



Agricultural  
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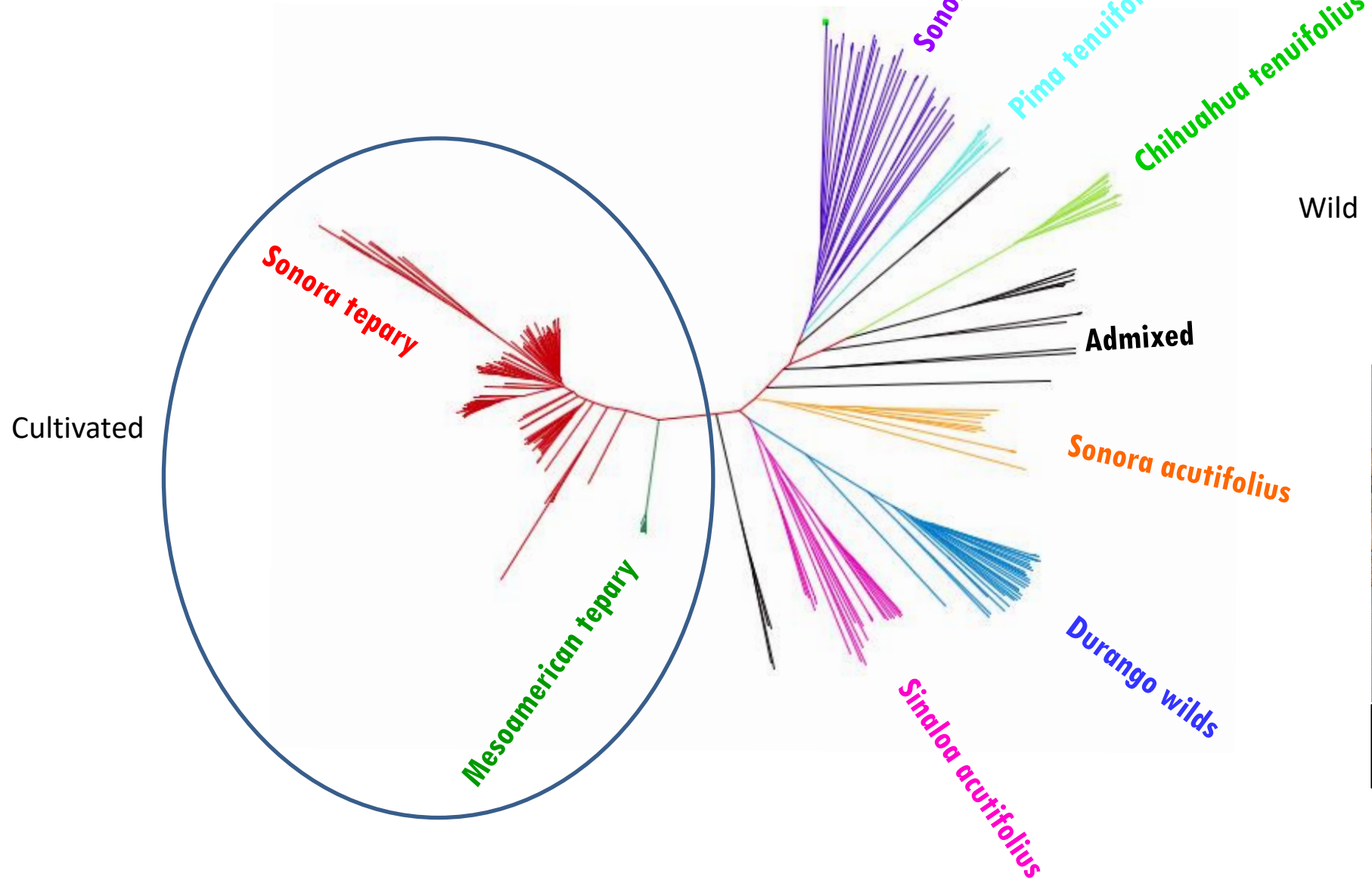


## Using wild tepary bean to improve common bean

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# Tepary Diversity Panel



Tepary Diversity Panel (315)  
Hart et al., 2019

# Bruchids cause significant postharvest losses

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- Sources of resistance identified in Tepary bean (*P. acutifolius*), (e.g. G40199)
- Transfer of resistance successful from P.a. to P.v. (Kusolwa and Myers, 2011)



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GERMPLASM

Registration of AO-1012-29-3-3A Red Kidney Bean Germplasm Line with Bean Weevil, BCMV, and BCMNV Resistance

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# Response of tepary bean breeding lines and entries of the Tepary Diversity Panel (TDP) when infested with the common bean weevil, *Acanthoscelides obtectus*

TDP #	ID, Type, County of origin	First evaluation			Second evaluation				
		60 d # soft seeds	60 d # damaged seeds	Total # seeds	60 d # soft seeds	60 d # damaged seeds	Total # seeds	100 seed weight (g)	% loss of initial weight
61	G40078, Wild, Texas	1	0	20	0	0	20	2.4	0.2
68	G40087, Wild, Durango, Mexico	0	0	20	0	0	20	7.1	3.0
173	G40196, Wild, Texas	1	1	20	0	1	20	6.4	0.0
194	G40214, Wild, Arizona	2	0	20	0	0	20	4.3	8.1
235	G40253A, Wild, Mexico	0	0	20	0	0	20	3.3	0.2
334	PI 661753, Wild, Unknown	1	0	20	0	0	10	1.5	0.0
341	PI 640989, Wild, Arizona	2	0	20	1	0	20	3.1	0.0
372	PI 310803, Cultivated, Nicaragua	6	6	10	20	18	20	18.7	57.8
318	Bawi, PI 440799, Cultivated, Arizona	9	9	10	20	18	20	21.1	53.4
312	TARS-Tep 23 <sup>1</sup> Breeding line	20	20	20	20	9	20	20.6	40.0
NA	TARS-Tep 90 Breeding line	20	20	20	20	12	20	22.0	46.4
NA	TARS-Tep 93 Breeding line	20	20	20	20	5	20	16.6	49.0

# BCMV virus response (NL3)

## CULTIVATED



Veinal Necrosis PL



No Symptoms



Mosaic



Leaf Curl



Necrotic Local Lesions



No Symptoms

## WILD



Veinal Necrosis



No Symptoms



Mosaic

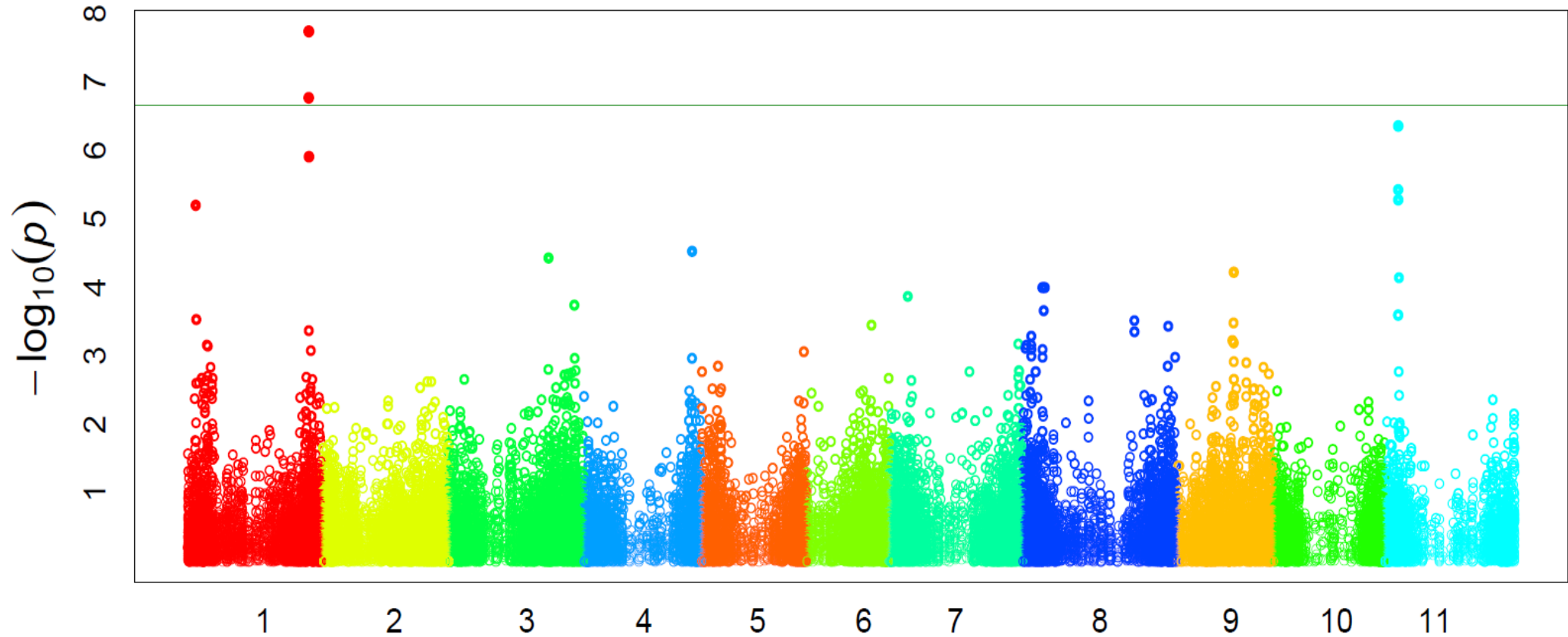


Necrotic Local Lesions



No Symptoms

# BCMV-NL3 GWAS results, ELISA

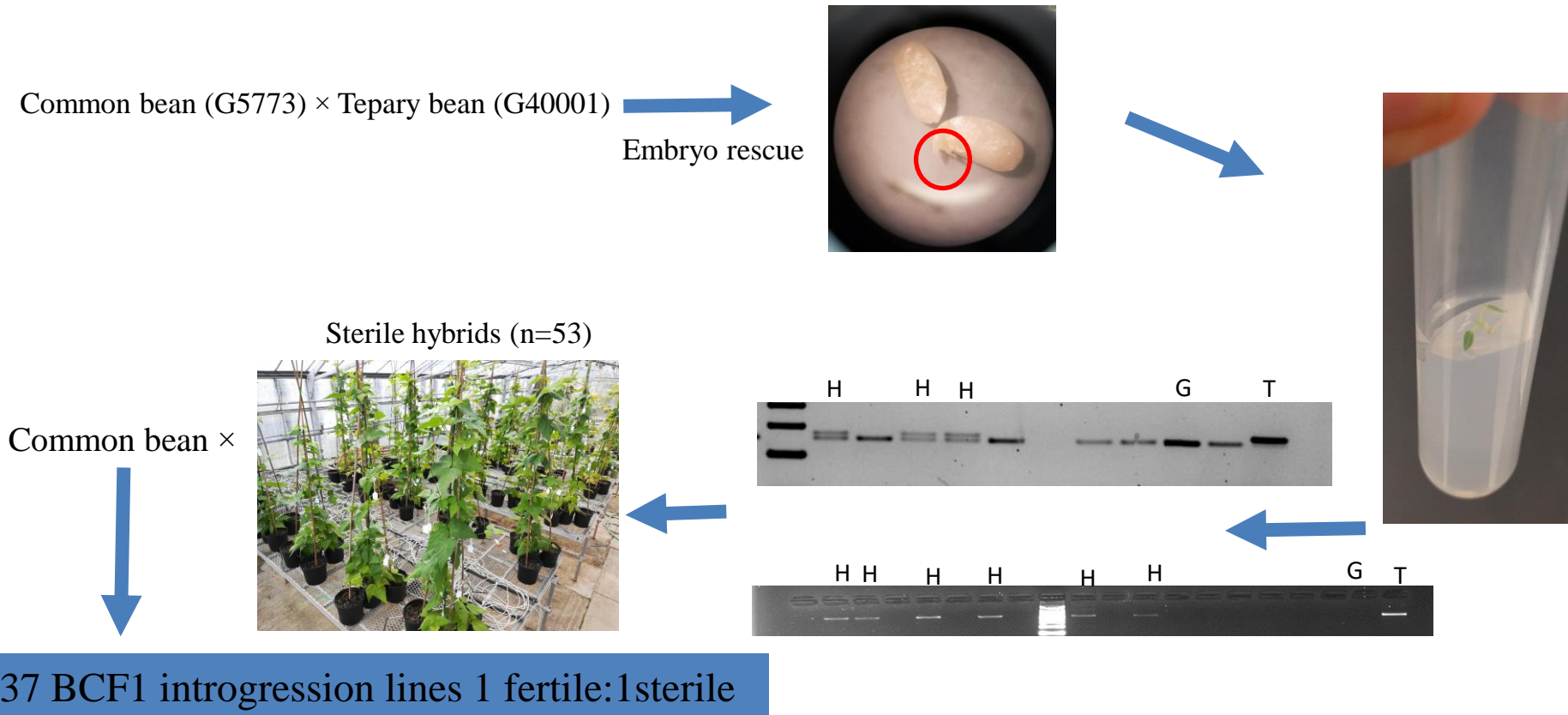


-Resistance only in wild tepary beans

-Introgression to cultivated tepary in process

-BC2 generation

# Developing Common bean (*Phaseolus vulgaris*) lines with introgressions from tepary bean (*Phaseolus acutifolius*)



(Ali Soltani & David Lowry, MSU)

# Pv/Pa Interspecifics

USDA-MSU Collaboration



Intersp/Tepary



Intersp/Common bean





# Field performance, F<sub>5</sub> Interspecific lines



May 2021 (moderate heat, Isabela, PR)



August 2021 (High temp., Juana Diaz, PR)