Howden Climate
Risk & Resilience

Climate risk management –

How can we build resilience in the agricultural industry?

Dr Chris Nankervis

HOWDEN

About Howden

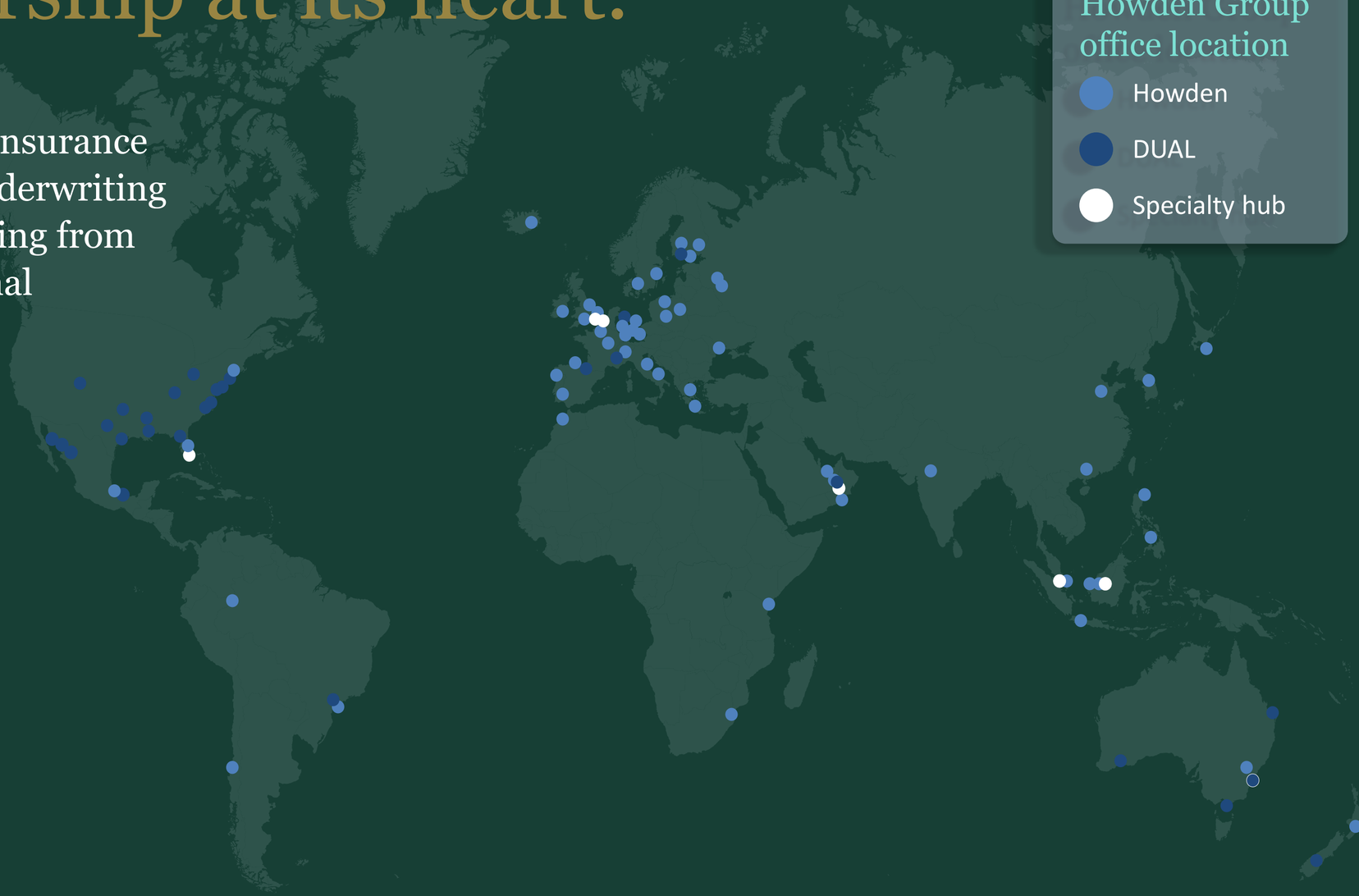
A leading global insurance group with employee ownership at its heart.

Founded in 1994, Howden provides insurance broking, reinsurance broking and underwriting services and solutions to clients ranging from individuals to the largest multinational companies.

55 Countries

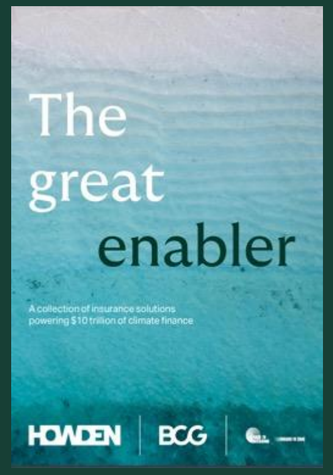
20,000 People

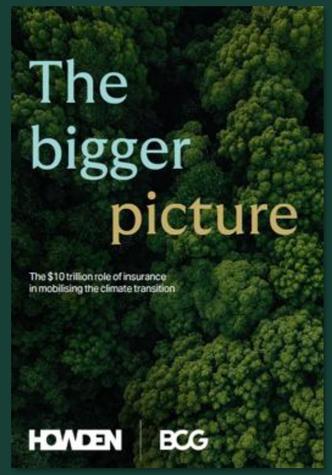
$42bn Premium



Howden is a leading voice in the climate debate

Our publications and partners





COP29 Baku Azerbaijan
UN CLIMATE CHANGE CONFERENCE

COP28 UAE

CLIMATE WEEK NYC
CLIMATE GROUP

LONDON
CLIMATE ACTION WEEK

COP16 COLOMBIA
Paz con la Naturaleza

Climate Risk & Resilience vision & mission

To position insurance as an enabler of a resilient climate transition to safeguard our future through addressing risks and opportunities and accelerating finance to safeguard our future.

To lead the insurance industry in the race to net-zero by unlocking investment, de-risking challenges and advancing climate adaptation to protect businesses, livelihoods and nature.

SUPPORTED BY Microsoft

Generating customer-centric de-risking solutions

Emerging challenges
- Key market gaps
- Evolving regulation
- Unmeasured climate risks

Innovative analytical solutions
- Risk intelligence
- Data-driven insights
- Appropriate metrics

Agricultural Resilience

Risk Management

Climate Risk Assessment

Evaluate exposure, potential climate impacts and risk mitigation capacity

How can the system components be managed/ protected to withstand and recover from climate-related hazards, trends, and disturbances?

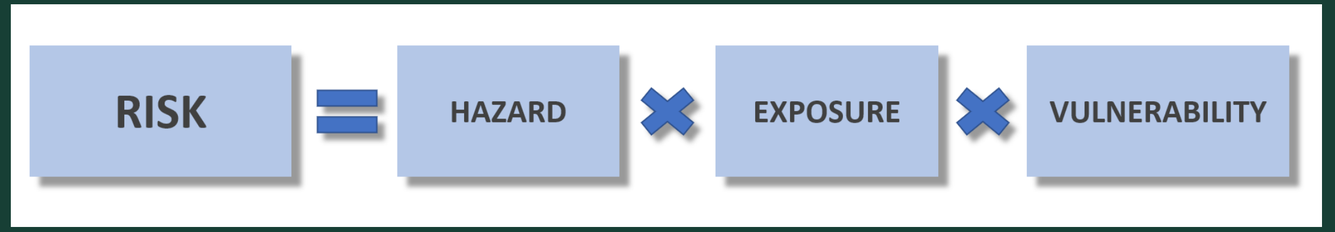
Evaluate Resilience Measures

Do resilience approaches help achieve, maintain quantifiable performance and objectives in the face of Physical Climate Risk?

Risk Avoidance, Retention, Transfer or Mitigation

Reducing Disaster Risk

- Human component to all disasters, which can be evaluated and effectively managed
- Resilience measures reduce the vulnerability/ susceptibility to extreme weather and climate change and lowers risk
- Risk mitigation measures ideally cost less to implement than the return over a defined timeline - financial, or regulatory, or KPI



The Food System

Climate change is significantly impacting agriculture, leading to more extreme weather events like droughts, floods, and heatwaves

Resilience building needs to be across the entire system

Horticultural Resilience - Hail netting

Extreme hailstones (> 5cm) are becoming more common in the Mediterranean & Southern Europe

In Gironde, at least 10,000 hectares of vines lost more than 30% of their crop in 2022, with some areas suffering losses exceeding 70%, according to The Drinks Business.

Vineyard hail netting can reduce the loss of grapes during a hailstorm by 78% compared to a vineyard with no hail protection [EyouAgro, 2024]

Drought Insurance

Parametric insurance products can support climate-vulnerable communities facing food insecurity, such as in Sub-Saharan Africa

Indices are developed using historical monitoring of soil and crop conditions from space

Finance is typically supplied to a humanitarian aid organisation, or government within days to weeks

Agricultural Resilience

Products are designed to unlock financial assistance quickly, which enables communities to invest in future crops

Risk transfer coverage for a 1 in 20-year drought situation can be provided at a favourable rate

Insurance is an efficient mechanism for protection when no viable risk mitigation or avoidance is possible

Crop resilience – Nature Based Solutions

Flood management solutions, when effectively implemented, can help build agricultural resilience

Nature-based solutions, such as woodland plantations and restoring natural ecosystems, can limit run-off and leaching from soils

Cover crops can also be effective for flood alleviation on sloped terrains

Reductions in flooding can help protect soils, improve crop performance, and maintain more stable farming incomes

Protecting Soils/ Carbon Offsetting Projects

Maintaining soil carbon and health can help improve crop performance for future generations

Carbon offsetting projects can also be financed through private investment, however, there are potential reputational and liability risks associated with these activities

Howden can help assess carbon offsetting projects and provide financial protections to de-risk these activities and insure against extreme weather events that may cause them to become ineffective

Climate risk assessments can also be undertaken to assess their ongoing cost effectiveness

Greenhouses/ Polytunnels

Outdoor constructions such as greenhouses and polytunnels are vulnerable to extreme weather events such as wind gusts and hailstorms, but also overheating

Risks associated with construction can be transferred; but resilience measures such as materials and engineering design/ retrofitting can lower premiums

Climate risk assessments and storyline scenarios can help advise owners, investors and agricultural teams on material risks.

These analytics can help quantify the return on investment for resilience measures.

Questions?

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Networking Break

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Research Digest - “fireside chat” with researchers

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Effects of extreme weather and future climate on crop diseases

Jon West
Principal Research Scientist
Rothamsted Research

Effects of extreme weather and future climate on crop diseases

Jon West, Rothamsted Research

Climate change forecast for the UK

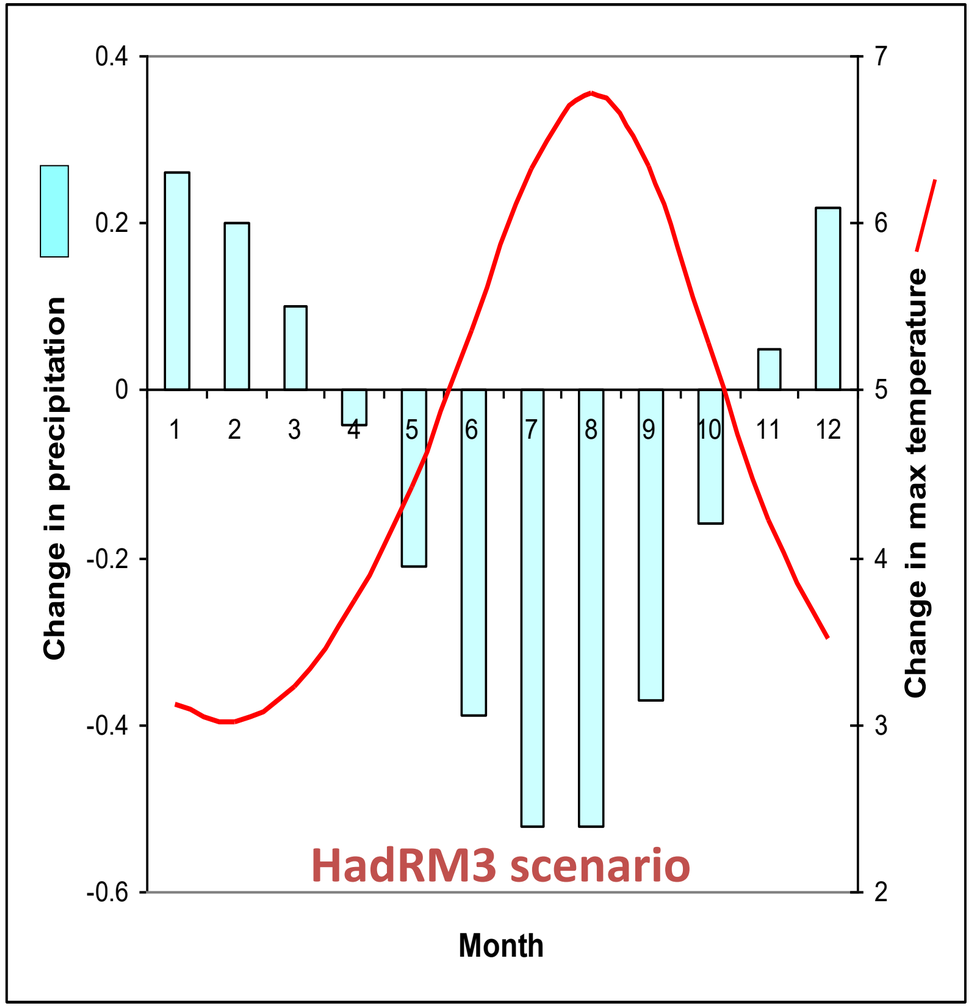
Wetter winters

Much drier summers

Warmer

+3 in winter

+6 in summer



Impact on Crop Diseases

- Disfunction of some host resistance genes
- Inability to spray on wet land
- The amount of pathogen (inoculum survival might increase or decrease, increased number of reproductive cycles)
- New or more sporadic diseases
- Milder winters will advance crop growth and disease epidemics with more survival of pathogens. So T0 sprays and resistant varieties could increase in importance
- More insect activity will increase virus and phytoplasma diseases

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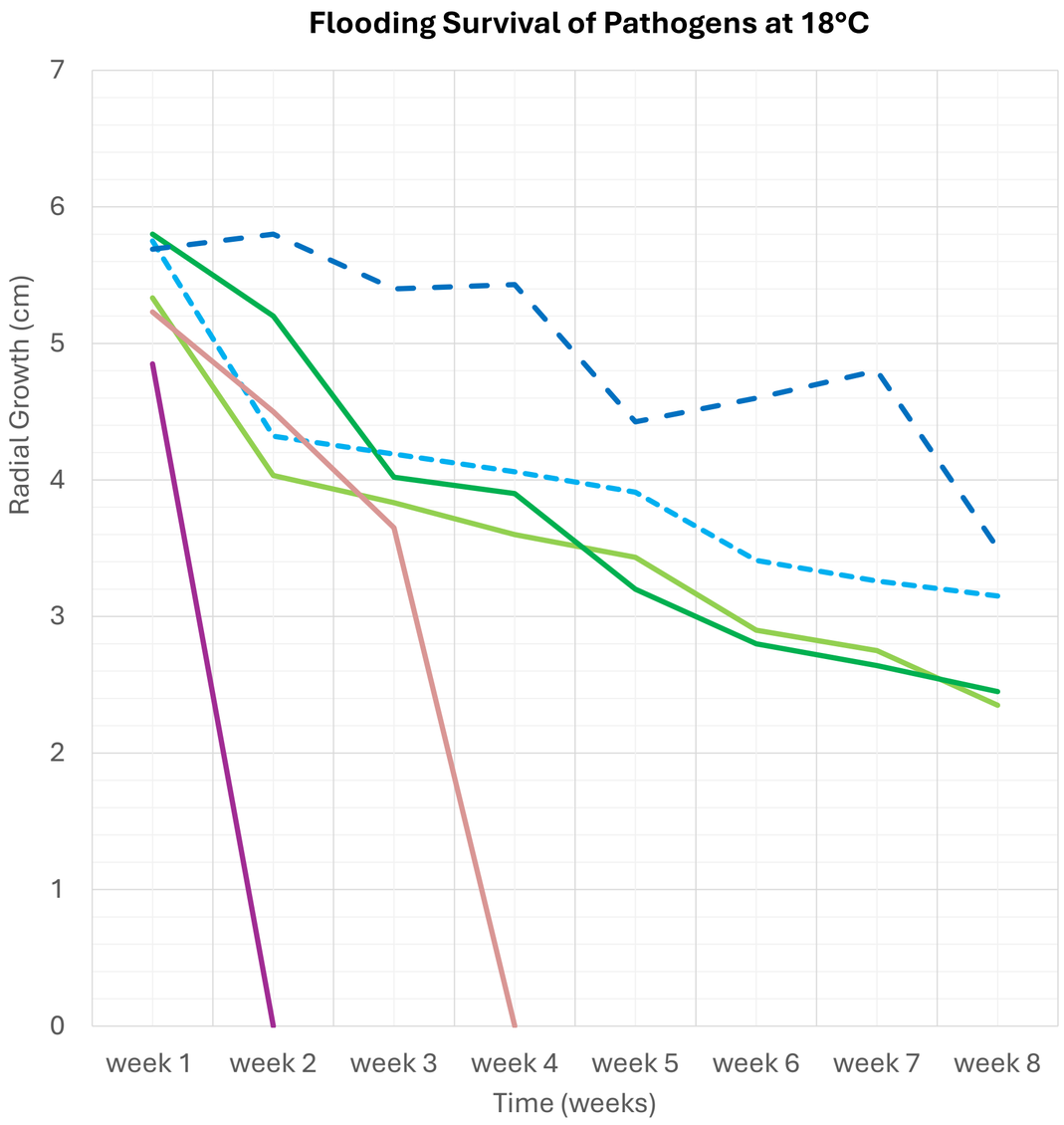
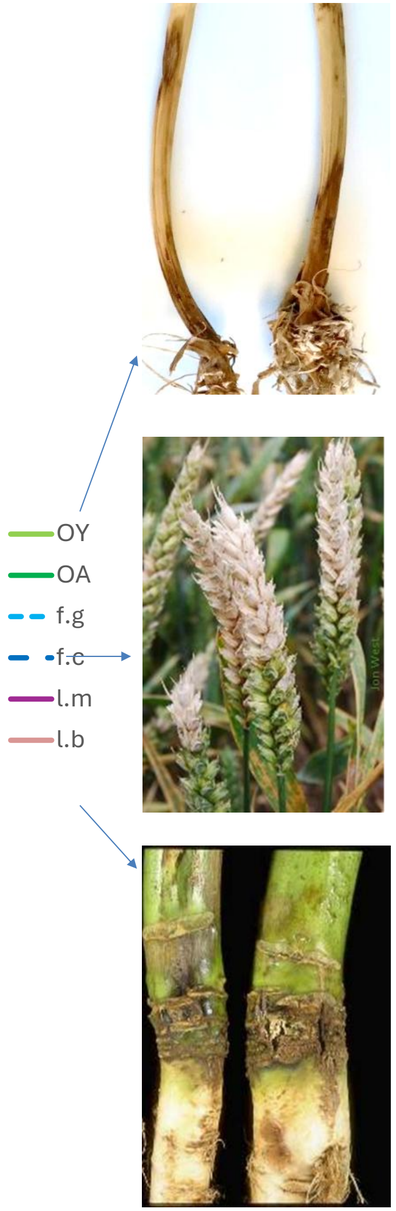
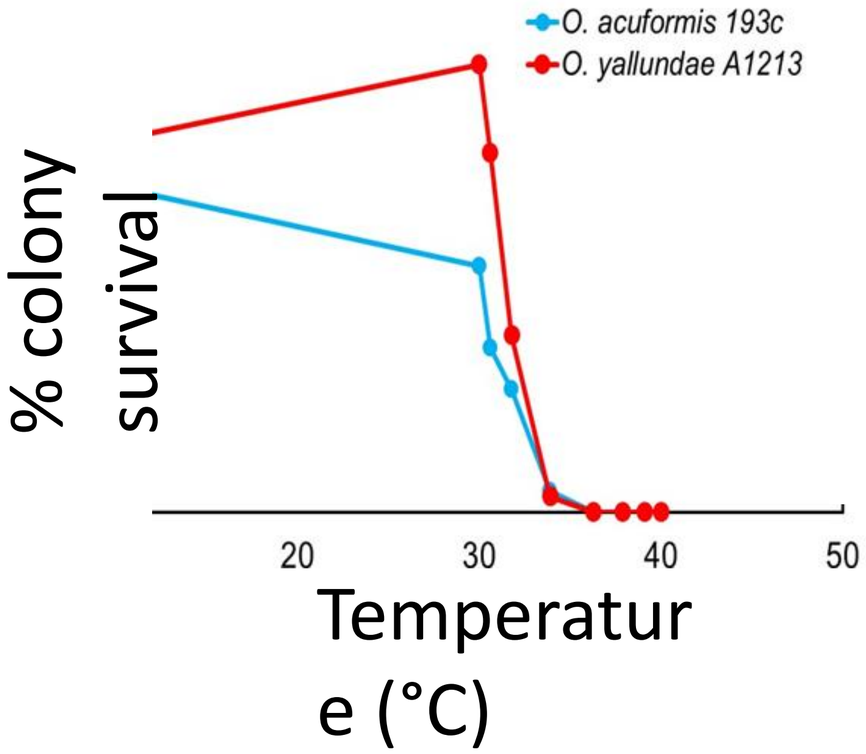
ROTHAMSTED RESEARCH





Effect of 6 hour high temperature exposure on survival of mycelium



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Predictions based on ecological traits (dispersal, infection requirements, epidemic type)

ROTHAMSTED RESEARCH

Disease type	Prediction
Winter-spring foliar-infecting polycyclic rain-splashed fungus e.g. *Mycosphaerella graminicola*	Slight increase (with a few exceptions – e.g. cool-preferring *P. brassicae*)
Dry air-dispersed polycyclic foliar fungus e.g. *Puccinia triticina*	Sporadic – capacity for more severe and less severe seasons
Upper leaf and ear/flower infecting fungus *e.g. Fusarium* spp	Little change except an increased or increased risk for *F. graminearum*, flag smut karnal bunt and *Ramularia*
Monocyclic root and stem-infecting fungus (above-ground autumn-winter infection) *e.g. Leptosphearia maculans*	Increase in severity and yield loss per unit of disease
As above (above-ground spring infection) *e.g. Sclerotinia sclerotiorum*	On average, little change in incidence or severity, possible increase in yield loss per unit of disease
As above (root infecting) *e.g. Verticilium*	Varied/unknown response w.r.t. disease severity, probable increase in yield loss per unit of disease
Insect vectored virus e.g. BYDV	increase
Soil-borne virus e.g. wheat soilborne mosaic	Little change – depending on rainfall at location
Phytoplasma (insect vectored) e.g. Aster yellows	increase

West et al (2012) Eur J. Plant Pathol. 133: 315–331

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Tackling climate-driven resurgence of a forgotten foe

Diane Saunders,
Project Leader, Crop Genetics
John Innes Centre

Tackling climate-driven resurgence of a forgotten foe

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John Innes Centre

Scientists fear resurgence of devastating wheat disease in Britain & Europe

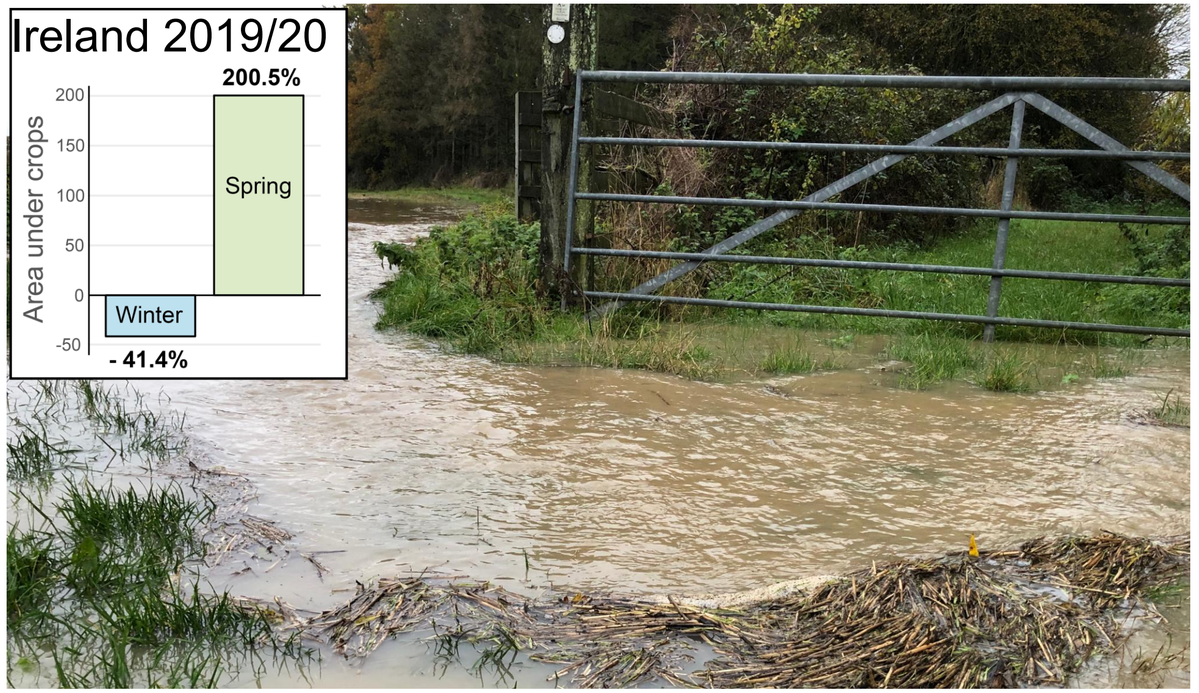
REUTERS

2022: First large-scale stem rust outbreak in UK in recent history

Wheat stem rust

Climatic and environmental risk factors for wheat stem rust infection

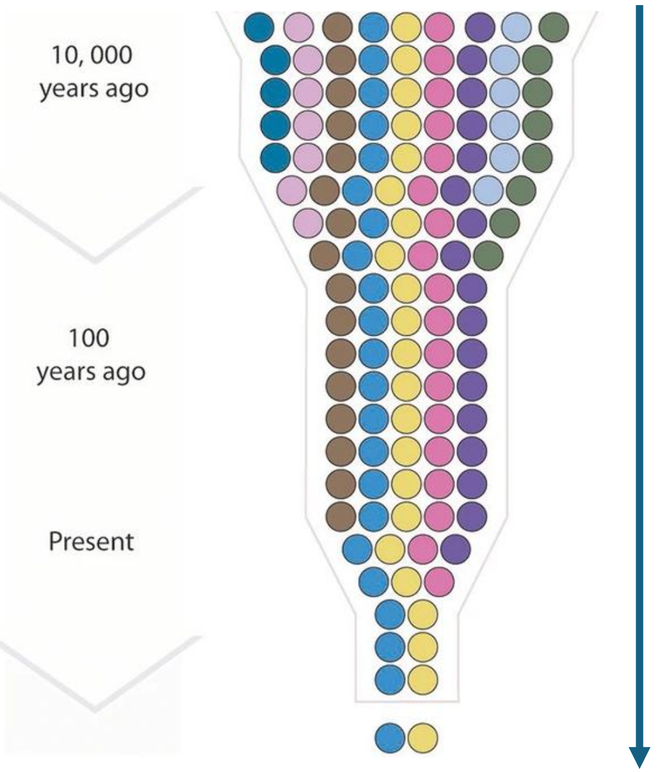
Saharan dust clouds
facilitates influx of rust spores



Increased spring planting
Greater infection risk

With 96% of UK wheat varieties susceptible to stem rust infection we need new sources of resistance

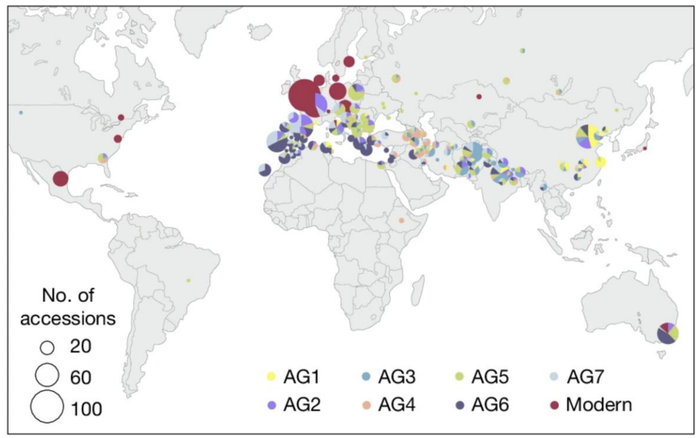
Utilizing “lost” genetic variation to safeguard future wheat production

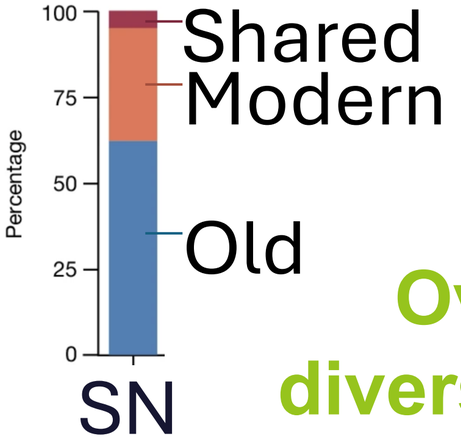


Modern British wheat varieties

Severe reduction in wheat diversity

Sequence 827 old and 208 modern wheat varieties

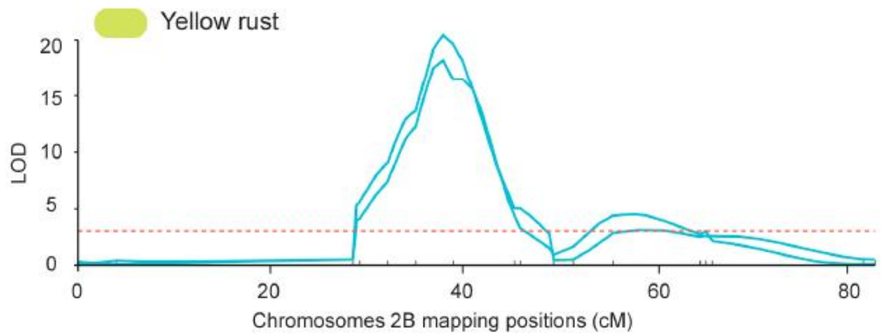




Shifeng Cheng

Simon Griffiths

Over 60% of diversity untapped



33 accessions with ‘Warrior’ YR resistance

Thousands of genetic effects identified that are useful for UK wheat breeding!

Cheng et al., 2024. Nature 632, 823-831.

Genetic approaches to improve crop water-use efficiency

Graham Dow
Group Leader
NIAB

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Win-win-wins: Practices for climate change mitigation, resilience and profitability

Toby Townsend
Senior Climate and Sustainability Consultant
ADAS

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Thank You!

Keep in touch!