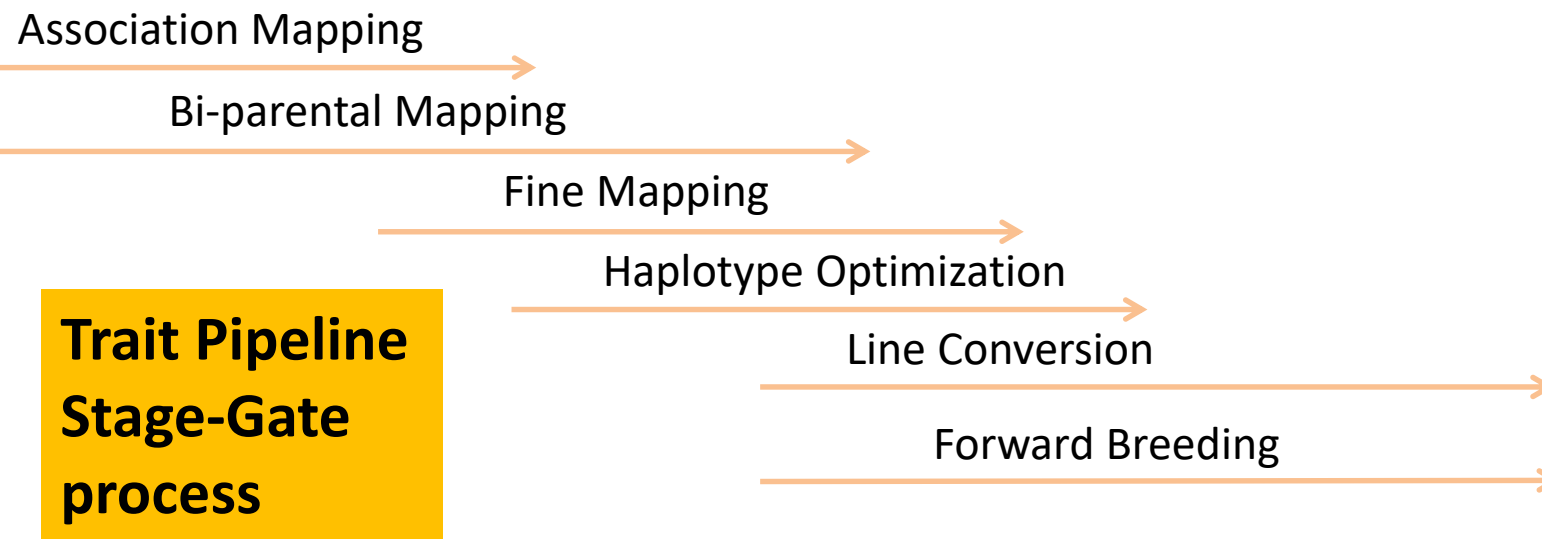
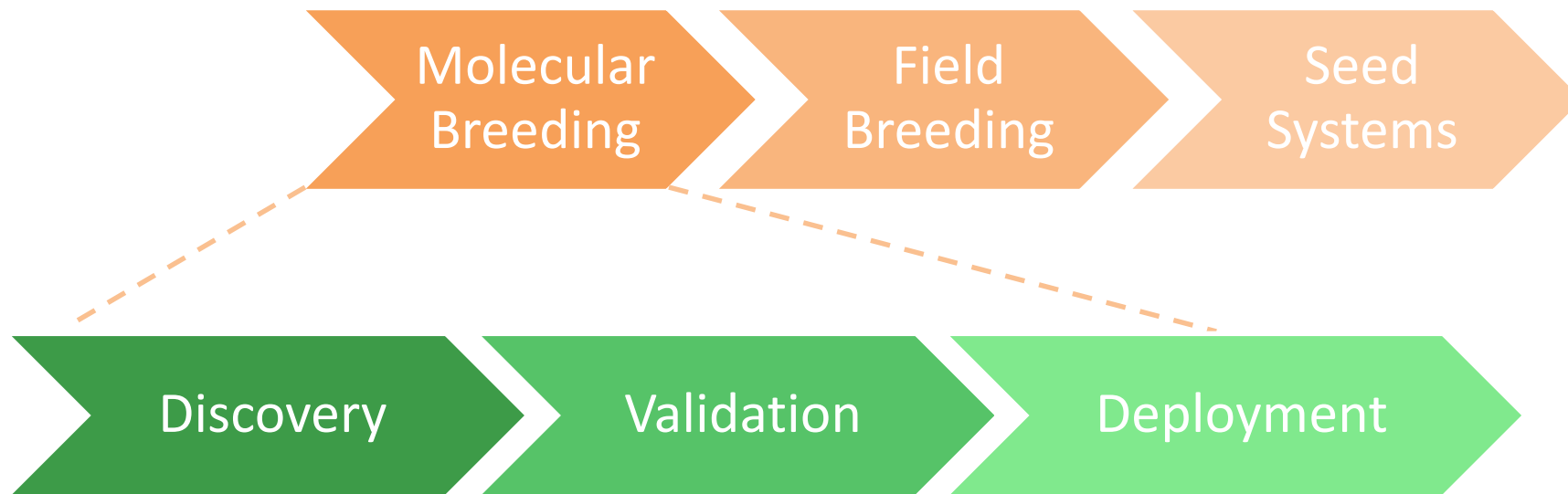


Discovery, Validation and Deployment of Major QTL for Resistance to Maize Lethal Necrosis

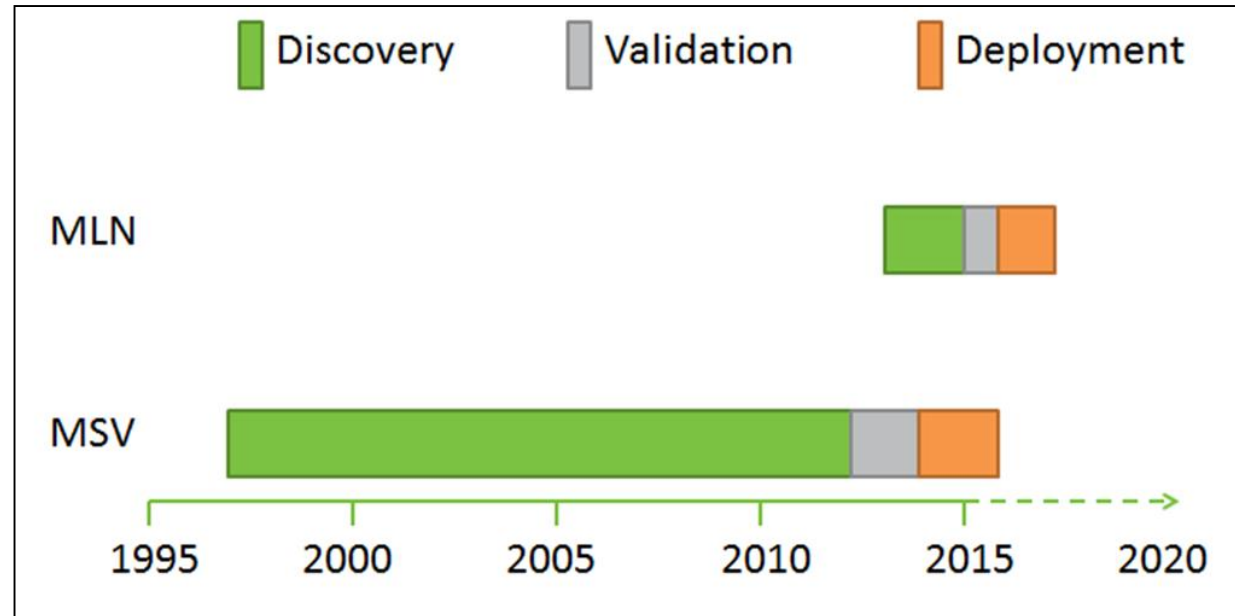
January 15, 2018 – PAG conference

M.Olsen, M.Gowda, B.Tadesse, A.Murithi, K. Semagn, M. Nganga, V. Oguga, K. Dhugga



Critical Path Analysis

- Optimization of discovery to deployment pipeline
- Focus on critically time-sensitive steps
- Role specialization to improve efficiency at bottlenecks
- Integration with breeding workflows



Outline

- First wave discovery and rapid deployment
 - Cohort 1 MABC
- Second wave discovery, validation, deployment
 - Validation and fine mapping
 - Forward breeding deployment
 - Cohort 2 MABC



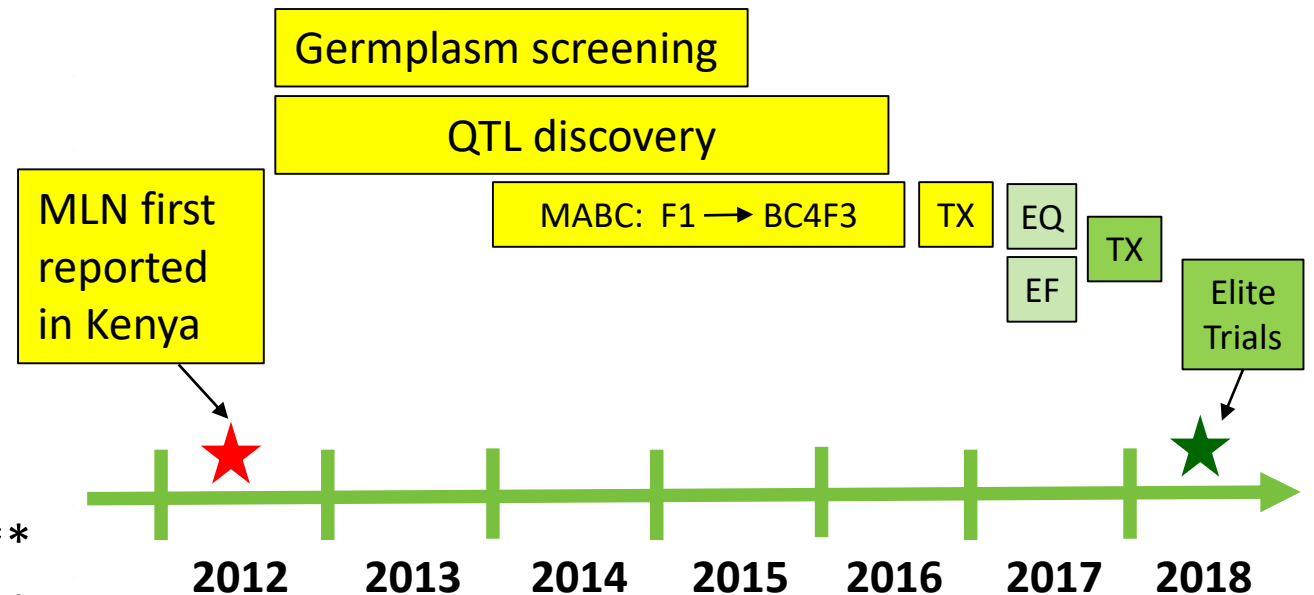
Maize Lethal Necrosis



MLN QTL deployment

MLN Conversions		
CML202	CML539	DTPWC9-F67-2-2-1
CML312	CML540	LPSC7-F103-2-2-2
CML341	CML544	LPSC7-F180-3-1-1
CML343	CML545	LPSC7-F64-2-6-2
CML373	CML546	CKL05015
CML442	CML547	CLRCY034
CML444	CML548	CML574 (CLRCY039)
CML445	CML550	CLYN231
CML489	CZL052	CLWN270
CML507	CZL068	DTPYC9-F46-1-2-1

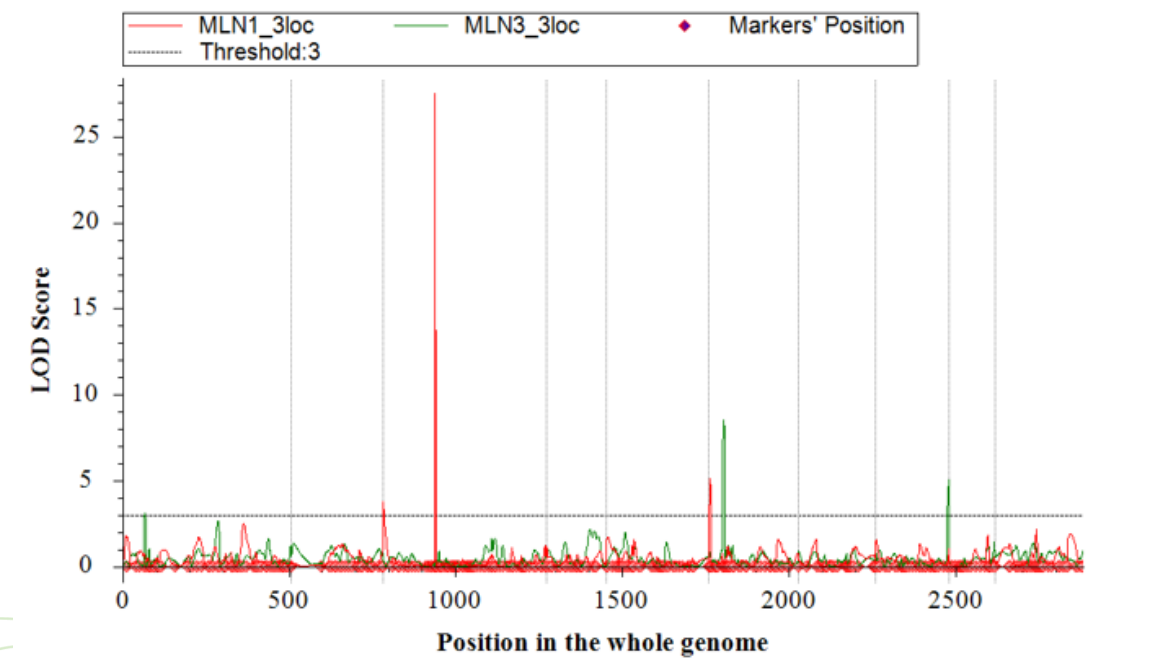
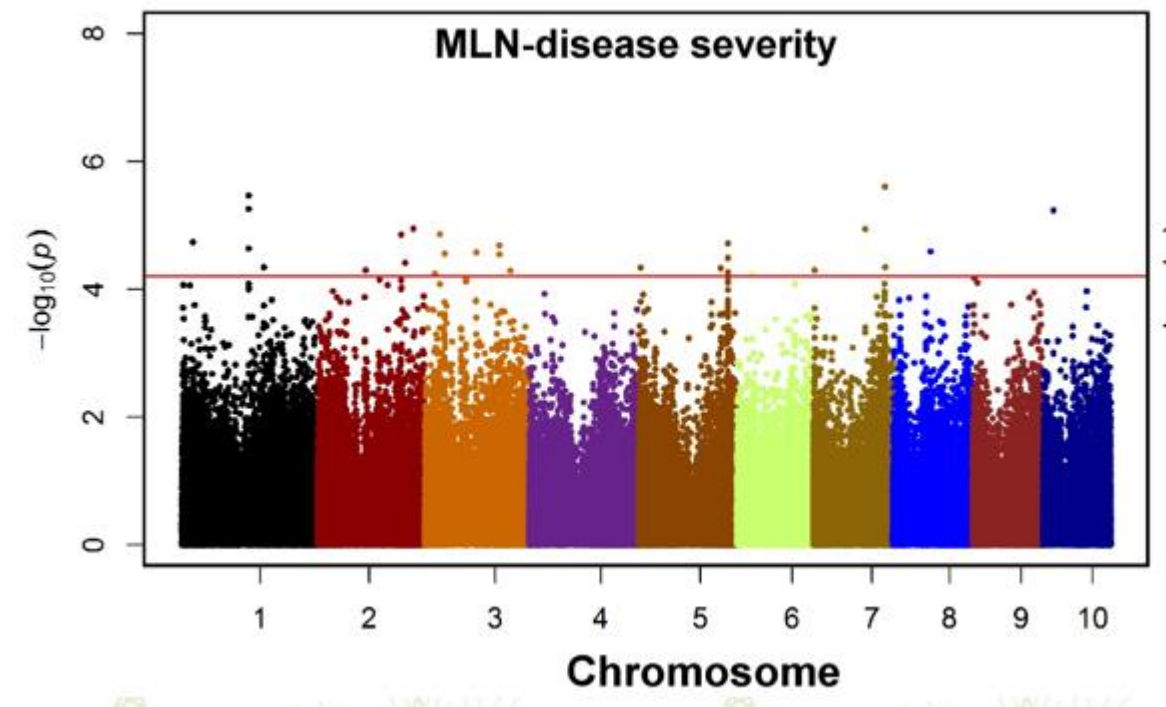
** MLN tolerant lines converted from yellow to white + MSV1



- 3 generation per year nursery
- BC4F3 Testcross evaluation
- BC4F4 Line evaluation



Haplotype	HG A DONORS				HG B DONORS			
	DTPF46	CLWN270	CLYN261	CML509	CLRCY034	CML574	CML494	CML543
MLN_01.002							1	
MLN_02.185			1					
MLN_02.194	1		6			2		1
MLN_03.044	1		8			1		
MLN_03.113			2					
MLN_03.133	3	1	2		1	2		
MLN_03.140								9
MLN_03.171							4	
MLN_03.189	2	1	7		1	2		
MLN_06.020								8
MLN_06.166			5					
MLN_07.142							3	
MLN_07.158								2
MLN_08.074	2					1		
MLN_09.108							4	
MLN_09.146			1					
MSV_01.087				3				3
Y1_06.082				3				2



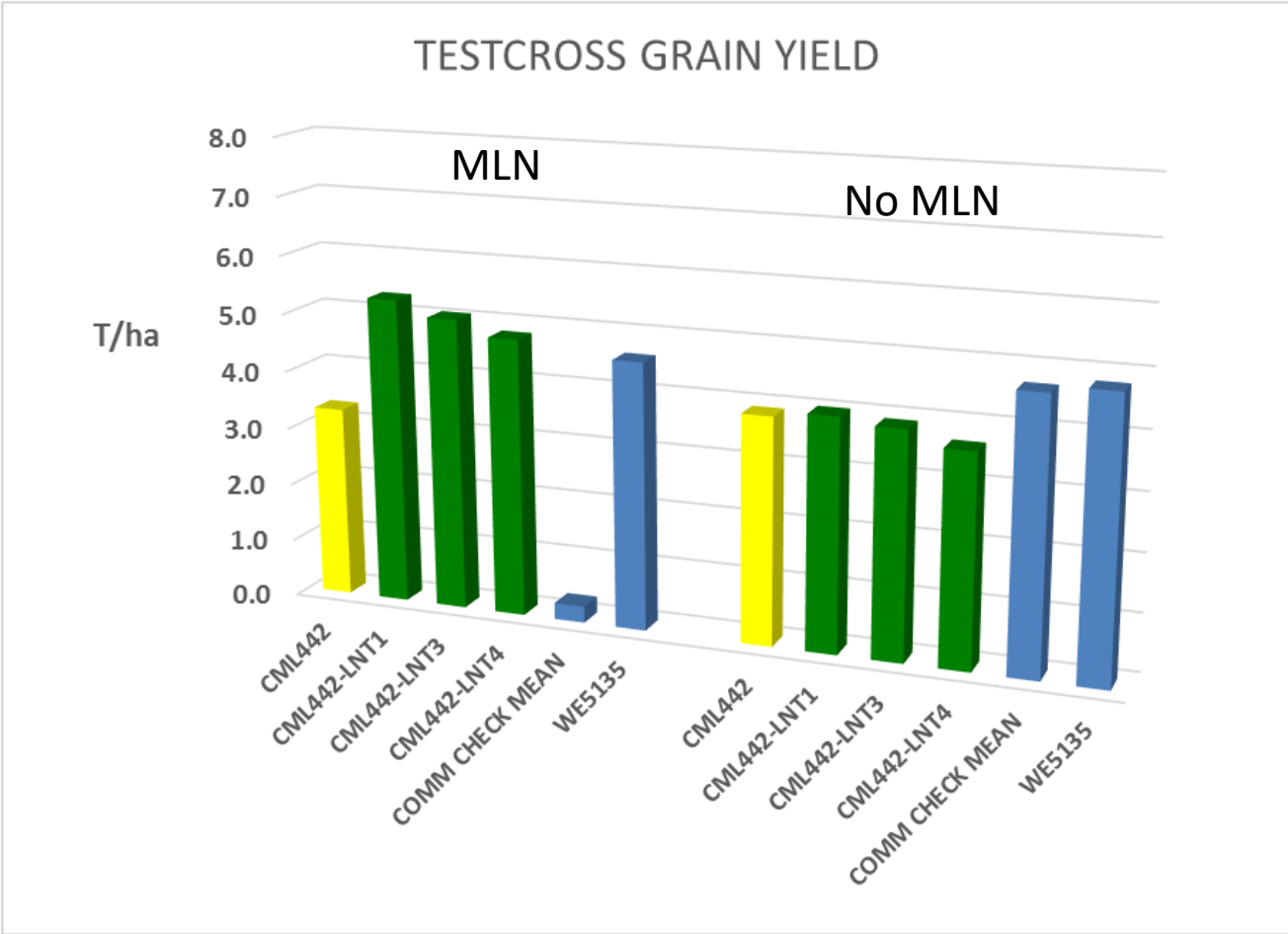
Improved MLN tolerance of elite stress tolerant lines: CML442



CML442*5/CLWN270

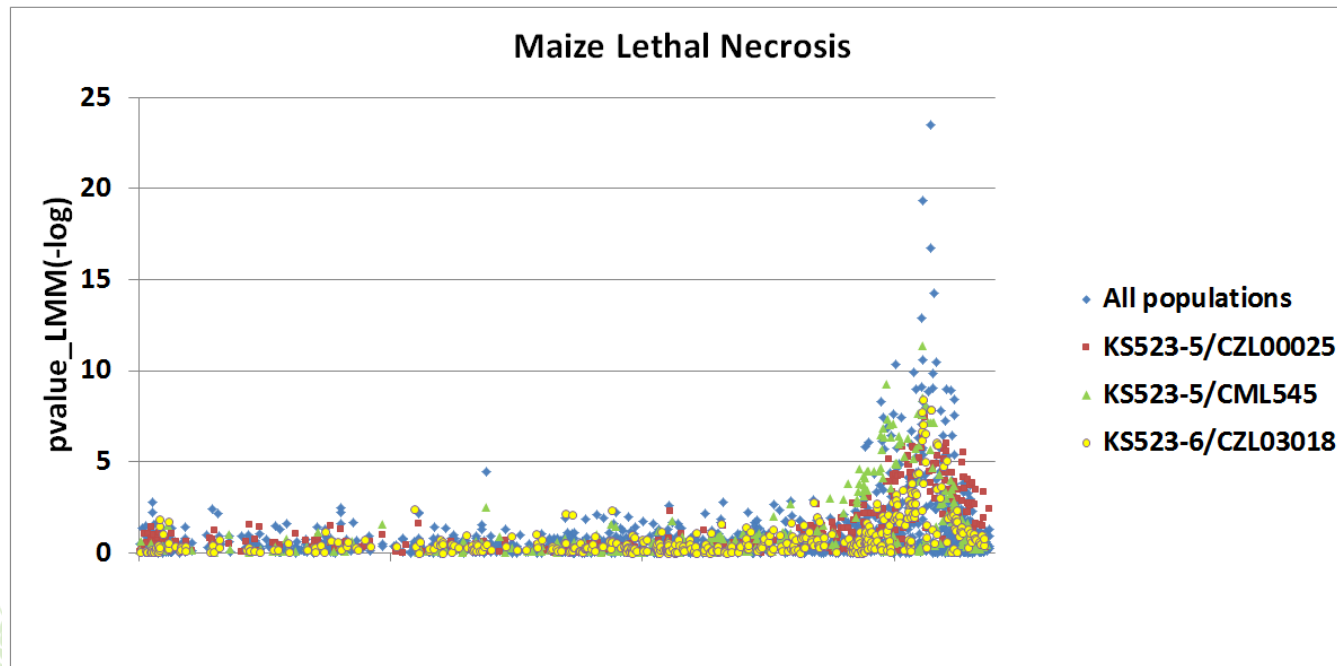
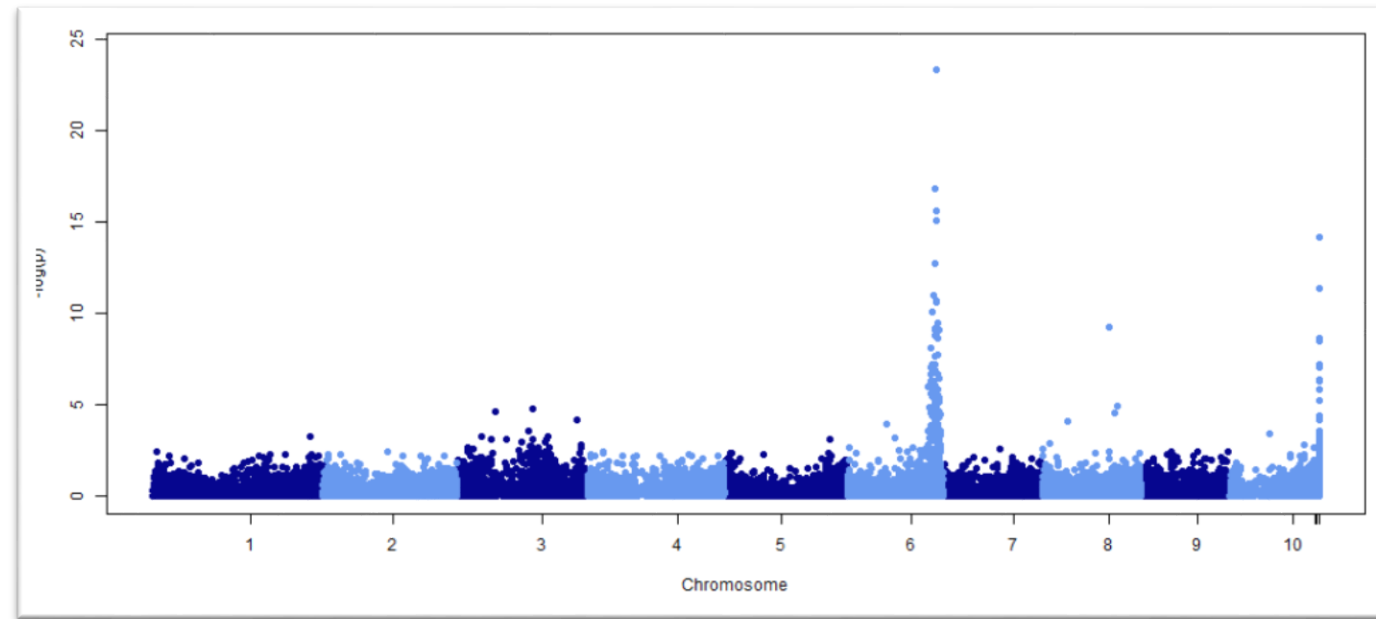
CML442

1.8 t/ha testcross yield increase under severe MLN pressure
Yield parity in absence of MLN

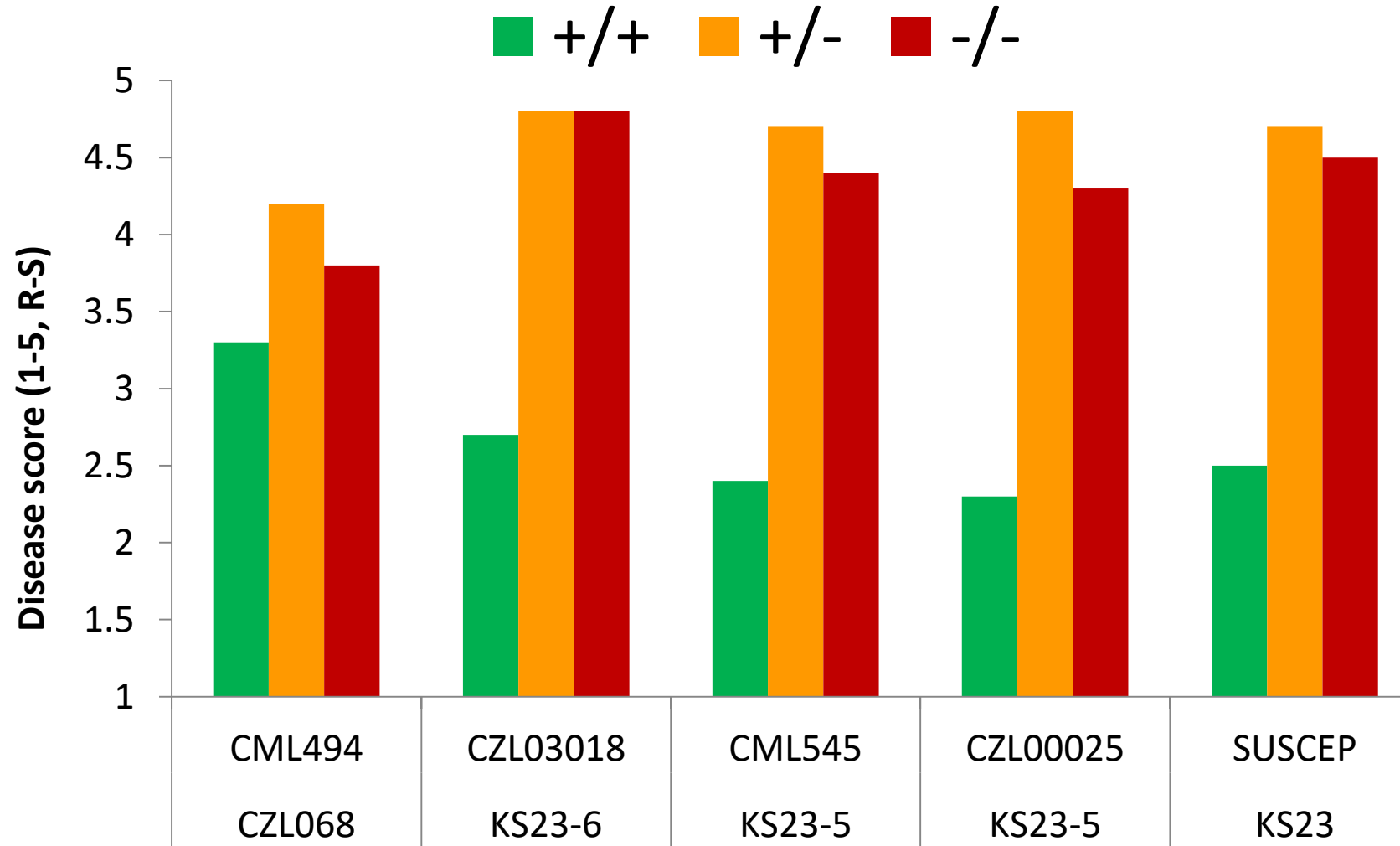


KS23 MLN QTL

- Modified QTL seq method
- Consistent detection in three populations



Contribution of MLN_R Locus to Resistance Against MLN



Parents in cross (KS23 resistant)



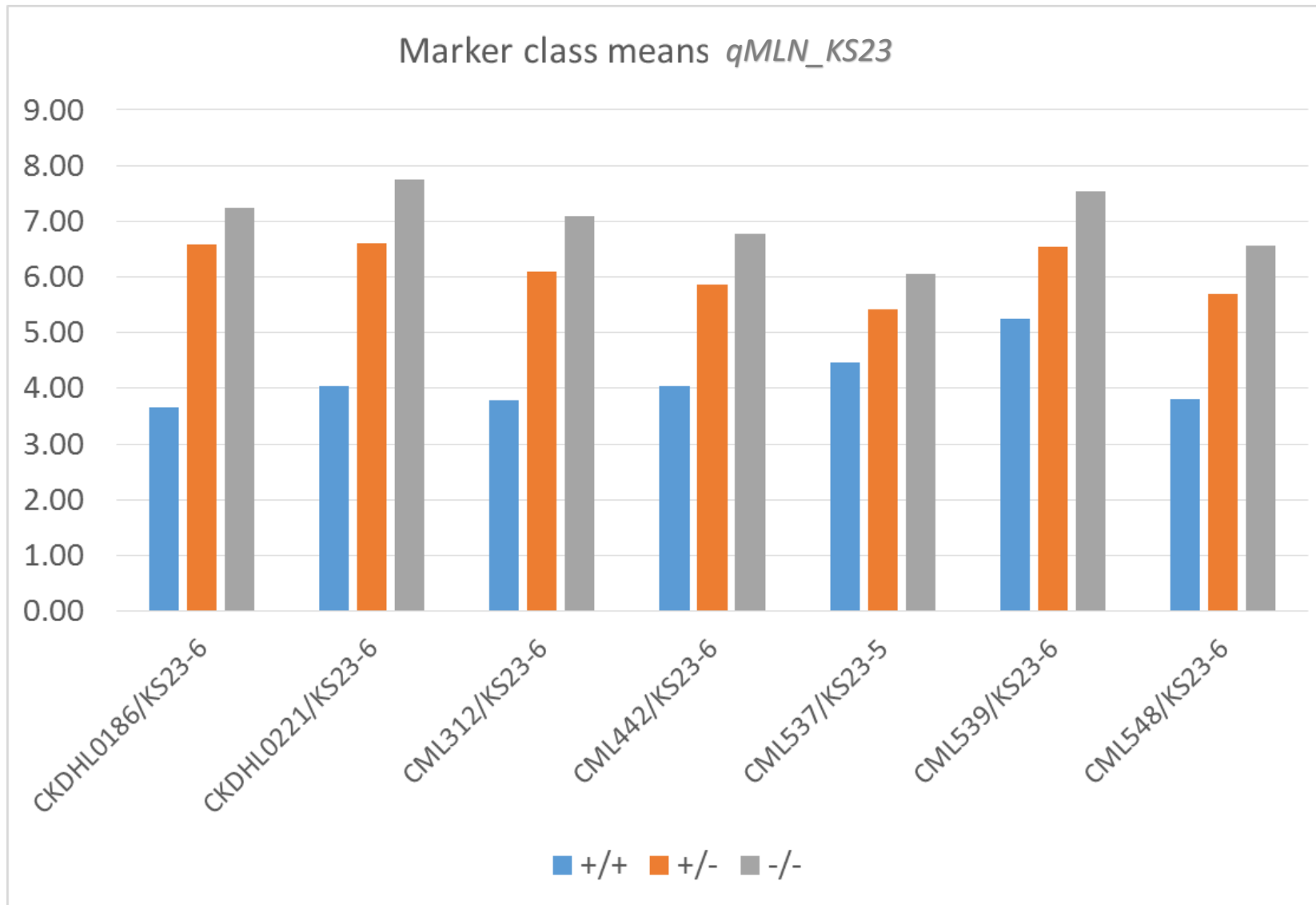
qMLN_KS23 +/-



qMLN_KS23 +/+

qMLN_KS23 +/-



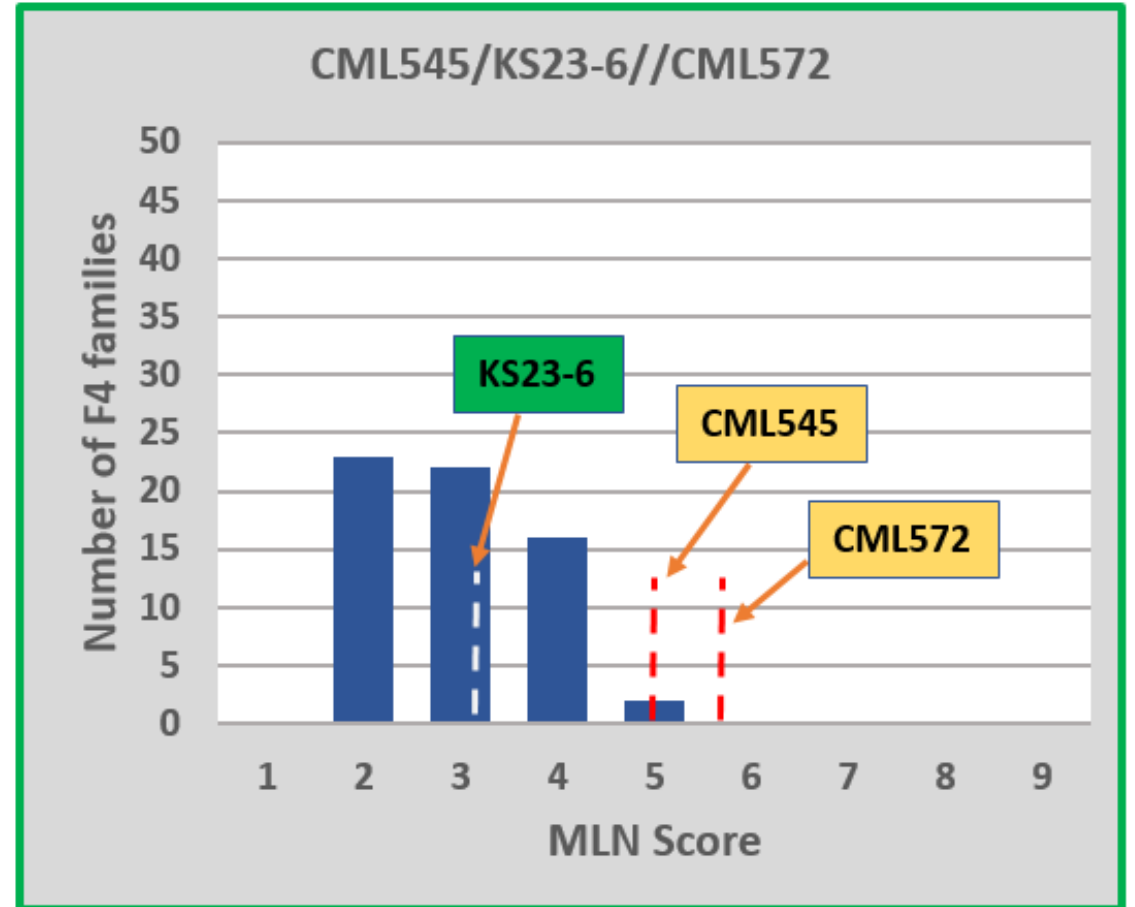


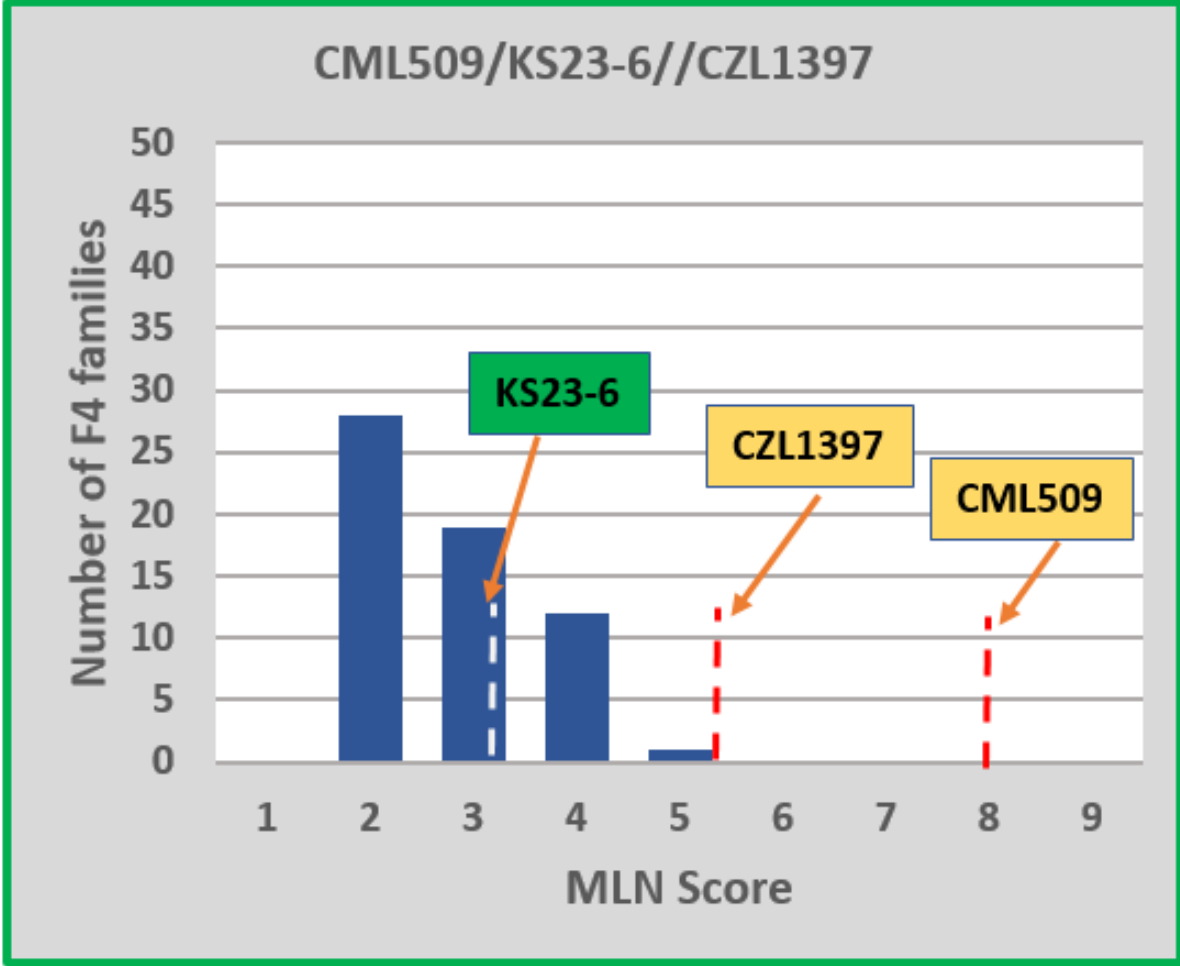
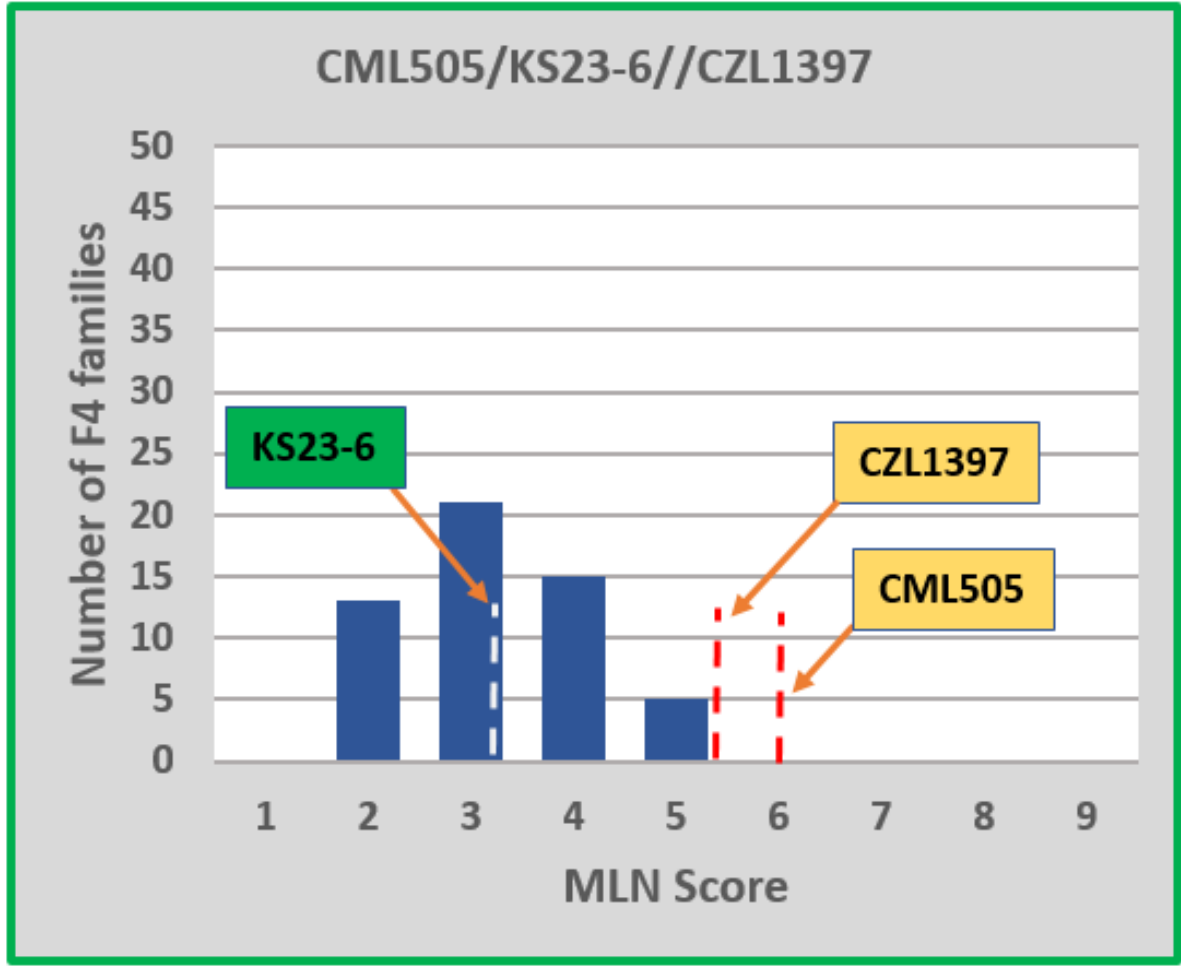
qMLN_06.157 deployment strategy

Drought response KS23-6

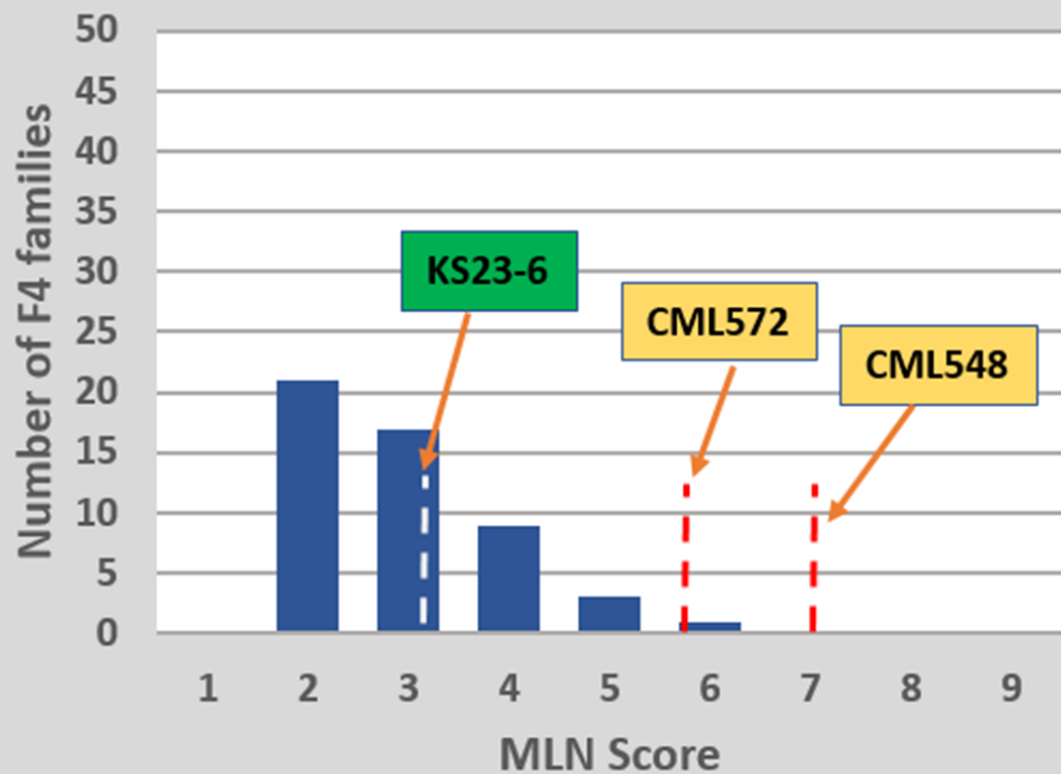
KS23-6

CKLMARS1C3S50264

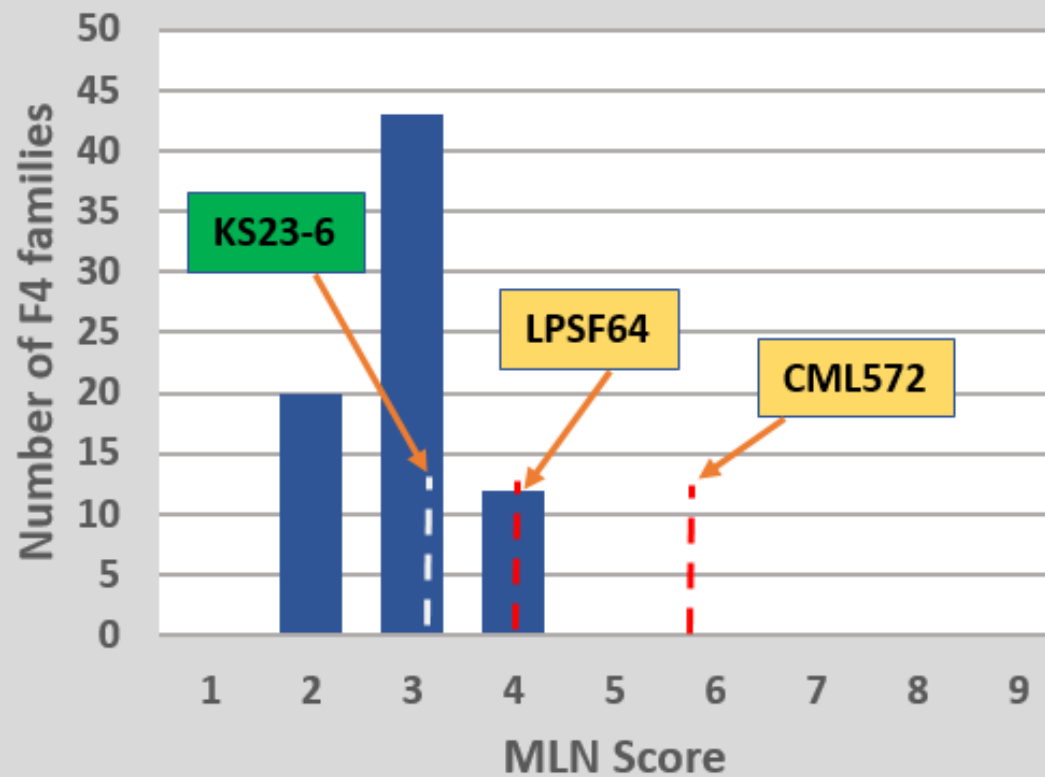




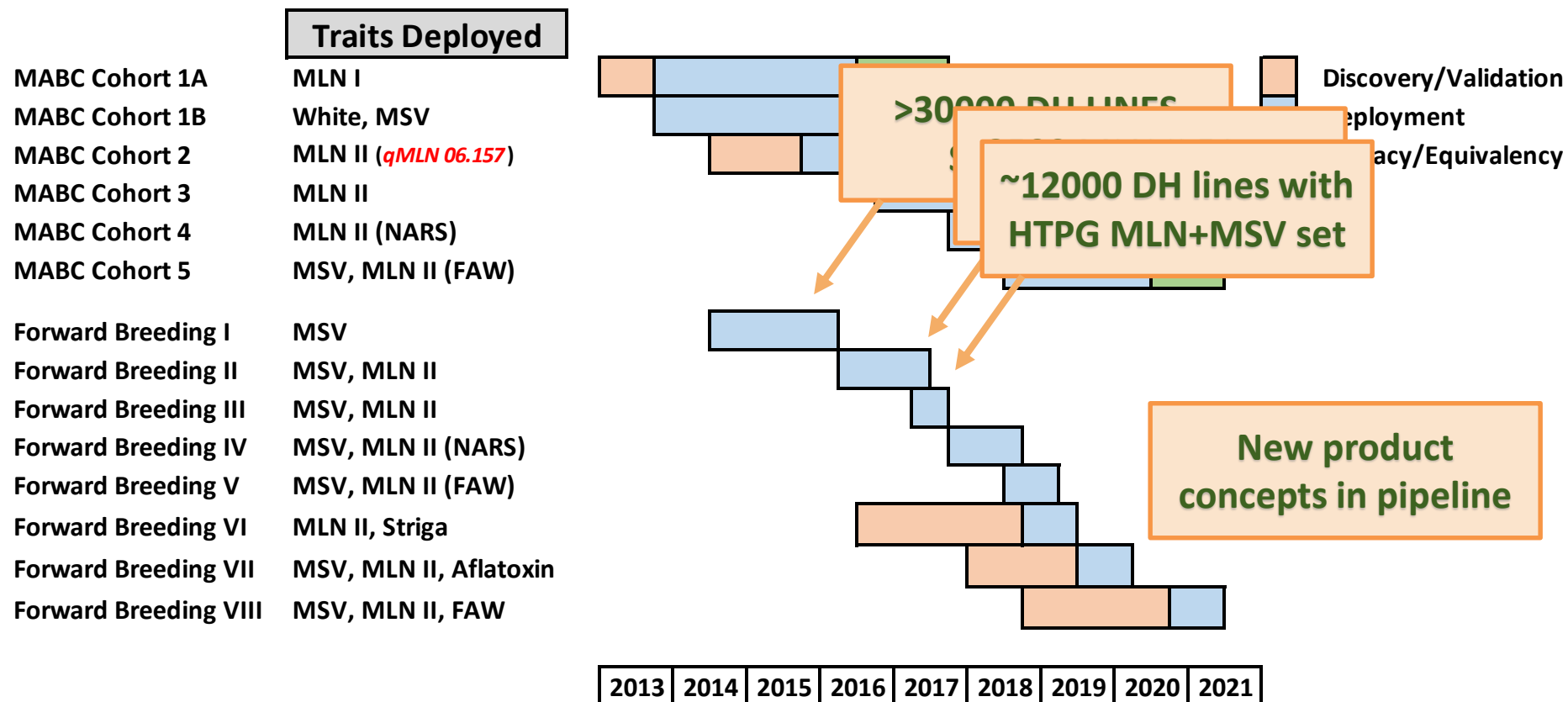
CML548/KS23-6//CML572



KS23-6/LPSF64//CML572



Marker Deployment Strategy: Africa





Acknowledgements

- Bill and Melinda Gates Foundation
- USAID
- Syngenta Foundation for Sustainable Agriculture
- Kenya Agriculture and Livestock Research Organization (KALRO)
- Dow DuPont Pioneer
- USDA-ARS
- Ohio State University
- University of Nairobi
- Diversity Arrays Technology
- Integrated Genotyping Service and Support (IGSS)

