



Developing Resistance to Fusarium wilt in lettuce

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Fusarium oxysporum f.sp. *lactucae* (FOL)

- Part of the *F. oxysporum* species complex comprising of multiple *formae speciales*, each uniquely adapted to a specific host.
- *F. oxysporum* f.sp. *lactucae* (FOL) causes wilt and root rotting in both field and glasshouse grown lettuce
- FOL races have evolved due to the deployment of resistant lettuce cultivars
 - **Race 1 (FOL1)** widespread and causes disease in field grown lettuce in warmer locations such as USA and southern Europe
 - **Race 4 (FOL4)** has emerged very recently in N. Europe affecting protected lettuce only
 - Races 2 and 3 less important and only found in Asia
- FOL Races are defined by differential resistance / susceptibility to a set of lettuce lines



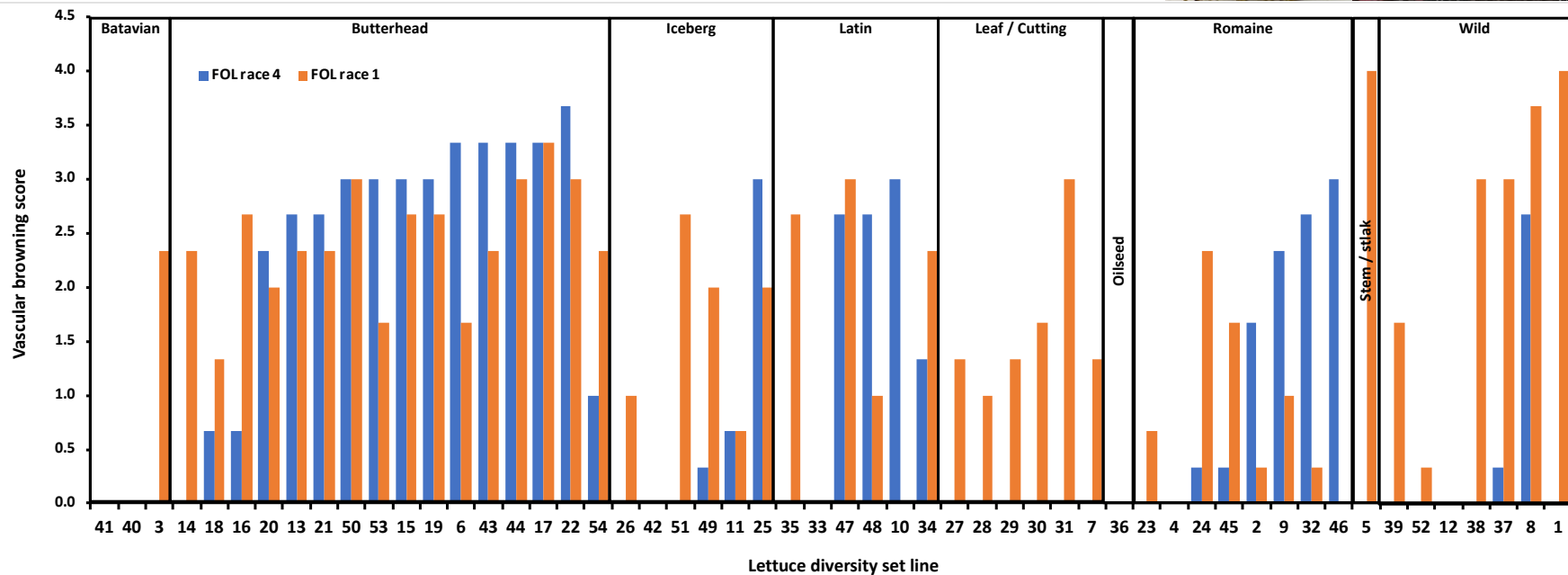
Developing FOL resistance

- 1) Identified lettuce accessions resistant to both FOL1 and FOL4 (VeGIN)
- 2) BBSRC/AHDB PhD project – Andrew Legg: collaboration with Enza Zaden to develop resistance. Production of mapping populations (R x S)
- 3) Collaboration with EU lettuce breeders / researchers to standardise lettuce differentials used to identify FOL4 and levels of resistance

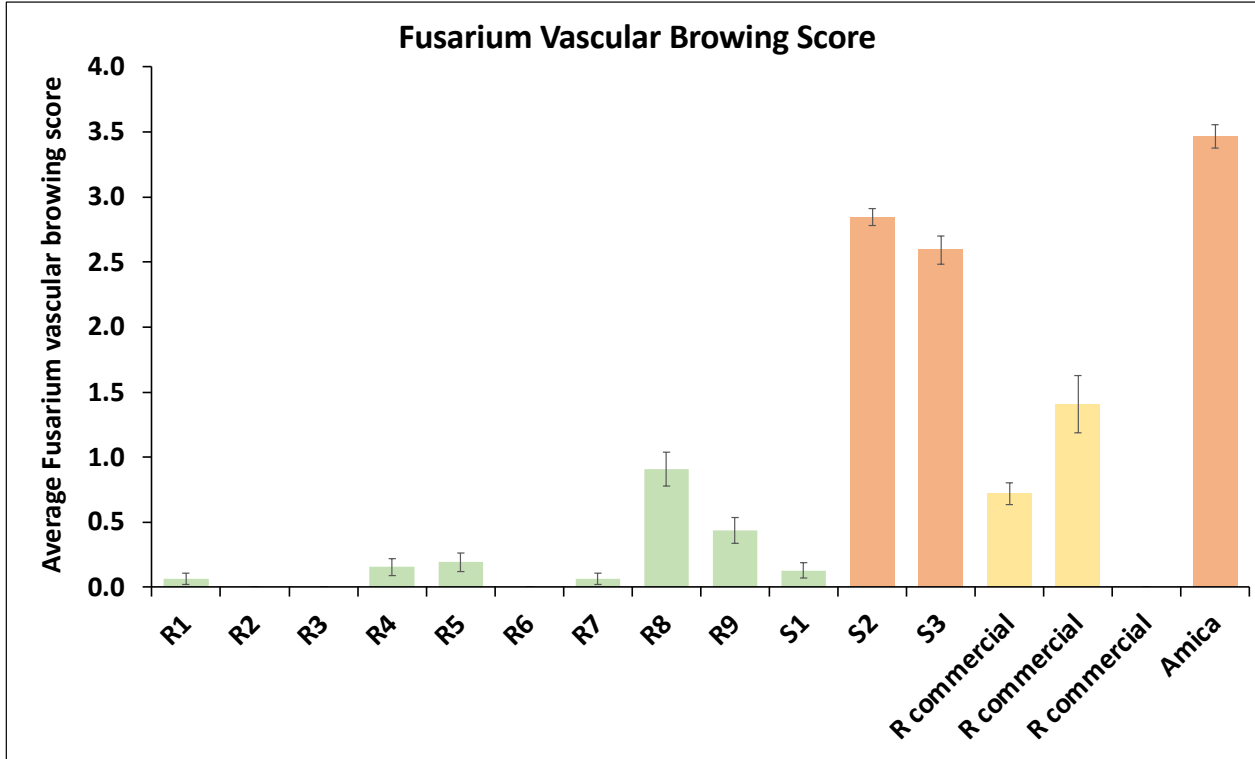
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VeGIN: FOL1 / FOL4 resistance screening



PhD FOL4 Resistance: mapping population parents and commercial lines (polytunnel)



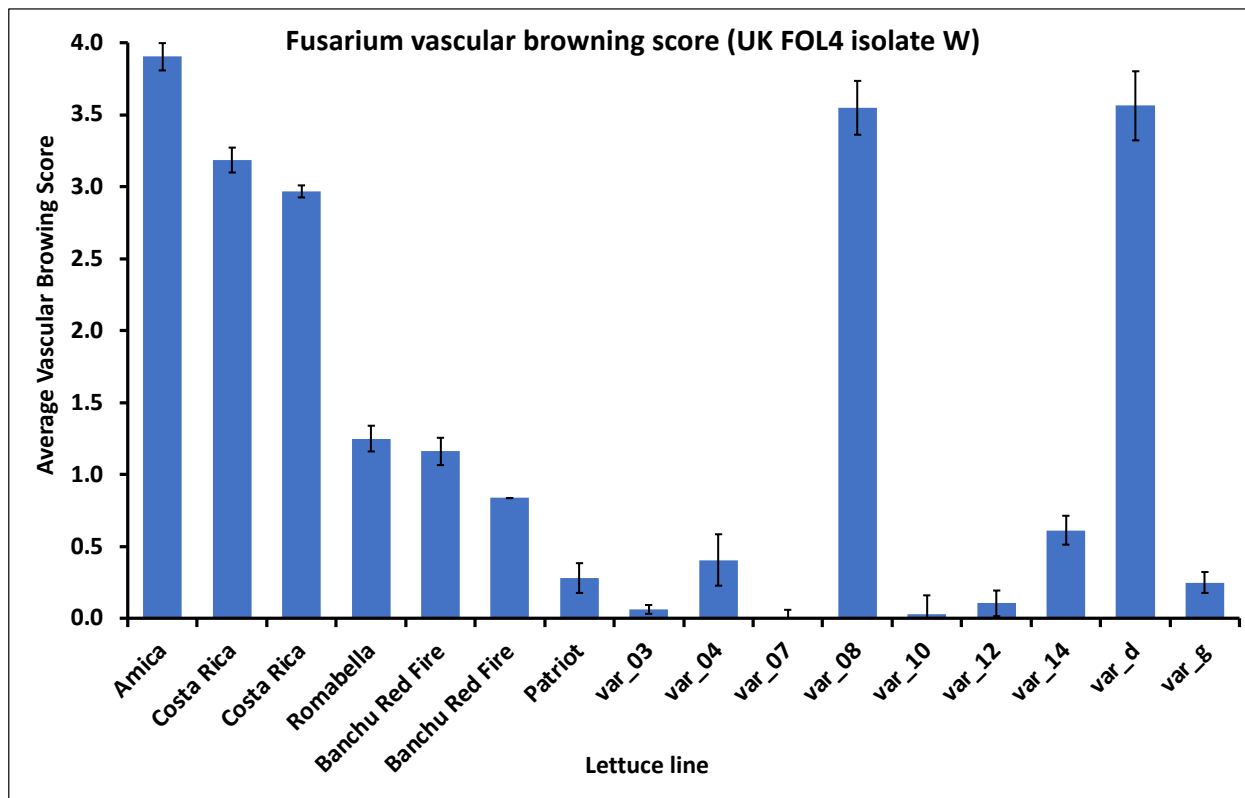
EU Ring test: FOL4 differentials

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- 4 FOL4 isolates vs 16 lettuce lines
- Certain isolates resulted in better differential response between resistance and susceptibility
- Warwick – confirmed in polytunnel test with UK isolate



EU Ring test: FOL4 differentials



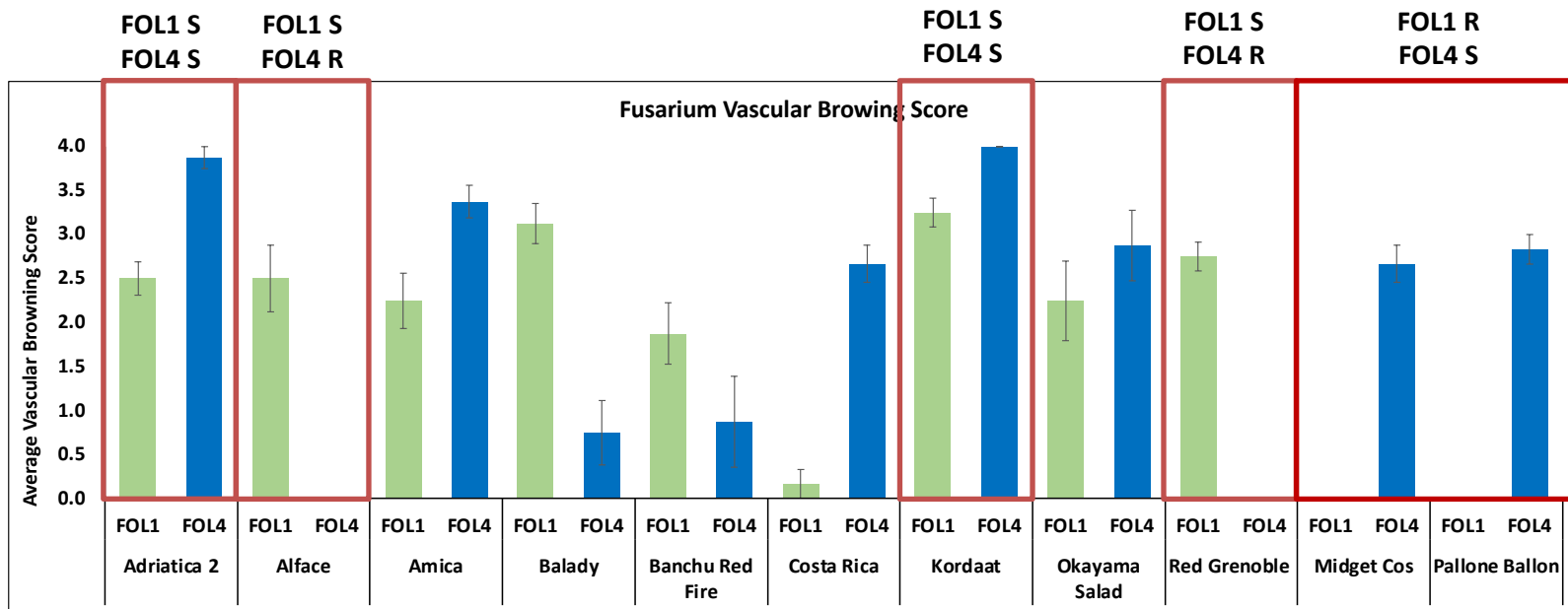
FOL differentials - latest

Differential cv.	FOL1	FOL2	FOL3	FOL4
Patriot	S	S	S	IR
Costa Rica	HR	S	S	S
Banchu Red Fire	S	HR	S	IR
Gisela	S	-	-	S

- Costa Rica - good differential FOL1 HR and FOL4 S
- Need cv FOL1 S and FOL4 HR
- Need universal susceptible

New FOL1 / FOL4 differentials

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Summary

- New sources of resistance identified to both FOL1 and FOL4
- FOL4 susceptible and resistant parent lines identified for genetic analysis
- Better differential sets being developed

With thanks to.....

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