Ramularia Workshop – London Standsted, UK – October 3rd and 4th , 2018

"Ramularia leaf spot in Argentina: an emerging pathogen in an emerging crop"

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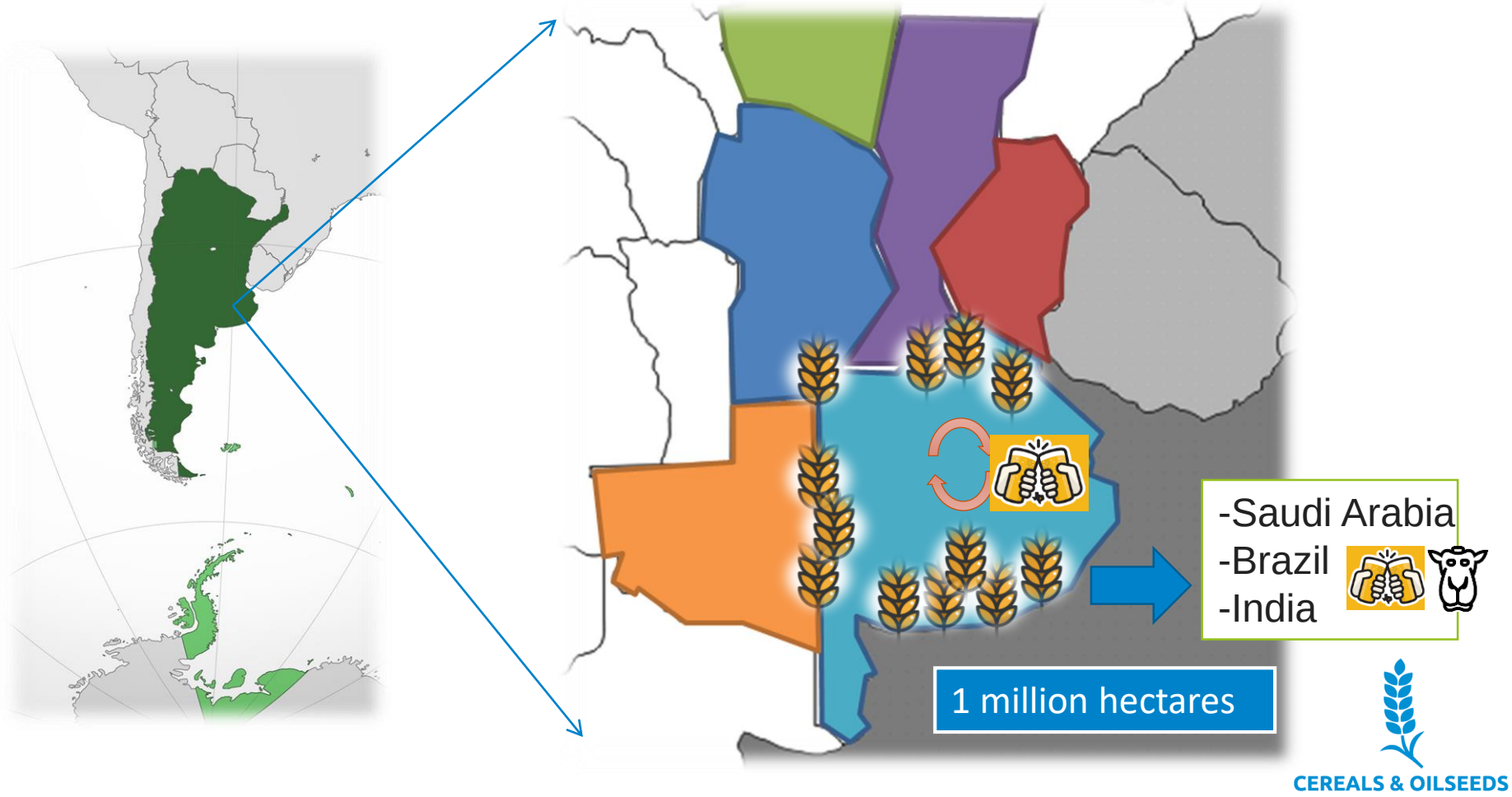
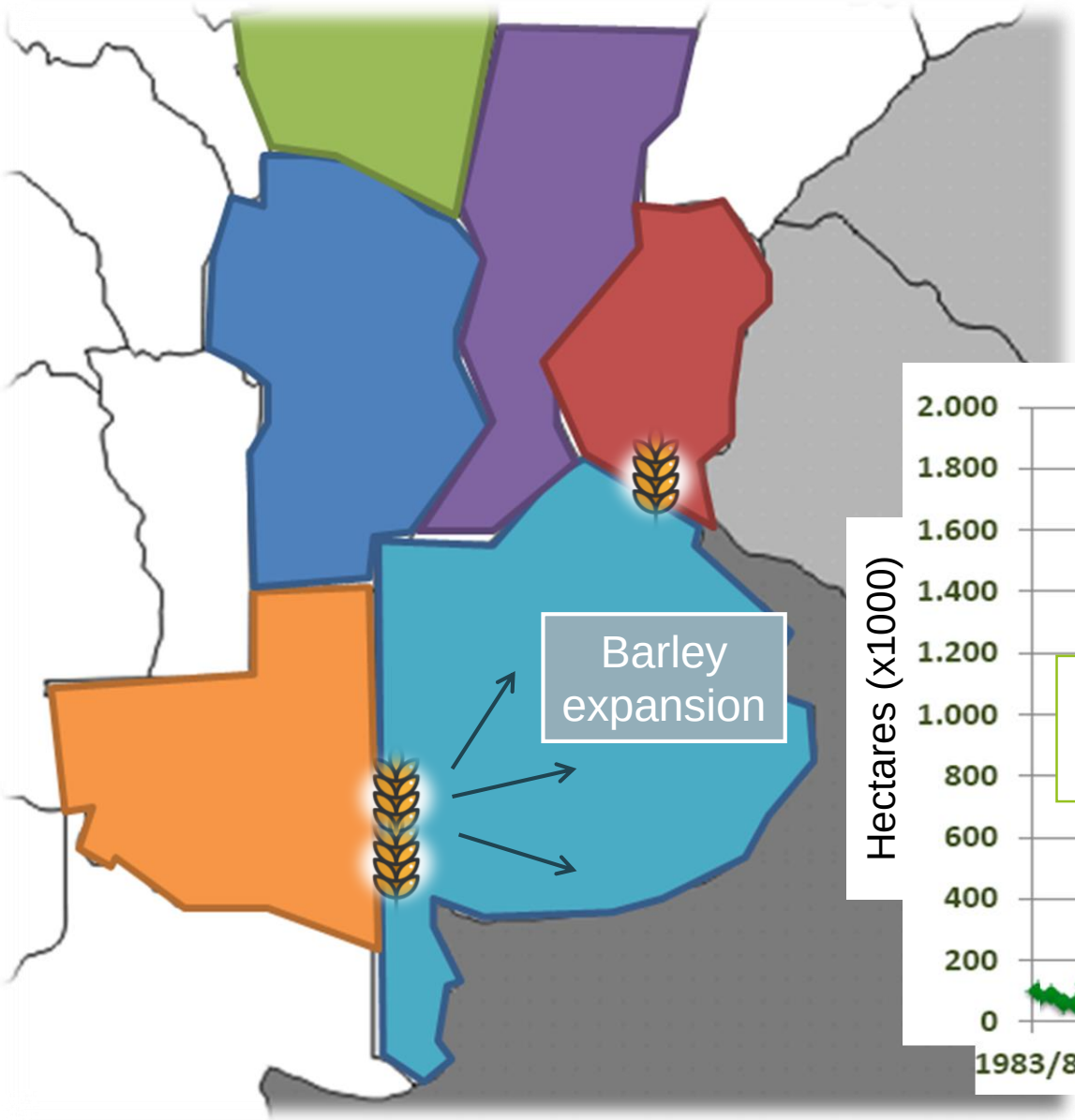
*part of these results belong to my PhD research (FCA, UNMdP)

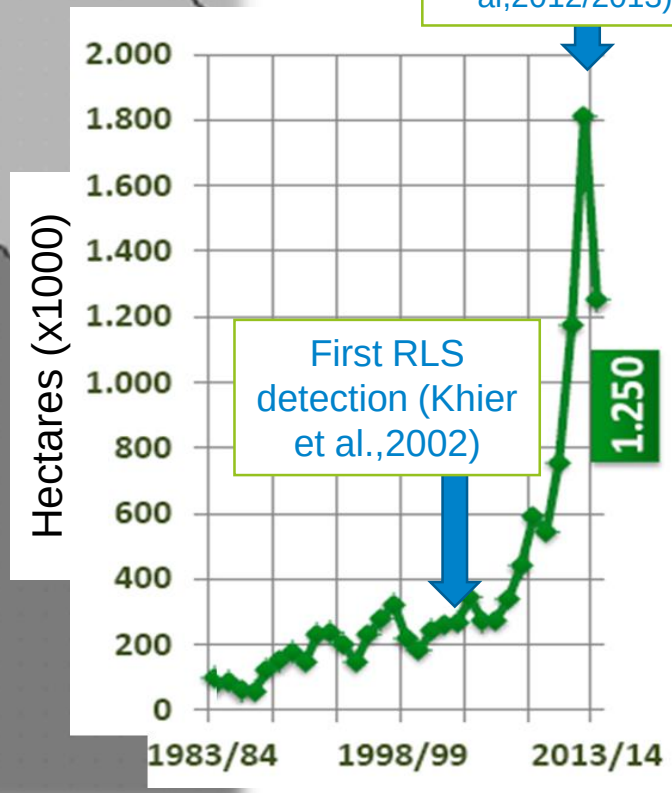
Barley in Argentina -2018



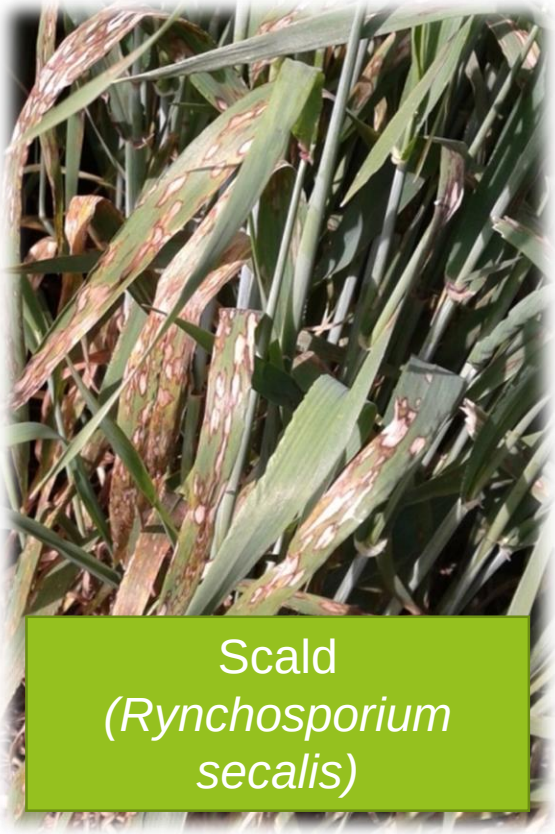
40 years ago and still…..

Barley in Argentina – from 1999





Main barley diseases in Argentina until 2012/13



Scald *(Rynchosporium secalis)*

Net Blotch *(Drechslera teres sf teres)*

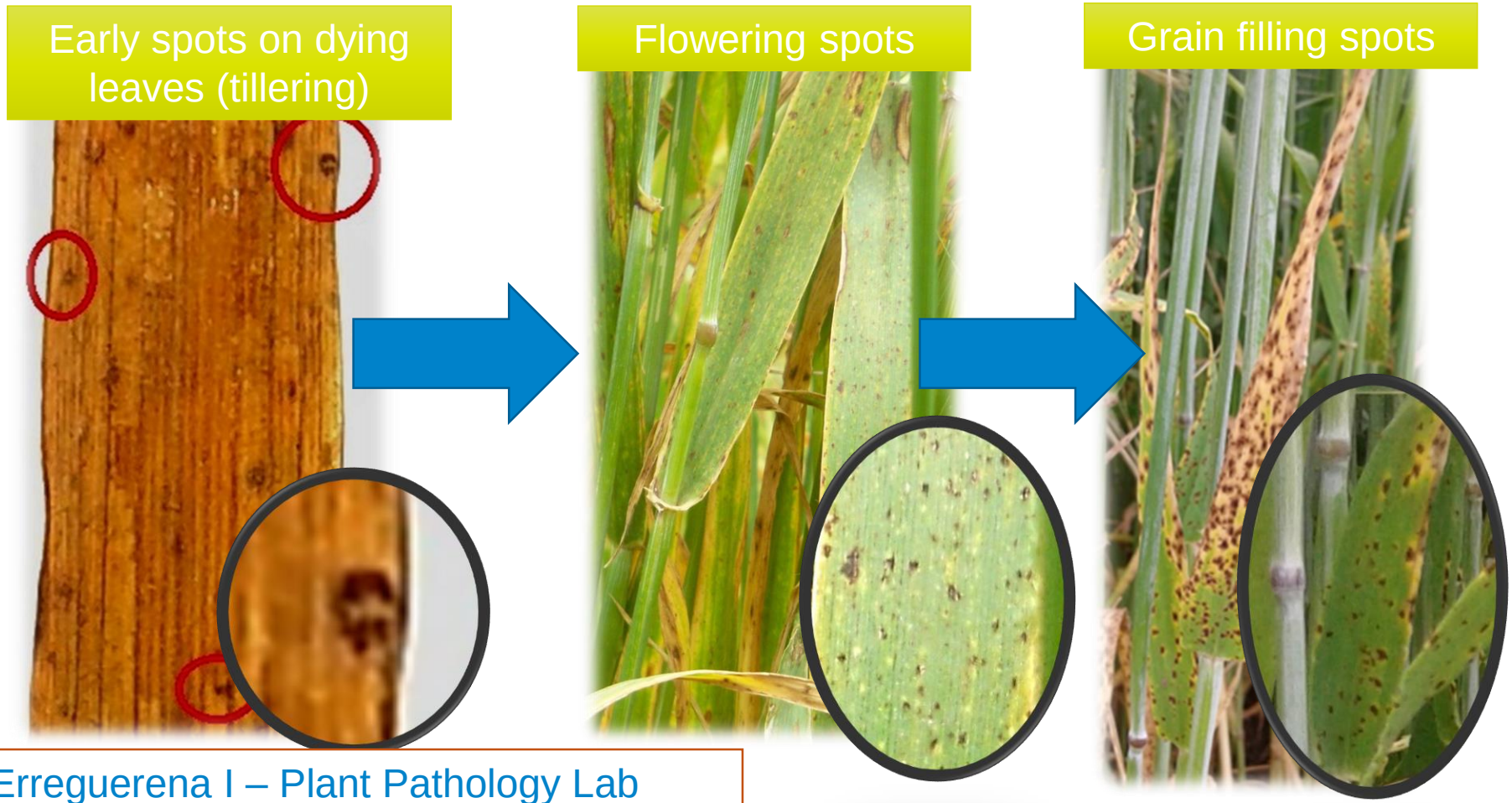
Bipolaris spot *(Bipolaris sorokiniana)*

Ramularia collo-cygni in Argentina

- Diagnosis?
- Isolation?
- What fungicide is available and best spraying time?
- Distribution - could be an endemic disease?
- Which environmental conditions triggers RLS?
- Inoculum source: which is more important for outbreak levels?
- How can we introduce RLS control in barley disease management program?
- Does spring UV exposure significantly enhances RLS?
- And questions goes on…

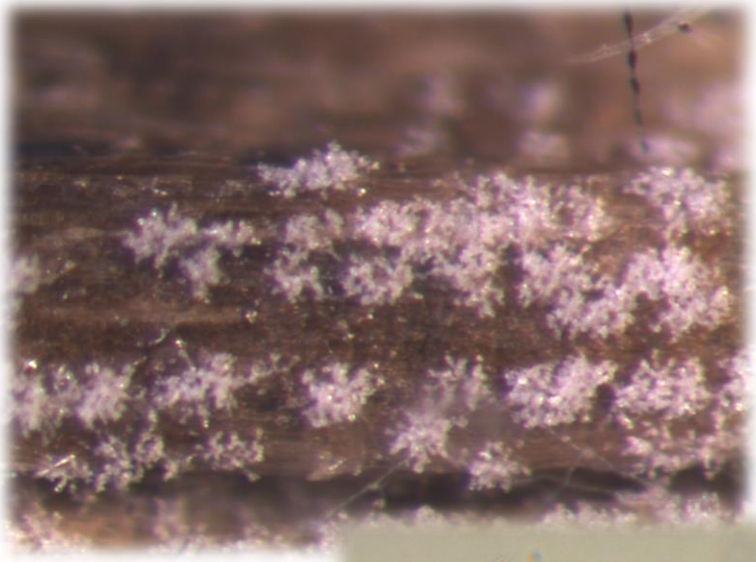
Ramularia collo-cygni in Argentina

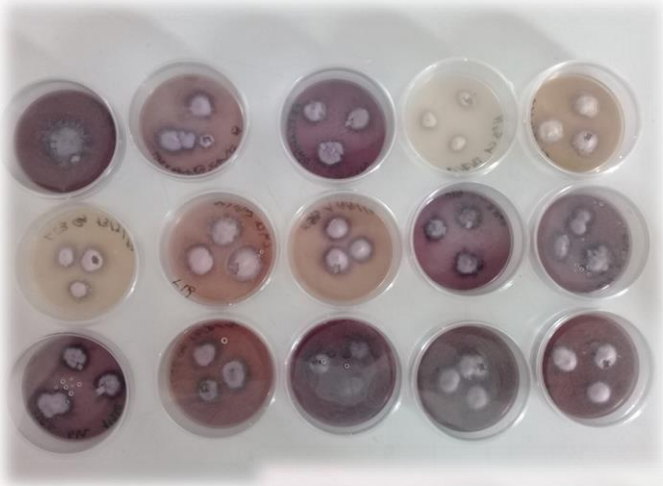
- Symptoms

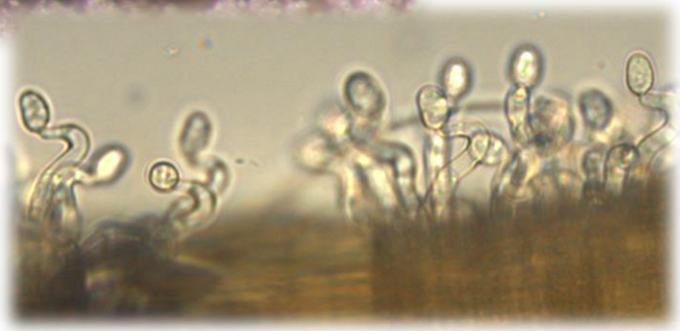


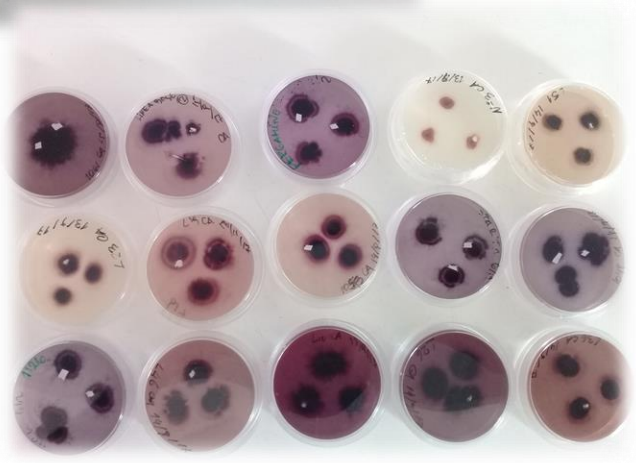
Ramularia collo-cygni in Argentina

- Conventional diagnosis and pathogen isolation





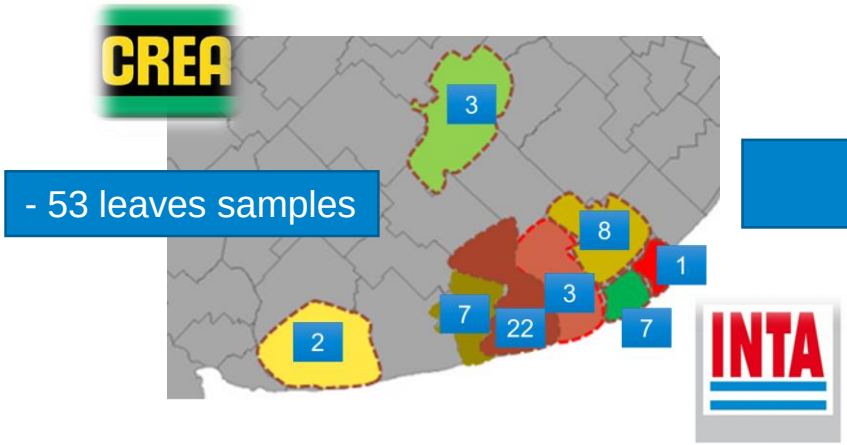


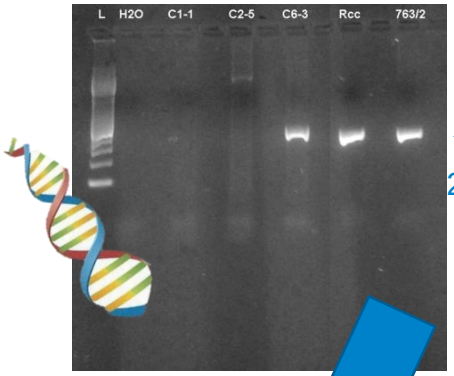


Erreguerena I – Plant pathology Lab

Ramularia collo-cygni in Argentina

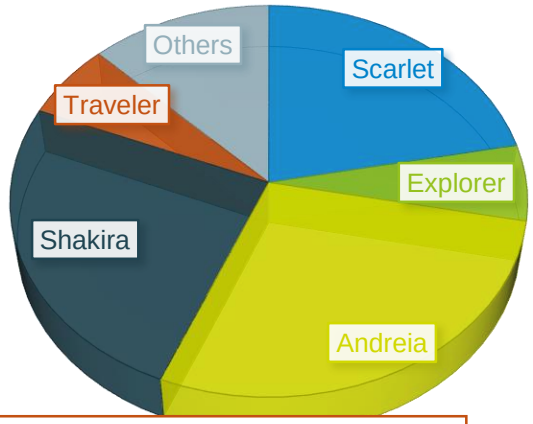
- Molecular diagnosis (PCR) on early stages (Z2X)





◄348 bp (Frei *et al.*, 2007)

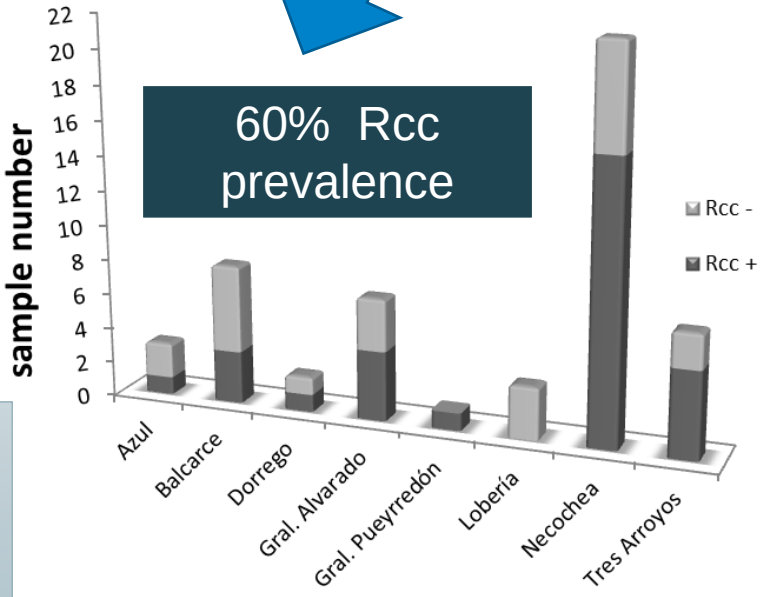
VARIETIES WITH RCC+



Erreguerena et al.,2015.

94% seed and 100% with RLS+!!!

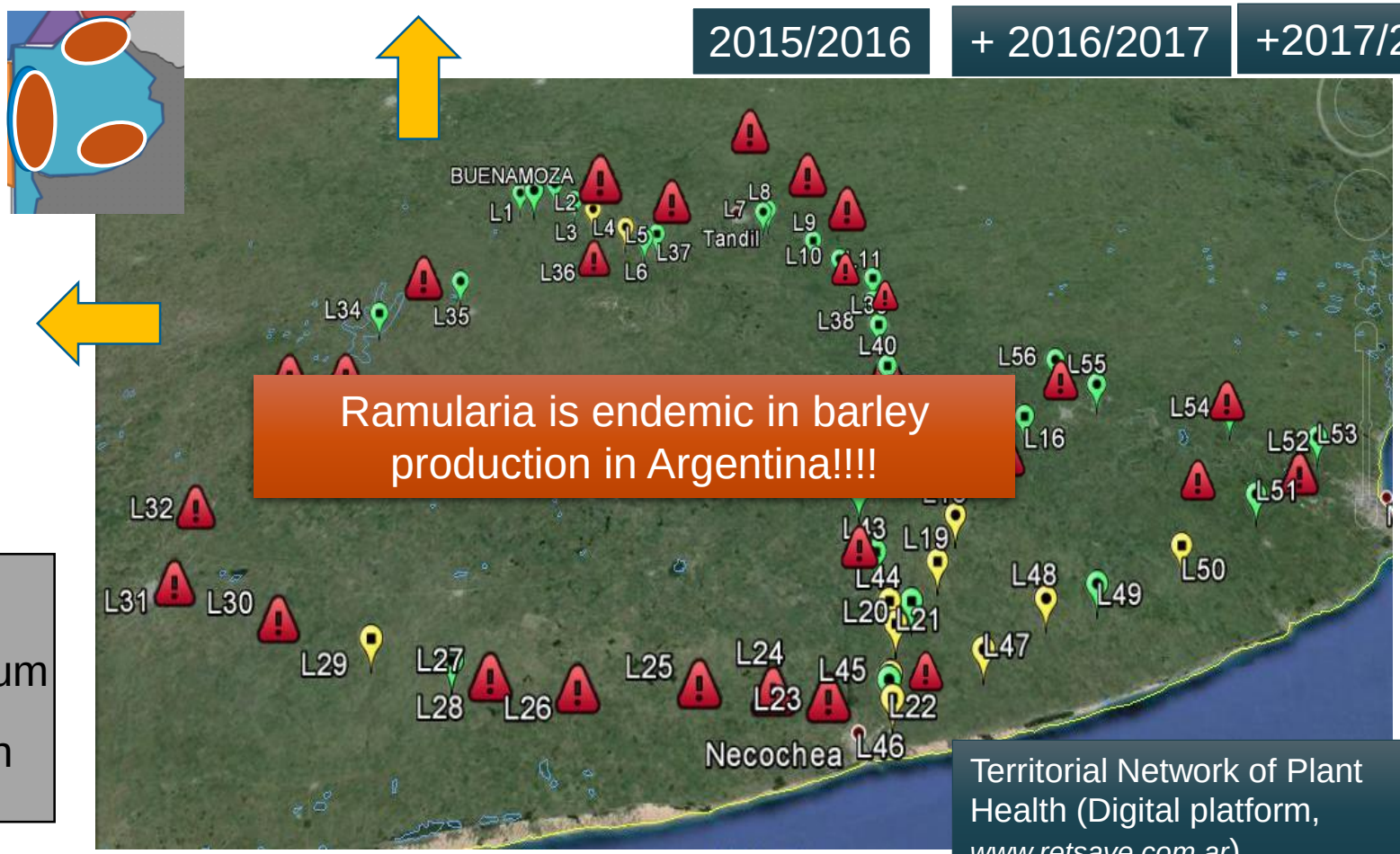
Havis et al., 2014.



60% Rcc prevalence

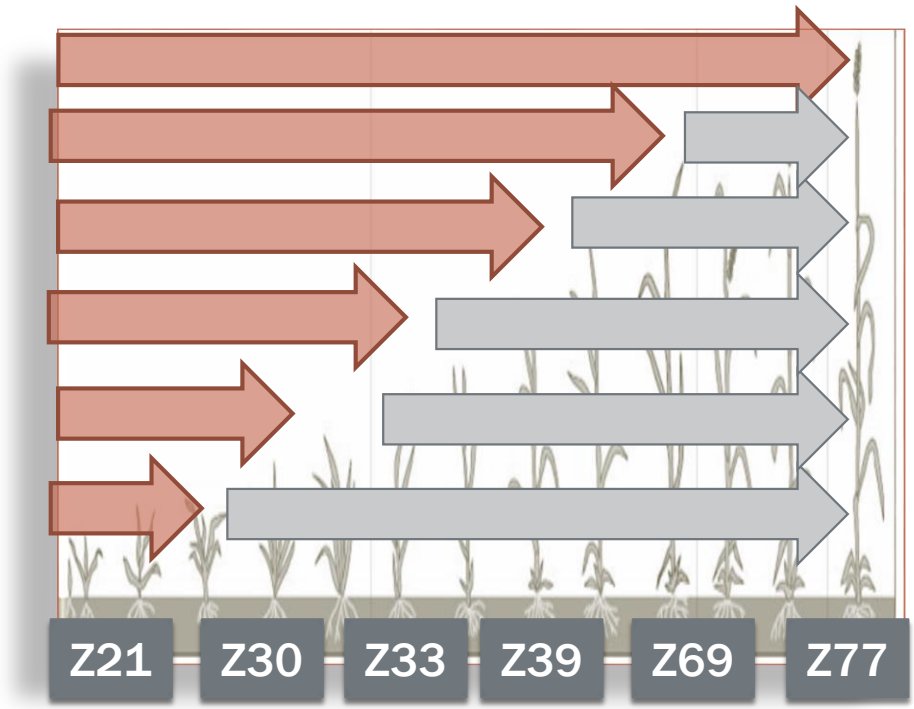
Ramularia collo-cygni in Argentina

- Epidemiological status - Distribution



Ramularia collo-cygni in Argentina

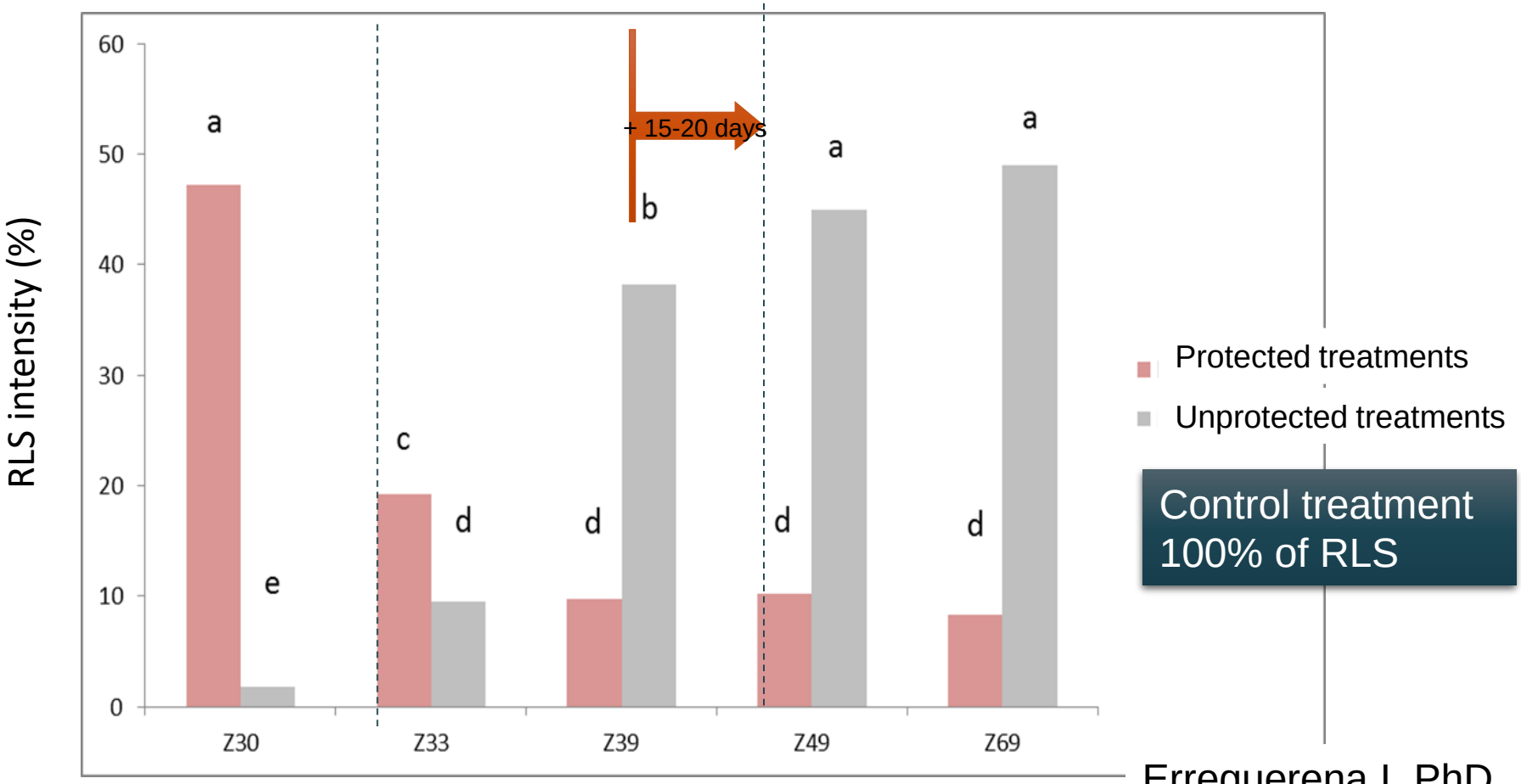
- Carboxamides Protection Window for RLS Control



-Variety: Andreia.
-isopyrazam 12.5 g + azoxistrobine 20 g (500cc/ha).
-Four years.
-Five locations.

Ramularia collo-cygni in Argentina

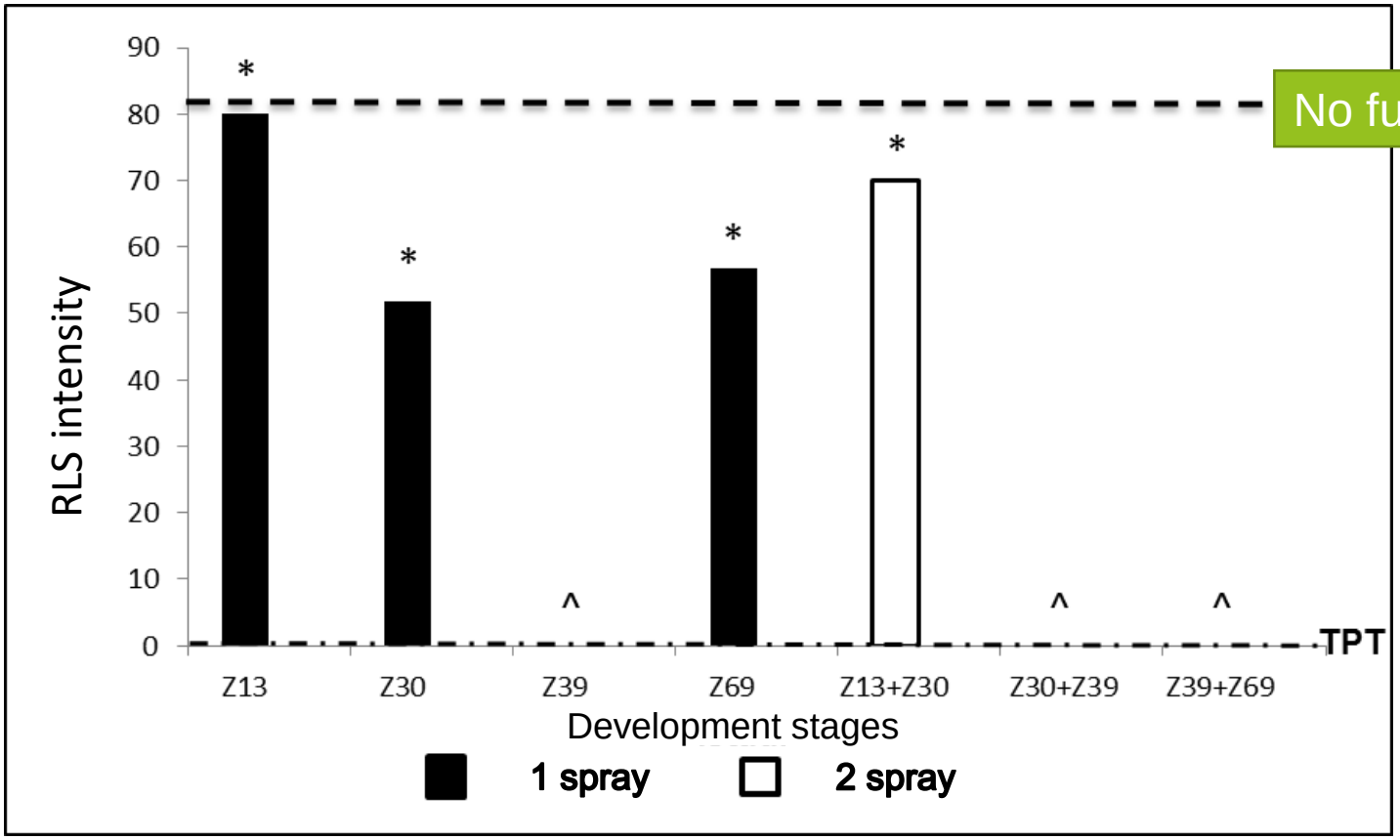
- Carboxamides Protection Window for RLS Control



Erreguerena I, PhD

Ramularia collo-cygni in Argentina

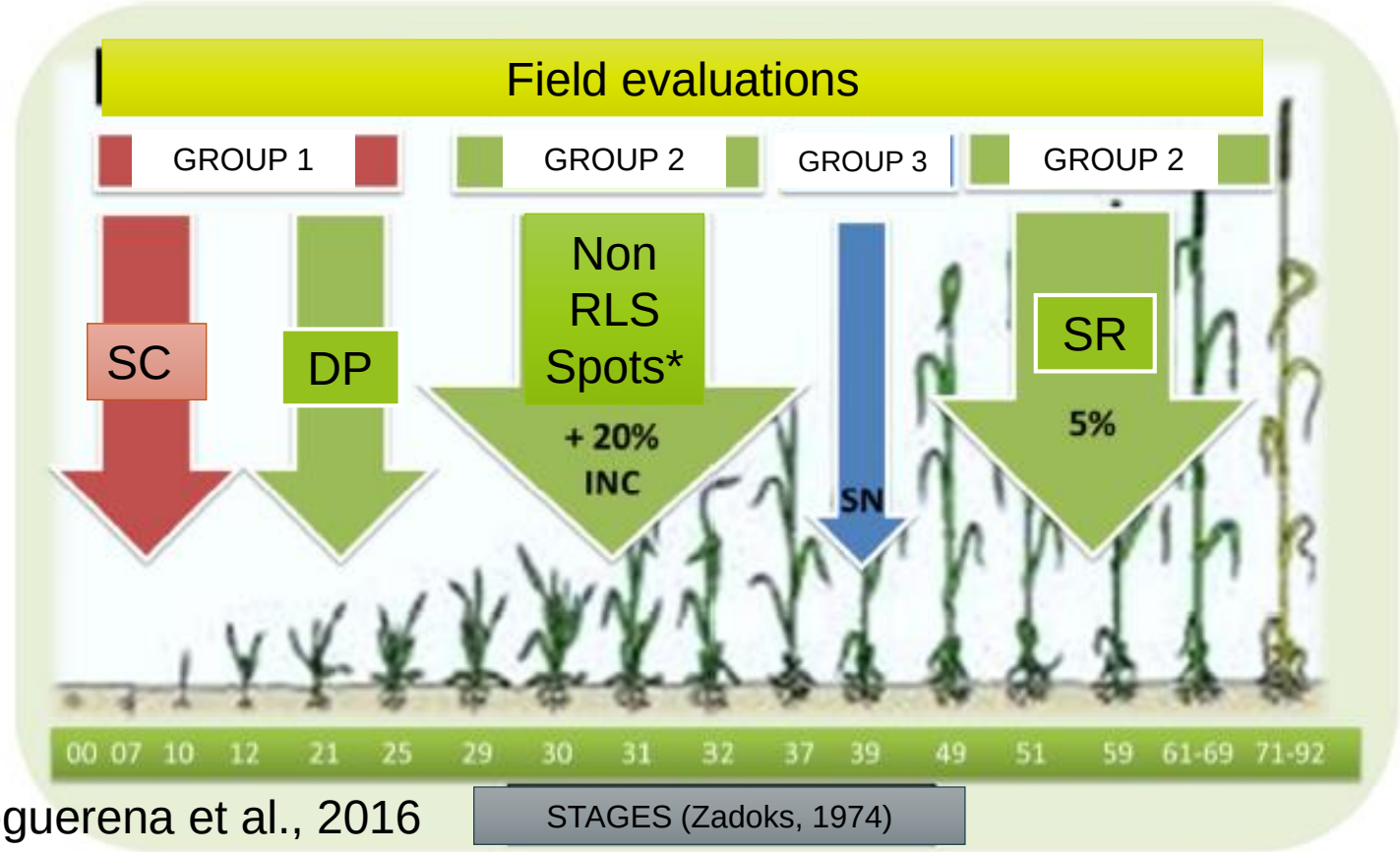
- Validation of Protection Window for RLS Control



Farengo et al., 2015

Ramularia collo-cygni in Argentina

- Validation of Protection Window for RLS Control in an integrated barley diseases protection program



Erreguerena et al., 2016

*Carmona et al.,2015

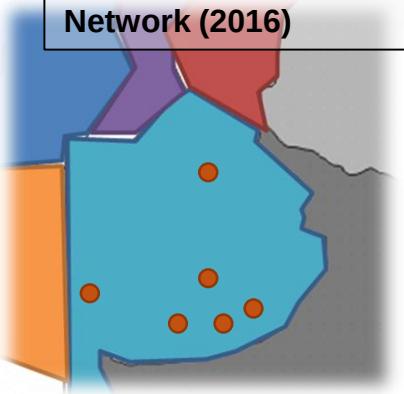
Ramularia collo-cygni in Argentina

- Validation of Protection Window for RLS Control in an integrated barley diseases protection program

Seed	Threshold	Flag leaf	BSP	NBNF	SC	RLS
fluoxastrobina protioconazol tebuconazol	protioconazol trifloxistrobina	-				
fluxapyroxad triticonazol	fluxapyroxad epoxiconazol pyraclostrobina	epoxiconazol pyraclostrobina				
fluxapyroxad triticonazol	-	fluxapyroxad epoxiconazol pyraclostrobina				
sedaxane difenoconazol fludioxonil tiametoxam	-	isopyrazam azoxistrobina				
-	azoxistrobine tebuconazole procloraz	fluxapyroxad epoxiconazol pyraclostrobina				
-	-	-				
fluxapyroxad triticonazol	fluxapyroxad epoxiconazol pyraclostrobina	fluxapyroxad epoxiconazol pyraclostrobina				

Controls

Barley Protection Network (2016)

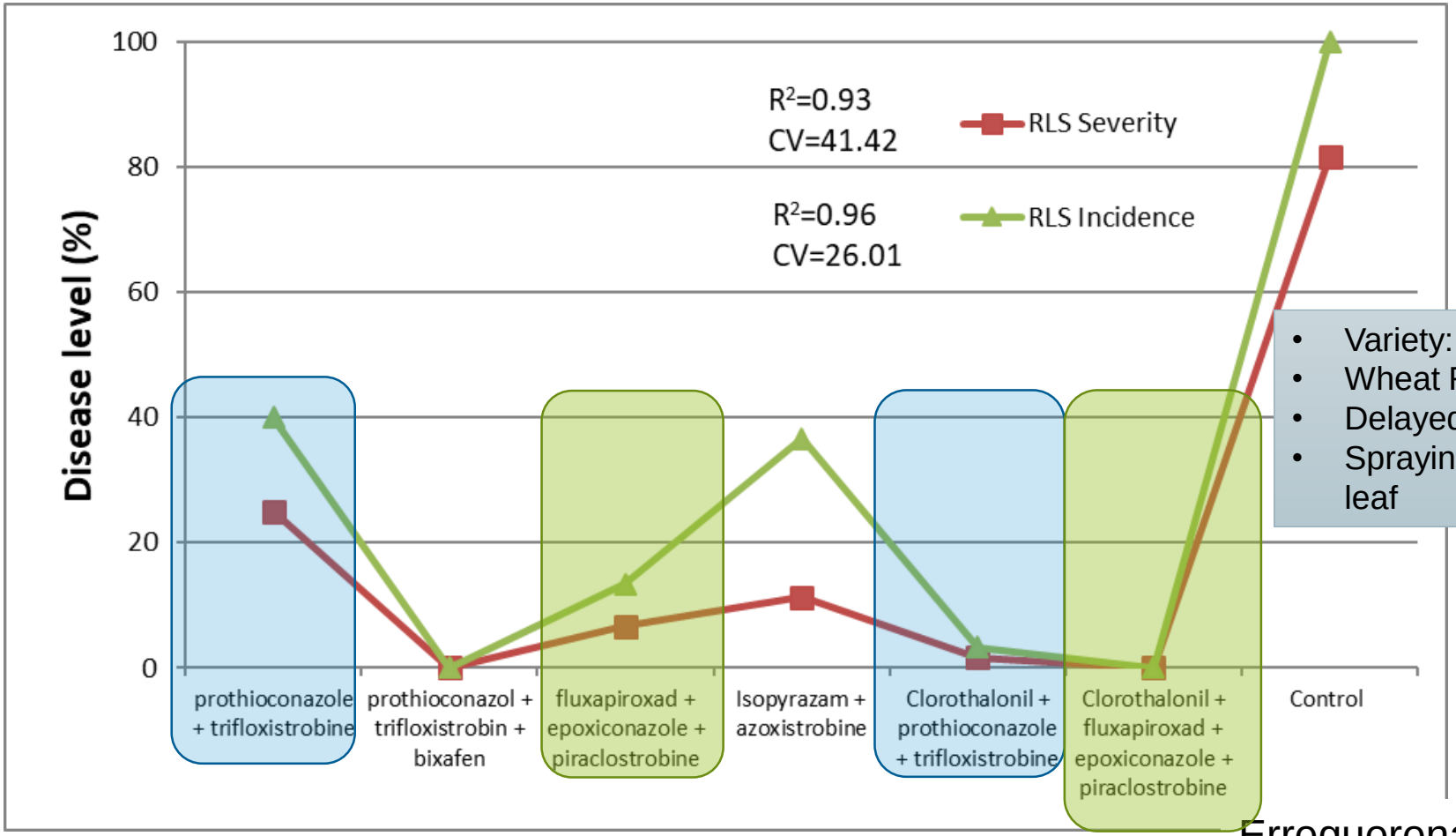


Control levels

Erreguerena et al., 2016

Ramularia collo-cygni in Argentina

- Validation of Protection Window for RLS Control in an integrated barley diseases protection program



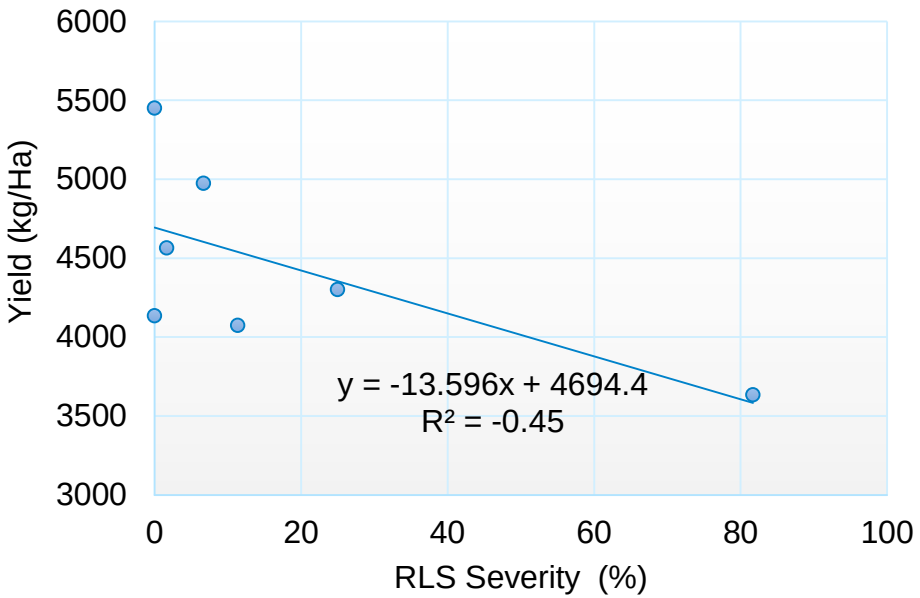
- Variety: Andreia
- Wheat Rotation
- Delayed planting Date
- Spraying time: flag leaf

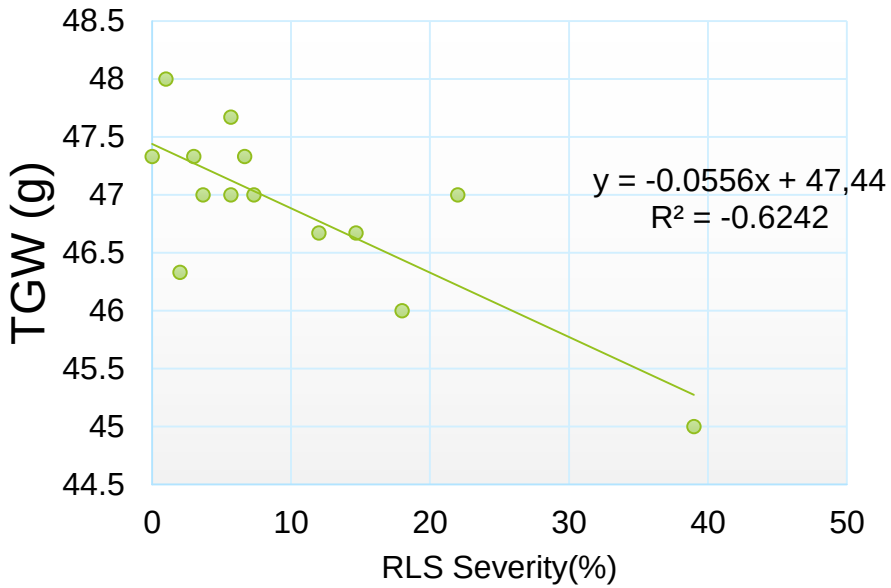
Erreguerena, 2018

Ramularia collo-cygni in Argentina

- Ramularia and barley production in Argentina

	Incidence			Severity		
	Scald	BSP	RLS	Scald	BSP	RLS
Yield	**-0,6**	**-0,6**	-0,31	**-0,5**	**-0,5**	-0,45
TGW	-0,06	-0,3	-0,39	0,04	-0,46	**-0,63**
2-8 mm	0,03	0,25	0,5	0,03	-0,41	**-0,6**





Ramularia collo-cygni in Argentina

- Prospects

  - Studies on Pathogen variability.
  - Ramularia population sensitivity to fungicide active ingredients.
  - Disease Forecast – epidemiological modelling.
  - Inoculum sources.
  - Awarness on the risk of Ramularia and others pathogens to turn resistant or loss sensitivity to fungicides.
  - Many others…

Ramularia collo-cygni in Argentina

- Acknowledgements

-My family and friends.
-Facundo Quiroz and all my colleagues/friends at INTA.
-Marcelo Carmona and Silvia Pereyra.
-Neil Havis and all the people in SRUC.
-And many many people who supported me all this years.

Balcarce, 2013

Thank you all!!!

“Your work makes ours easier, thank you for showing us the way”

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