



# OREGIN – pathogen collection and disease resistance

University of Hertfordshire

OREGIN stakeholder Meeting, Warwick Crop Centre  
(Theme: Oilseed genetic improvement: the next 10 years)

16 Oct 2023



# OREGIN project - UH

## WP2.1 pathogen collection

### Phoma stem canker pathogens

- *L. maculans* Isolates (68 new isolates from 8 countries)
- *L. biglobosa* Isolates (18 new isolates from three countries)

### Light leaf spot pathogen

*Pyrenopeziza brassicae* isolates

## WP4.1: OREGIN field Expt phenotype for disease resistance - UH, RRes & NIAB

Phoma stem canker and light leaf spot resistance in OREGIN 2022/2023 field expt

# OREGIN field expt phenotype for disease resistance - UH, RRes & NIAB

## Phoma stem canker



## Light leaf spot



ROTHAMSTED  
RESEARCH

University of  
Hertfordshire **UH**

# **OREGIN field expt phenotype for disease resistance - UH, RRes & NIAB**

**OREGIN 2022/2023 field expt (33 lines) at Harlaxton in Lincolnshire**

**Light leaf spot and phoma leaf spot assessment, 13 April 2023**

**Light leaf spot and phoma stem canker assessment, 5 July 2023**



# Disease assessment team, 13 April 2023

Jon West (Rothamsted)

Yongju Huang (UH)

Tom Wood (NIAB)

Huw Davis (NIAB)





**Field experiment well established, 13 April 2023**





13 April 2023

# Severe light leaf spot symptoms



# Severe phoma stem canker symptoms

13 April 2023



Parkside



13 April 2023

## Severe leaf scorch damage





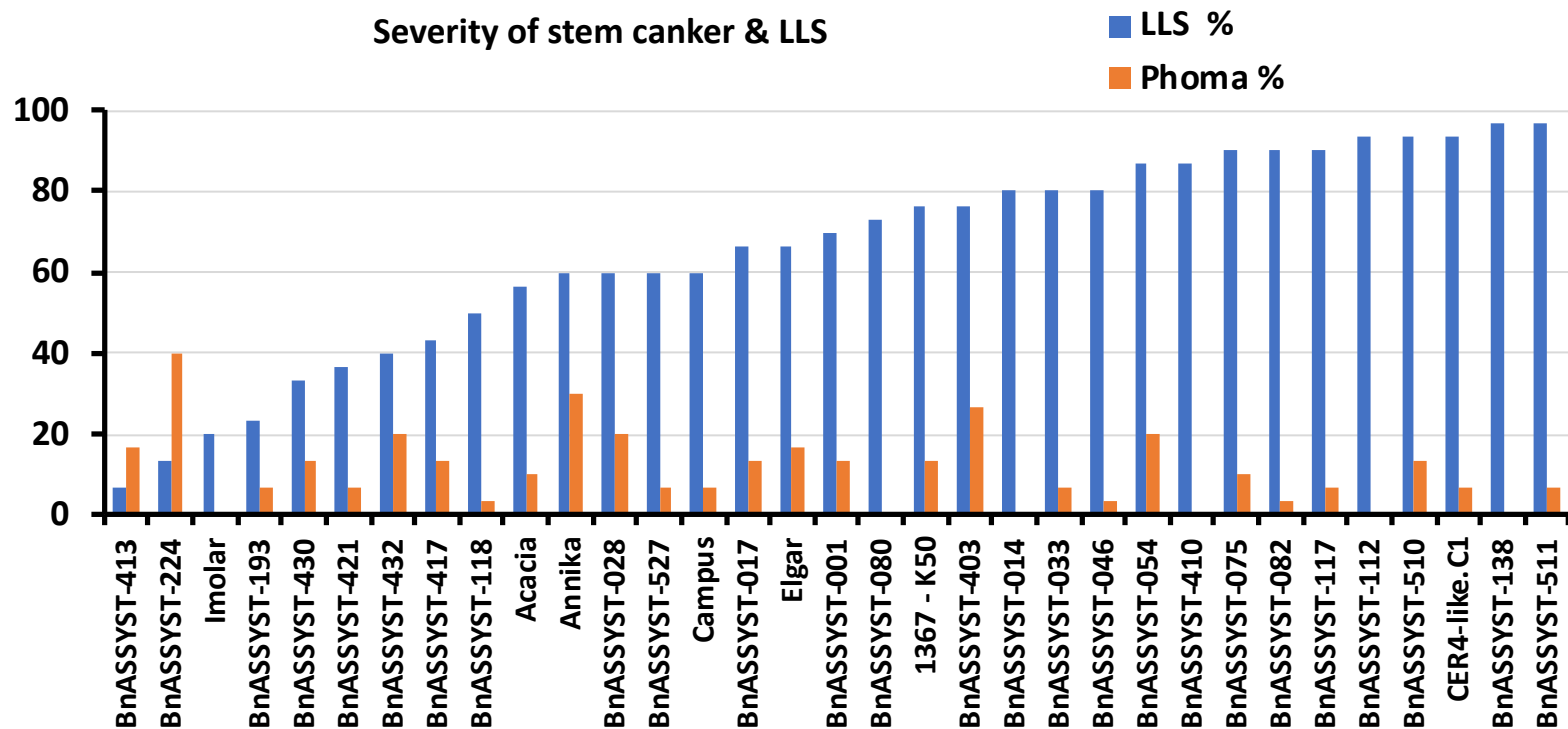
13 April 2023

## Severe leaf scotch damage

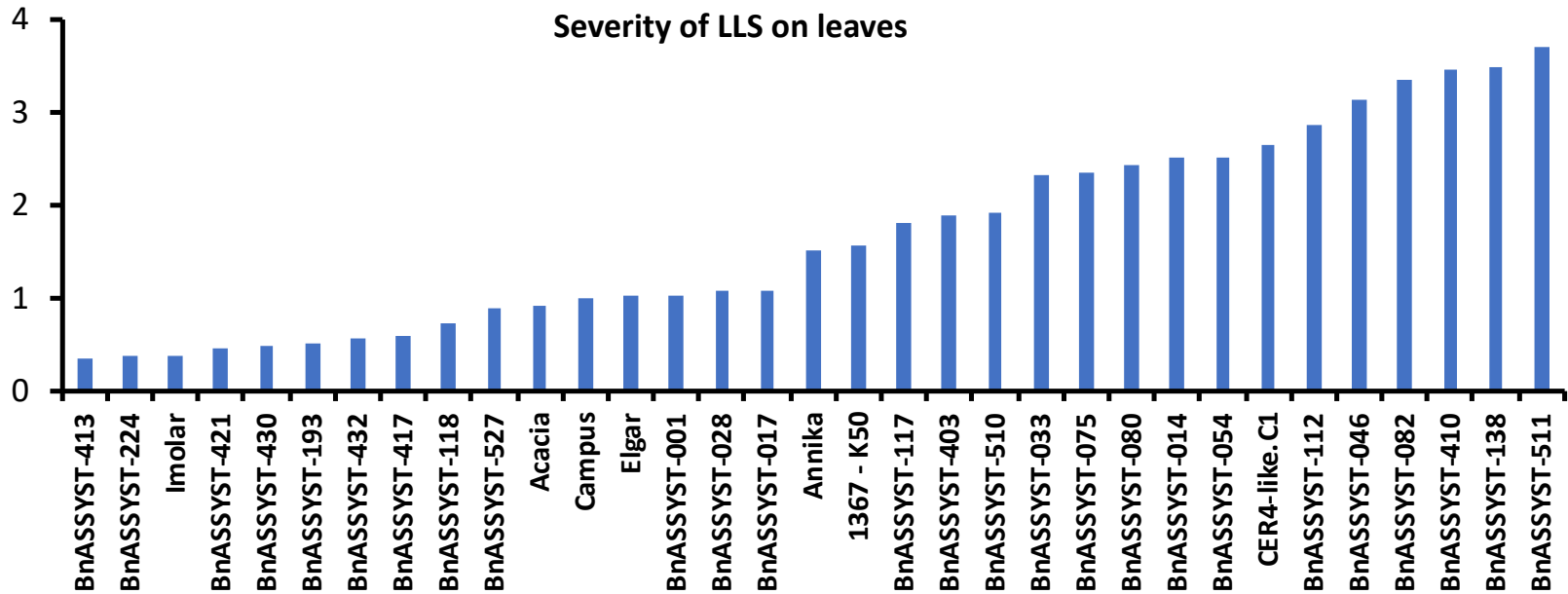




# Phoma leaf spot & light leaf spot (LLS) incidence on different cultivars/lines, 13 April 2023



# Light leaf spot severity on different cultivars/lines, 13 April 2023



LLS severity score at 0-7 scale

Severe phoma leaf spot was <1 on most lines

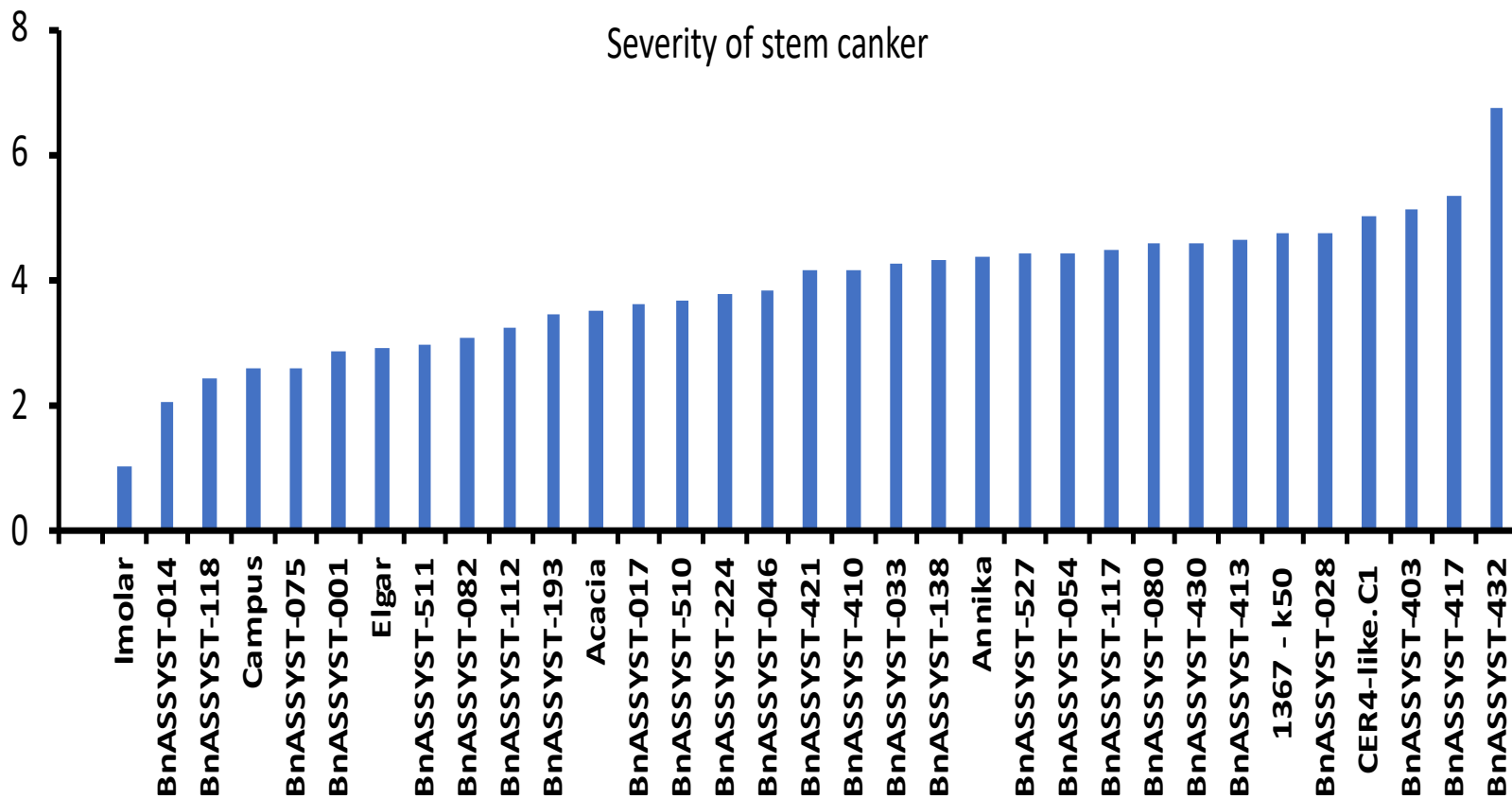


# Disease assessment team, 5 July 2023

Jon West (Rothamsted)  
Yongju Huang (UH)  
Tom Wood (NIAB)  
Huw Davis (NIAB)  
Irfan Ali (UH)

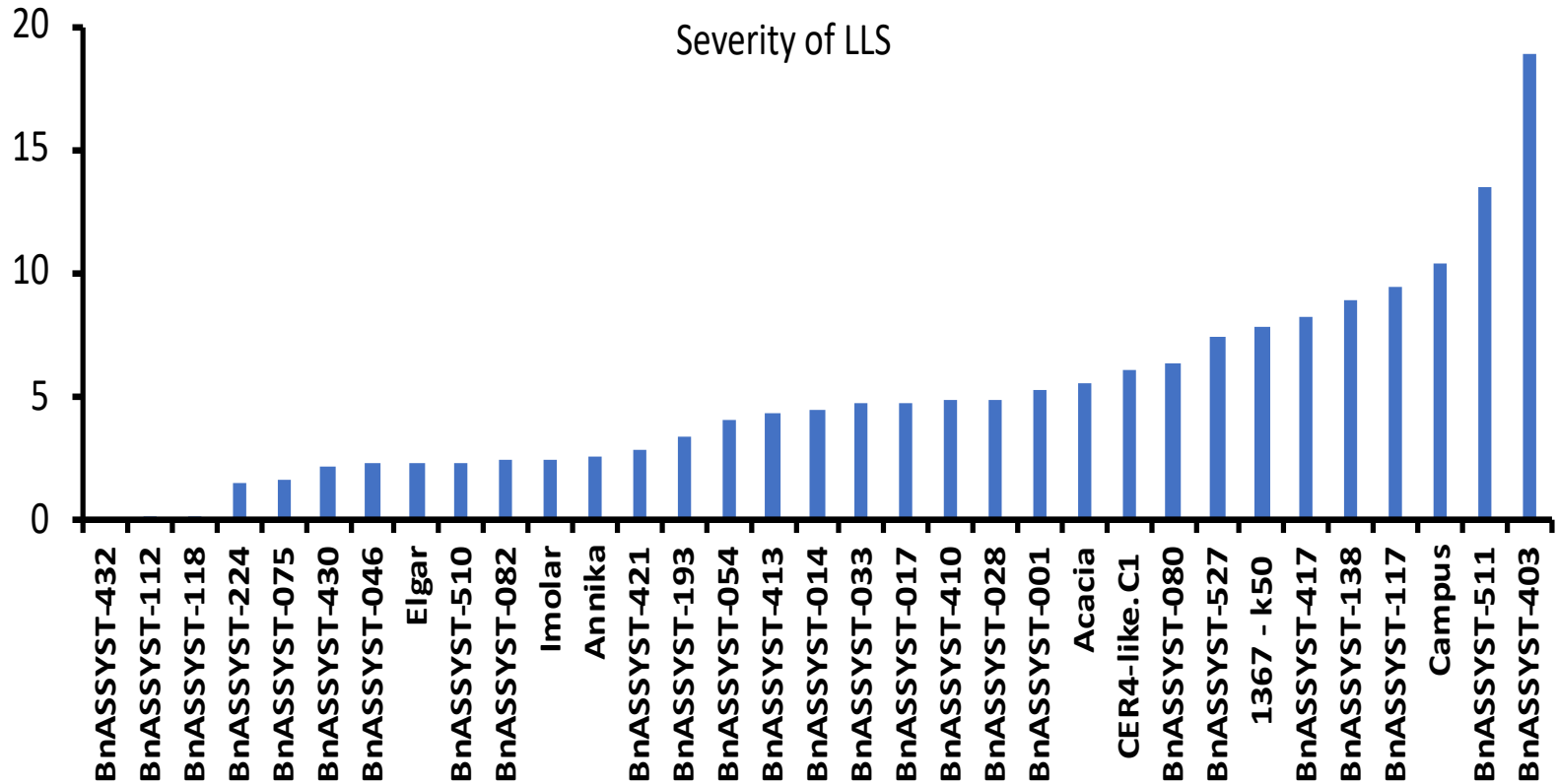


# Severity of phoma stem canker on different cultivars/lines, 5 July 2023

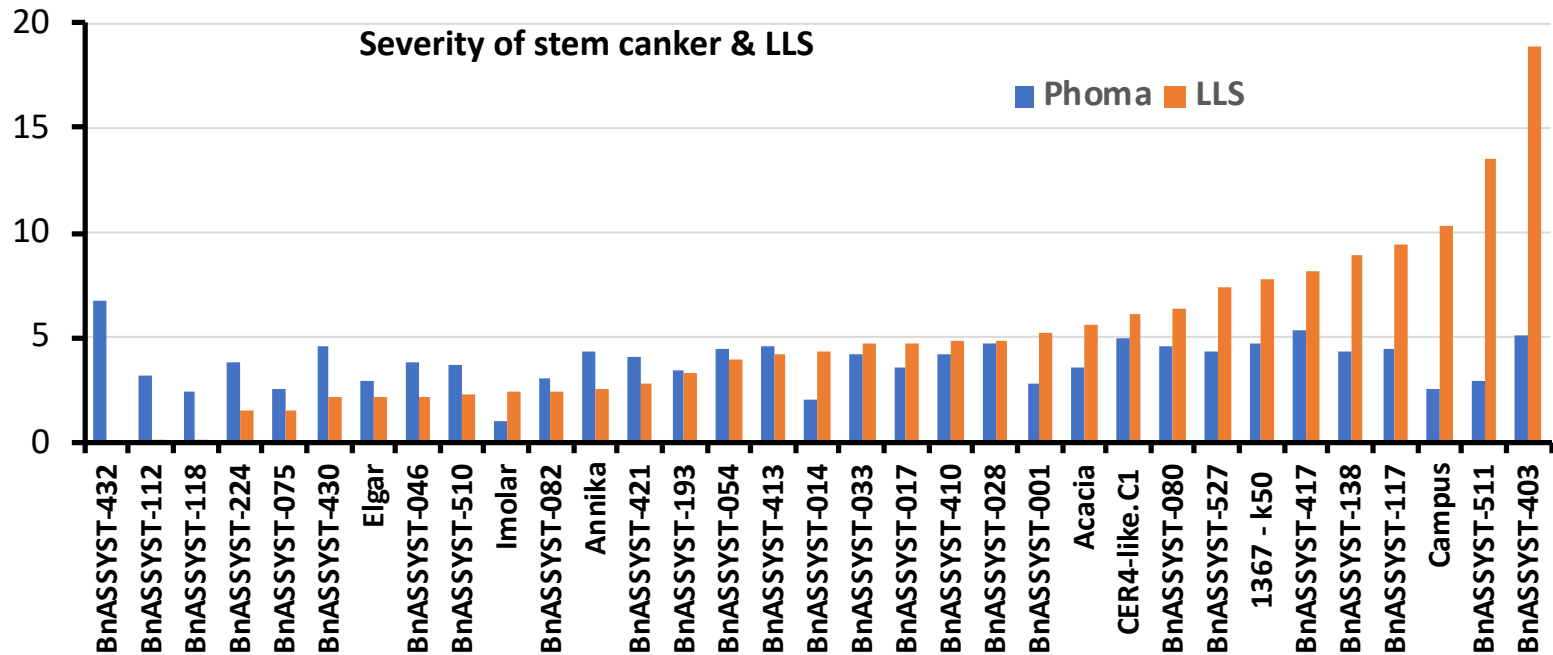




# Severity of light leaf spot on different cultivars/lines, 5 July 2023



# Severity of phoma stem canker and light leaf spot on different cultivars/lines, 5 July 2023



Severe phoma stem canker scored at 0-7 scale  
LLS scored as % of stem or pod area with LLS



**Severe LLS  
no canker**



**Severe canker  
no LLS**



## Severe LLS & canker

Cer4-like.C1



BnAssyst-033





## Good resistance to both LLS & phoma stem canker





## Other diseases



**Severity of verticillium on stems, 5  
July 2023**

**Ranged from  
3% to 60%  
among the  
33 lines**

# Information on differences in resistance to pathogens between genotypes in OREGIN diversity set can be used to improve breeding for resistance

- *Differences in resistance to phoma pathogens*
- *Differences in resistance to light leaf spot pathogen*
- *Novel sources of resistance for breeders*
- *May be interactions between pathogens*

# OREGIN website at UH



## About OREGIN

› Project outline

› Links

Information

Linkage map

Trait data

Pathogen Collection

Functional Genotypes

Contact OREGIN

## About OREGIN

### Welcome to OREGIN

Providing a pre-breeding pipeline, to integrate sustainability traits into Oilseed Rape cultivars.

The Oilseed Rape Genetic Improvement Network (OREGIN) has been successful in achieving initial objectives of providing a focus for the UK Oilseed Rape genetic improvement R&D and stakeholder communities, and a mechanism for prioritising research requirements.



The principal activities of the OREGIN project are the generation, gathering, collation and dissemination of information and genetic resources for the benefit of the stakeholders. Ongoing discussions amongst the R&D and breeder communities have identified the highest priority requirements in the context of Defra strategic objectives. It is recognised that other trait areas such as pest resistance may be of increasing commercial priority and affect the long-term sustainability of the crop.

The components of the OREGIN pre-breeding platform will also provide a foundation for and contribute significantly to other projects of relevance to the overall objectives of achieving improvements in sustainability through crop genetic improvement.

## Contact OREGIN

Get in touch with us and find out the latest developments

**The website is maintained and regularly updated at UH**



A vibrant field of yellow flowers, likely rapeseed, stretches across the foreground and middle ground. The flowers are in full bloom, creating a dense sea of bright yellow. In the background, a line of green trees is visible against a clear, light blue sky. The overall scene is bright and cheerful.

**Thank you**