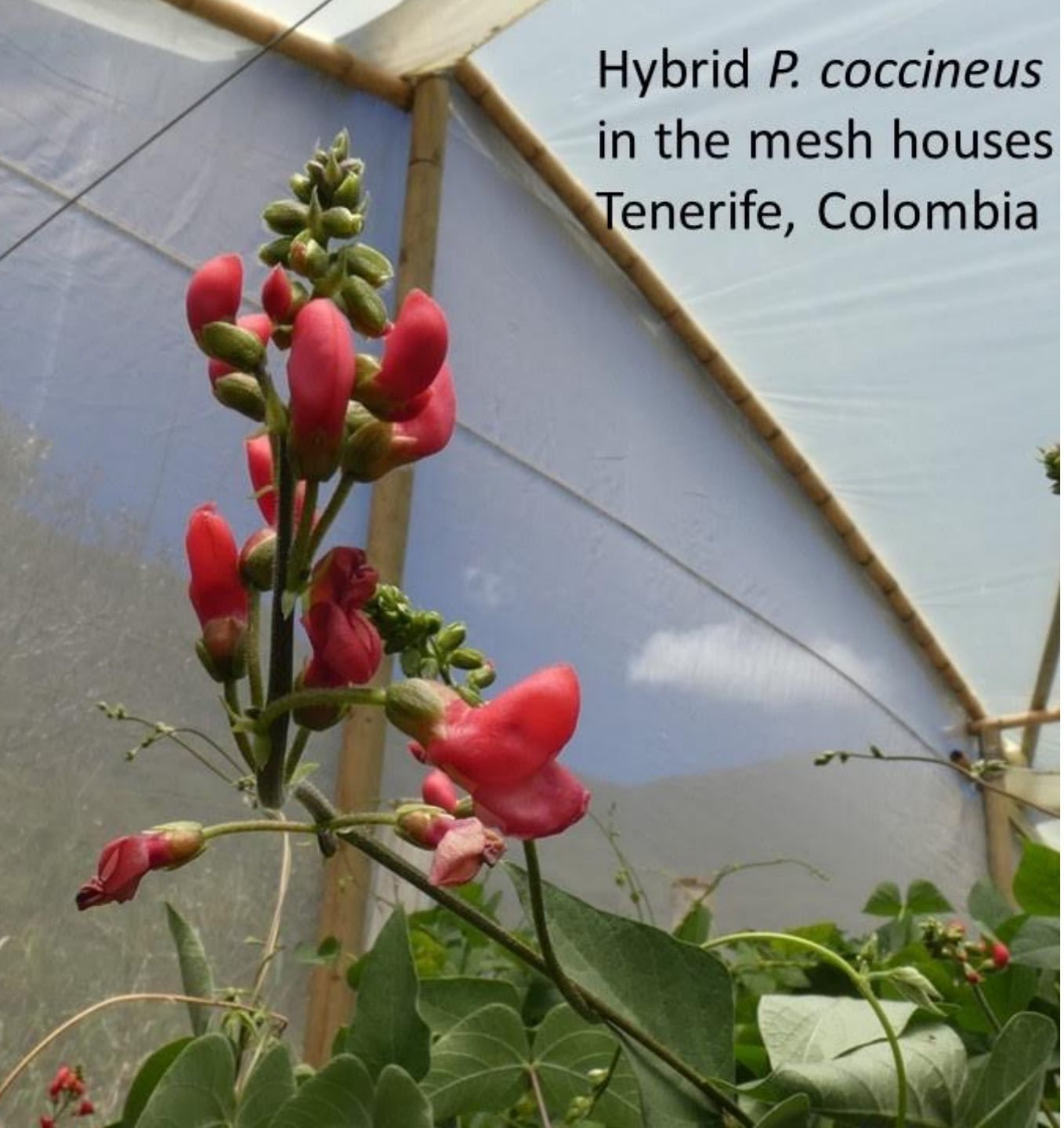
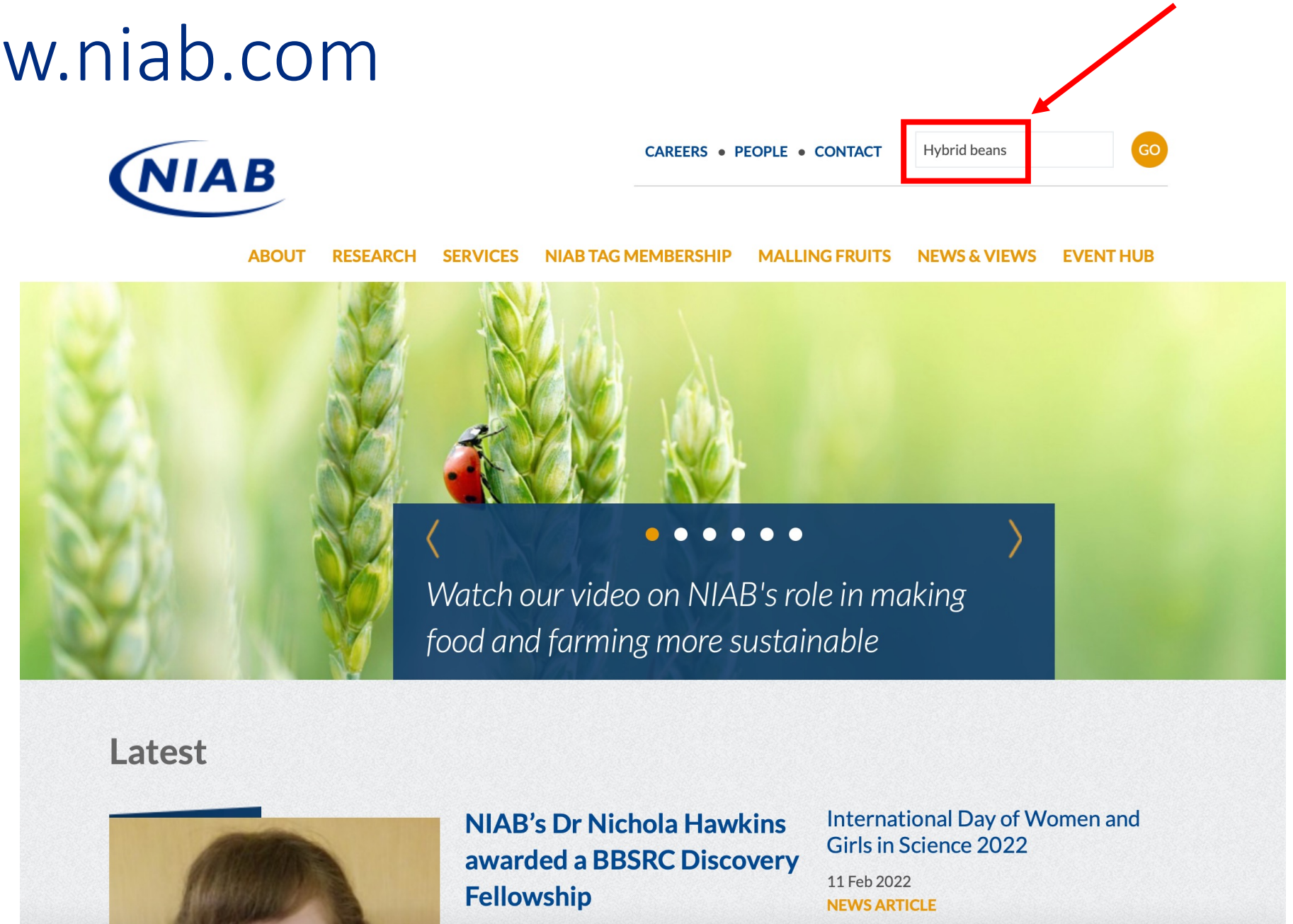


Accessing germplasm, genotypic and phenotypic resources

Hybrid bean virtual workshop
March 1st 2022

Sarah Dyer sdyer@ebi.ac.uk

www.niab.com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NIAB's Dr Nichola Hawkins awarded a BBSRC Discovery Fellowship
International Day of Women and Girls in Science 2022
11 Feb 2022
NEWS ARTICLE

www.niab.com/research/agricultural-crop-research/research-projects/characterising-hybrid-beans

Characterising hybrid beans

Characterising a hybrid bean collection to advance climate-ready bean breeding

Researchers will be exploring common bean hybrid populations to learn more about their physical characteristics, genetics, responses to disease and ease of use for breeding programmes. All information will be made available here and through CIAT's genebank.

By reducing the barriers to inclusion of wild material into breeding programmes, we hope to help breeders produce better beans in a shorter time, and have a positive impact on global food security.

Led by project partners NIAB and CIAT, this project is funded as part of BBSRC's Global Challenges Research Fund (GCRF) Bioinformatics and Biological Resource (BBR) fund, and will run from May 2018 – April 2023.

About us

To become involved in the research contact Dr Tom Wood.

Materials

About us

To become involved in the research contact Dr Tom Wood.

Materials

We have selected 12 populations from within CIAT's genebank for further study. View a complete list.

Activities

- **Characterisation** - the materials will be grown in Colombia and the UK, and their physical characteristics recorded including flowering, seed and root traits.
- **Disease screening** - material will be grown under controlled conditions at NIAB in the UK and tested for responses to white mold, anthracnose and web blight.
- **Crosses** will be attempted against a *P. vulgaris* line to test viability of offspring and ease of use within breeding programmes.
- **Genotyping** - all populations will undergo DArT genotyping to learn more about the background of these materials.

News

For the latest news and updates on the project

Resources

- Rhizoctonia root rot disease screening results - February 2022
- Web blight, white mold and anthracnose disease screening results - February 2022
- Natural bean hybrids - 2018 poster for farmer facing events

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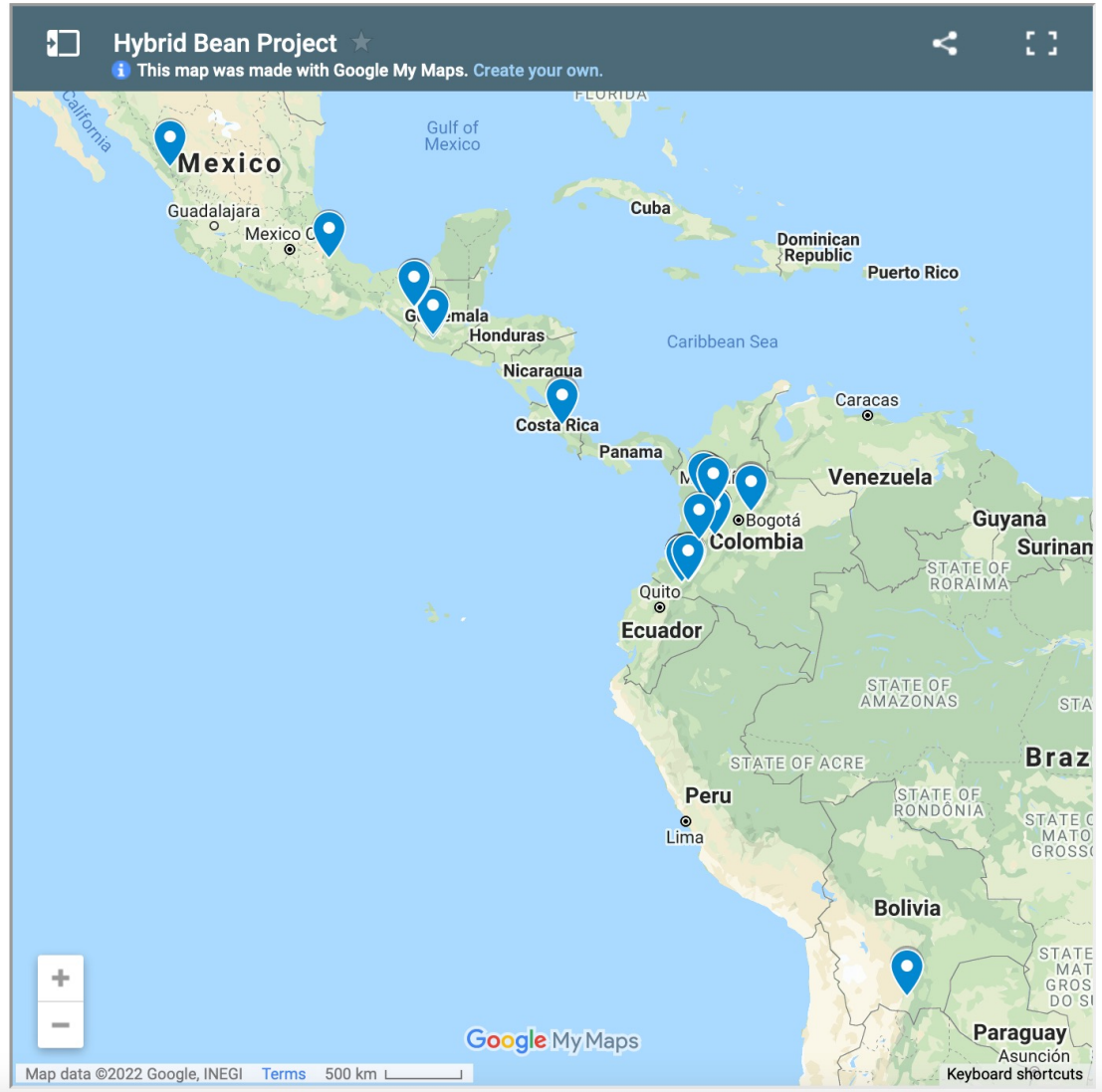
List of materials

The project researchers have selected the following hybrid accessions from CIAT's genebank for further study:

Hybrid accession	Species	Collection information	Representative parent 1	Representative parent 2
G24764B	*P. dumosus* x *P. vulgaris* hybrid	Colombia, Boyacá, Garagoa	G36179, *P. dumosus* cultivated	G24764D, *P. vulgaris* feral
G35980H	*P. vulgaris* x *P. dumosus* cultivated	Colombia, Tolima, Chaparral	G23992, *P. vulgaris* cultivated	G35980, *P. dumosus* cultivated
G50785Y1	*P. vulgaris* x *P. coccineus* hybrid	Colombia, Antioquia, Andes	G50785V2, *P. vulgaris* cultivated	G35998, *P. coccineus* cultivated
G50879X4	*P. vulgaris* x *P. coccineus* hybrid	Colombia, Caldas, Salamina	G50879V1, *P. vulgaris* cultivated	G36211, *P. coccineus* cultivated
G51274I	*P. vulgaris* x *P. coccineus* hybrid	Colombia, Nariño, Pasto	G51274D, *P. vulgaris* cultivated	G35361, *P. coccineus* cultivated
G36124	*P. dumosus* x *P. coccineus* cultivated	Colombia, Putumayo, San Francisco (valley of Sibundoy)	G35270, *P. dumosus* cultivated	G35271, *P. coccineus* cultivated
G36393	*P. dumosus* x *P. costaricensis* feral	Costa Rica, Cartago, Cartago	G35807, *P. dumosus* cultivated	G40893B, *P. costaricensis* wild



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CIAT

Bean collection

Passport		
Identification	Accession number	G24764B
	CIAT code	G24764B
	DOI	10.18730/S5YMF
	Synonyms	OT-452
	Common names	
Taxonomic information	Genus	*Phaseolus*
	Species	*x(p. dumosus x p. vulgaris)*
	Subspecies	
	Variety	
Ecological observations	Biological status	Cultivated
	Type of material	Hybrid
	CORE collection	0
Geography	Country	Colombia
	Department	Boyaca
	County	Garagoa
	Place	6 km N Garagoa vía Chinavita, vereda Caldera Abajo
	Altitude (masl)	1450.0
	Latitude (decimal)	5.14
	Longitude (decimal)	-73.36
	Map	
Collection information	Date of collection(dd-mm-yyyy): 17-01-1993 Collector name: Jose Orlando Toro Chica, Stephen Edgar Beebe, Guillermo Leon Valencia Tobon Trip report:	
Donor's	Name:Jose Orlando Toro Chica Institution:CIAT Country:Colombia	

Phenotyping - Characterisation & passport data

CIAT

Bean collection

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Photo	

Characterization														
Growth habit	Seed color	Seed shape	Seed brightness	100 seed weight (g)	Days to flowering				Harvest				
					Days to flowering	Place	Year	Responsible	First harvest (Number of days)	Last harvest (Number of days)	Place	Year	Responsible
Indeterminate climbing	Brown, Other, Cream	Kidney	Bright	45.3	62			Gilberto Arana, Arturo Martos, Orlando Toro					Gilberto Arana, Arturo Martos, Orlando Toro

Reactions to biotic and abiotic stresses				
BCMV (Bean Common Mosaic Virus)		Empoasca		
Reaction	Responsible	Reaction	Responsible	Date of evaluation (dd-mm-yyyy)
Susceptible	Mauricio Castaño Jaramillo			

Seed storage proteins	
Protein	Responsible
M11	Cesar Humberto Ocampo Nahar, José Orlando Toro Chica

Español

Welcome!

Here you can search for, and request germplasm from the bean, cassava and forages collections. All germplasm is available under the Standard Material Transfer Agreement (SMTA) of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)). You can accept the SMTA by:

-Filling in the needed information on SMTA pages 2 and 8 and signing,
-Accepting the conditions of the SMTA electronically, in case you request germplasm via our website (as opposed to email), or by

Crosses – hybrids x SER16

If you are interested in evaluating these materials:

Contact: tom.wood@niab.com

Phenotyping results

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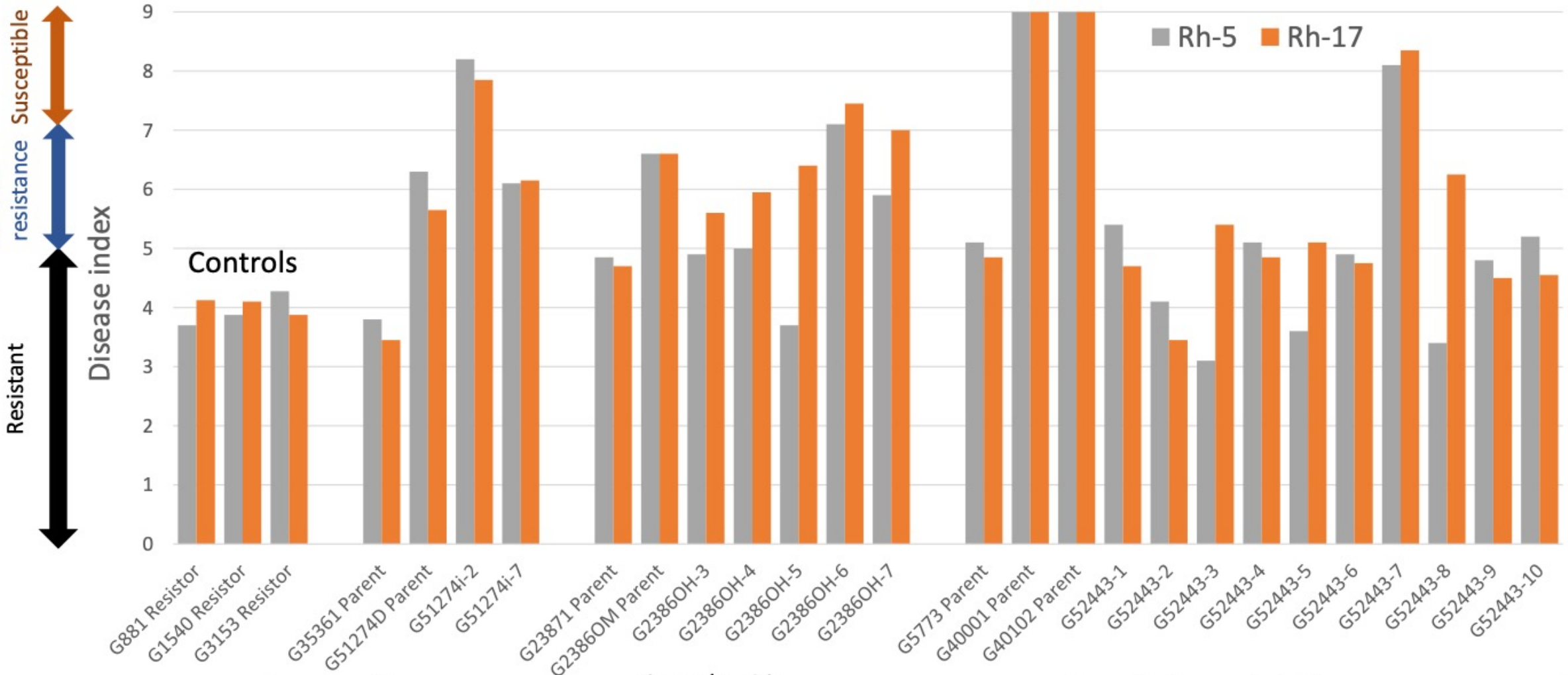
Disease screening: Rhizoctonia root rot



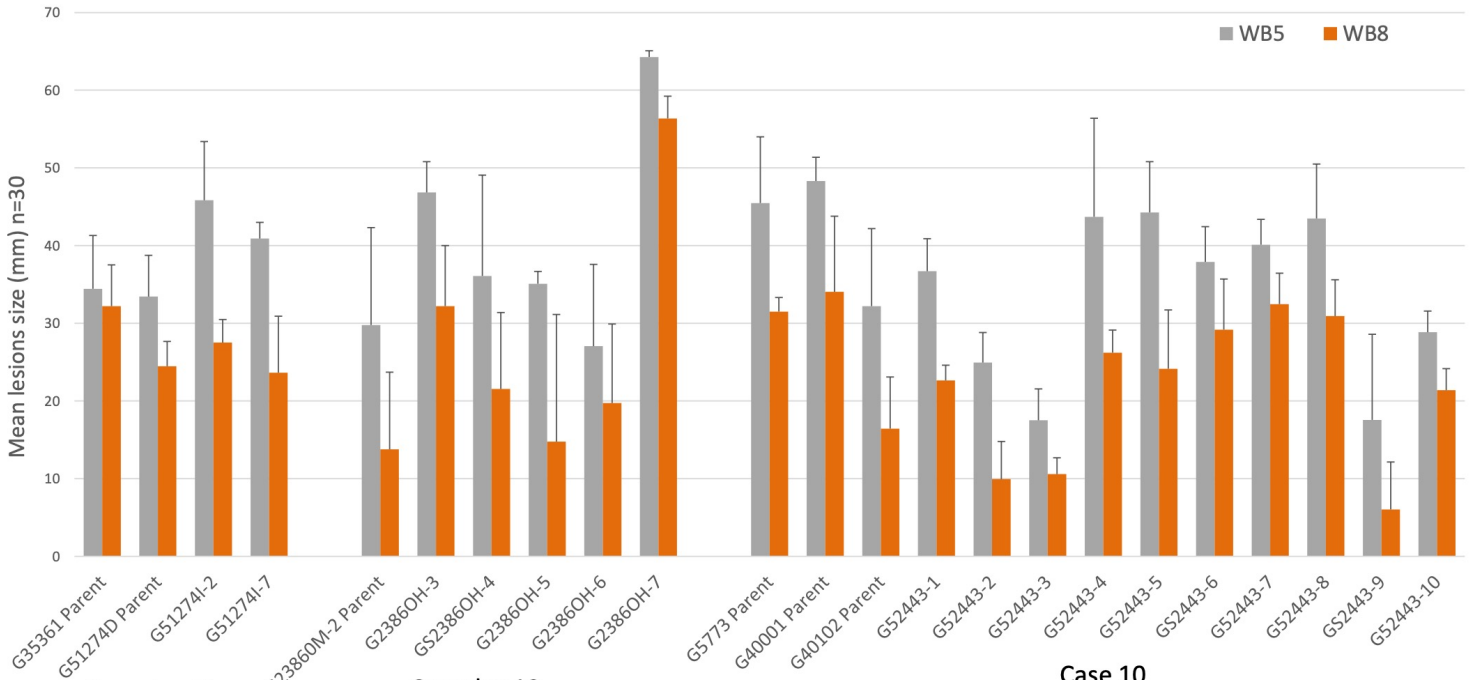
Complex 11
Cultivated
P. vulgaris x coccineus
hybrid

Complex 19
P. vulgaris wild x feral
hybrid

Case 10: 3-way hybrid
P. vulgaris x parvifolius x acutifolius

NIAB
world-class experience, skills and resources

Disease screening: Web blight

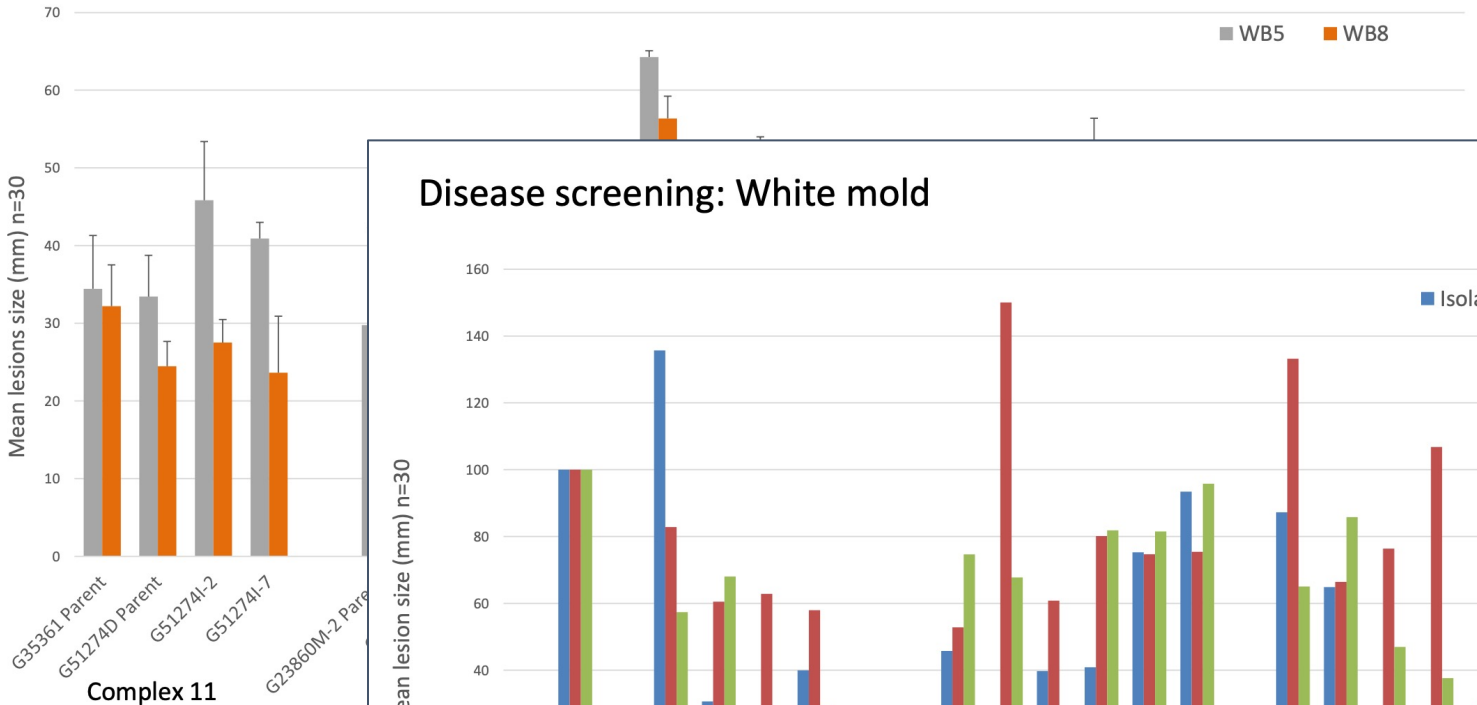


Complex 11
P.vulgaris x P.coccineus

Complex 19
P.vulgaris
cultivated x wild

Case 10
P.vulgaris x P.parvifolius x P.acutifolius

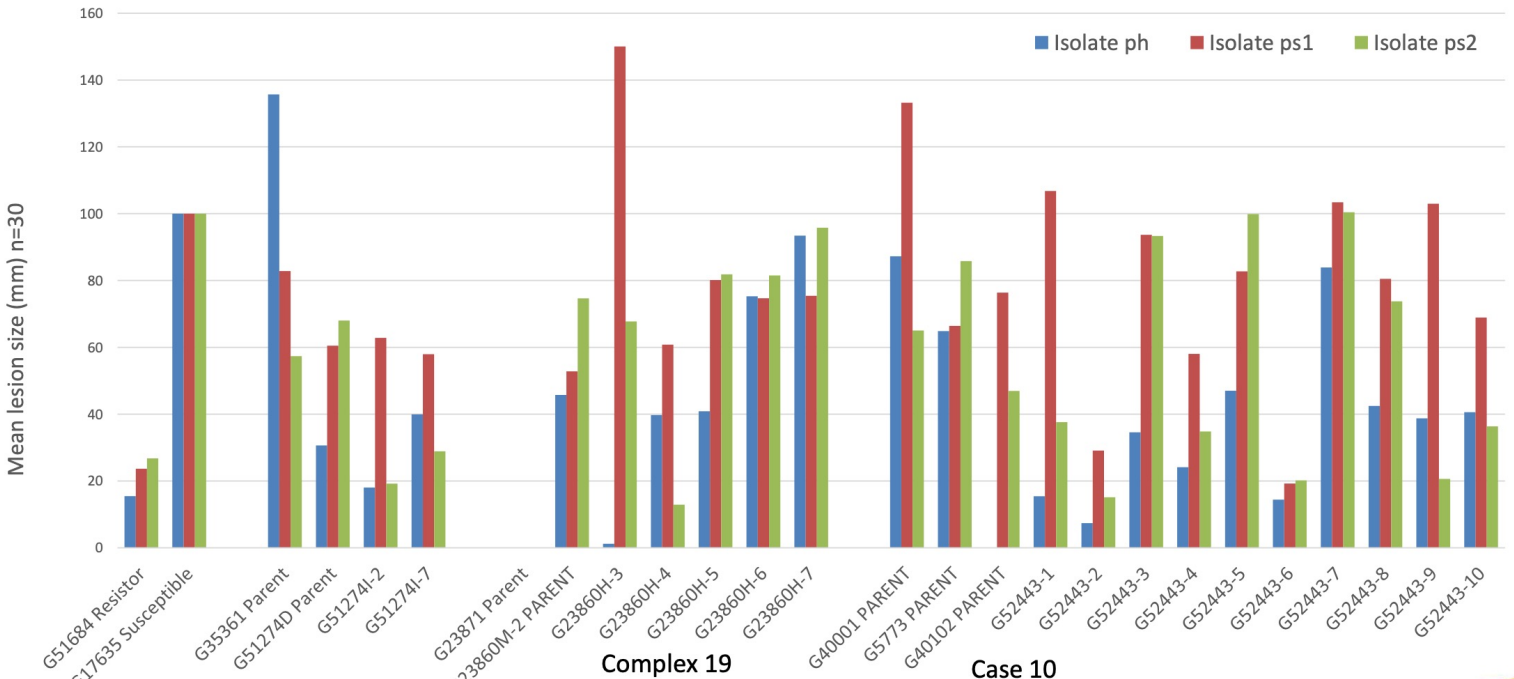
Disease screening: Web blight



Complex 11

P.vulgaris x P.coccineus

Disease screening: White mold



Controls

Complex 11

P.vulgaris x coccineus

Complex 19

P.vulgaris

cultivated x wild

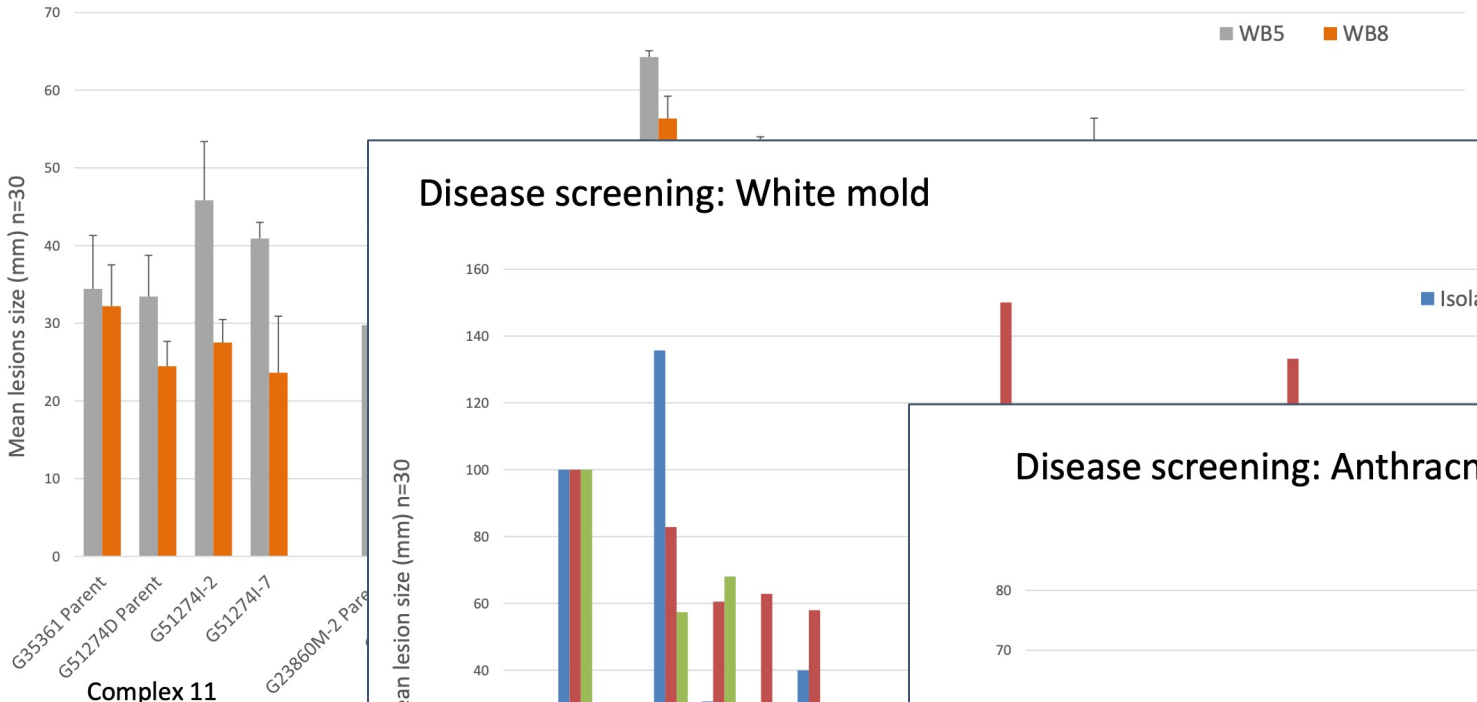
Case 10

P.vulgaris x parvifolius x acutifolius

NIAB

world-class experience, skills and resources

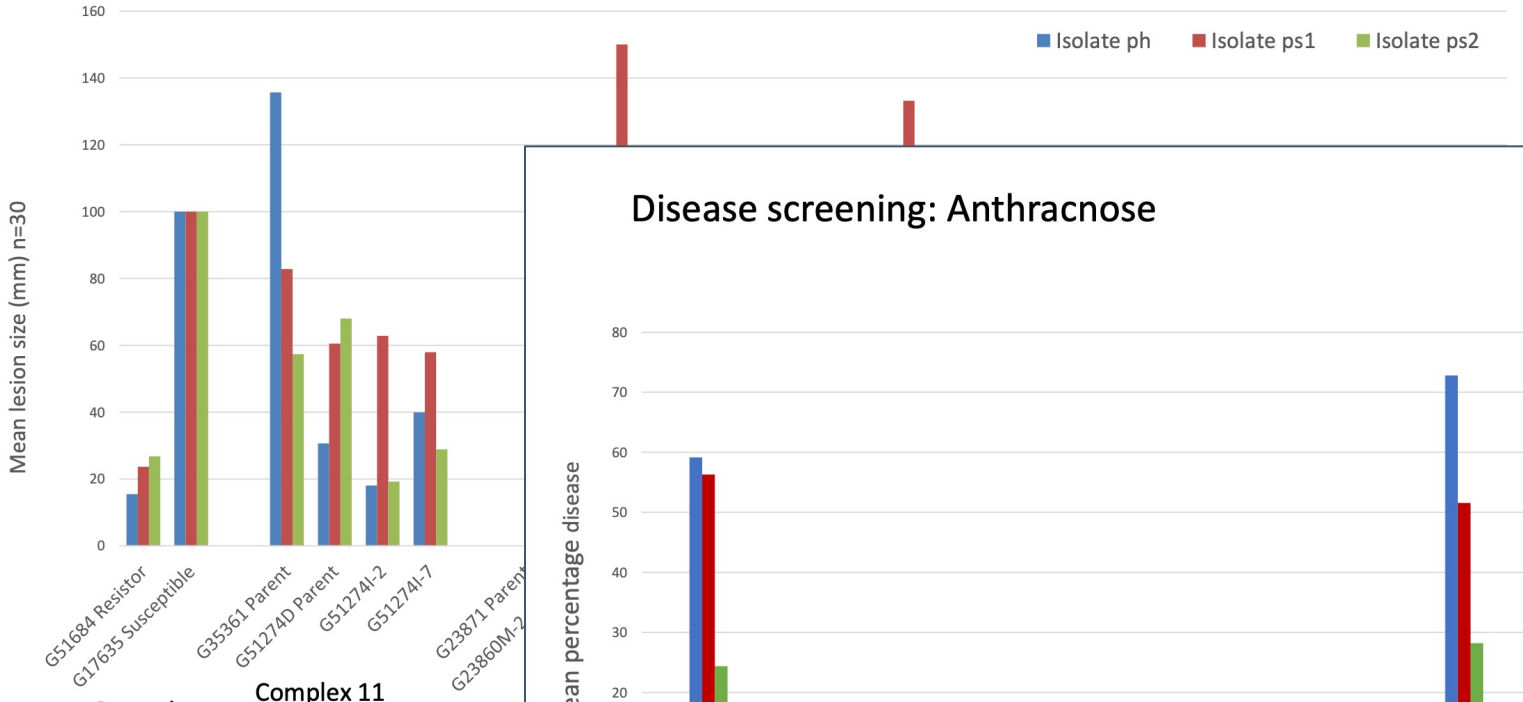
Disease screening: Web blight



Complex 11

P.vulgaris x P.coccineus

Disease screening: White mold

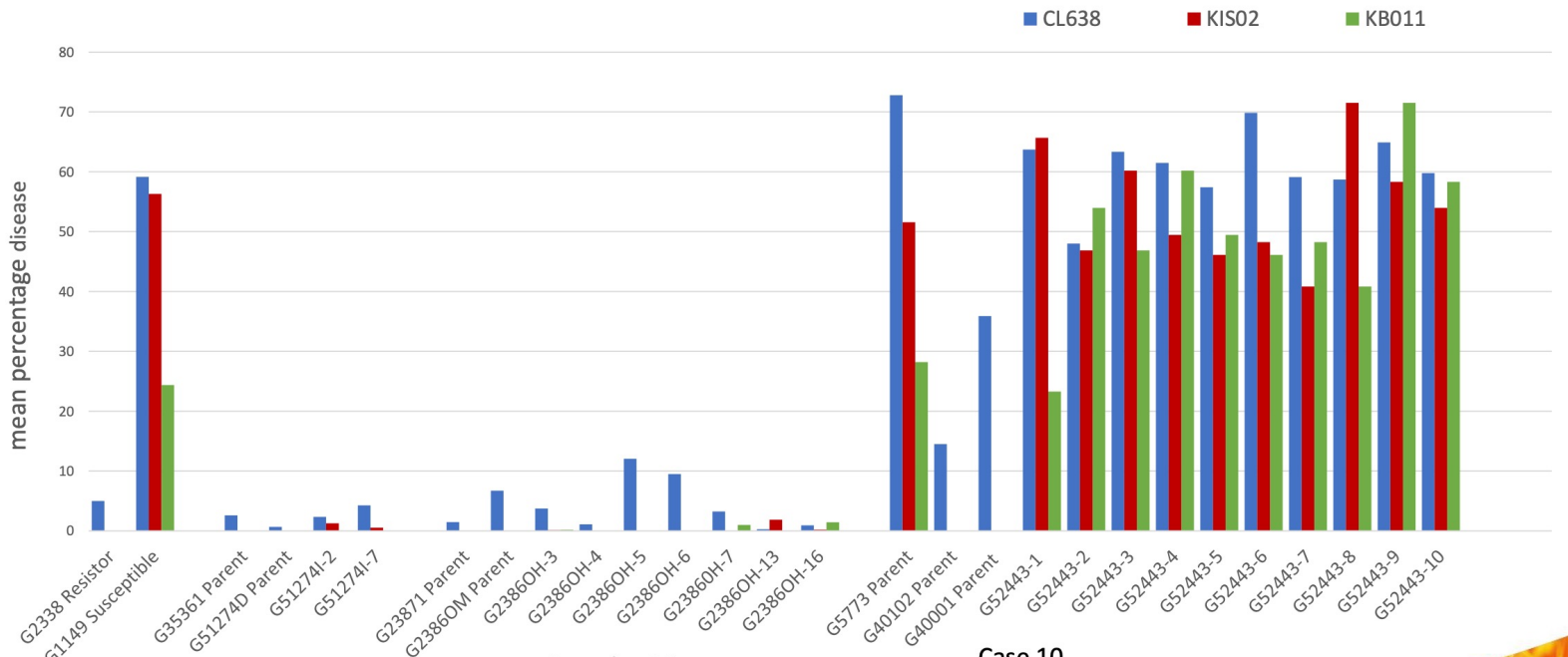


Controls

Complex 11

P.vulgaris x coccineus

Disease screening: Anthracnose



Controls

Complex 11

P. vulgaris

x coccineus

Complex 19

P.vulgaris

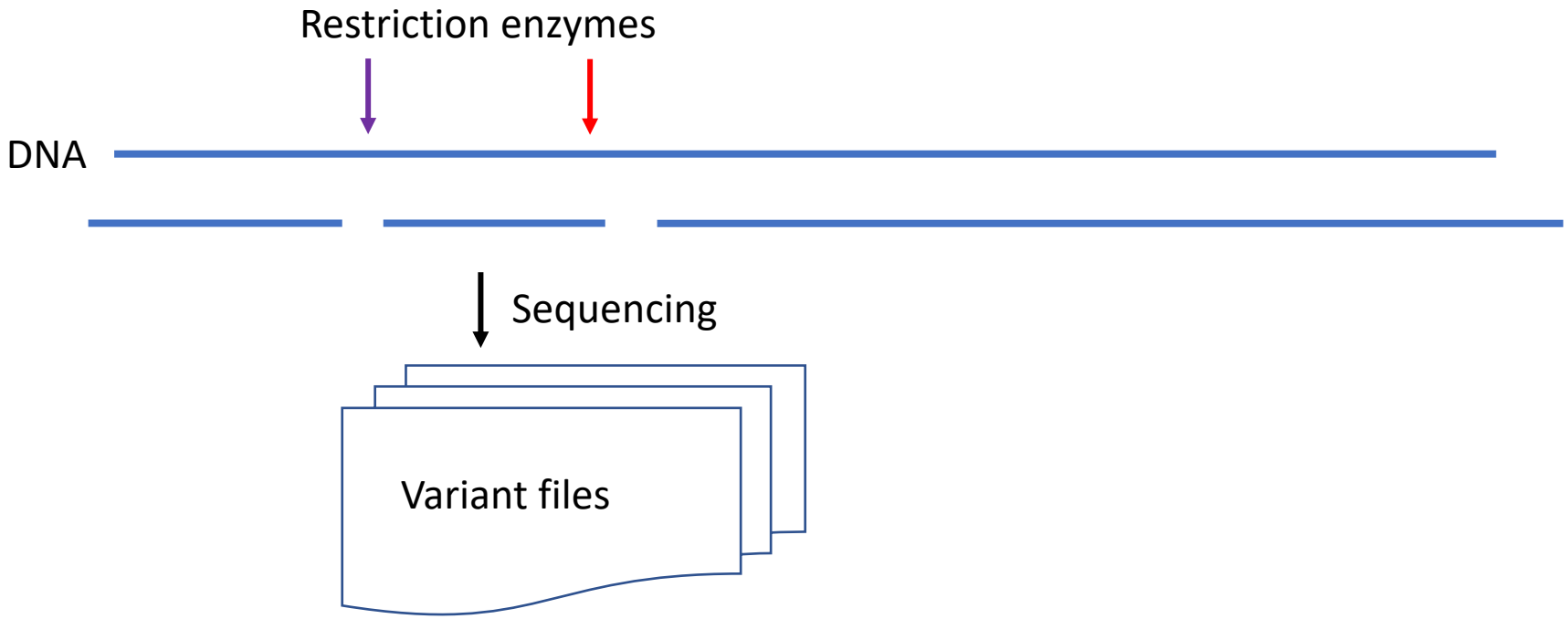
cultivated x wild

Case 10

P.vulgaris x parvifolius x acutifolius

Genotyping data

- Genotyping currently in progress for 94 samples
  - X hybrids and x representative parents from x complexes
- DArT-Seq



Genotyping data

- DArT variant files will be made available via project website
- Variants will be aligned to *Phaseolus vulgaris* reference v1.0
  - Schmutz J, McClean PE, Mamidi S et al. 2014. Nat Genet.. 46(7):707-13.
- Variants will be deposited into ENA at EMBL-EBI

Summary

- Project information, contacts, materials list, phenotypes, genotypes and news visit: www.niab.com and search for ‘hybrid beans’

- Accession passport, characterisation data and ordering (from mid-2022) visit: https://genebank.ciat.cgiar.org or www.genesys-pgr.org

Contact: tom.wood@niab.com or M.Santaella@cgiar.org