New avenues for breeding Sclerotinia stem rot resistance into Australian canola

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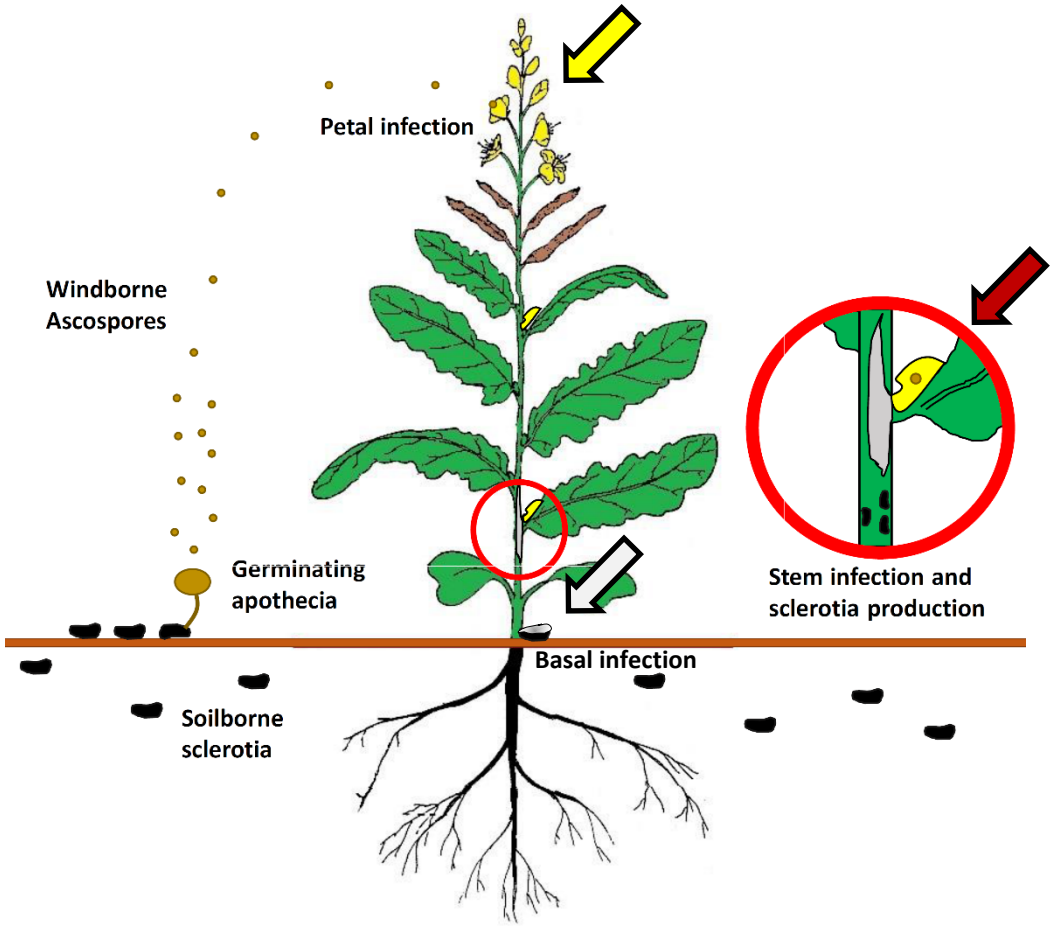
Sclerotinia stem rot (SSR)

- Caused by the fungus *Sclerotinia sclerotiorum*
- Estimated to have > 400 hosts.
- Estimated to cause up to $AUD 59M p.a.
- Outbreaks are highly dependant on environmental conditions.
- Primarily controlled by applying fungicides
- Current canola varieties are susceptible to SSR.

Sclerotinia stem rot – infection points

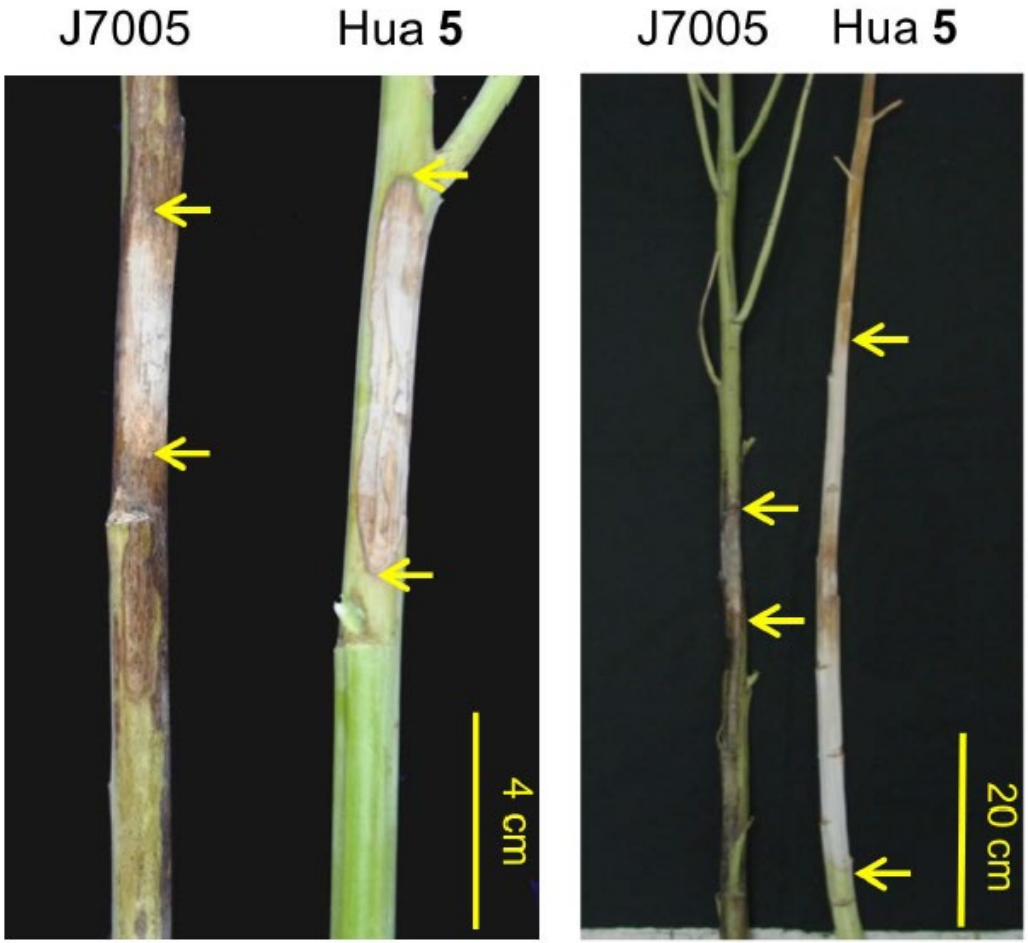


Adapted from *Derbyshire and Denton-Giles, 2016. Plant Pathology*

Stem infection literature e.g.

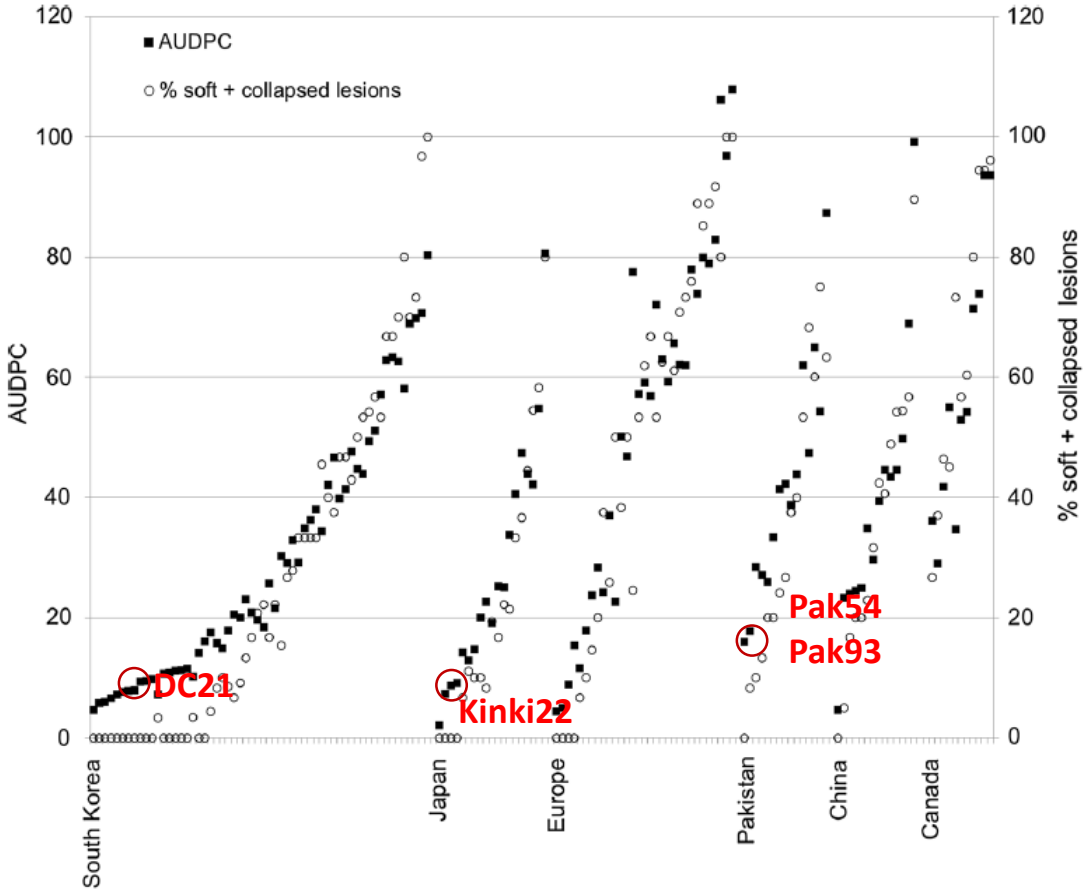
Rana *et al.*, 2017.
Gyawali *et al.*, 2016.
Wei *et al.*, 2016.
Wu *et al.*, 2013.

SSR partial resistance



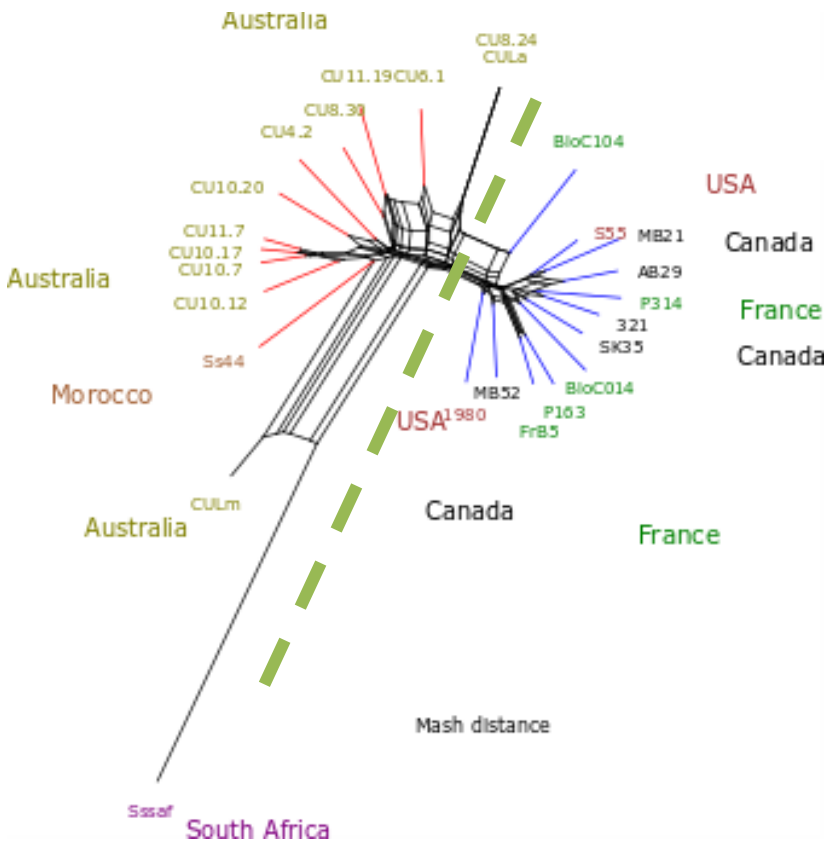
Wu *et al*., 2013. *PloS One*

Four *B. napus* accessions partially resistant to Canadian isolates identified by collaborators in Canada



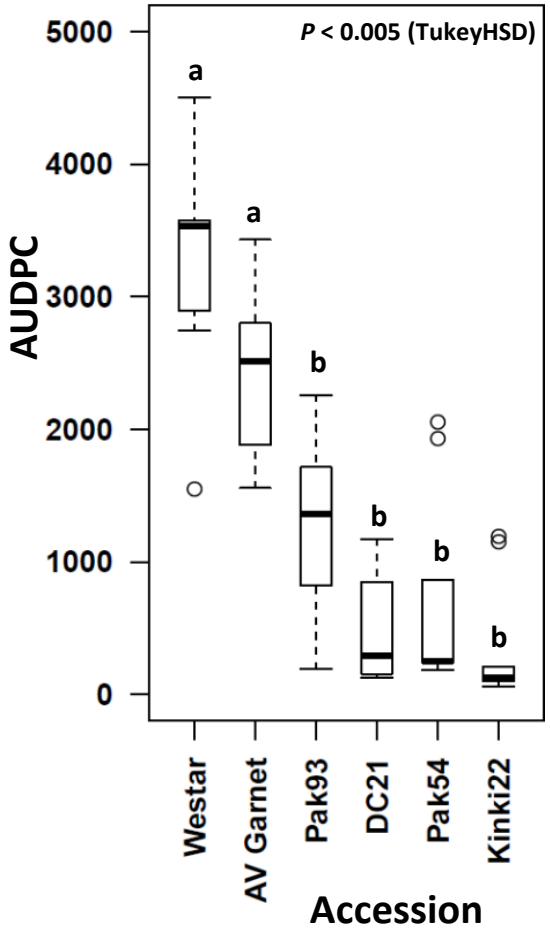
Gyawali et al., 2016

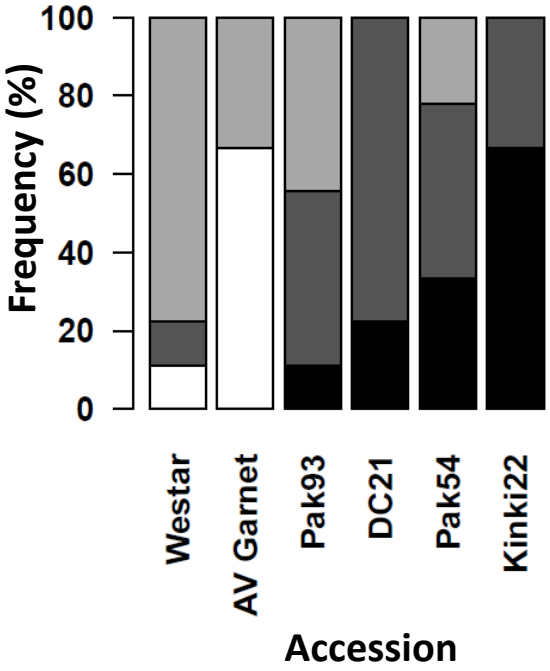
What about Australian isolates of the pathogen?



Genome sequencing shows that Australian isolates are genetically distant from Canadian and European isolates

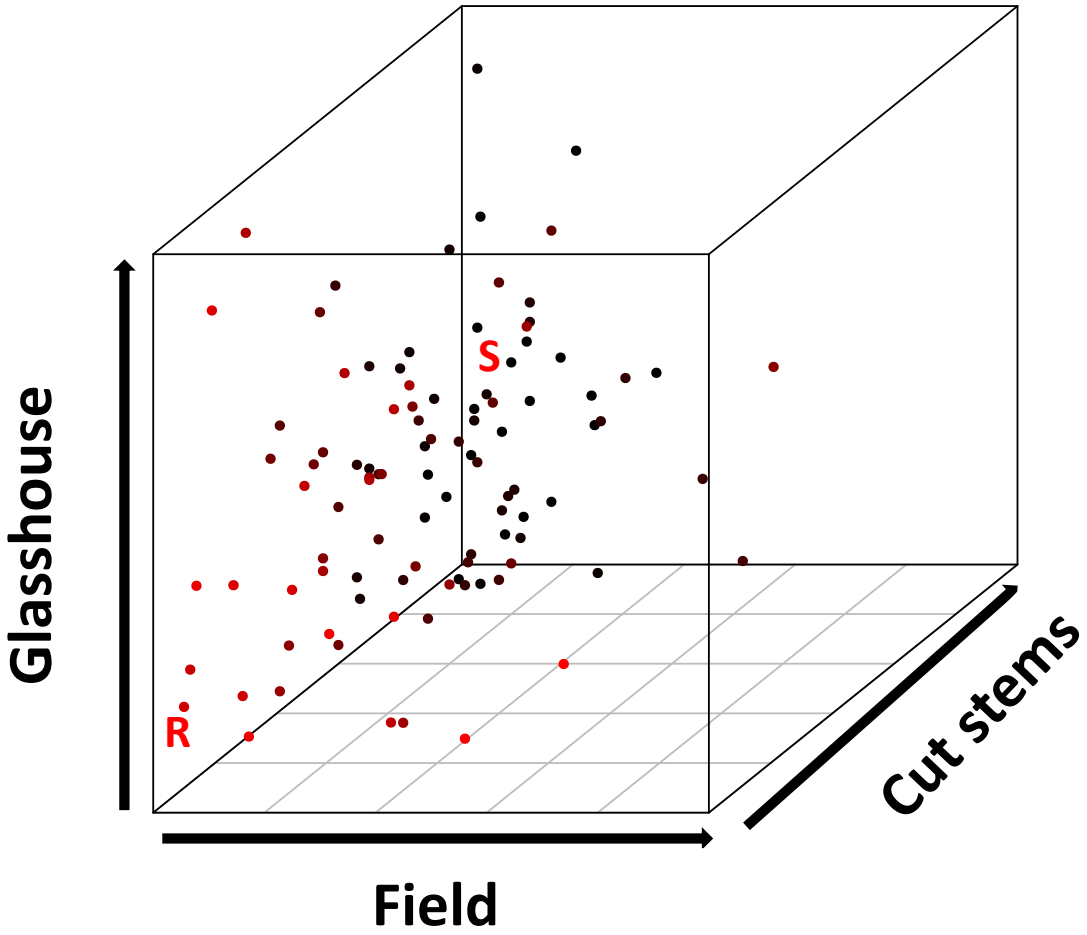
Four *B. napus* accessions partially resistant to Canadian isolates were retested with AUS isolates





SSR partial resistance - CCDM

Res *Westar*



Denton-Giles et al., 2018 unpublished

Next steps

Bi-parental mapping?

Resistant line

Susceptible cultivar of breeder's choice

x

Partially resistant *B. napus* germplasm identified in GWAS population

Expand GWAS population?

Identification of markers associated with SSR resistance

Uptake of markers and resistant germplasm by breeders

Biotech approach?

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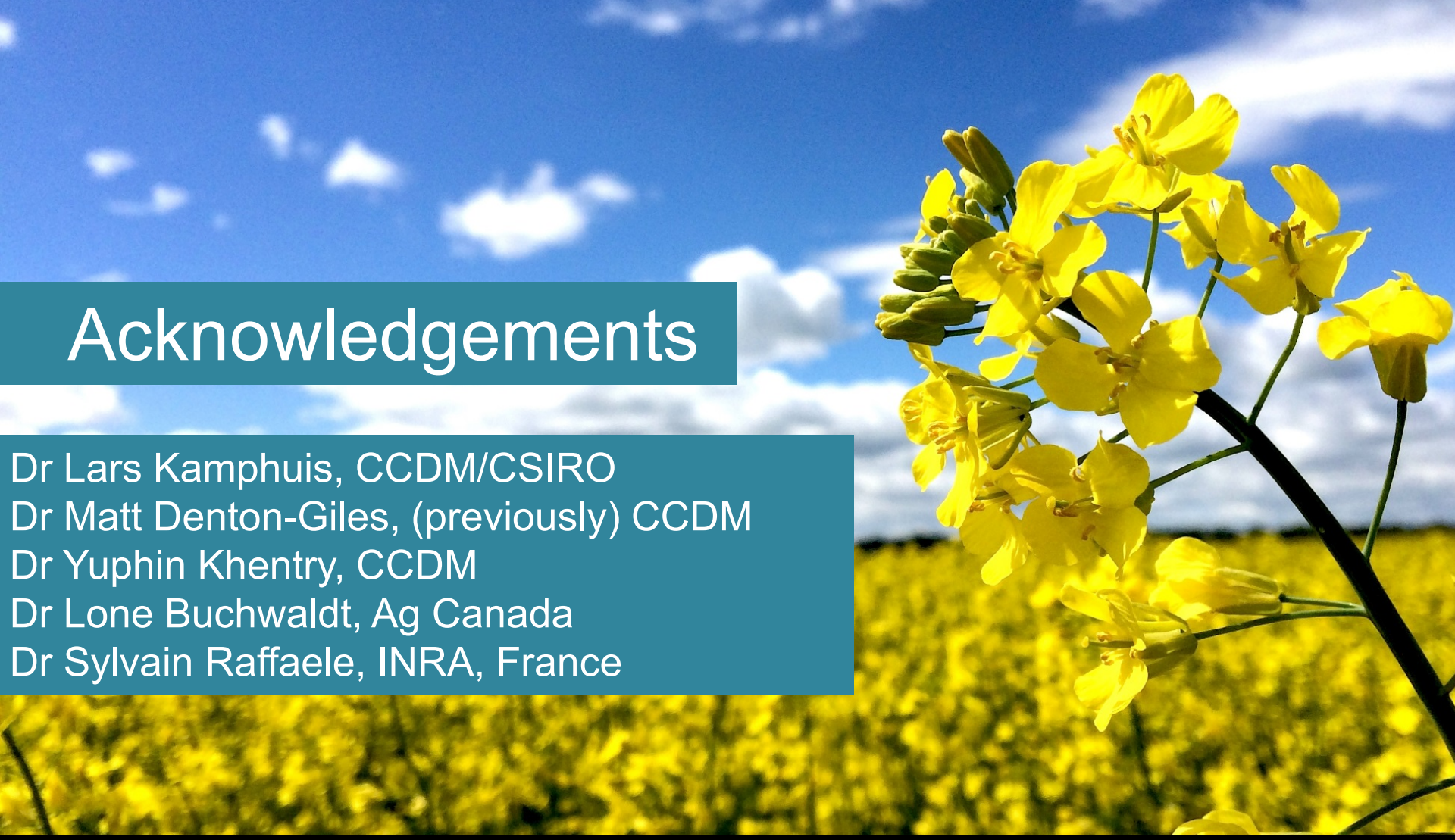

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