Alfalfa to get back into planetary boundaries

2025 world alfalfa congress
FRANCE REIMS-CHÂLONS

Sequence 3: Genetics and breeding

Charlie Brummer

Young professionals event

FROM 03 TO 06 nov. 2025

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Evaluation of Non-Dormant Alfalfa Germplasm for Resilient Commercial Cultivar Development

Kartika Nalle, E. Charles Brummer, and Brian Irish

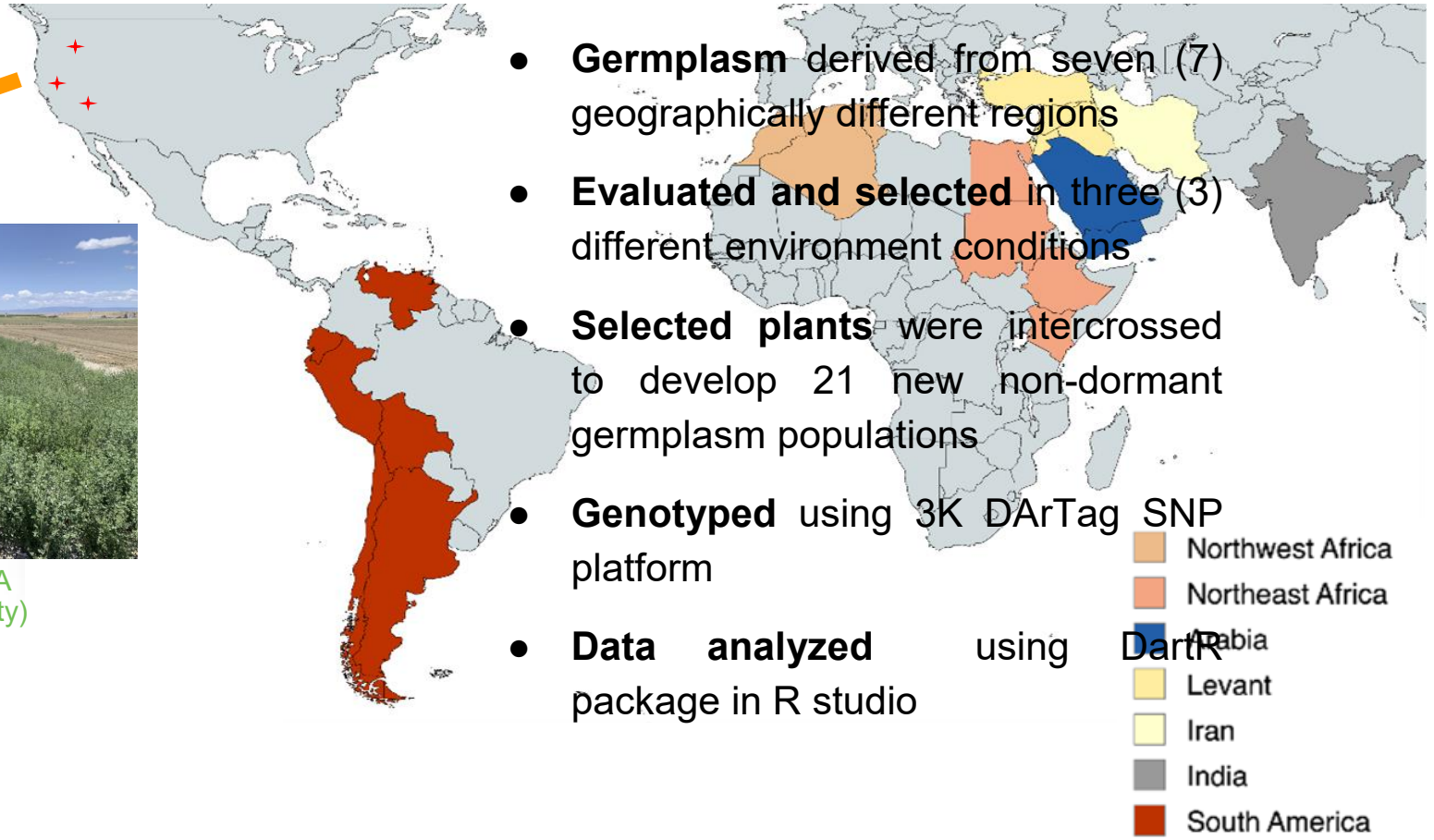
FROM 03 TO 06 nov. 2025

Background & method

Prosser, WA
(Winter hardiness)

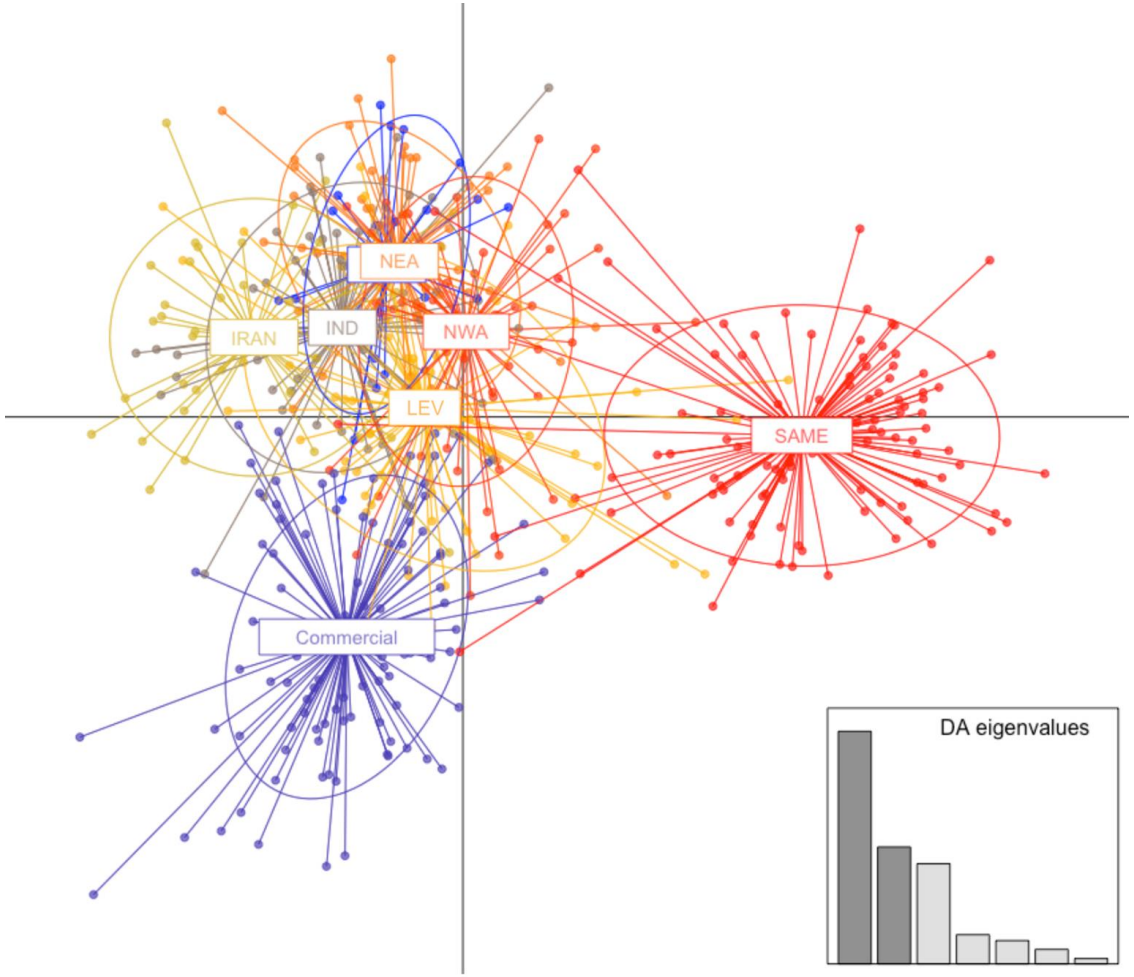
Five Points, CA
(Heat and salinity)

Davis, CA
(High productivity)



- **Germplasm** derived from seven (7) geographically different regions
- **Evaluated and selected** in three (3) different environment conditions
- **Selected plants** were intercrossed to develop 21 new non-dormant germplasm populations
- **Genotyped** using 3K DArTag SNP platform
- **Data analyzed** using DartR package in R studio

Result



- **The South America (SAME)** population forms a distinct genetic cluster.
- **Commercial cultivars** clearly separated from all other germplasm groups.
- **Experimental populations** show moderate overlap, suggesting shared ancestry or recent gene flow.
- **The non-dormant germplasm** represents divergent genetic diversity from current US commercial cultivars.