

Reemergence of stem rust at epidemic levels in Argentina and Uruguay in 2014

P. Campos¹, M. Castro², S. Pereyra², M. Quincke², H. Millisich³, L. Gieco³, J. López¹ and S. German²

¹National Institute of Agricultural Technology (INTA), EEA Bordenave CC44, CP 8187, Bordenave, Buenos Aires, Argentina; ² National Institute of Agricultural Research (INIA) Uruguay. ³ National Institute for Agricultural Technology (INTA), EEA Paraná campos.pablo@inta.gob.ar

Argentina and Uruguay are neighboring countries located on the same rust epidemiological area. The last widespread epidemic of stem rust (*Puccinia graminis* f. sp. *tritici*) occurred in 1950 in Argentina and 1976 in Uruguay. After that, stem rust was frequently observed in experimental fields and off-season nurseries, but was mostly absent in commercial fields.

During 2014, a widespread epidemic of stem rust was observed in the total wheat area of Argentina and Uruguay (4.6 million ha). Stem rust severity reached 80S in susceptible cultivars in both countries. In Paraná (Argentina), average yield loss of eight stem rust susceptible cultivars which had no detectable foliar diseases was 70% (table 1).

Table 1: Yield losses in trials in Parana (Argentina)

Cultivar	Stem rust (Severity)	Yield (kg)with Fungicide	Yield (kg)without Fungicide
BIOINTA 3006	70	2883	85
BIOINTA 3008	70	2005	85
Cipres	70	1819	87
Cedro	70	2430	53
Baguette 601	70	2261	70
Alhambra	75	3330	57
Baguette 801	70	3019	79
SY 110	70	3219	43

In Uruguay the actual area sown to susceptible cultivars has continued to increase, from 15% of the wheat area in 2009 to 48% in 2014.

Table 2: Frequency of races found in 2014 in Argentina

Race	Percentage isolates
QHFTC	61,7
QFCSC	16,7
QRFTF	5,0
QHKTC	5,0

Four main races were identified in samples from Argentina. Race QHFTC was prevalent, while the other three had an intermediate to low frequency.

Experimental field



Commercial field

The stem rust epidemic outbreak was most probably due to the widespread cultivation of susceptible cultivars, which accounted for 50% of the Argentinean and 48% of the Uruguayan wheat area in 2014. Most of this area was sown to high yielding French germplasm with high susceptibility to leaf and stem rust which has been introduced and released in both countries since the last decade.

Resistance genes *Sr31* and *Sr24* are effective in Argentina and Uruguay and are believed to be the most important conferring resistance in regional cultivars. New effective resistance genes should be introduced into elite breeding germplasm and new wheat cultivars to decrease the genetic vulnerability of the crop to stem rust.

National Breeding Programs in both countries are working to improve the resistance to local races and the UG99 group of races.