

Resistance Biology



SLU Alnarp
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INTERNATIONAL YEAR OF
PLANT HEALTH
2020

Resistance genes (R-genes) – make the plants more resistant

Reception of the pathogen

Co-evolving with pathogens -often gives problems if not stacked

Sensitivity genes (S-genes) -make the plants more sensitive to infection

Negative regulation of defence

Pathogen nutrients

Inactivation gives recessive resistance

Genomeditering (CRISPR/Cas9)

2020 late blight field trials in Skåne (transgenic and non-transgenic)

- Three stacked resistance genes (Desiree+King Edward) Transgenic -CIP construct
- Combined resistance (classical breeding)
- Single old resistance genes
- Single new resistance genes –Jonathan Jones, The Sainsbury Laboratory
- Different backgrounds (tetraploids and diploids-hybrid breeding) -Solynta
- Two S gene deletions (in King Edward)

Wang et al (2020) Tissue Culture and Refreshment Techniques for Improvement of Transformation in Local Tetraploid and Diploid Potato with Late Blight Resistance as an Example. *Plants* 9(6):695

Which part is classified as GMO ? (2020)

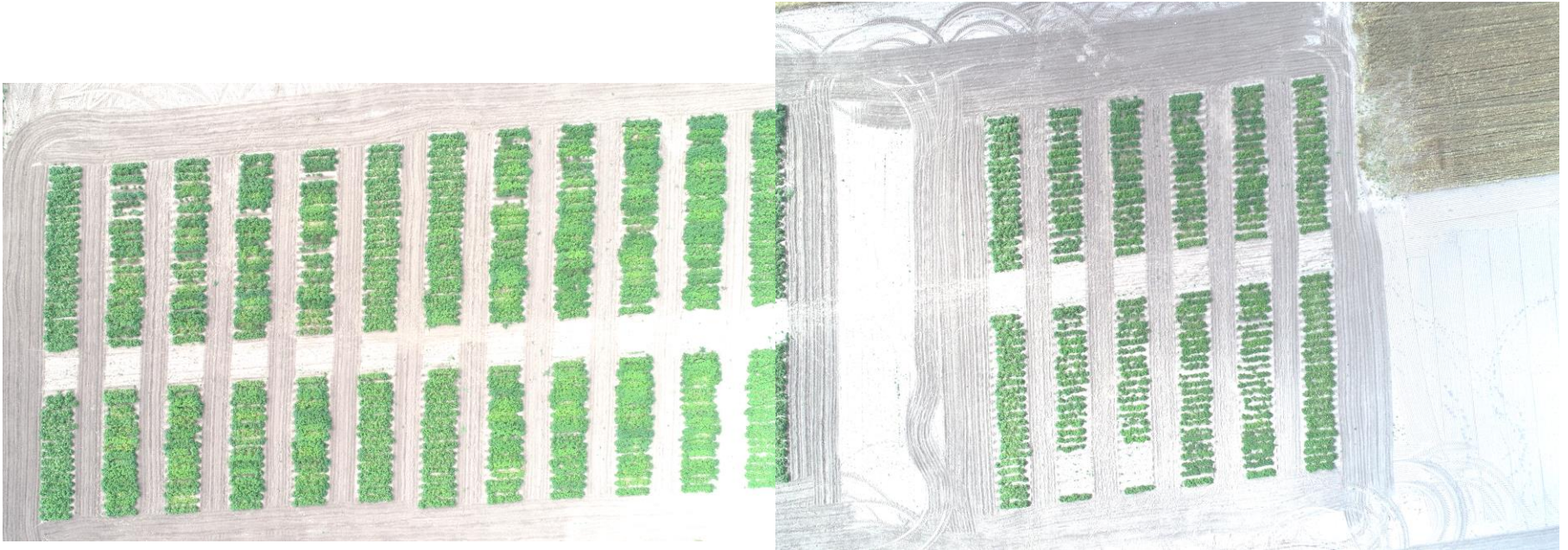


Photo by Jesper Cairo Westergaard, Copenhagen Univ

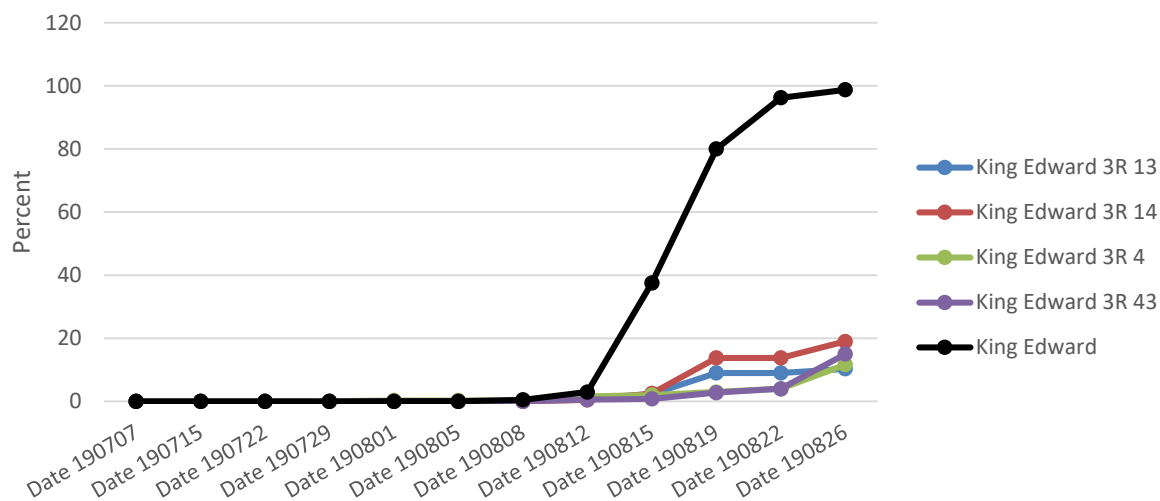
GMO Field trial potato King Edward (Sweden)



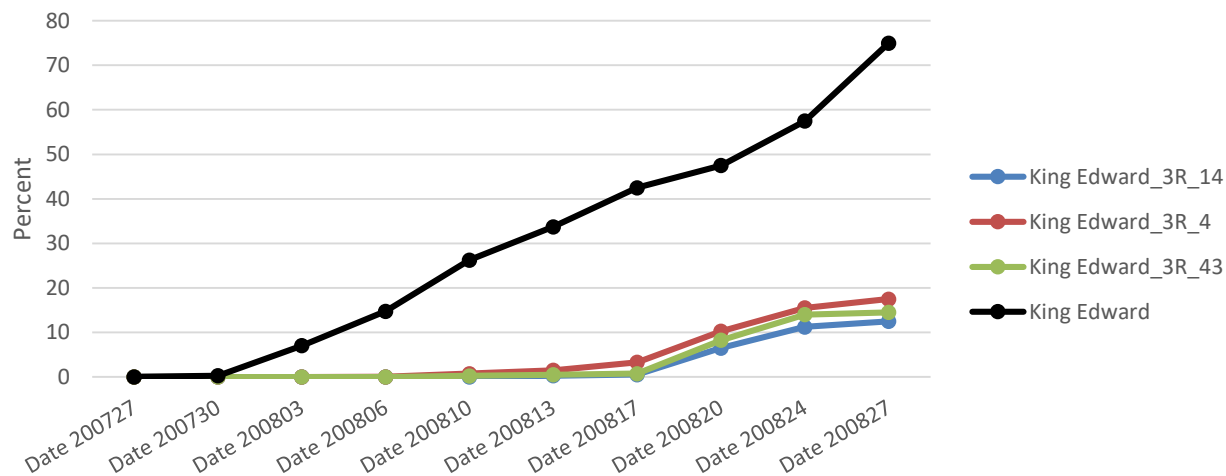
If implemented this GM potato with three stacked resistance genes alone could reduce the total agricultural fungicide use in Sweden by several percent

3R King Edward 2019 and 2020

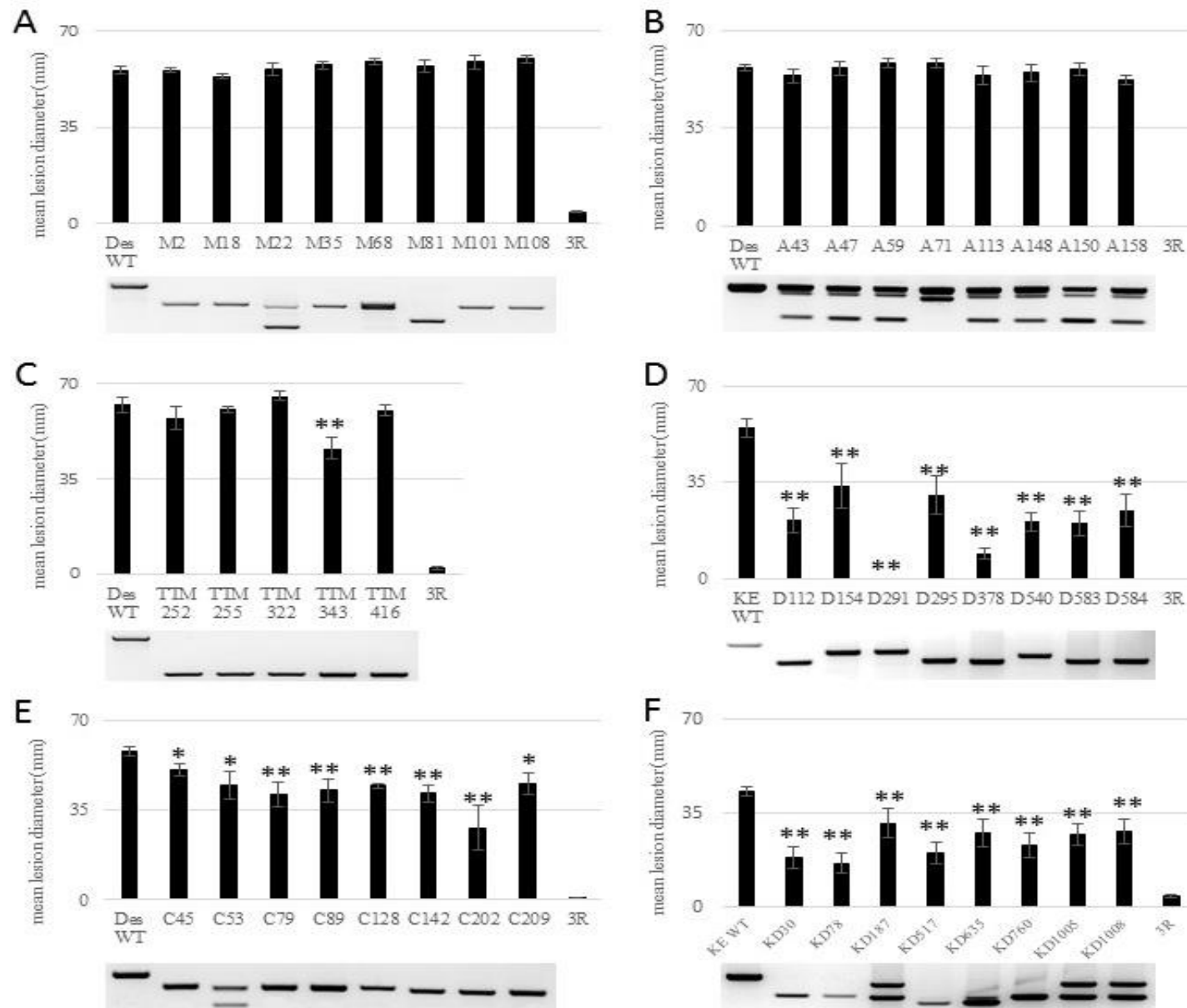
GMO field unsprayed Borgeby 2019



GMO field unsprayed Borgeby 2020



CRISPR/Cas9 generated S gene deletions in King Edward (lesion diameter of late blight in chamber)



Field survey before and after visit the GMO field (One bus -open invitation via mainly social media)



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