far will be summarised in a report with some recommendations regarding the potato sector and its varieties which will be presented to the Scottish Government.

Acknowledgements

We are very grateful to the participants for the time they spent with us to contribute to this research. We would also like to extend our thanks to those who helped to broaden the breadth of expertise by generously sharing their personal networks.

This work was funded by the Scottish Government's Rural and Environment Science and Analytical Services (RESAS) Division.

The views and recommendations expressed in this report are drawn from the participants and are not necessarily representative of the wider potato growing community. Furthermore, this report does not represent Scottish Government policy.

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APPENDIX 1: Statements completed by participants -Food Security dimensions sentences

		ions sentences	· · · · · · · · · · · · · · · · · · ·
To make potatoes varieties <u>available</u> to people in Scotland, we need "	To make potatoes contribute to <u>nutritious diets</u> of people in Scotland, we need"	<i>To encourage people to <u>use</u> potatoes in healthy diets we need"</i>	Statements added in plenary n=23
To tap into huge interest that already exists	To take the diversity discussion away from people in the city	To adopt a more holistic approach to cultivation	To focus on the right problem we are trying to solve (is farming the problem?)
To co-ordinate existing initiatives	Investments (on the production side)	To adopt a more holistic approach to the promotion of potatoes (champion the wonder potato)	To find a way to get the message in the processing sector [not sure what this means]
To come to terms with level of ignorance	To promote regional food	To eat more local [food]	To promote farming amongst the younger population
More local potato days and (see below)	To encourage / stimulate demand	To get supermarkets on board	To ease entrance into farming for people out of the industry [i.e. not already farming background]
Follow up trails of different types [not sure what this means- related to above]	To push / expand the genetic diversity (the market won't do it)	To change the image of potatoes ("couch potato")	To enable more access to land
To make time for cultivation (prioritize)	To expand the range of food people have access to	To educate where generations have missed cooking skills	To promote "new blood" into farming (non-farming kids)
Accessibility to more small outlets with local knowledge	To make customers aware that potatoes are not perfect	To eat more seasonal [produce]	To think about potatoes in the context of a healthy diet
To incorporate allotments in planning	To make early varieties available	To promote key messages w.r.t healthy choice	To re-inforce nutritional messages
Better education	Price is not an issue	To target resources (education / land) to areas with poorest diets	To include them in the "5 a day" programme
To change mind-set -high carbs / fries / sweet potatoes	To change people's mind-set	To review the supply chain	To change the marketing message [regarding potatoes]
To get kids growing	Celebrity potato	To focus on grass-	To focus on healthy

things (potatoes)	chefs (competition)	roots solutions (community supported agriculture / networks etc.)	diets
To "big up" potato varieties	To make people aware of the smell of potatoes	More land Land / land / land!	Gardeners to rise up [raise] the profile of potato varieties
To have more tastings	To make people aware of the characteristics of the varieties	To make more varieties cheaper (gourmet varieties are more expensive)	To increase the number of gardening groups
To make purchasing more flexible (buying individual or by weight)	To have people try potatoes ion supermarkets (like cheese [tasting])	[varieties?] To be available (Conflict between commercial varieties and taste)	To challenge the modern supply chain model
More education	To get rid of the risk assessment [for growing/gardening/ cooking/using???] in schools	New names for potatoes to attract kids / consumers (eg Tattie McTattie ⓒ)	To stop looking at potatoes in isolation
To promote fun "peel off"	To make potato characteristics marketable and fashionable (similar to change in coffee industry)	To do more research w.r.t resilience (climate change)	To look at commercial growers for quantity
Garden centres to get better (cultural [cultivation??] hints / recipes	To make the books like "Getting started on the allotment" available to schools	To address the supermarket / farmer disconnect	To stimulate people to pay more for special varieties (will stimulate farmers to grow them)
Garden centres to sell individual potato kits	To make potatoes / seeds available to schools	To address economic / political aspect and power [need those in power to take an interest]	To promote [potatoes] through events and museum to put it [them] on the scene
To make gardening fun	To make the timing [of events] right with school schedules (e.g. PiP)	The food-chain to be led from the consumer / grower	To look at fundamental issues such as disconnect [between people and food?]
To develop cooking skills	Blight free varieties	To make farmers more proactive, seen and heard	To reconnect people with potatoes

	positively	
To make people	To get farmers and	To solve the
aware of the fact	growers visible and	disconnect of power
that there are	vocal	distribution in the
different varieties		supply chain – need
		political action
To remind people of	To highlight the	To encourage
traditional dishes /	Scottish potato	people to grow
meals	heritage	more potatoes
Education	To promote Scottish	To increase
	potatoes better	knowledge about
		use [of potatoes]
To train people to	To keep potatoes	
cook potatoes	visible	
Education [of?] and	To show [advertise?]	
school dinner	different varieties	
 contractors		
To educate about	To encourage	
taste of potatoes (people to try /taste	
not just as support	difference varieties	
for gravy)		
To teach children to	To help people to	
cook	help themselves	
	To make cultivation	
	skills available to all	
	To ensure	
	opportunities are	
	available to "do it	
	yourself"	
	To educate re different varieties	
	and how to cook	
	To educate w.r.t.	
	taste To educate w.r.t.	
	cooking options	
	To educate w.r.t.	
1	options / varieties	

APPENDIX 2. List of edited statements used by participants for sorting and rating exercises.

Statement	#
Challenge the whole modern supply chain model	1
Gardeners to rise up the profile of potatoes	2
Promote regional food	3
Educate people about growing	4
Solve the disconnect between consumers and farmers/farm produce	5
Educate people about use	6
Incorporate allotments in planning	7
Promote heritage varieties	8
Make farmers more visible and vocal	9
Re-enforce nutritional messages	10
Do more research about resilience	11
Make gardening at school easier	12
Garden centres to make it easier for gardeners to grow potatoes	13
Change the image of potatoes	14
Make gourmet varieties cheaper	15
Make purchasing more flexible (buying individual or by weight)	16
Make people aware of the characteristics of varieties	17
Have more potatoes tasting	18
Increase access to land	19
Focus on grass-roots solutions – community supported agriculture and networks	20
Adopt a more holistic approach to cultivation & promotion of potatoes	21
Celebrity chefs to promote potatoes	22
Change people's mind set	23
Target resources (land/education) to areas with poorest diets	24
Make potatoes fashionable / fun	25
Promote potatoes through events & museums	26
Stimulate people to pay more for special varieties	27
Price is not an issue	28
Increase access to more small-scale outlets & local knowledge	29
Look at commercial growers for quantity	30

More seasonal	31
Make early varieties more available	32
Make customers aware that potatoes are not perfect	33
Make time for cultivation (prioritize)	34
Expand the range of varieties people have access to	35
Stimulate the demand	36
Co-ordinate existing initiatives	37
Close the generational knowledge gap	38
Educate people about the existing diversity	39
Get supermarkets on board	40