

Tacking a formidable foe: the fightback against a forgotten enemy in Western Europe

Wheat stem rust (part 1)

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2013: First record of wheat stem rust in UK for > 60 years!

Fears raised over stem rust risk to UK wheat crop

VINCE BAMFORD · 13 FEBRUARY, 2018

BritishBAKER

Steven Kildea
@kildea1

Over the last few days we have detected stem rust in some of our fungicide untreated winter wheat plots. Not one that I have ever seen in the field until now. 2020 is definitely a strange year - photo courtesy @FionaBHutton



TTTTF, a kind of stem rust, damages tens of thousands hectares of crops in Sicily

NEW Food

NATURE | NEWS

Deadly new wheat disease threatens Europe's crops

Researchers caution that stem rust may have returned to world's largest wheat-producing region.

Shaoni Bhattacharya

02 February 2017

Sicilian stem rust strain cause for concern

03 Feb 2017 Share Categories: Frontdesk / Arable

 FarmingOnline

BIG STORY 10 FEBRUARY 8, 2018 / 10:04 AM / UPDATED 4 YEARS AGO

Scientists fear resurgence of devastating wheat disease in Britain & Europe

By Thin Lei Win, Thomson Reuters Foundation

 **REUTERS**

News > UK > Home News

Wheat rust: The fungal disease that threatens to destroy the world crop

Experts in Europe and Africa are racing to develop resistant grain varieties as university researchers predict the likely spread across continents of the air-borne spores of the fungus

Christy Chamy | Saturday 19 April 2014 23:01 BST | 0 comments

Stem rust attacks in Sweden heralds the return of a previously vanquished foe

PUBLISHED: 01 NOVEMBER 2017

News > UK > Home News

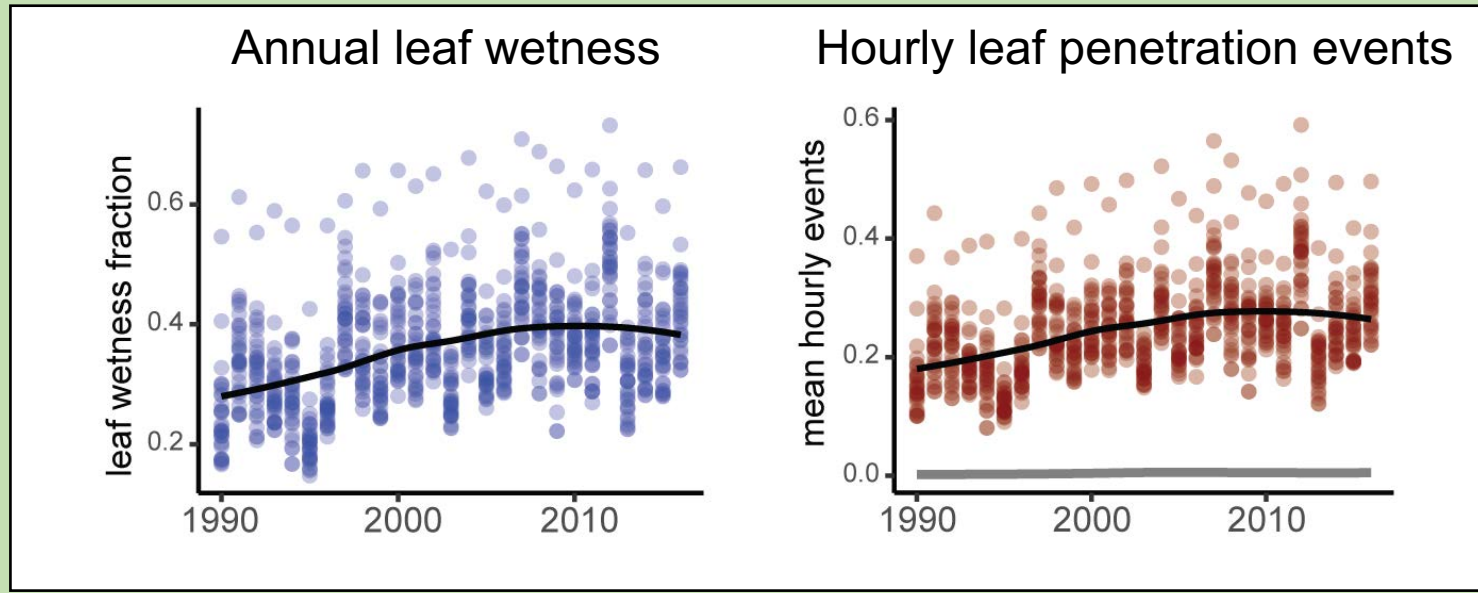
Wheat rust: The fungal disease that threatens to destroy the world crop

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 **INDEPENDENT**

2020/21: Stem rust recorded in Ireland and UK



Environmental conditions have become more conducive to support stem rust infection over past 25 years

2020: Stem rust - 5 trial sites Ireland

2021: Stem rust - multiple sites in Suffolk

Photo: Steven Kildea, Teagasc

Photo: Clare Lewis, JIC

Lewis et al. & **Saunders**, 2018. Communications Biology 1:13; **Saunders et al.**, 2019. Comms. Bio. 2:51; Tsushima et al. & **Saunders** 2022. Plant Path.

Why have no wheat stem rust epidemics been recorded in the UK since 1955?

Breeding



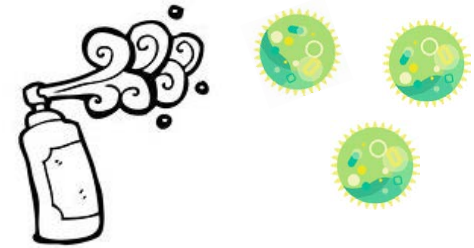
Earlier maturing varieties
& resistance reduce infection

Barberry removal



Inhibits sexual reproduction &
overwintering in cooler climates

Modern Fungicides



Good levels of control

Plant breeders

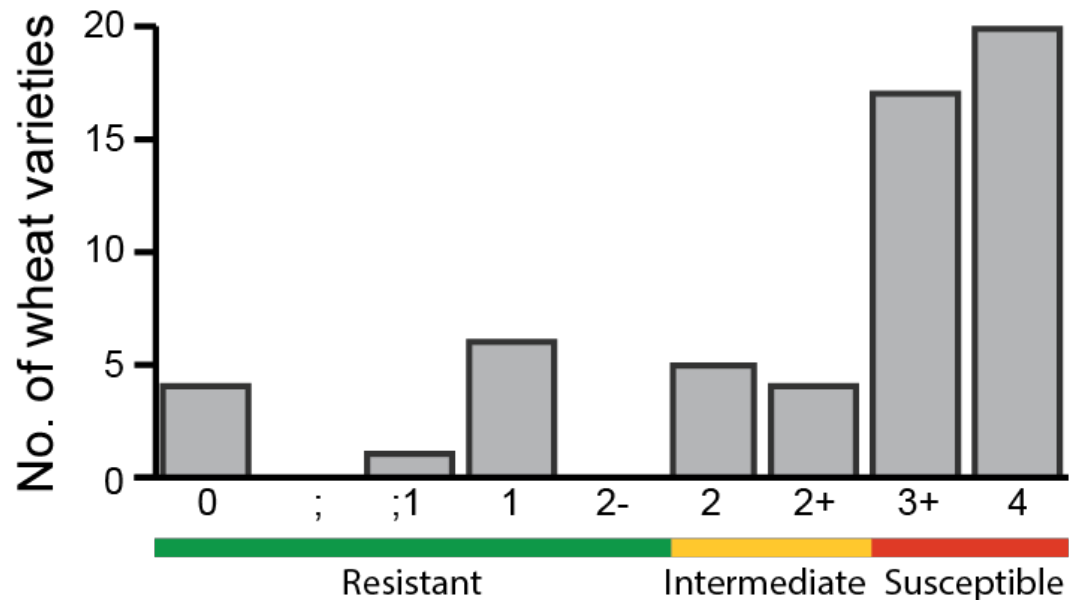
Ag-Chem companies

Pathologists

Policy makers

UK wheat varieties are highly susceptible to stem rust

Seedling glasshouse tests



>80% of 43 UK varieties tested were susceptible

Jane Thomas, NIAB

Adult plant tests – South Africa



ALL 58 UK varieties were classed susceptible in field trials (2018 – 2020)

Willem Boshoff, Uni. Free State

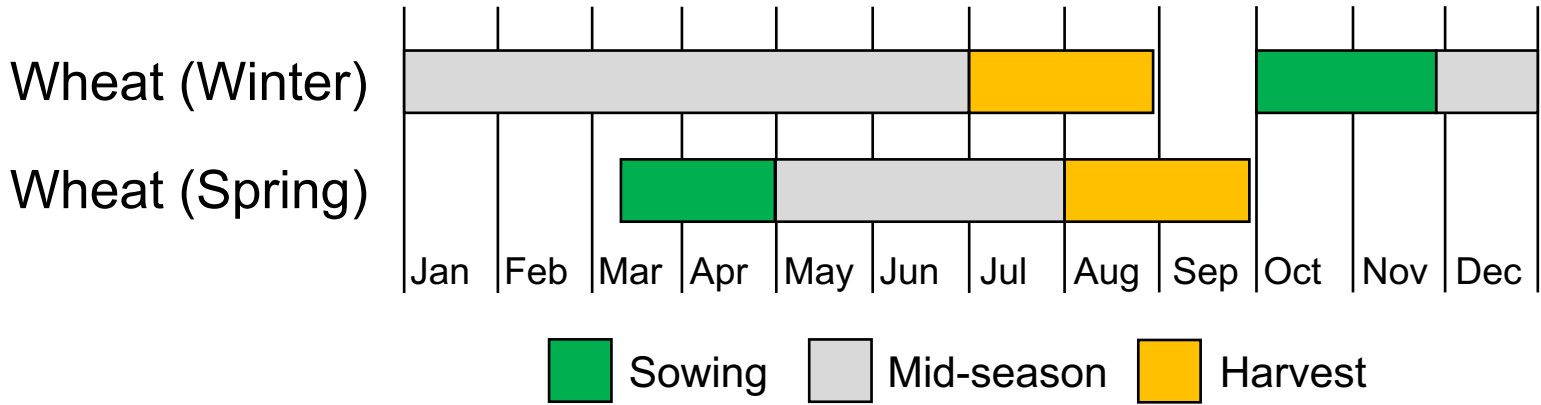
Climate instability could threaten the protection afforded by early maturity

Ireland

Table 1 Area under Crops

Description	June 2018	June 2019	June 2020	Change 2019 - 2020	
	' 000 hectares			' 000 hectares	%
Wheat - total	58.0	63.5	46.4	-17.1	-26.9
Winter wheat	54.4	59.7	35.0	-24.7	-41.4
Spring wheat	3.6	3.8	11.4	7.6	200.5

Central Statistics Office



USDA

Increased spring planting could enhance incidences of warm temperature diseases

Autumn 2019

What about the role of the alternate host?

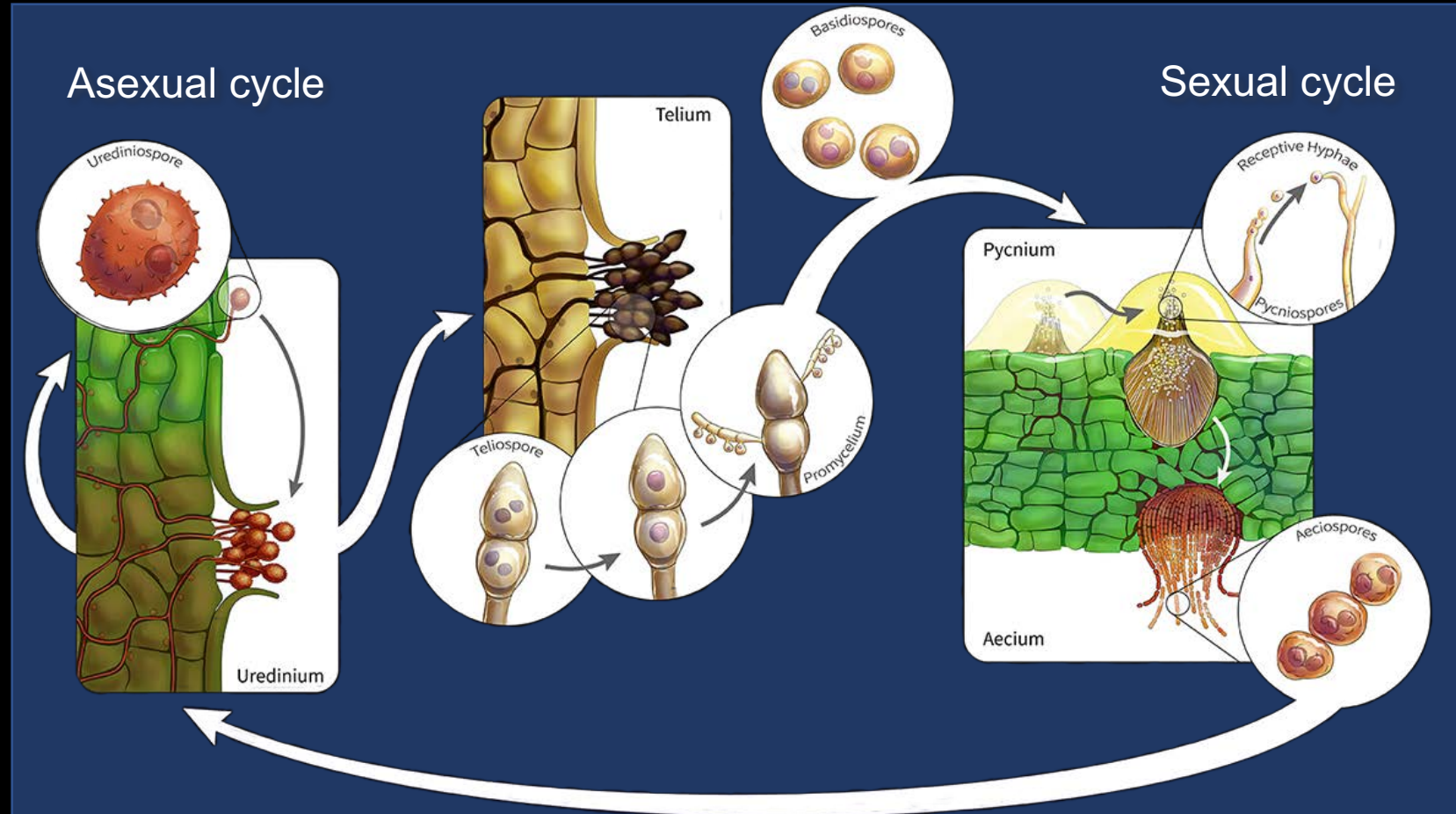


Common barberry
(*Berberis vulgaris*)

The complexity of the wheat rust infection cycle



Wheat



Common barberry
(*Berberis vulgaris*)

Five different spore stages and two different hosts!

Sources of stem rust inoculum

In-country inoculum
Aeciospores
on *Berberis* spp.

Inoculum from overseas
Urediniospores



Suffolk UK, August 2019



Elizabeth
Orton

Orton et al. & Saunders, 2019. New Disease Reports 40, 11.

Stem rust on barley