

A woman wearing a blue headband and glasses stands in a field of tall, green barley plants. The field extends to the horizon under a cloudy sky. In the background, there are rolling hills and a line of trees.

Linking science and industry to tackle sustainable
production and supply of barley

The International Barley Hub (IBH)

Collaborative Training Partnership (BARIToNE)



The IBH is underpinned by decades of world class barley research in Scotland

We are now facing very different challenges- reducing inputs and a variable unpredictable climate while maintaining yield and quality

This requires a holistic, innovative and collaborative approach between the barley research community and the industry end users, farmers & Government

The IBH allows translation of barley research, realising impacts on breeding, farming, malting, brewing, feed, food, health and related industries.

Creating the world's leading centre of excellence in barley science supporting the supply chain through industry focused research, innovation and knowledge exchange





BARIToNE Collaborative Training Partnership

BARIToNE is a £3.6m BBSRC and industry-funded six-year Collaborative Training Partnership led by the Scotch Whisky Research Institute and supported by the James Hutton Institute and the universities of Dundee and Nottingham.

BARIToNE: Barley Industrial Training Network is a £3.6m BBSRC and industry-funded six-year Collaborative Training Partnership (CTP) providing support for 30 PhD researchers and led by the Scotch Whisky Research Institute. It focuses on the medium-long term challenge of maintaining a sustainable supply of local high-quality barley, produced using fewer inputs and having fewer environmental impacts. It will provide state of the art research training through close academic associations with the International Barley Hub (IBH) and innovation through industry-relevant research. It is focused on research excellence as a vehicle to ensure the long-term sustainability of barley supply and value chains.



Climate Resilience



Lowering Inputs



Plant-Soil Interactions



Climate Resilience

Can we use whisky by-products to produce more sustainable barley in a changing climate?


Chivas Brothers
Pernod Ricard

 The James
Hutton
Institute

Do cooperatives in driving change supporting the climate challenge


SAOS
Working together to shape the future



University of Dundee

Can we control grain diseases that affect the quality?


magb


SRUC



Chivas Brothers
Pernod Ricard

The problem

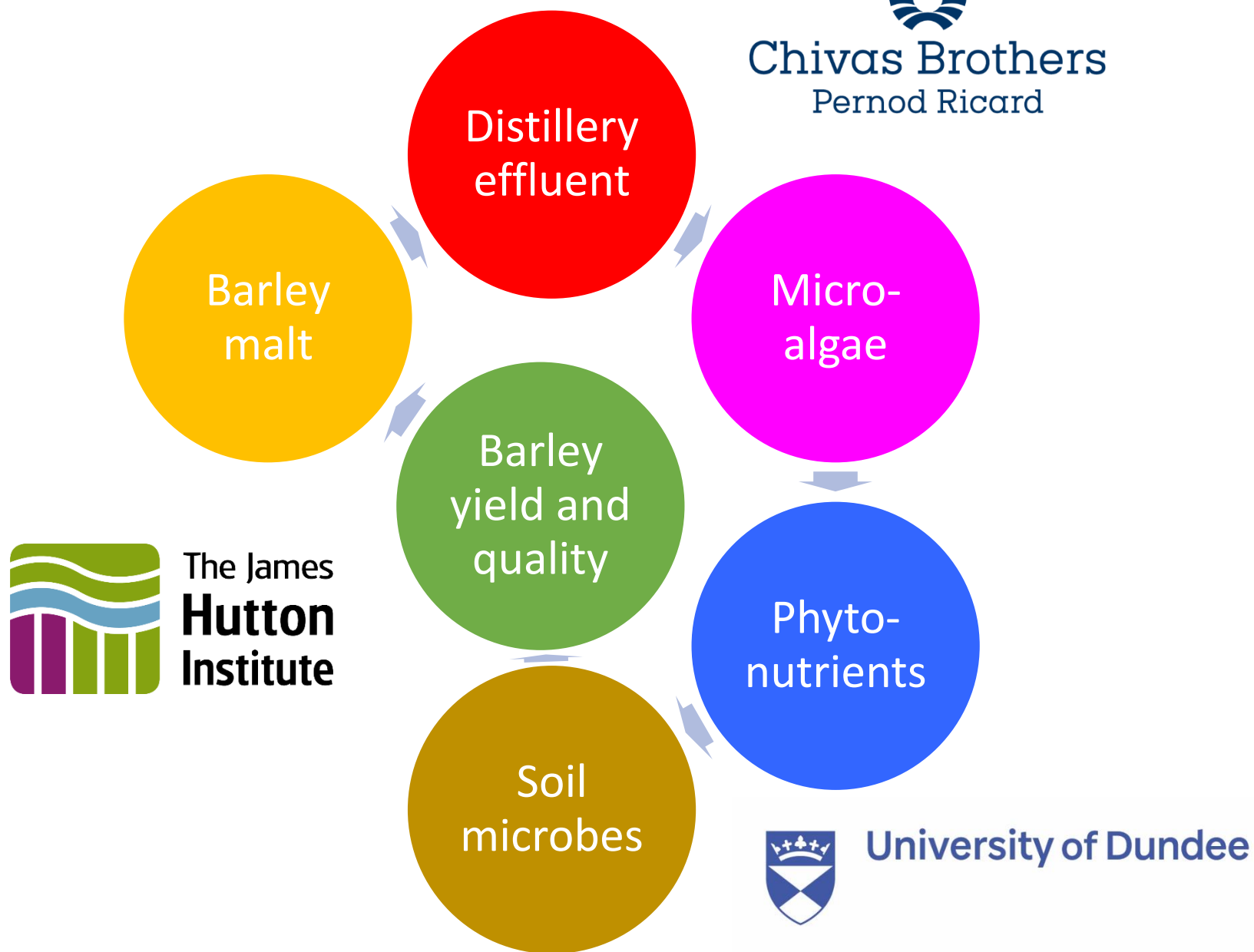
Net zero commitment by 2040-
reducing reliance on inorganic
fertilisers to maintain yield and
quality

Potential solution

Can we develop novel barley
phytonutrients from whisky
production to facilitate
sustainable barley growth in a
changing climate?



The James
**Hutton
Institute**



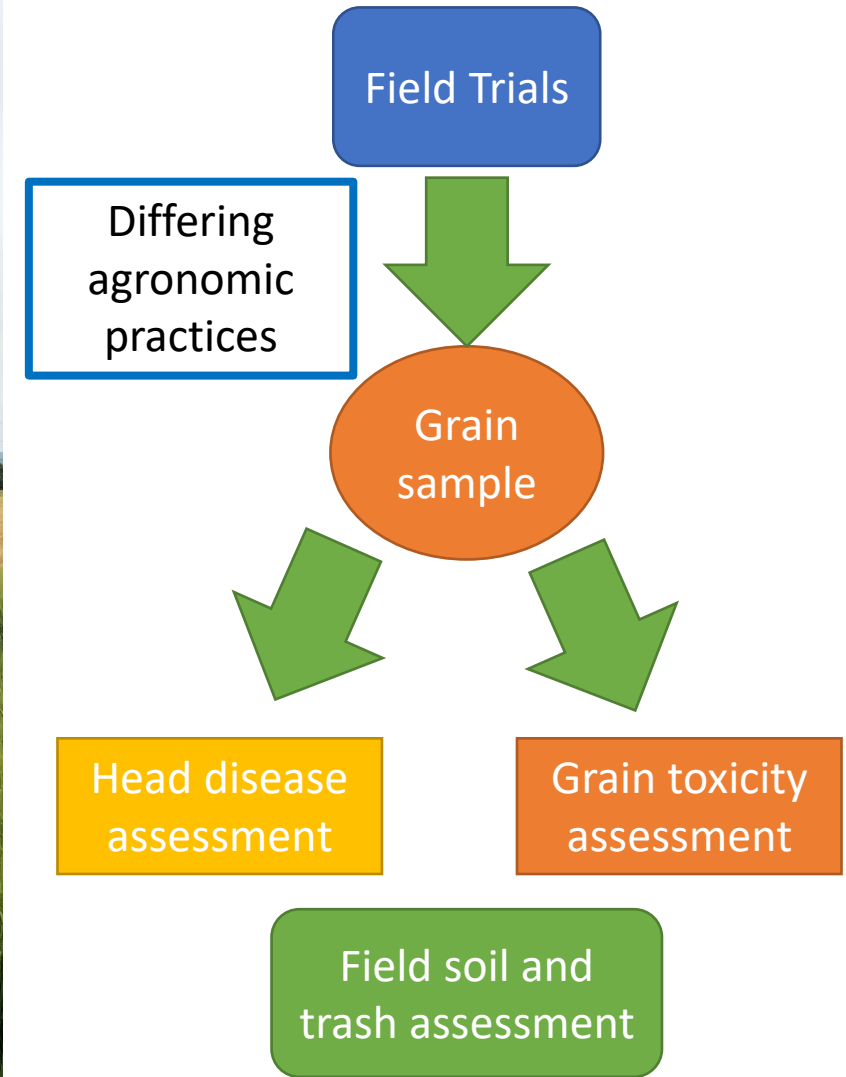
The problem

0.5 to 1.7% of barley are rejected because of ergot an unpredictable, undetected toxic contaminant



Potential solution

Develop novel strategies for early detection and determine underlying genetic factors



University of Dundee

THE
Scotch Whisky
RESEARCH INSTITUTE



The James
**Hutton
Institute**

Defining the genetic basis of
barley metabolite content to
improve nutrient use
efficiency, crop quality and
resilience with reduced inputs

Defining barley varietal traits for
climate change mitigation and
adaptation with emphasis on
reduced inputs and variable
water

KWS



The James
**Hutton
Institute**

Lowering
Inputs



DIAGEO

University of Dundee

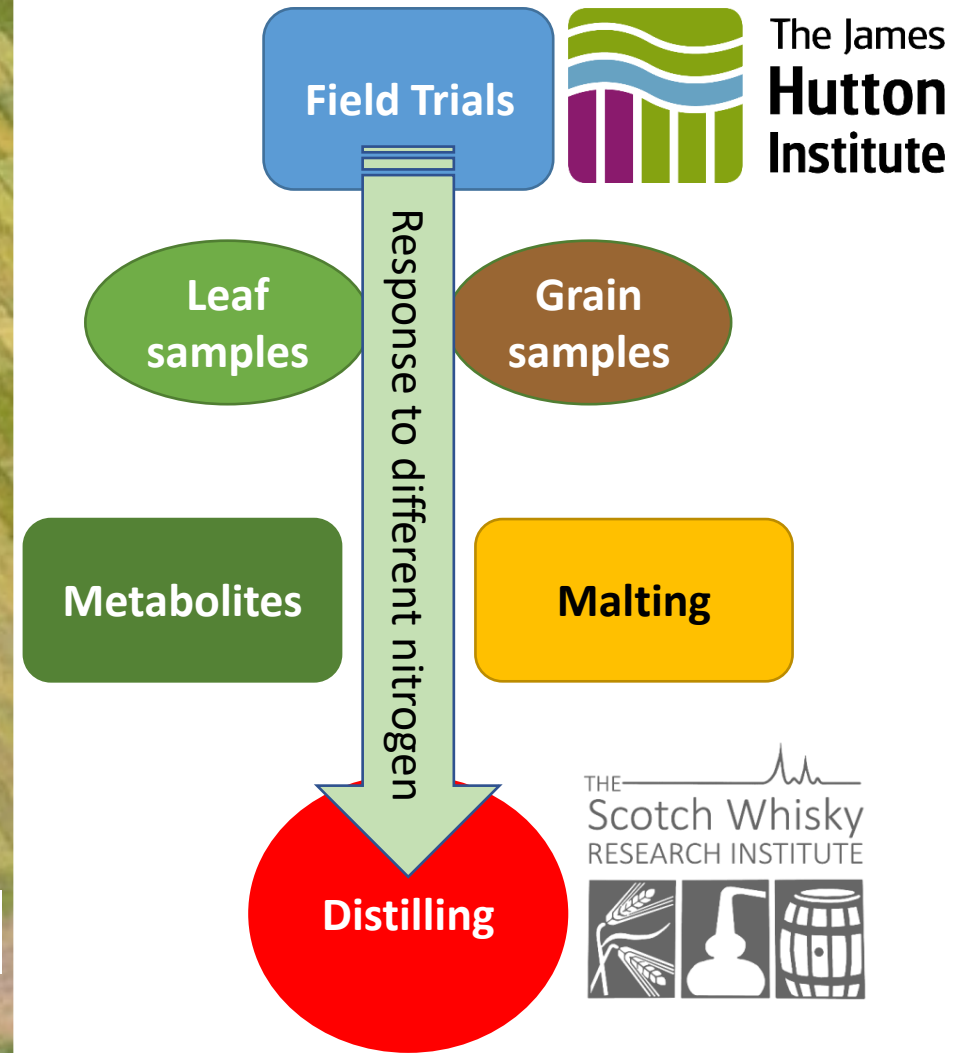
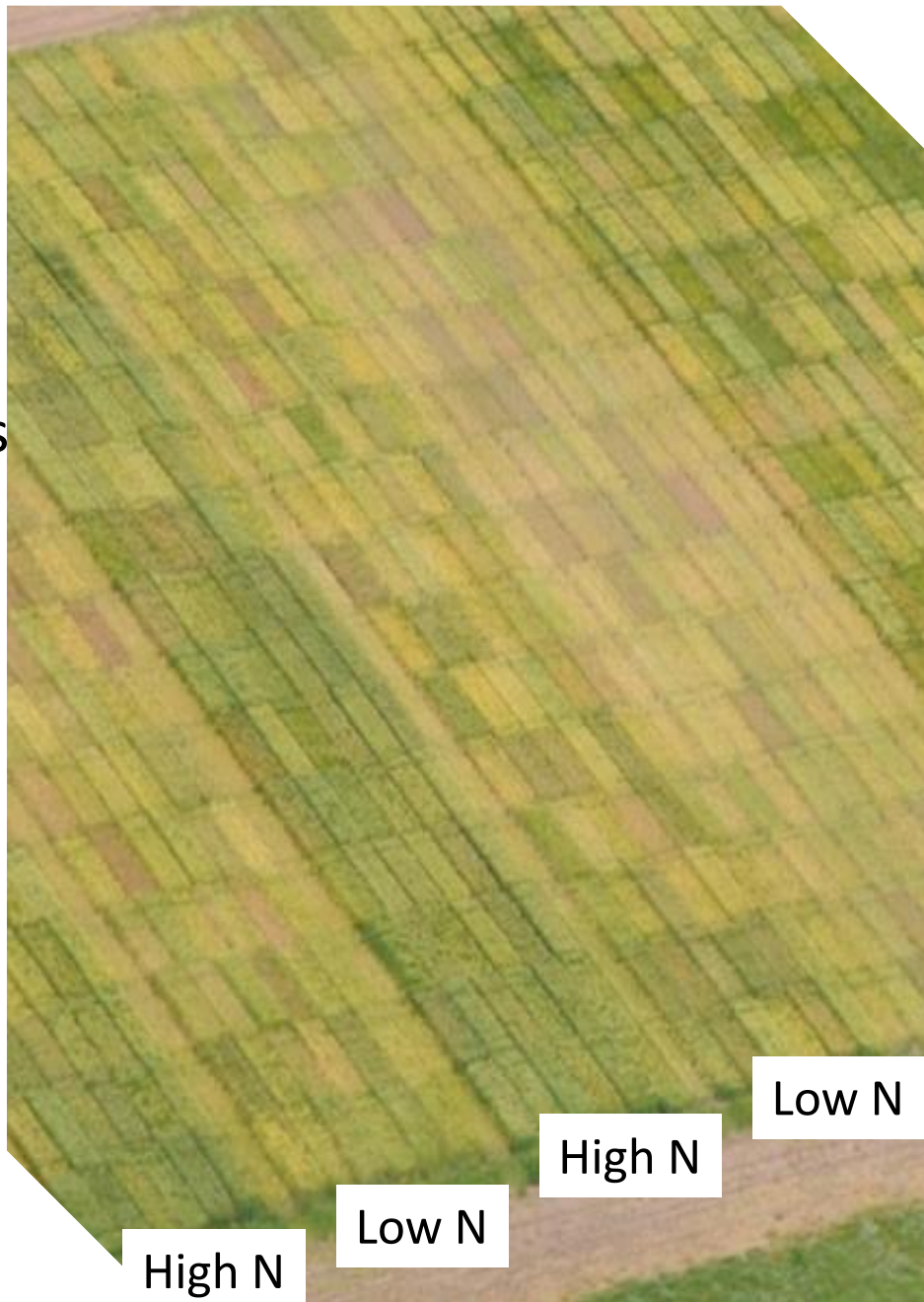
Advanced sensing technology
for improving nutrient
management in barley

The problem

Production and transport of N fertilisers and the run-off are **MAJOR** source of GHG emissions

Potential solution

Improve nutrient efficiency using multiple approaches – maintaining yield and malting and distilling quality





Understanding the genetic control of rhizosheath and its role in tolerance to abiotic stress in barley



Identifying novel traits and molecular markers for improved N-use efficiency in malting barley



Plant Soil Interactions

BARIToNE 2023 projects



- Producing more with less: adapting high-yielding barley varieties to low-input agriculture

- The effect of the barley pathogen *Ramularia collo-cygni* on the quality of malt and the potential to control the disease through host resistance



- Barley starch structure and quality for brewing: Impacts of genotype, environment and crop management.

- Barley growing systems towards the net zero economy



- Unlocking the Potential of the soils for carbon farming to meet net zero through real time GHG predictions

- Barley malting - a steep learning curve



- Malting Quality in a changing climate

- Machine learning based image analysis for phenotyping to speed up barley breeding

- Moving to net zero barley production.

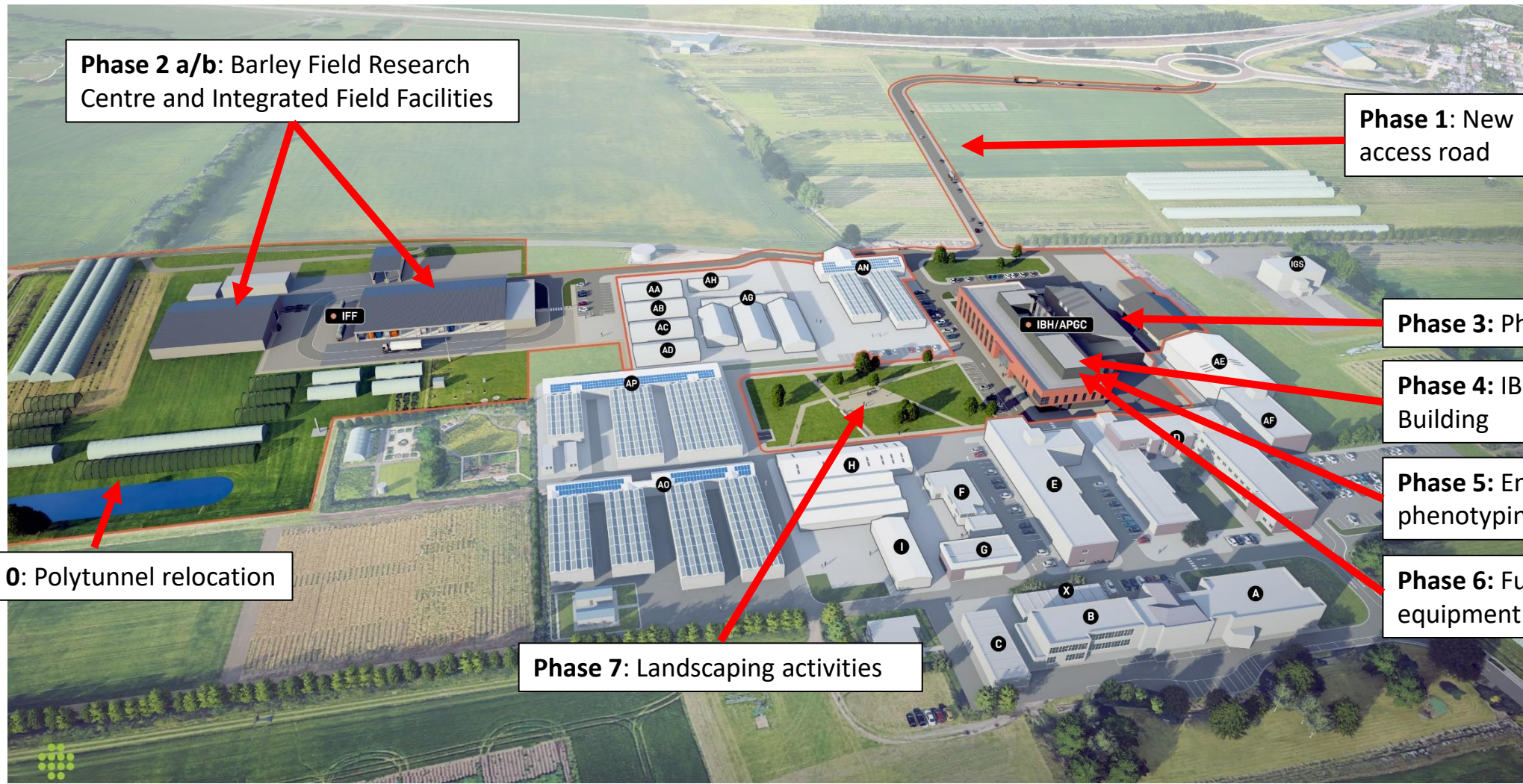


- Towards climate-Positive baRley: developing mOdel-based approaches to idenTify pathways and EvidenCe benefiTs (PROTECT)

- The genetic basis of grain skinning.



The Future Dundee Site



Phase 2 a/b: Barley Field Research Centre and Integrated Field Facilities

Phase 1: New access road

Phase 3: Phased demolition

Phase 4: IBH & APGC main Building

Phase 5: Environment and phenotyping systems installation

Phase 6: Furniture, IT and equipment fit out

Phase 0: Polytunnel relocation

Phase 7: Landscaping activities

Thanks to all IBH staff and supporters and
BARIToNE supervisors and industry partners



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Field 2016

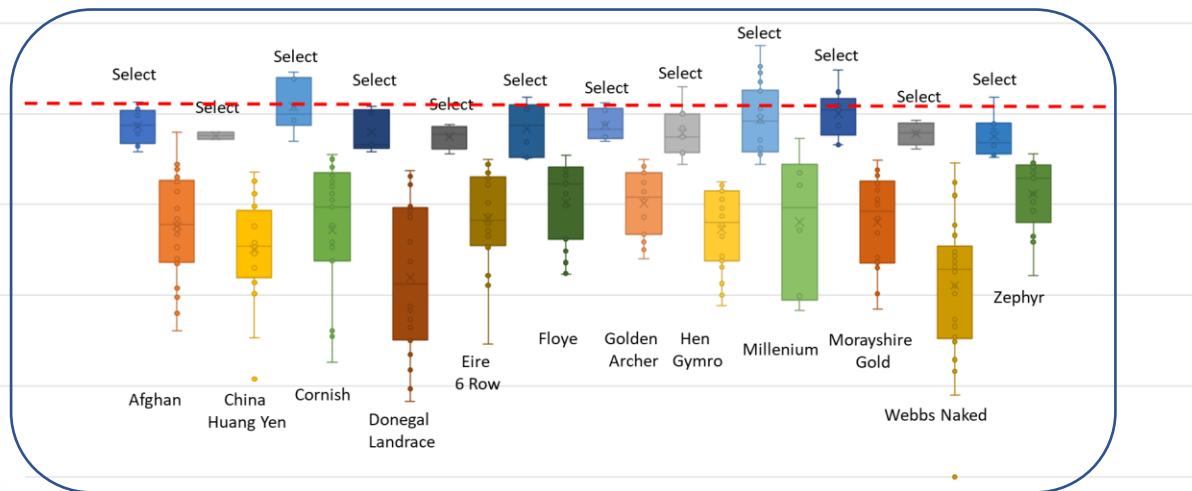
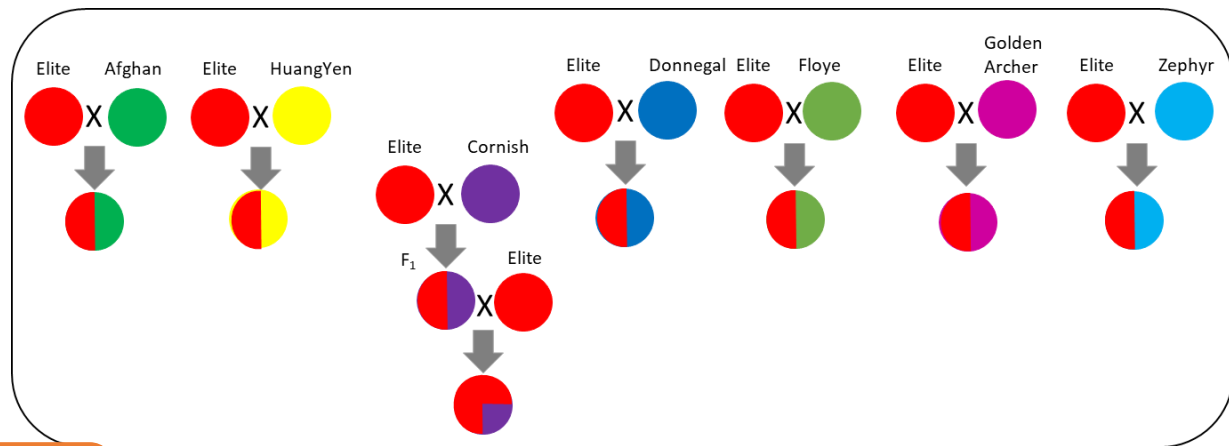
40 crosses
To KWS Irina

159,00
 Bc_1F_2 plants

4,753
 Bc_1F_3 plants

494
 Bc_1F_4 plants

89
 Bc_1F_6 plants



Field 2022

