

# Introducing MAPpoly2 and updates on QTLpoly: Supplementary Slides

Marcelo Mollinari

Gabriel Gesteira

Guilherme Pereira

Zhao-Bang Zeng



This project is funded by USDA NIFA Specialty Crop Research Initiative Award # 2020-51181-32156 (09/01/20 - 08/31/24)



# MAPpoly2

## GitHub page and Rpubs

- <https://github.com/mmollina/mappoly2>
- [https://rpubs.com/mmollin/tutorial\\_mappoly2](https://rpubs.com/mmollin/tutorial_mappoly2)
- [https://rpubs.com/mmollin/multi\\_family\\_simulation](https://rpubs.com/mmollin/multi_family_simulation)



This project is funded by USDA NIFA Specialty Crop Research Initiative Award # 2020-51181-32156 (09/01/20 - 08/31/24)



# Inter-connected tetraploid alfalfa families



Genetic  
Resources

ORIGINAL ARTICLE

*Genetic Resources* (2023), 4 (8), 55–63  
DOI: 10.46265/genresj.EMOR6509  
<https://www.genresj.org>  
ISSN: 2708-3764

## A public mid-density genotyping platform for alfalfa (*Medicago sativa* L.)

Dongyan Zhao<sup>a</sup>, Katherine Mejia-Guerra<sup>a,b</sup>, Marcelo Mollinari<sup>c</sup>, Deborah A Samac<sup>d</sup>, Brian M Irish<sup>e</sup>, Kasia Heller-Uszynska<sup>f</sup>, Craig T Beil<sup>a</sup> and Moira J Sheehan<sup>\*a</sup>

<sup>a</sup> Breeding Insight, Cornell University, Ithaca, 14853, NY, USA

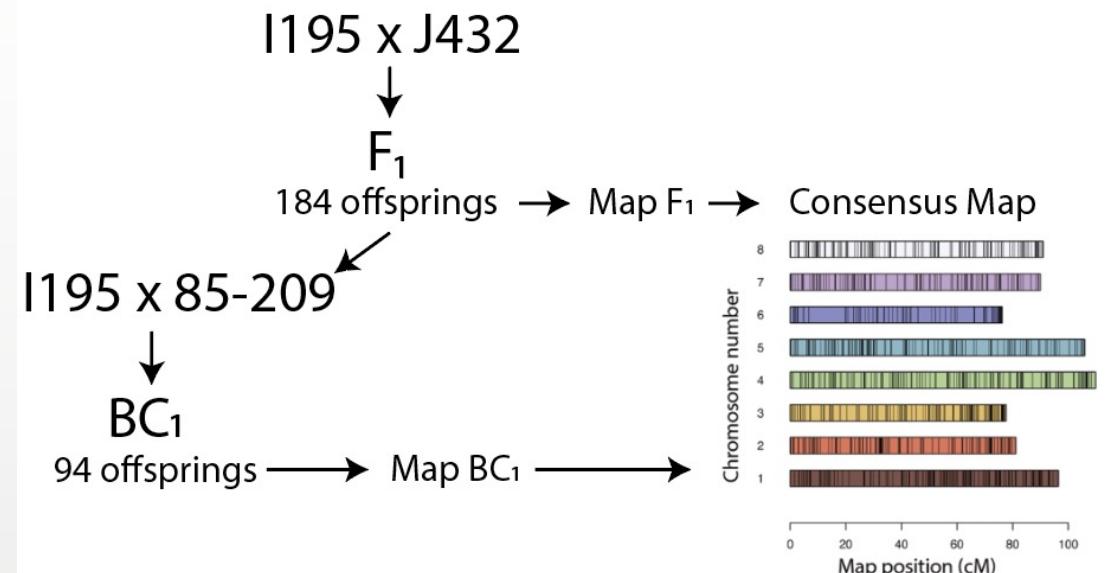
<sup>b</sup> Sarepta Therapeutics, Cambridge, 02142, MA, USA

<sup>c</sup> Campus Box 7609, North Carolina University, NC, Raleigh, 27695, USA

<sup>d</sup> Plant Science Research Unit, USDA-ARS, St. Paul, 55108, MN, USA

<sup>e</sup> Plant Germplasm Introduction and Testing Research Unit, USDA-ARS, Prosser, 99350, WA, USA

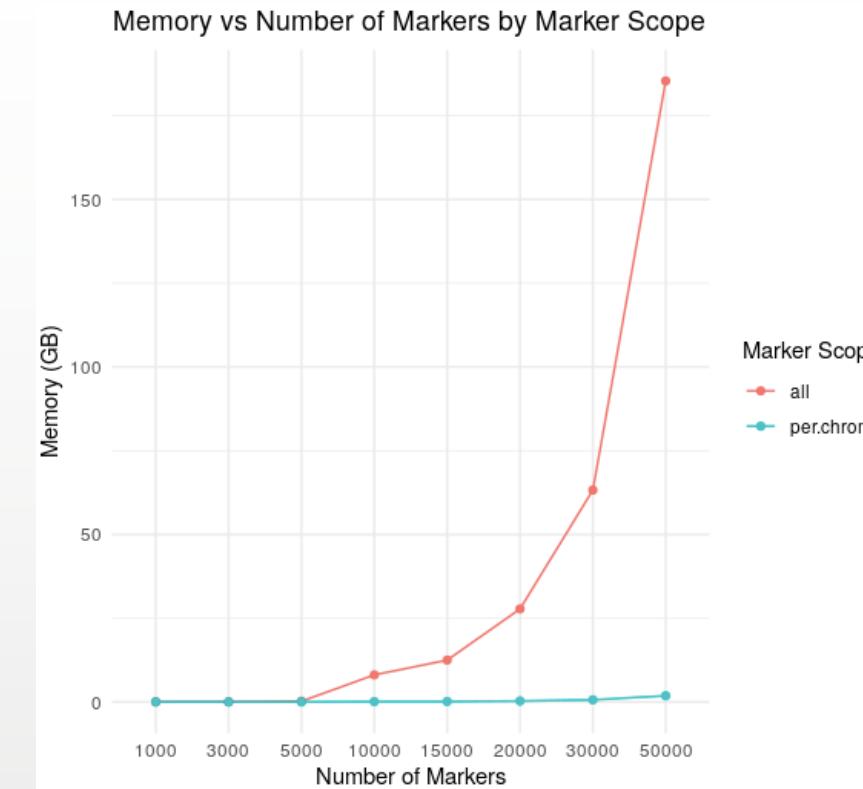
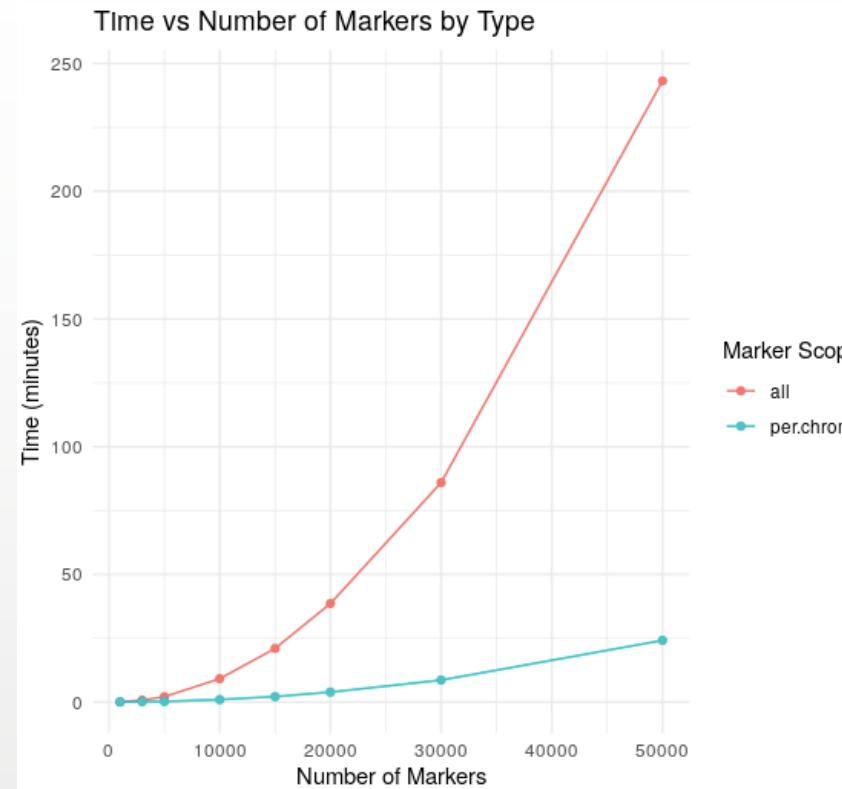
<sup>f</sup> Diversity Arrays Technology, ACT 2617, Bruce, Australia



This project is funded by USDA NIFA Specialty Crop Research Initiative Award # 2020-51181-32156 (09/01/20 - 08/31/24)



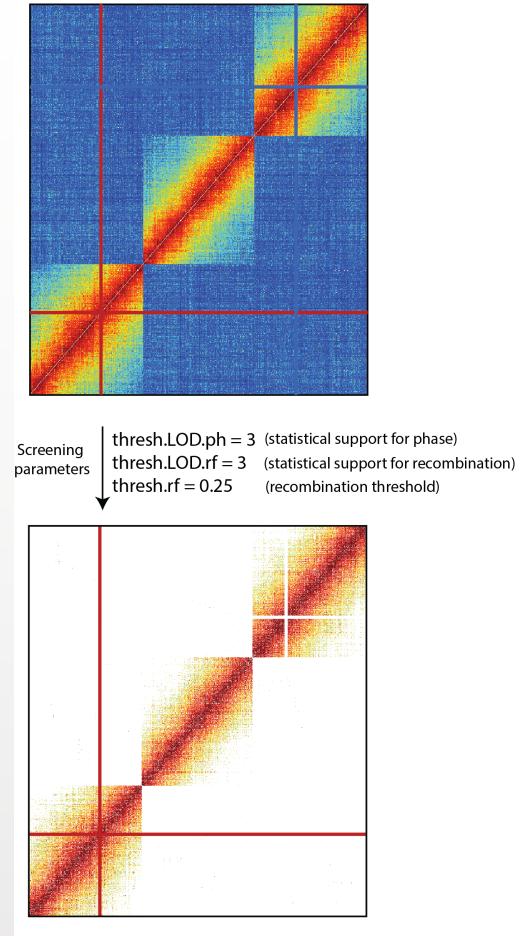
# Pairwise recombination – Time and Memory



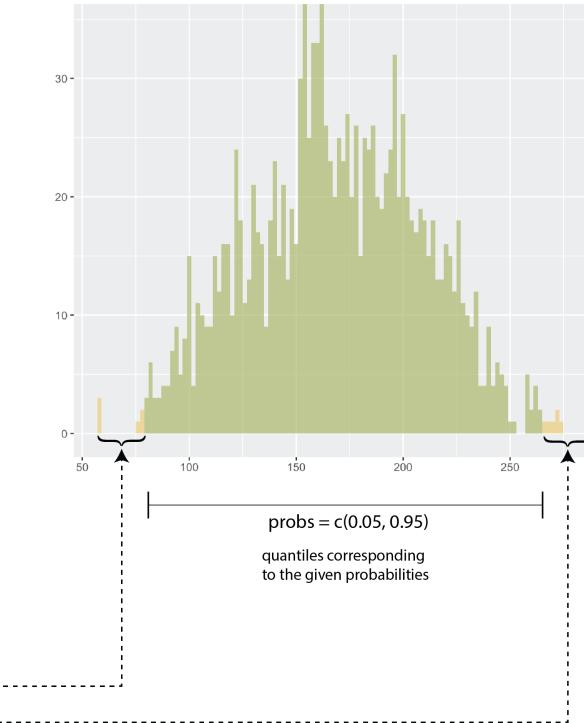
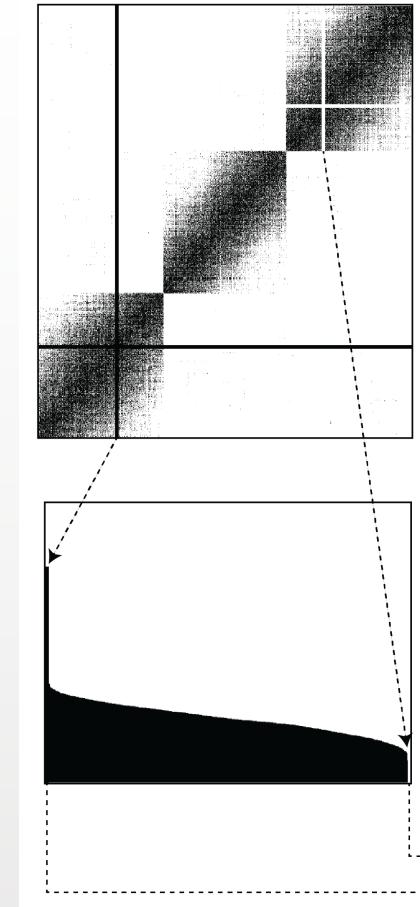
The simulation results showcased in this Figure were obtained using an Intel(R) Xeon(R) Gold 6226R CPU running at 2.90GHz, combined with 376 GB of RAM and 32 processing cores.

10 chromosomes

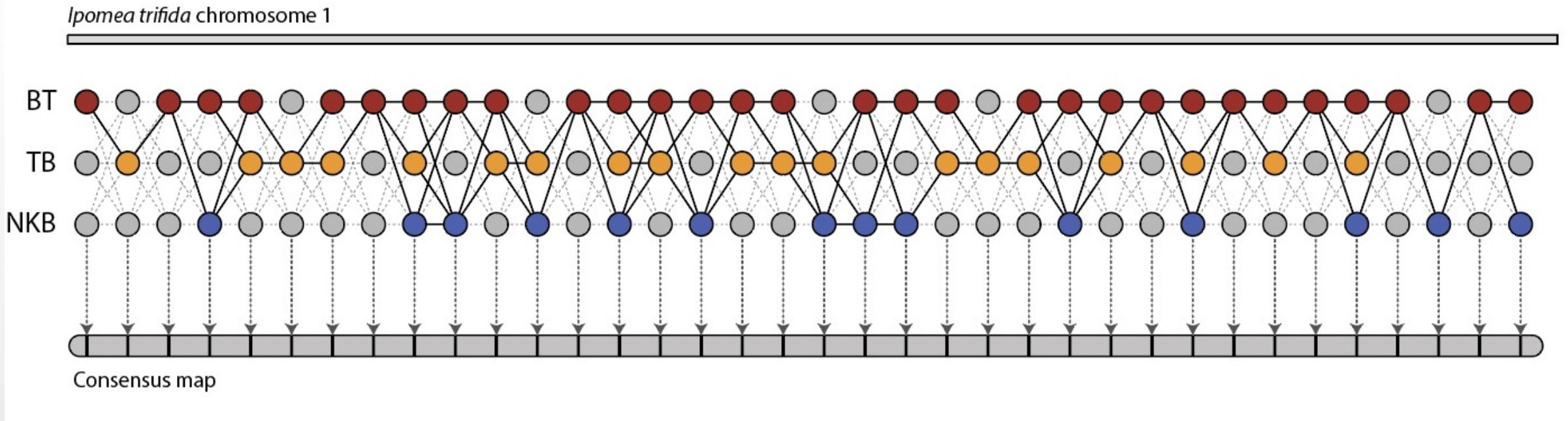
# Recombination fraction-based filtering



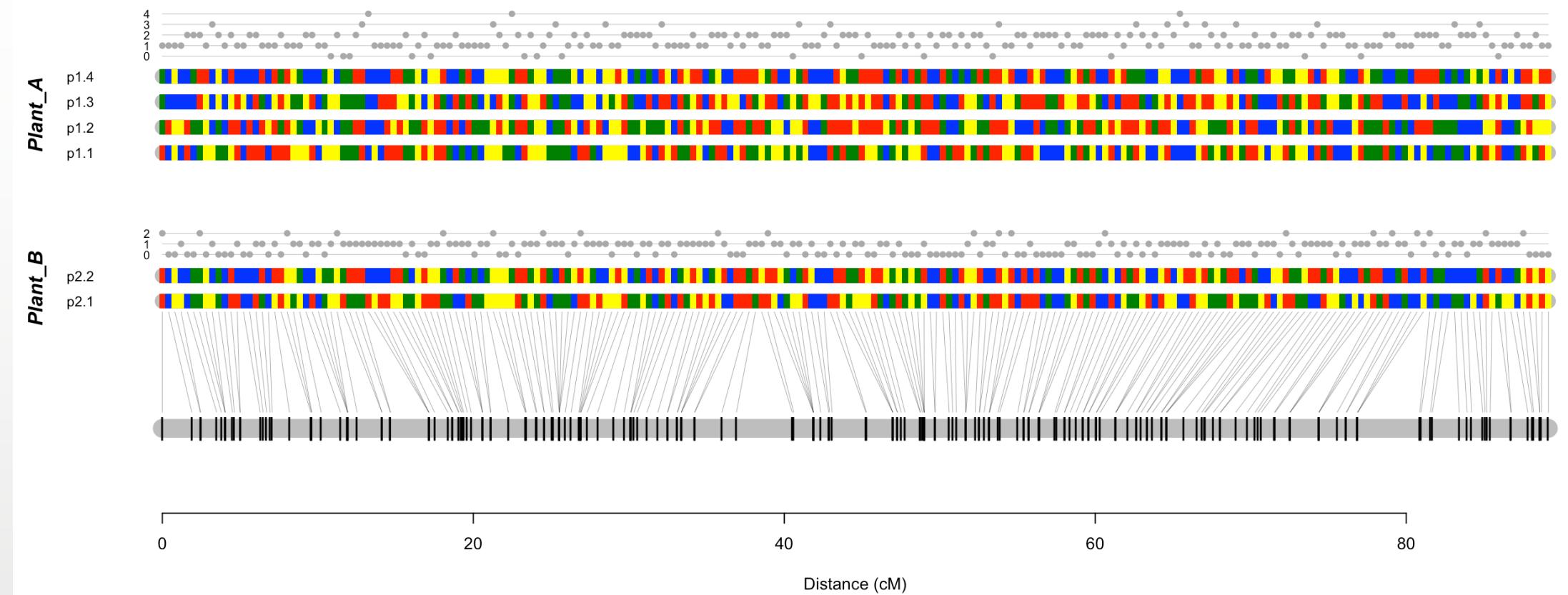
Binarization



# HMM and propagation of information in multiple maps



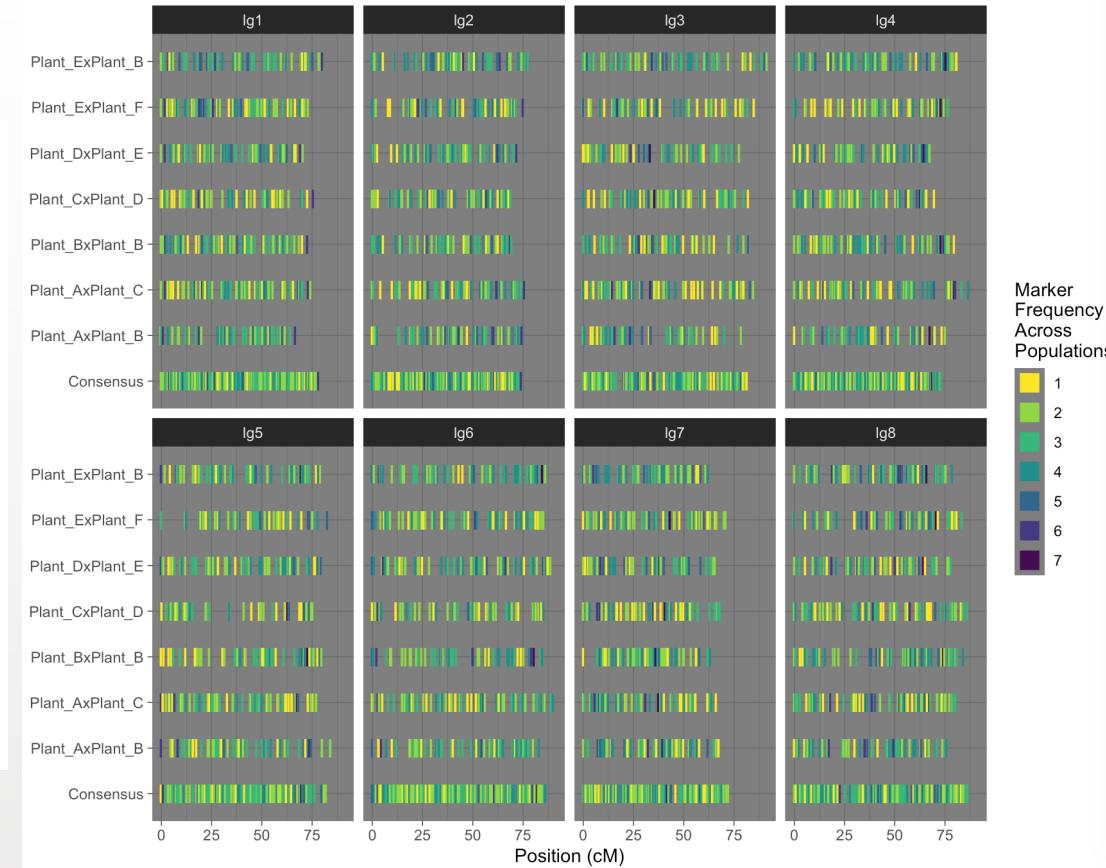
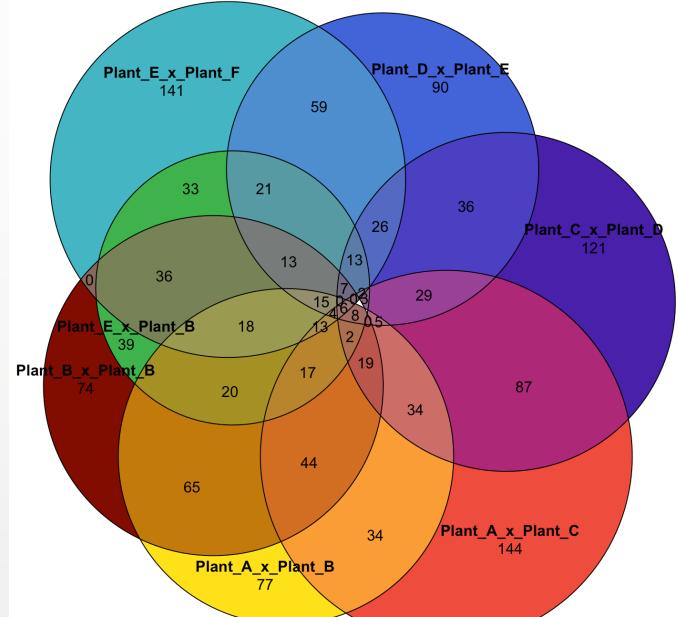
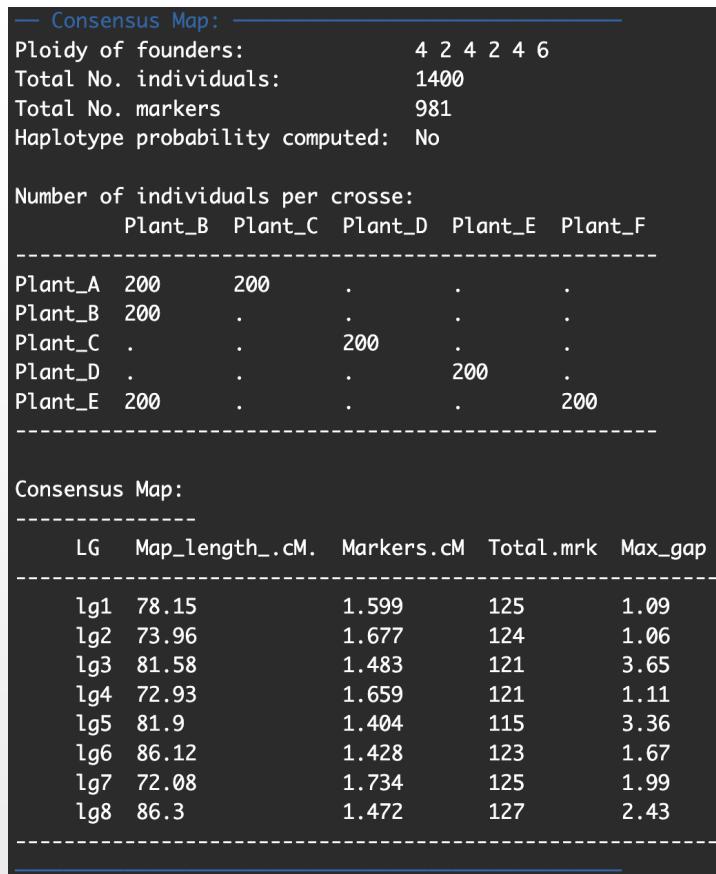
# Mixed-ploidy cross: 2 x 4



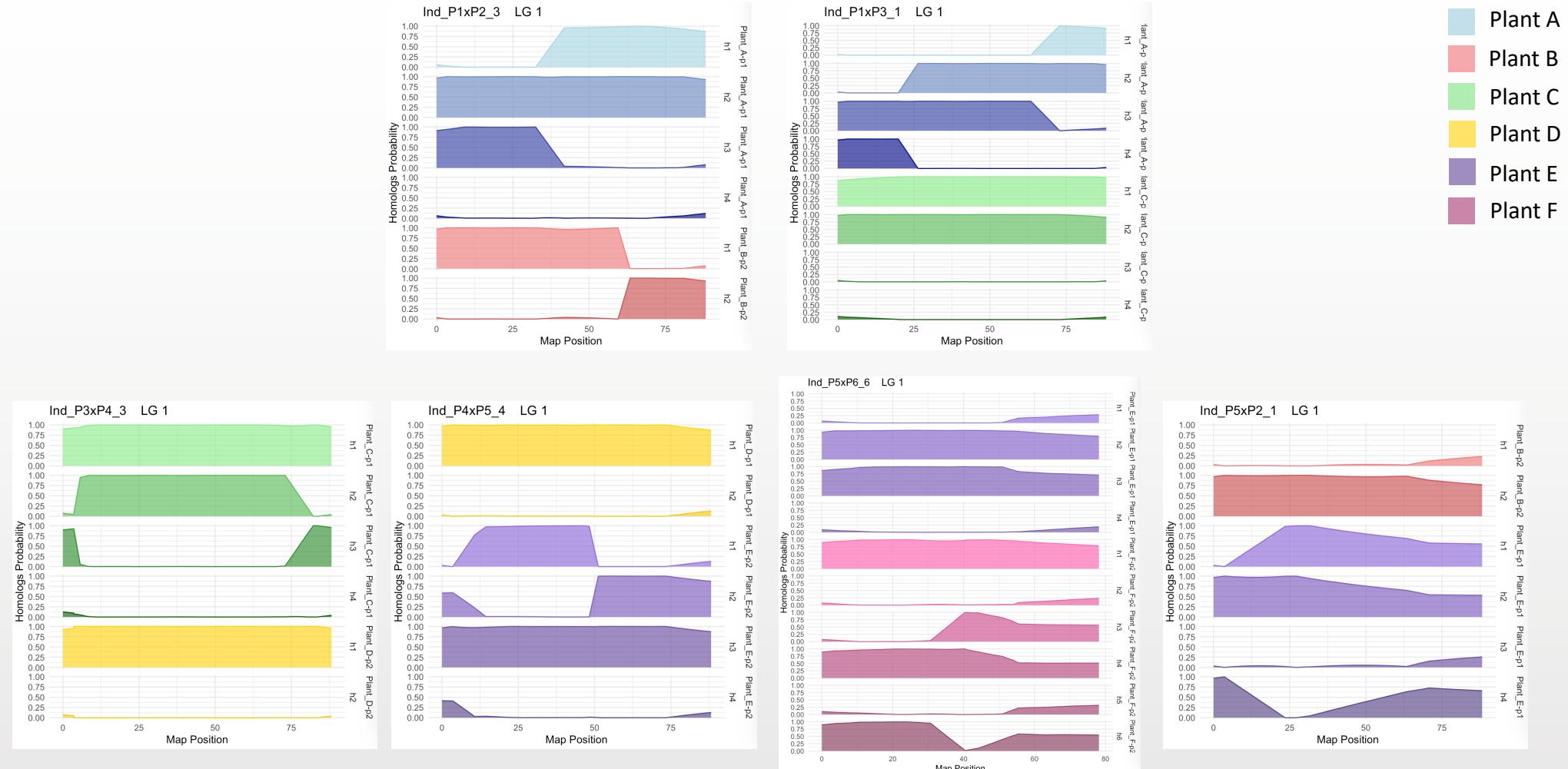
This project is funded by USDA NIFA Specialty Crop Research Initiative Award # 2020-51181-32156 (09/01/20 - 08/31/24)



Seven populations, 6 parents, 3 ploidy levels



# Haplotype probabilities



# Project Members



Cornell University



**NC STATE**  
UNIVERSITY



This project is funded by USDA NIFA Specialty Crop Research Initiative Award # 2020-51181-32156 (09/01/20 - 08/31/24)



BILL &  
MELINDA  
GATES  
foundation

**NC STATE**  
UNIVERSITY

# Other Collaborators



Neuhouse Farms



Woolf Roses L.L.C.



This project is funded by USDA NIFA Specialty Crop Research Initiative Award # 2020-51181-32156 (09/01/20 - 08/31/24)

