Reciprocal transplant experiments in the *Senecio* hybrid zone on Mount Etna

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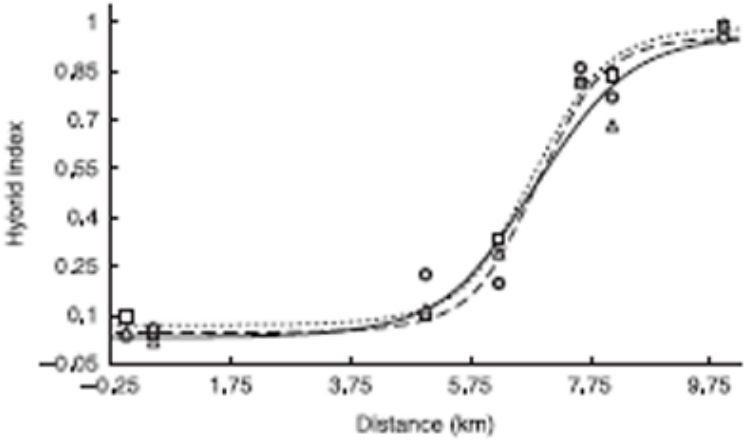
Background

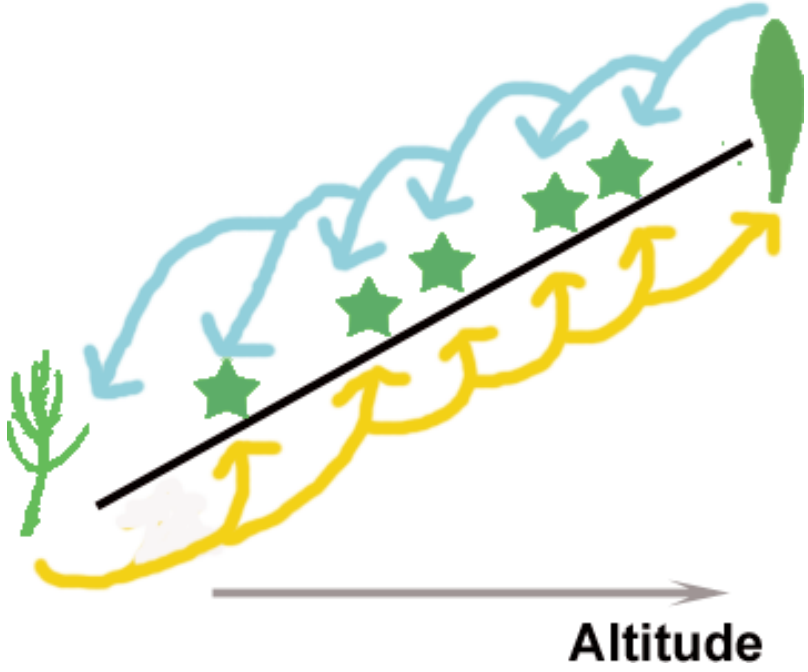
- Long history (> 40 years) of study of morphological and genetic clines in the Mount Etna hybrid zone
- Lots of forward movement on the population genetics side
- But….
  - Ecological aspects less well studied

Experimental design

- Reciprocal transplant experiment on Mount Etna with progeny of controlled crosses.

Parental taxa, F1s, F2s, 10 hybrid crosstypes with different levels of admixture

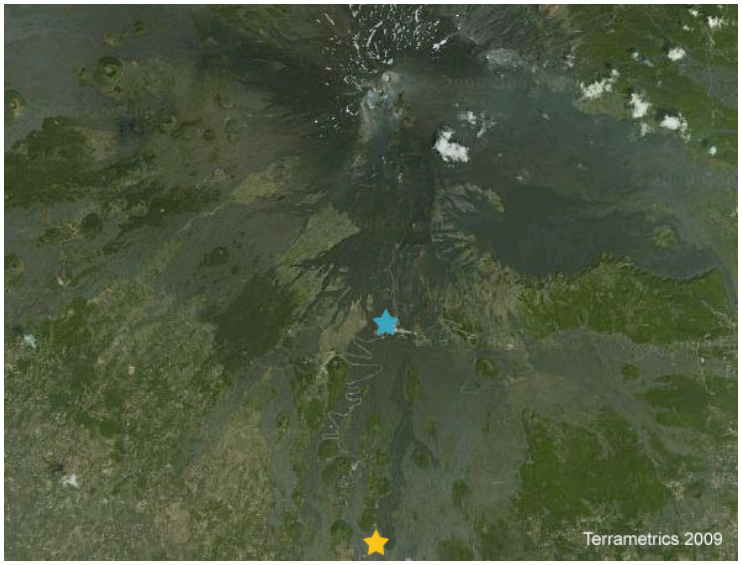


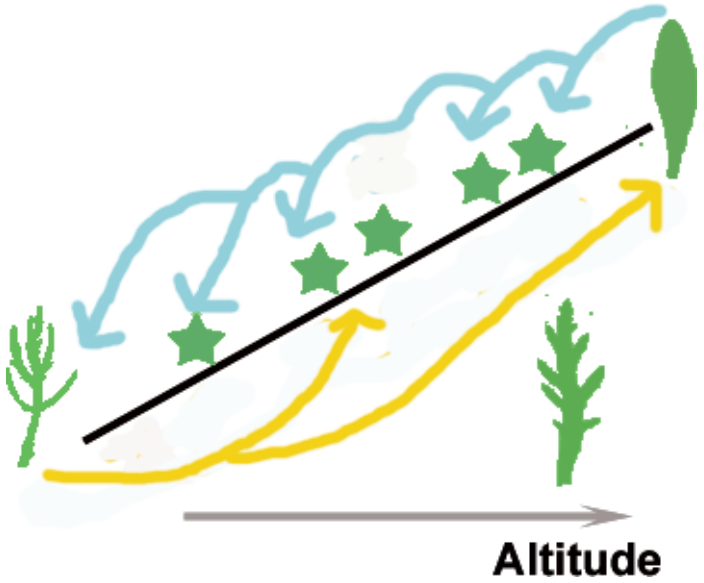


Brennan et al. New Phyt 2009

Experimental design

- Sites: Sapienza (1930 masl); Nicolosi (830 masl)
- Plants: *S. aethnensis, S. chrysanthemifolius,* F1s, F2s, 4 local parent x hybrid crosses, 1 foreign parent x intermediate hybrid (+ *S. squalidus)*





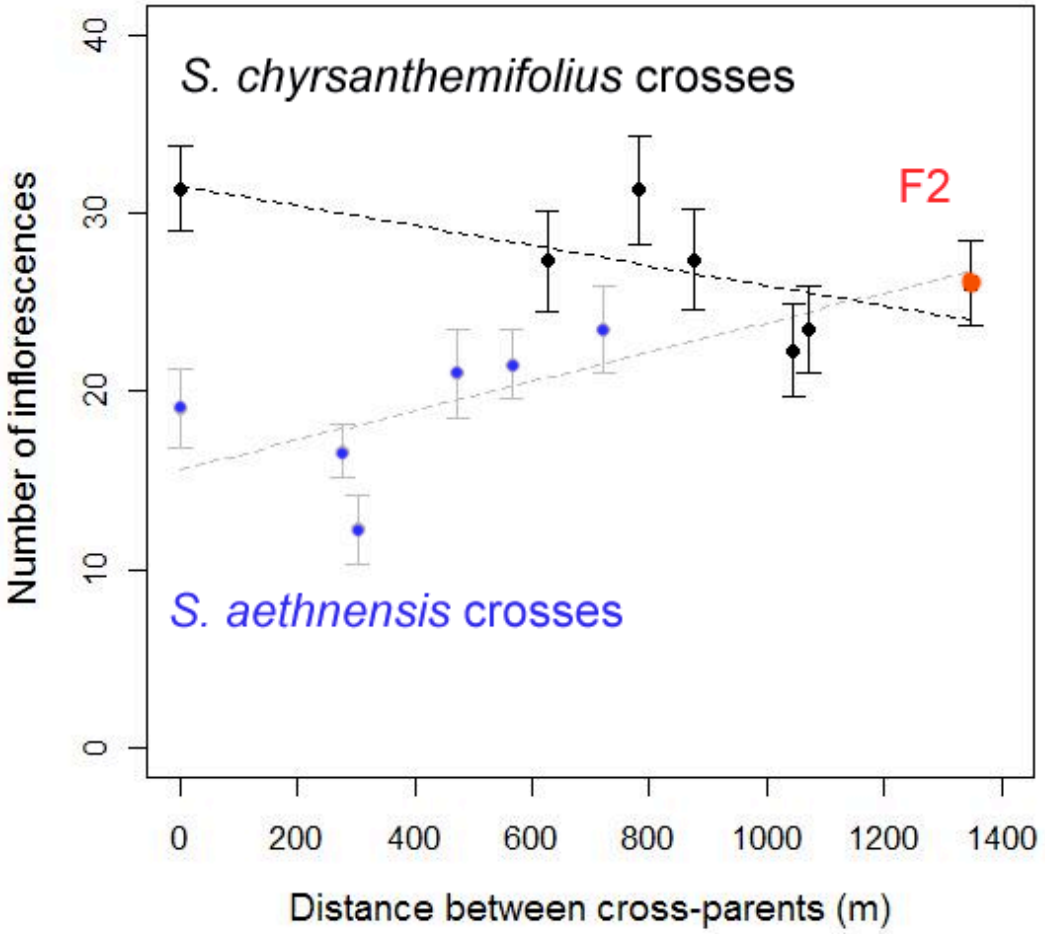
Data Collection

- >1000 plants in the field

- Growth, reproduction, survivorship
- Time to flowering
- Photosynthesis & transpiration
- Chlorophyll fluorescence
- Long-term water use efficiency
- Leaf and capitulum morphology
- Flower visitors

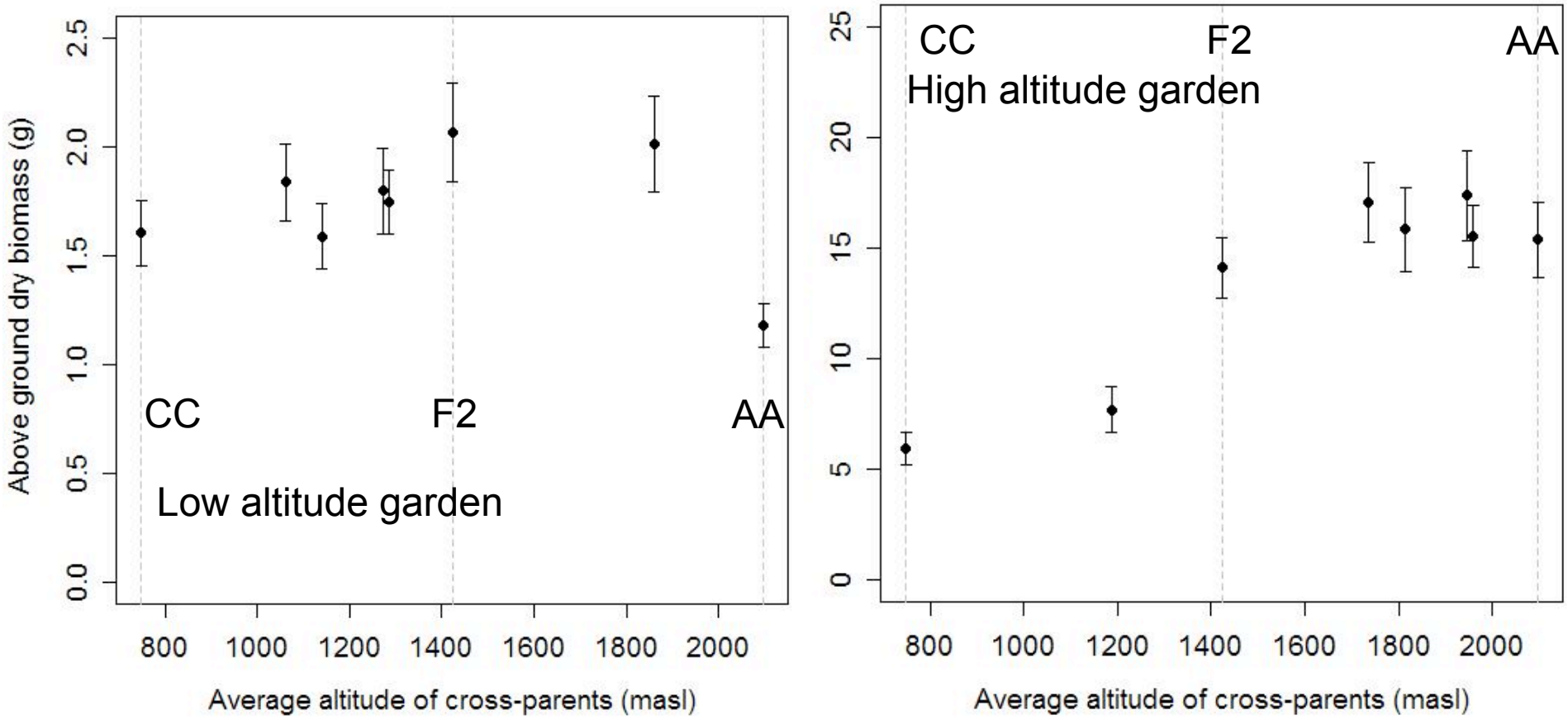
Results: greenhouse

- F2 reproduction = mid-parent average;
- all cross types > 95% seed germination

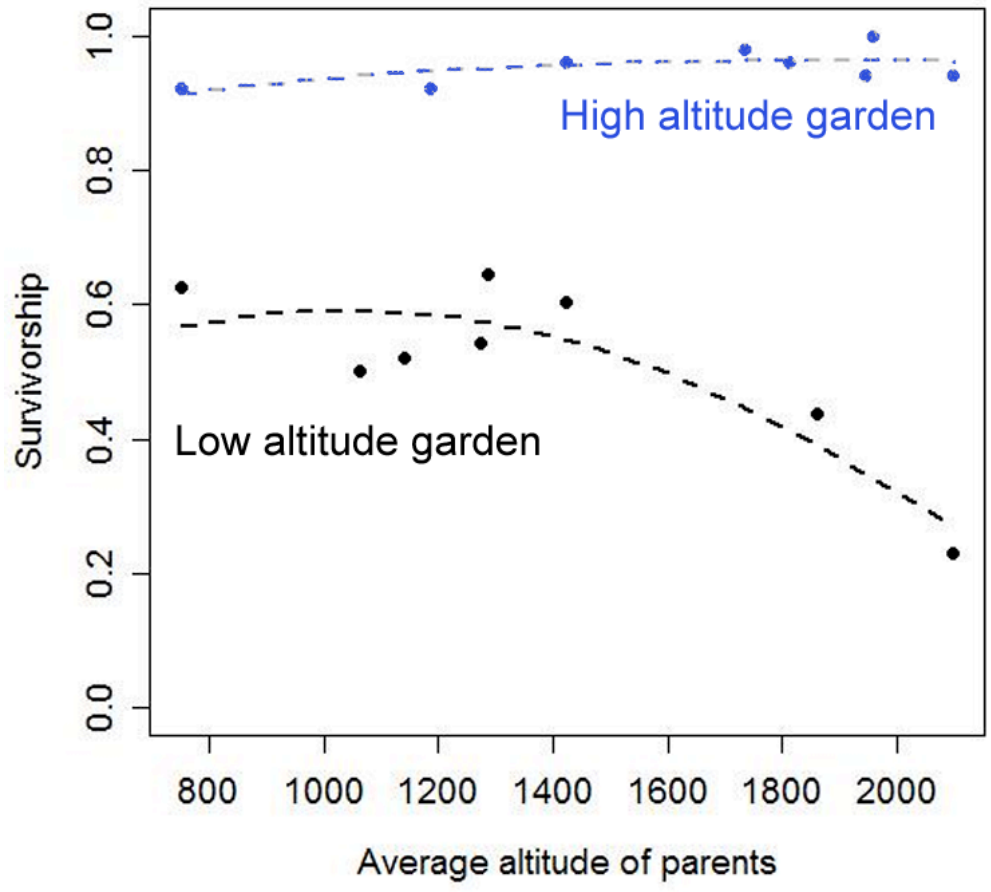


Results: field

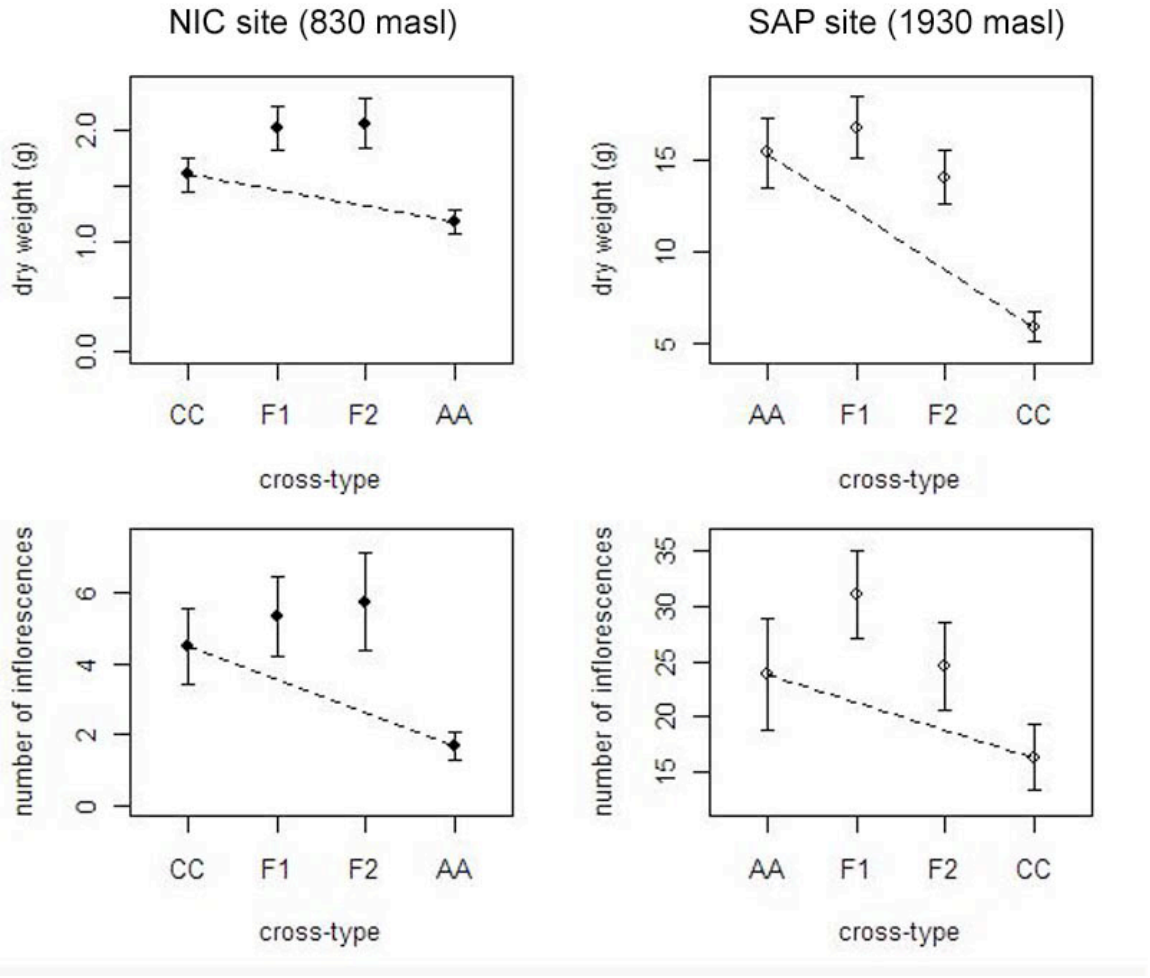
- All cross-types flowered and seeded
- F2 & local hybrids similar to local parent



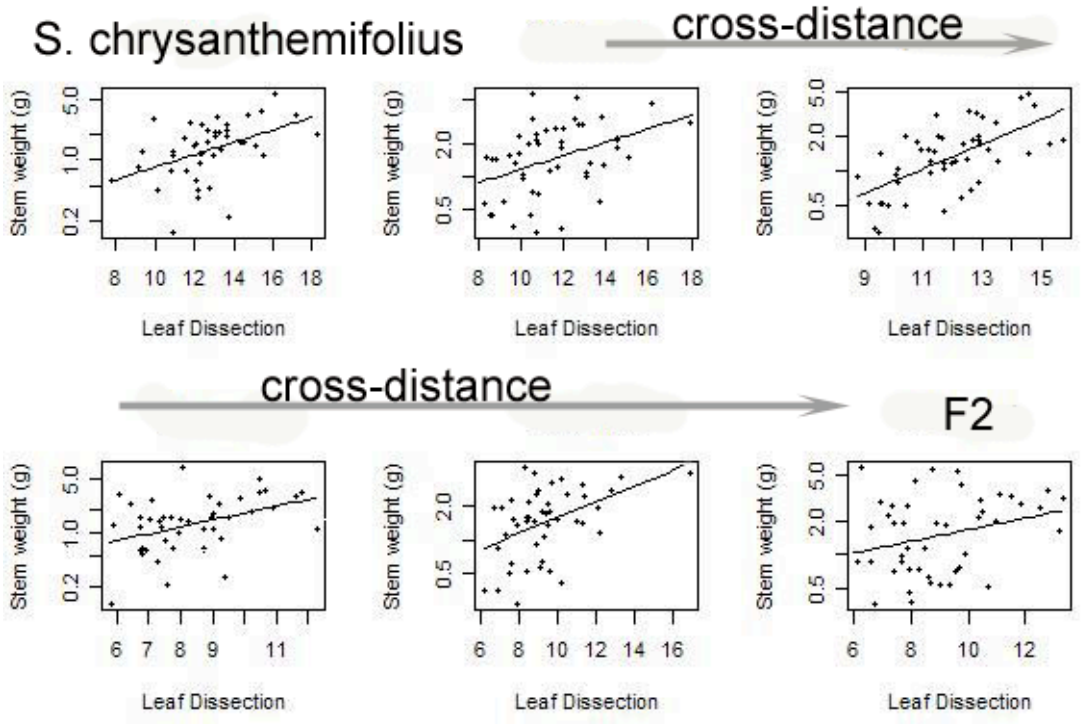
High (summer) survivorship at SAP, but lower survival in more *aethnensis*-like crosses at NIC.

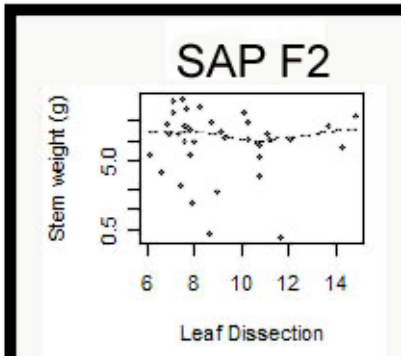


F1 and F2 hybrids have similar fitness across both gardens



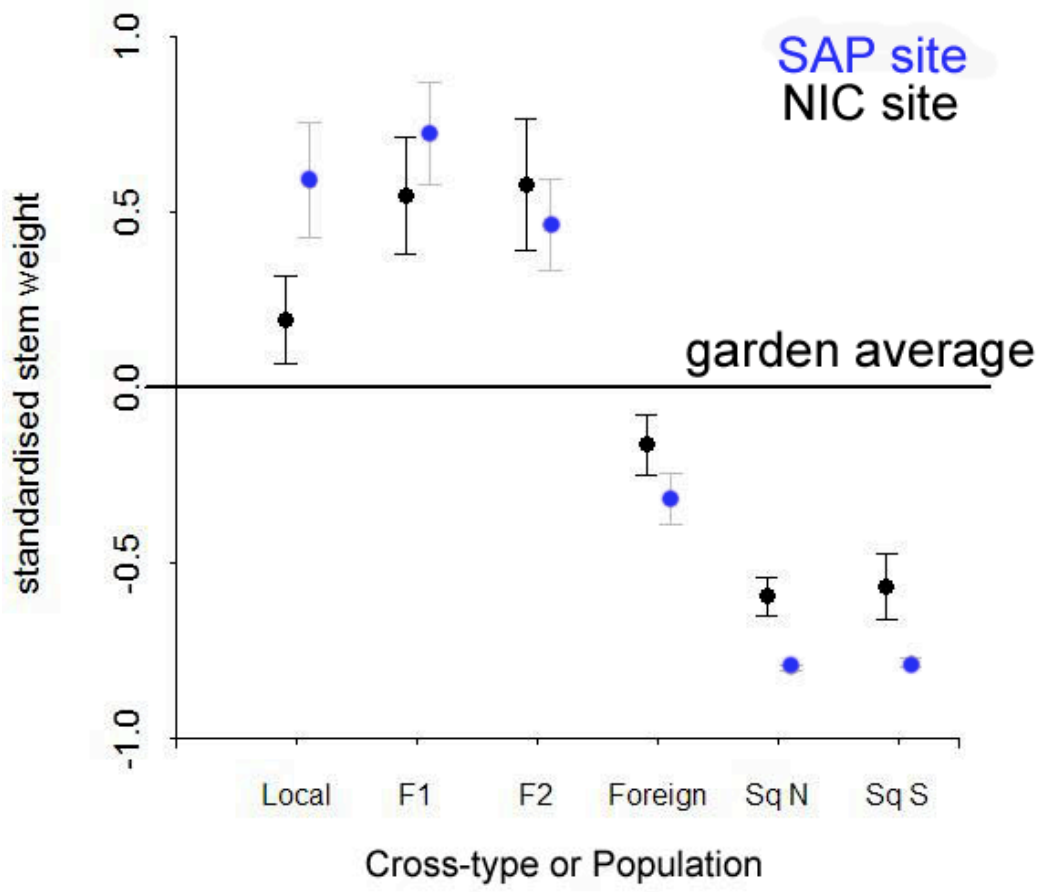
Selection for dissected leaf morphology in hybrid cross-types at NIC





But not at SAP

Strong selection against *S. squalidus*



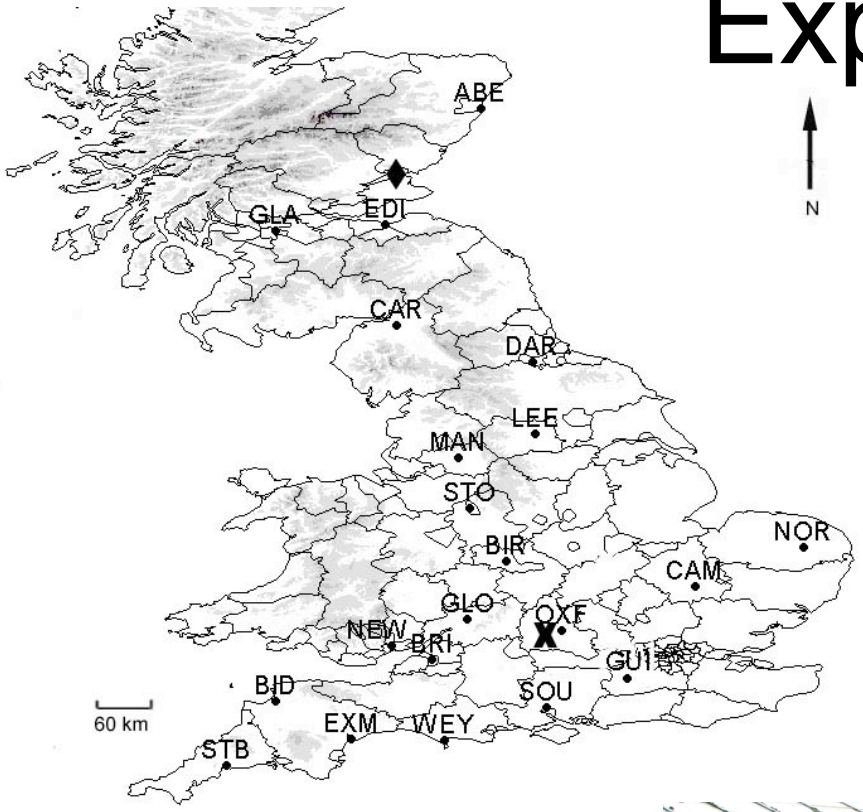
Acknowledgements

- Gatsby Charitable Trust
- The Queen's College
- Ente Parco dell'Etna & Orazio Nicoloso
- Adriana di Mauro, Katie Dick

If you have any particular questions on results, please ask me!

Reciprocal Transplant Experiments with *S. squalidus*

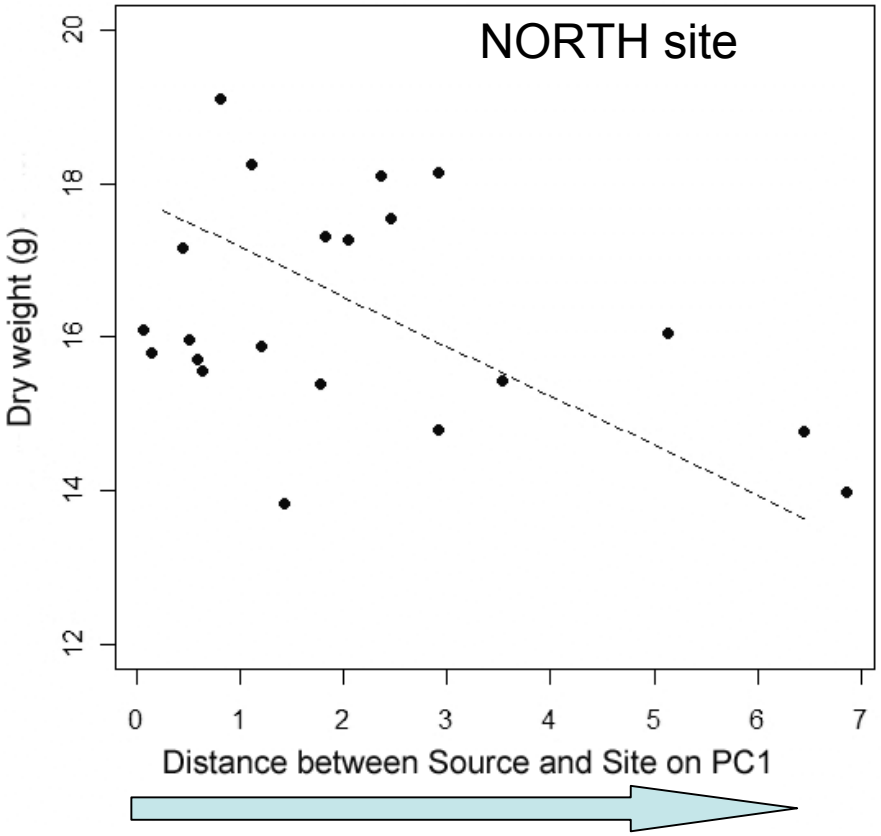
Experimental design



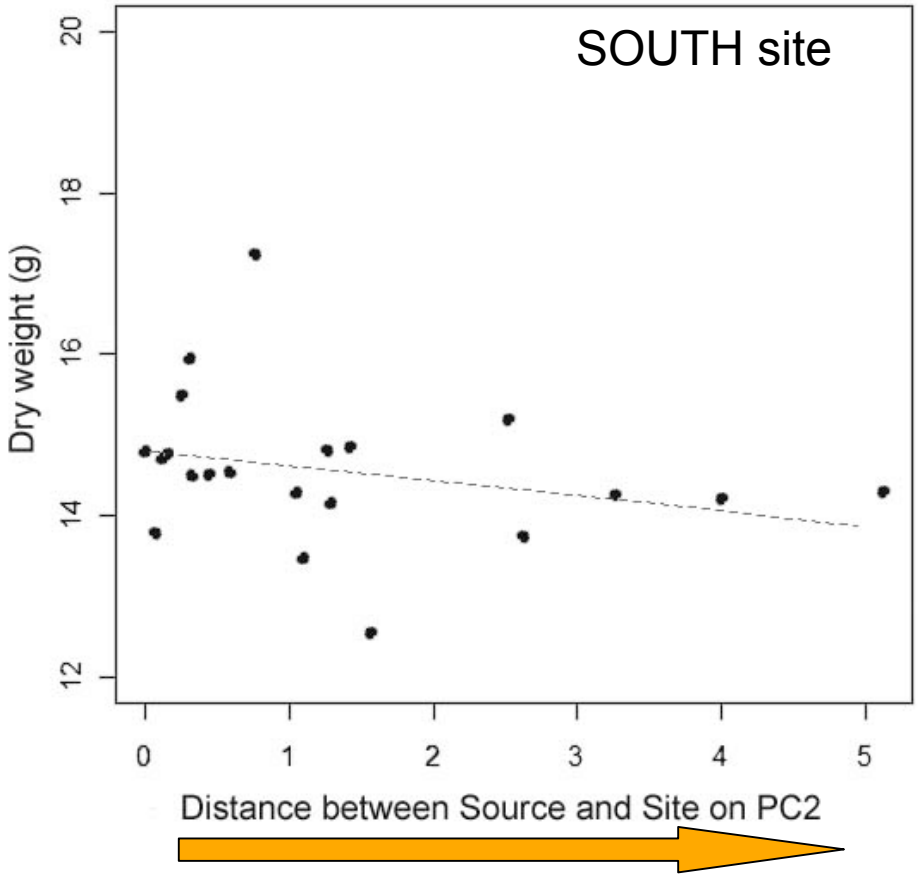
21 populations sampled across the UK range

Grown in common gardens in North and South UK

Lower growth by plants from more climatically distant places

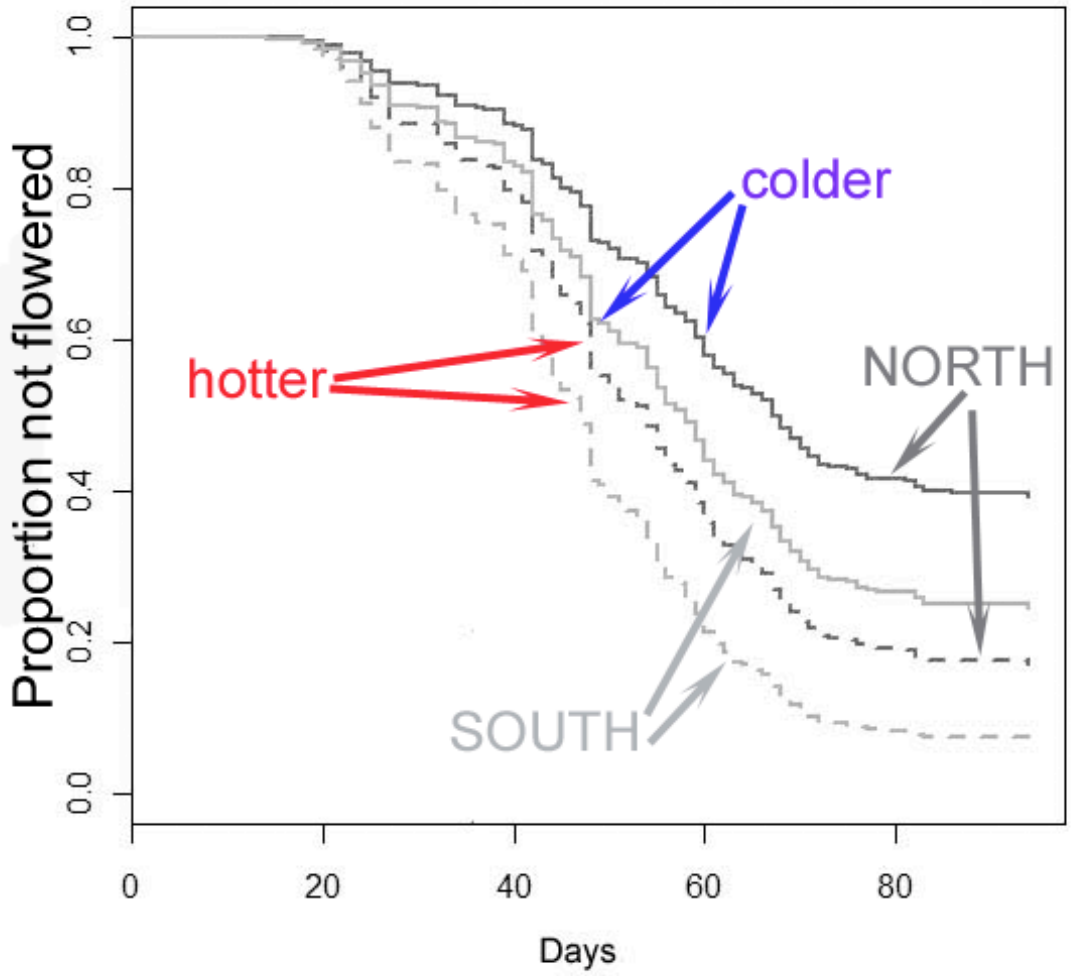


Increasing difference in precipitation between population site and common garden



Increasing difference in temperature between population site and common garden

Establishment of a cline in flowering time



- Plants from colder places flower later
- And produce fewer flowers

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- The Queen's College
- Ente Parco dell'Etna & Orazio Nicoloso
- Richard Abbott, David Forbes, St Andrews Botanic Gardens

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