



29th September 2015
GRDC Final Report



Yellow spot and *Stagonoapora nodorum* blotch (SNB) assessment of CAIGE lines

Manisha Shankar
DAFWA



Yellow spot assessment of CAIGE lines

- **Project DAW00206 (2010-2015) - Germplasm enhancement for yellow spot resistance in wheat**
- **A total of 1044 CAIGE lines assessed from 2010 to 2014**
 - 81 lines identified with seedling resistance (RMR to MR)
 - 30 lines with broad spectrum resistance (MR to MRMS) at various growth stages, environments and national sites
- **Six lines with broad spectrum resistance distributed to various breeding companies**
- **Six of these lines used for crossing to develop mapping populations targeting yellow spot resistance**



Yellow spot 2010 to 2014 - DAFWA

1044 lines assessed; 81 lines with seedling resistance; 30 lines with broad spectrum resistance

GH Seedling Assessment					Ring test - Lines with seedling resistance assessed at various growth stages, environments and national sites					
Year	Qcode	Description	No of lines assessed for seedling resistance	No of lines with seedling resistance (RMR to MR)	Year	No of lines with broad spectrum resistance (MR to MRMS)	Lines with broad spectrum resistance (MR to MRMS)			
2010	ZIZ09	ICARDA Bread	52	2	2011, 2012	1	ZIZ09 QNo 42*			
2010	ZWB09	ICARDA Bread	8	0						
2010	ZWW09	ICARDA Bread	7	0						
2010	ZDA10	CIMMYT Durum	49	6	2012	2	ZDA10 QNo 10	ZDA10 QNo 18		
2010	ZDI10	ICARDA Durum	100	13	2012	1	ZDI10 QNo 85			
2010	ZJN09	SBPN - CIMMYT	29	3	2011, 2012	2	ZJN09 Qno 2*	ZJN09 Qno 27*		
2011	ZIZ09	ICARDA Bread	33	3	2013	2	ZIZ09 Qno 21	ZIZ09 Qno 91		
2011	ZVS09	CIMMYT Bread	198	15						
2011	ZWB09	ICARDA Bread	12	4	2013	2	ZWB09 Qno 55	ZWB09 Qno 57		
2011	ZWW09	ICARDA Bread	9	0						
2011	ZJN10	SBPN - CIMMYT	12	2	2012					
2012	ZWB10	CIMMYT Bread	45	4	2013	3	ZWB10 Qno 53	ZWB10 Qno 127*	ZWB10 Qno 128	
2012	ZWW10	CIMMYT Bread	46	0						
2012	ZIZ09	ICARDA Bread	6	1	2013	1	ZIZ09 Qno 87			
2012	ZIZ10	ICARDA Bread	37	2	2013	2	ZIZ10 Qno 35	ZIZ10 Qno 36		
2012	ZWB09	ICARDA Bread	1	0						
2012	ZWW09	ICARDA Bread	4	4	2013	1	ZWW09 Qno 149*			
2012	ZJN11	SBPN - CIMMYT	23	4	2013	1	ZJN11 Qno 25			
2013	ZIZ11	ICARDA Bread	50	4	2014	3	ZIZ11 Qno 12	ZIZ11 Qno 45	ZIZ11 Qno 81	
2013	ZWB11	CIMMYT Bread	30	5	2014	4	ZWB11 Qno 124	ZWB11 Qno 172	ZWB11 Qno 56	ZWB11 Qno 95
2013	ZWW11	CIMMYT Bread	36	0						
2013	SBP12	SBPN - CIMMYT	35	2	2014	2	ZVS07 Qno 227*	ZWW09 Qno 43		
2013	ZAD13	CIMMYT Bread	40	4	2014	3	ZJN12 Qno 10	ZWW10 Qno 127	ZWW10 Qno 5	
2014	ZIZ12	ICARDA Bread	109	0						
2014	ZWB12	CIMMYT Bread	73	3	2016					
			1044	81			30			

Lines in blue font have broad spectrum resistance at various growth stages, environments and across all national sites.

Lines in red font have broad spectrum resistance at various growth stages, environments and across all but one national site.

*Lines used in crossing for population development targetting yellow spot resistance



- **Project : Genetic Analysis of SNB resistance in wheat under AWBMMP (2013-2018)**
- **A total of 191 CAIGE lines assessed from 2010 to 2014**
 - 13 lines identified with adult plant field resistance (MR)
- **Some of these lines will be used to develop mapping populations targeting SNB resistance**

Year	Qcode	Description	No of lines assessed for APR in the field	No of lines with APR (MR)	Lines with APR (MR)			
2010	ZJN09	SBPN - CIMMYT	25	1	30ZJN09*			
2011	ZJN10	SBPN - CIMMYT	12	4	ZJN10 Qno 3	ZJN10 Qno 8*	ZJN10 Qno 9*	ZJN10 Qno 12
2012	ZJN11	SBPN - CIMMYT	23	0				
2013, 2014	SPB12	SBPN - CIMMYT	35	2	ZEE10 Qno 77	ZVS07 Qno 227**		
2013, 2014	ZAD13	CIMMYT Bread	40	1	ZWW10 Qno 157			
2013	ZDA10	CIMMYT Durum	3	0				
2013	ZIZ09	ICARDA Bread	5	0				
2013	ZIZ10	ICARDA Bread	2	0				
2013	ZJN09	SBPN - CIMMYT	2	0				
2013	ZJN11	SBPN - CIMMYT	4	0				
2013	ZVS09	CIMMYT Bread	1	0				
2013	ZWB09	ICARDA Bread	4	0				
2013	ZWB10	CIMMYT Bread	4	0				
2013	ZWW09	ICARDA Bread	1	0				
2013	ZWW10	CIMMYT Bread	3	0				
2014	ZIZ11	ICARDA Bread	4	0				
2014	ZJN12	ZAD13 - CIMMYT	1	0				
2014	ZVS09	CIMMYT Bread	13	3	ZVS09 Qno 92*	ZVS09 Qno 133*	ZVS09 Qno 191*	
2014	ZWB11	SBP12 - CIMMYT	5	2	ZWB11 Qno 56**	ZWB11 Qno 172**		
2014	ZWW09	ZAD13 - CIMMYT	1	0				
2014	ZWW10	ZAD13 - CIMMYT	3	0				

191

13

*Lines also with seedling resistance to yellow spot

**Lines also with seedling and adult plant resistance to yellow spot



- **CAIGE is an important resource that provides additional resistance sources of yellow spot and SNB resistance**
 - Crucial to broaden the genetic diversity for effective and durable improvement of resistance to the two diseases.
- **Several resistant lines have been identified amongst CIMMYT and ICARDA germplasm.**
 - Some of these have been provided to various breeding companies and are valuable donors for developing resistant varieties
 - Some are being used for crossing and population development for identification and mapping novel resistance genes
- **Active and past projects which have used CAIGE material for pre-breeding purposes**
 - DAW00206 (2010-2015) - Germplasm enhancement for yellow spot resistance in wheat
 - Genetic Analysis of SNB resistance in wheat under AWBMMP (2013-2018)
 - Past project - DAV00076 (2005-2008). Synthetic Evaluation Project. Collaborative research with DePI Victoria resulted in the identification of new sources of adult plant resistance to stagonospora nodorum blotch among primary synthetics