

Recovery Plan for Wheat Blast

(caused by *Magnaporthe oryzae*
Triticum pathotype)



Contributors:

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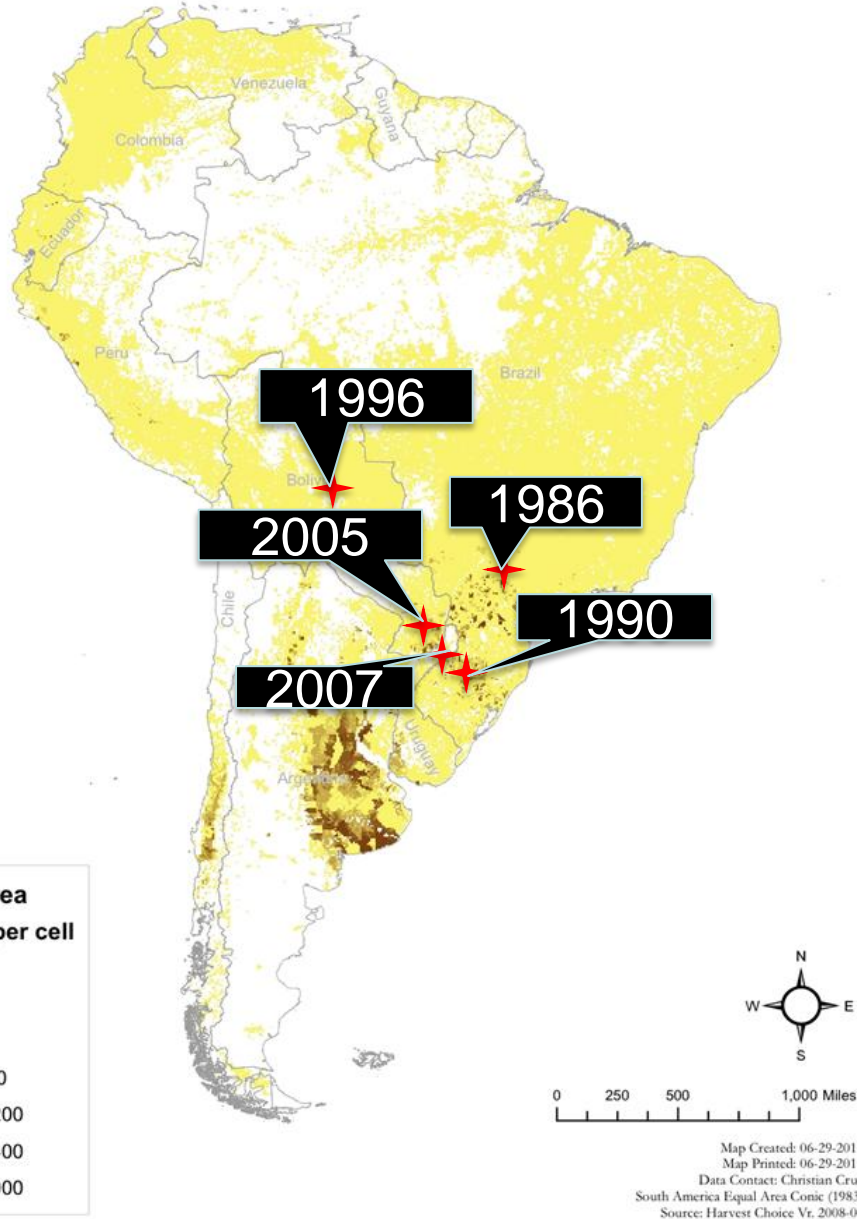
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Pierce Paul (*The Ohio State University*)

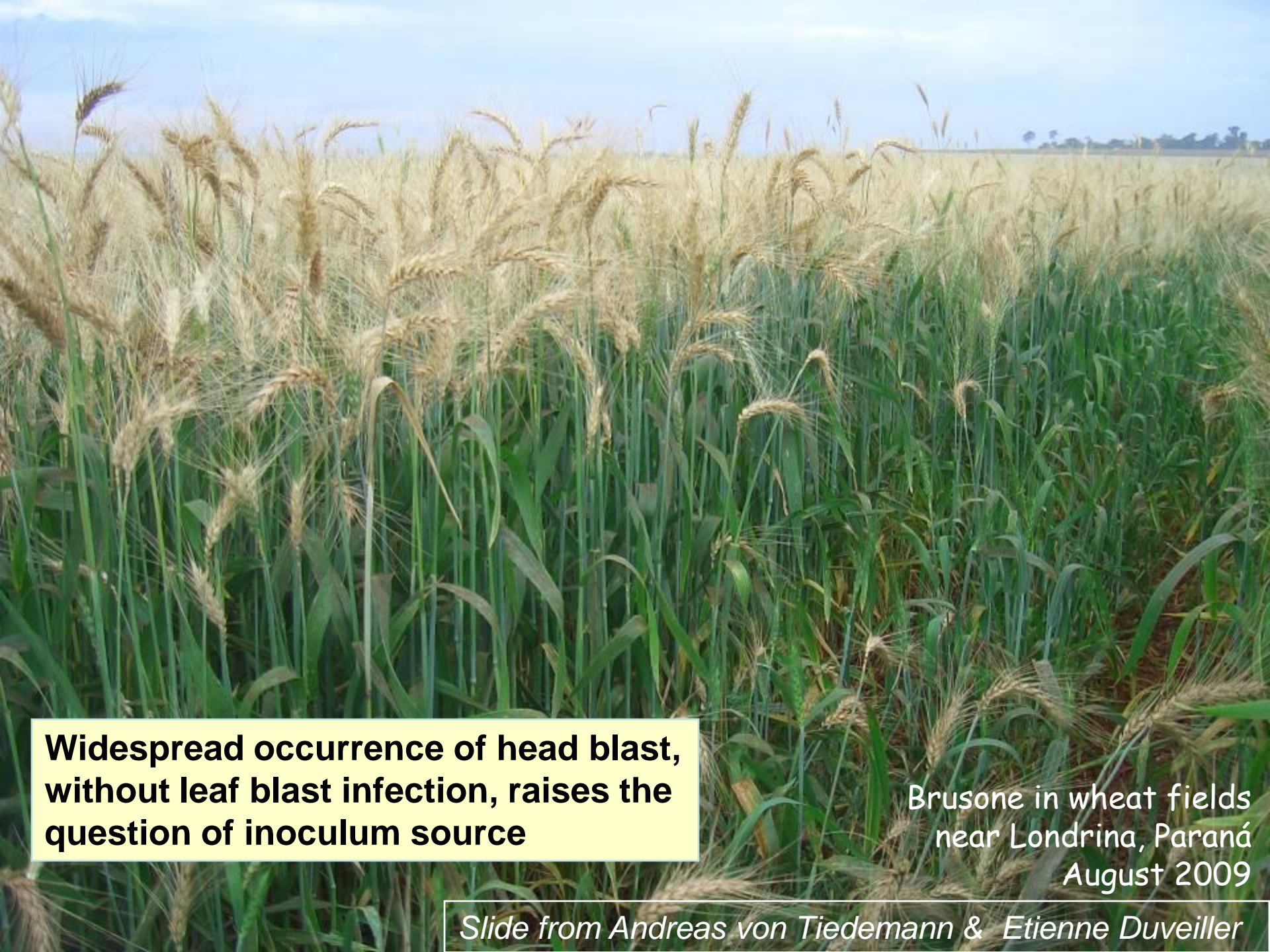
Known as 'Brusone do Trigo'

*Chair and Corresponding Author

Wheat Blast in South America



- In Brazil, Bolivia, Paraguay, and Northern Argentina
- Yield losses from 5 to 100% in individual fields
- Bad Blast outbreak in 2009 led to the 1st International Wheat Blast Workshop in Brazil (May, 2010) and establishment of the International Wheat Blast Consortium



Widespread occurrence of head blast, without leaf blast infection, raises the question of inoculum source

Brusone in wheat fields
near Londrina, Paraná
August 2009

Slide from Andreas von Tiedemann & Etienne Duveiller



Major resistance genes lacking; fungicide treatments unreliable; impact of climate change not understood

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Wheat Blast could easily be mistaken for Fusarium head blight if it appears in the US crop



Wheat blast symptoms (arrow).
From laboratory inoculations by
Gary Peterson (Ft. Detrick, MD).

- Main symptoms are bleached heads with traces of gray from blast sporulation
- With severe infection, seeds are shriveled, poorly developed
- The fungus can be transmitted through seeds

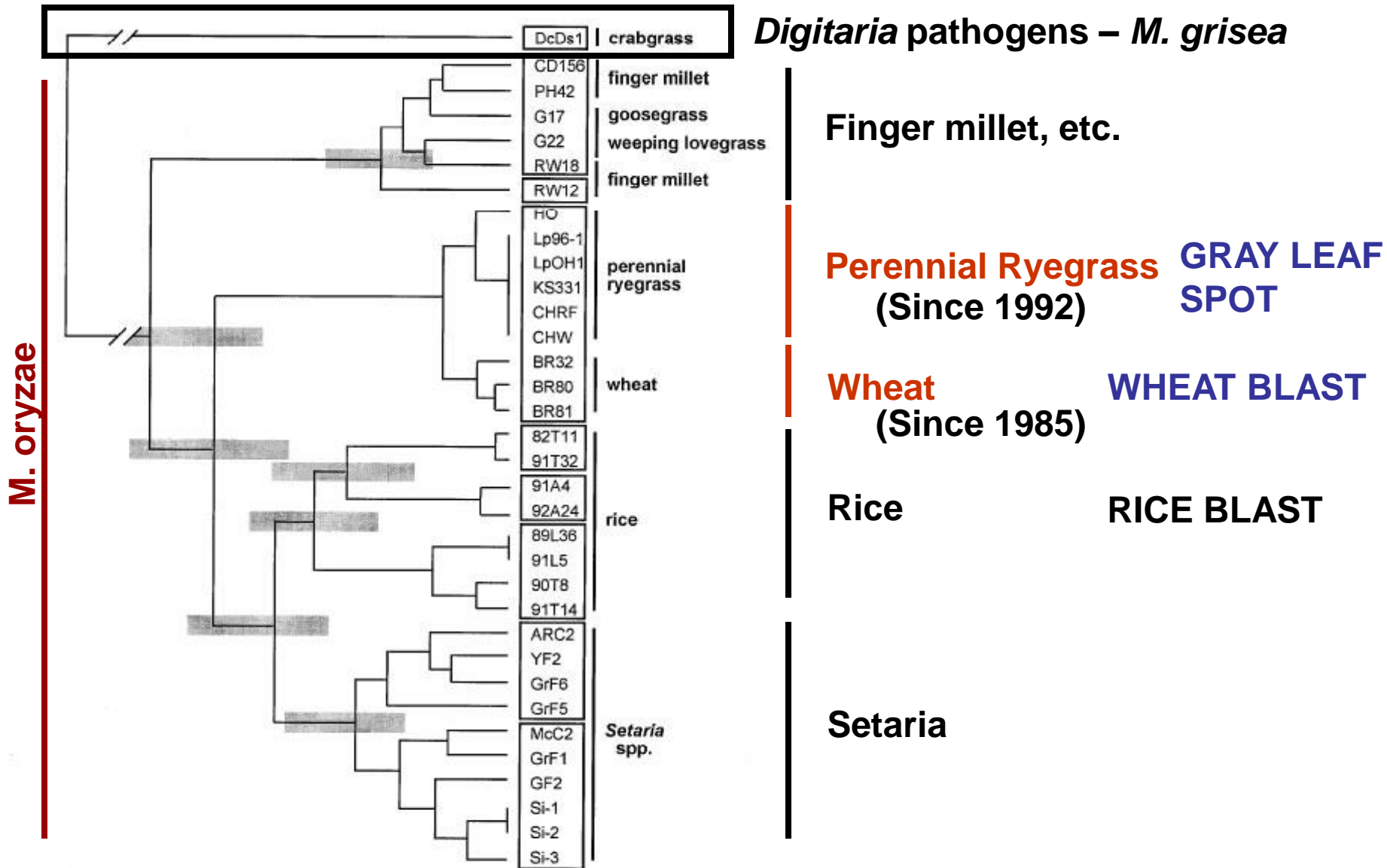


Christian Cruz and Bill Bockus, KSU.

Two potential routes to emergence of wheat blast in the U.S.

- Introduction from South American
 - **The fungus is seed-borne, increasing opportunities for spread**
- Host shift mutations in native U.S. Gray Leaf Spot turf grass pathogen strains
 - **This second route confirmed by single blasted wheat head in Kentucky**

Magnaporthe oryzae Includes Host-adapted Forms



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(LAST UPDATED APRIL 30, 2012 12:25 PM)

UK researchers find important new disease

BY KATIE PRATT

First report of wheat blast outside South America. Genome sequencing showed the fungus was a native US ryegrass strain.



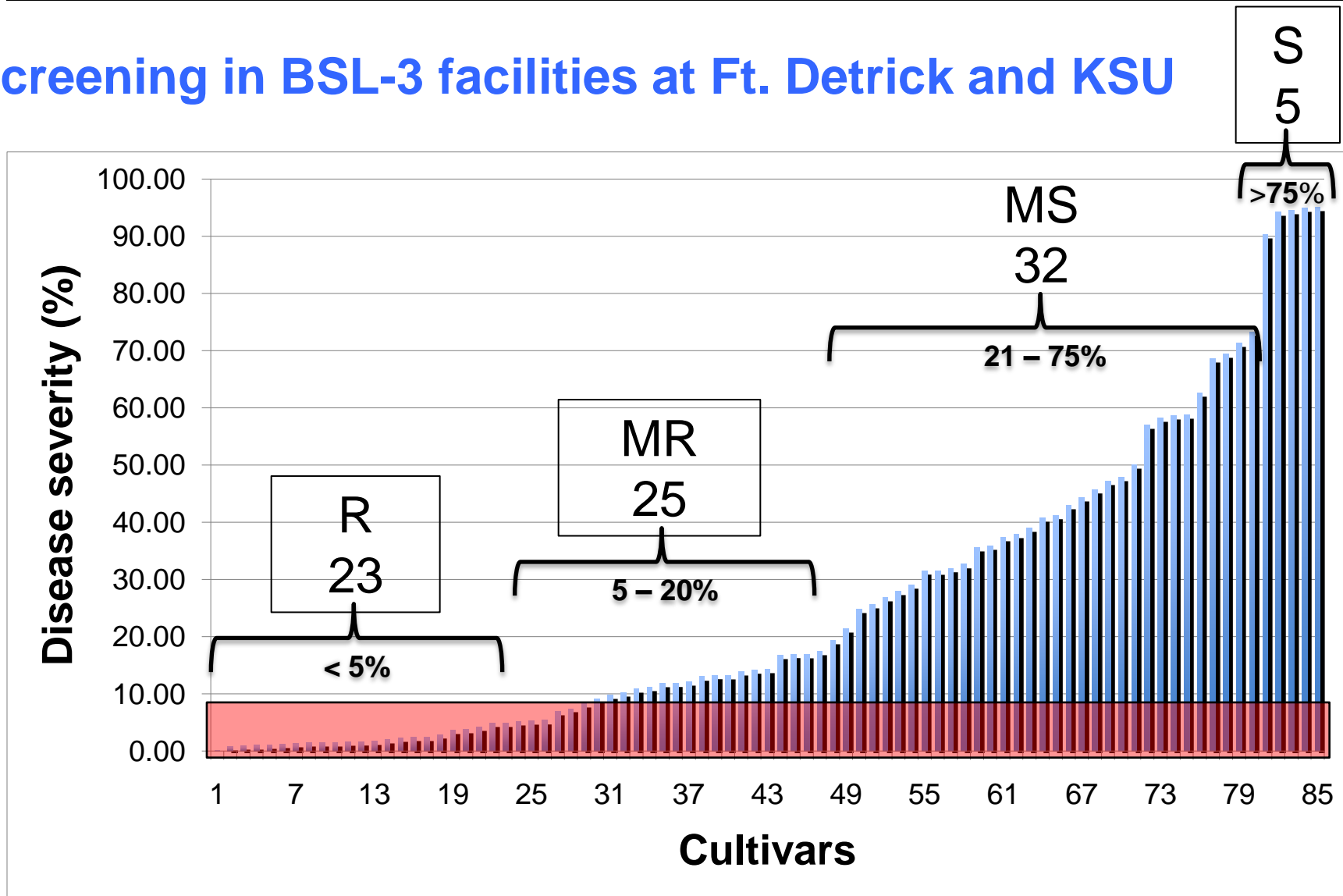
Wheat blast on the head of wheat found in Kentucky.

LEXINGTON, Ky. University of Kentucky College of Agriculture specialists are encouraging Kentucky wheat producers and crop consultants to scout their fields for a new disease that could have important implications for future crop years.

Lloyd Murdock, Don Hershman, Mark Farman, Gary Peterson

US Wheat Shows a Continuum of Reaction to Wheat Blast

Screening in BSL-3 facilities at Ft. Detrick and KSU



Field Tests in South America



First field tests completed in Bolivia and more are planned

Research Priorities:

- **Identify blast resistance in US wheat varieties through field tests in South America**
- **Molecular markers for broadly effective resistance genes**
- **PCR-based diagnostics**
- **Optimize fungicide treatments including seed treatments**
- **Understand wheat blast epidemiology**
- **Determine risk from native US ryegrass strains**
- **Wheat blast forecasting model**

Extension Priorities:

- **Train farmers and agricultural professionals to identify wheat blast**
- **Incorporate blast surveillance into ongoing wheat disease monitoring networks, perhaps into the developing ipmPIPE**
- **Educate growers and agricultural professionals about ryegrass blast and the potential threat to wheat**

Education Priorities:

- Develop and host wheat blast workshops and short courses for wheat stakeholders
- Develop and disseminate Extension publications on identification and management of wheat blast
- **Dovetail outreach efforts with NCERA-184 and WERA-97 to avoid duplication of effort and promote inter-group cooperation and activities**