

# Supplemental data for

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## Supplemental Note 1. Figure 1

The image in Figure 1 was sourced from [Scotland topographic map-en - List of outlying islands of Scotland - Wikipedia](#) and was edited to show the location of the Scottish archipelagos in this study. The full acknowledgement for the original image is:

By Eric Gaba (Sting – fr:Sting) - Own work; Topography: NASA Shuttle Radar Topography Mission (SRTM3 v.2) data (public domain); Bathymetry: NGDC ETOPO1 data (public domain); Reference used for confirmation for the additional data: ViaMichelin; Locator map: composition of Image: British\_Isles\_Northern\_Ireland.svg, Image: British\_Isles\_Scotland.svg and Image: British\_Isles\_Wales.svg (modified) created by Cnrb under PD., CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=3216830>

## Supplemental Note 2. Crofting

Crofting is a system of landholding and way of life which is characteristic of the Highlands and Islands of Scotland. It developed as a result of the removal and re-location of small-scale farm tenants, during the Highland Clearances (late 18<sup>th</sup> and most of the 19<sup>th</sup> century; Caird, 1979), from traditional farmed areas to more marginal land so that landowners could develop more profitable cattle and sheep farming. As a result of considerable unrest in the Highlands and Islands following the Clearances, a Commission of Enquiry was held and enlightened legislation was passed in 1886 providing crofters with several rights, including security of tenure. Today, there are about 20,000 crofts in Scotland and more than 750,000ha of land in Scotland is in crofting tenure (Crofting Commission, 2022). Most crofts are small and held in tenancy with size ranging from less than 0.5ha to over 50ha. Certain legal rights of tenure are assigned to crofters, but they also have legal responsibilities in relation to the management of their croft. In many areas crofters also have a share in common grazing land which covers about 500,000ha in the crofting counties. Management of common grazing is done collectively through Grazing Committees and Grazing Regulations which specify the number and type of stock each crofter can graze. As a result of these and other measures there is a need for sharing resources and co-operative working which results in a strong sense of community and common purpose in most crofting areas. Although crofts are usually primarily agricultural ventures, crofters are often involved in other economic activities and only about one quarter of crofters work exclusively on their croft (Black *et al.*, 2018). Amongst the Scottish Islands, crofting is especially strong in the Western Isles (which includes the Outer Hebrides); it is also strong in Shetland but less so in Orkney. In the Highlands and Western Isles, crofting is closely identified with Gaelic culture, including the Gaelic language. In Orkney and Shetland, however, cultural influences are more strongly Scandinavian as these islands only became part of Scotland in the 15<sup>th</sup> century. Supplemental Table 1 demonstrates the linguistic diversity associated with Scottish landraces.

Some of the main differences and similarities in cropping land use and crofting between the archipelagos in this study can be seen from Supplemental Table 2. Although Orkney has a smaller total area of agricultural land, there is a much higher proportion of this in crops and fallow which reflects the larger area of better quality agricultural land in Orkney compared with Shetland and the Outer Hebrides. Crofting is also less important in Orkney as reflected by the smaller number of crofts, even after allowing for its smaller agricultural area. Moreover, Orkney also has a much higher percentage of owned crofts (86%) compared with Shetland (36%) and the Outer Hebrides (4%).

### Supplemental Table 1. Linguistic diversity in Scottish cereal landraces.

Crop species	Shetland	Orkney	Outer Hebrides
Barley ( <i>H. vulgare</i> )	bere	bere	Uist barley, <i>eorna</i> (Gaelic)
Small oat ( <i>A. strigosa</i> )	Shetland aet, haver (Norse)	Black oats	Small oat, <i>coirce</i> , <i>coirce beag</i> (Gaelic)
Common oats ( <i>A. sativa</i> )	Scots oat	-	Big oat, mainland oat, <i>coirce mor</i> (Gaelic)
Rye ( <i>S. cereale</i> )	Not present	Not present	Rye, <i>seagal</i> (Gaelic)

### Supplemental Table 2. Main differences and similarities in cropping land use and crofting between the archipelagos in this study.

Archipelago	Area of crops and fallow (ha) <sup>1</sup>	Area of grass and rough grazing (ha) <sup>1</sup>	Total agricultural area (ha) <sup>1</sup>	Total holdings (number) <sup>1</sup>	Tenanted crofts (number) <sup>2</sup>	Owned crofts (number) <sup>2</sup>
Shetland	237	149,039	150,125	1,780	2,127	1,209
Orkney	5,408	82,569	88,870	1,921	66	396
Outer Hebrides	810	305,693	313,258	6,260	6,116	258

<sup>1</sup> Scottish Government, 2018

<sup>2</sup> Crofting Commission, 2021

### References

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## Supplemental Note 3. Survey questionnaire for landraces on Northern and Western Scottish islands 2018

### A. Growers details

A1. Name and contact details of Interviewee:

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A2. Is the interviewee the household head? Yes/No

A3. If no specify relationship to household head:

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### B. Landrace details

B1. Focus of farm production?	score
a) Plant production	0
b) Animal production	1
c) Mixed production	2

B2. What is the total land used on-farm?	2018 (ha)	How has the number changed over the past? Increased/constant/decrease	
		5 years ago	10 years ago
a) Arable land			
b) Meadows and pasture			
c) Orchards			
d) Wood			
e) Other (specify)			

B3. Number of crops and varieties cultivated in 2018				
Crops and varieties grown	Total number of varieties	From the total number, how many	How has the number changed over the past? Increased/ constant/decrease	Source of landrace seed (own/purchase d/gifted). If

	(List by name)	are landraces?	5 years ago	10 years ago	purchased / gifted, state source
a) Barley					
b) Oats					
c)					
d)					
e)					

<b>B4. If you previously grew landraces / old varieties, but have now stopped, please describe why?</b>	
<b>Traits</b>	<b>Preference ranking by importance (most importance 3; least importance 0)</b>
a) Tradition	
b) Yield	
c) Market demand	
d) Disease resistance	
e) Adaptability to existing soils / terrain	
f) Tolerance to extreme temperatures	
g) Low (less care) management requirements	
h) Low agronomic requirements	
i) Quality of products	

j) Other (specify)	
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**C. Future of the farm**

**C1. What do you see as a main constrains that you are facing in farming?**

**C2. Are you intending to continue cultivating landraces in the future? If Yes, are you planning to:**

	Increase	Without changes	Decrease	Leave the farm to next generation
Farm size				
Number of crops				
Number of old varieties				
Number of farm animals (if relevant)				

**D. AGRICULTURAL POLICY MEASURES**

**D1. Do you currently or have you ever participate in any agri-environmental support programme, such as basic farm payments?**

**D2. If YES, when did / does such participation take place?**

**D3. If you do NOT or are no longer participating, please state the reasons why?**

**D4. I which measures are you/were you included?**

Name of Measure	Participation dates	Type of support received	Value of support received

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**D5. In your opinion, how might the measures be improved for landrace support?**

**E. Willingness to accept the payments**

If additional support for the conservation programme were to be established in the future, would you be willing to participate based in the following conditions. Before you answer please note, that only a limited number of farmers would be selected to participate in the additional support scheme as the amount of funding for this would be limited. Therefore, the smaller the amount of additional support that you would require to participate in the scheme, the higher are your chances to being selected. This support would be in addition to any existing commercial benefit you get from selling the material. Please remember there is no right or wrong answer it is just your answer and will be treated confidentially.

Depending on the type of farmer being interviewed (check box - has landrace and participates in measure, has landrace but does not participate in measure, does not have landrace), ask one of the following questions:

- a) If you DO NOT currently participate in the measure, would you be willing to participate in these measures assuming a payment level equal to or higher than the existing one? YES/NO
- b) If you DO currently participate in the measure, would you be willing to increase the landrace area cultivated assuming a payment level equal to or higher than the existing one? YES/NO

<b>E1. If response to above question was “yes”, what would be the minimum amount of payment required for your participating in these measures?</b>		
Amount (£ per ha per month)	Put tick mark here against the <i>minimum amount</i> required for participating in the scheme	Maximum landrace area (ha) to be cultivated by farmer at this level of compensation
a. 50		
b. 60		
c. 70		
d. 80		
e. 90		
f. 100		
g. 110		
Any other amount (please specify):_____		

**E2. What adjustments would be necessary on the farm to accommodate landrace cultivation or its expansion, e.g., increased labour / equipment?**

**E3. Is there any kind of non-monetary support that could replace (or partially replace) some of the support that we were talking about in previous questions? Example: support for the veterinary services, fence for the grassland, feed, help with market development, education etc.)?**

**E4. Do you know any farmers nearby who do / have cultivated any landrace in the past??**

#### **F. Household characteristics**

**F1. Number of household members (people who live and eat under the same roof) including interviewees.**

**F2. How many members of the household are earning an income?**

#### **G. General attitudes to conservation and development**

**G1. How strongly do you agree / disagree with the following statements regarding landrace / old variety and support measures?**

Statements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Don't know
a) Landraces / old variety crops across the world are increasingly at risk of disappearing from farming systems						
b) Landraces / old variety crops in Scotland are increasingly at risk of disappearing from farming systems						



c) Bere barley varieties are at high risk of disappearing from farming systems						
d) I would continue farming landraces / old variety crops without subsidies						
e) Is it easy to follow all the administrative requirements of support measures						
f) The support available fully covers production costs						
g) Support levels needs to be increased						
h) Other aspects of the support system need to be improved						

**G2. How do you rate the following contributions of landraces / old variety to the environment?**

<b>Stakeholder responsible</b>	<b>Extremely important</b>	<b>Very important</b>	<b>Important</b>	<b>Not important</b>	<b>Don't know</b>
a) Landscape maintenance and resilience					
b) Maintenance of soil quality					
c) Sources of genetic material for current and future use					
d) Maintenance of heritage values (Traditional knowledge and cultural practices, including food culture)					
e) Aesthetic value (including for tourism)					
f) Other (specify) ....					

**G3. With whom does the responsibility chiefly lie for conserving threatened landraces / old varieties? Rank top 3 (1=most responsibility)**

Stakeholder responsible	Score
a) Government is responsible	
b) Farmer is responsible	
c) Local government is responsible	
d) Consumers are responsible	
e) Shared responsibility	