Table S1 Description of cultivars and advanced synthetic lines (ASLs) used in this study.

Cultivars/ASLs	Breeding categories	Creation/Released year	Origin (country)	Age categories
Quiñequeli	Cultivar	1960 / 1962	Chile	Older
Redqueli	Cultivar	1994 / 1997	Chile	Modern
Superqueli	Cultivar	2005 / 2011	Chile	Modern
StarFire	Cultivar	?? / 1999	USA	Modern
Tuscan	Cultivar	?? / 2007	New Zealand	Modern
Sel Syn Int IV	ASL	2010	Chile	Modern
Syn IntIV	ASL	2002	Chile	Modern
Syn IntV	ASL	2006	Chile	Modern
Sel SynPreI	ASL	2010	Chile	Modern
Sel Syn PreIII	ASL	2010	Chile	Modern
Syn PreIII	ASL	2002	Chile	Modern

ASL: advanced synthetics lines of red clover.

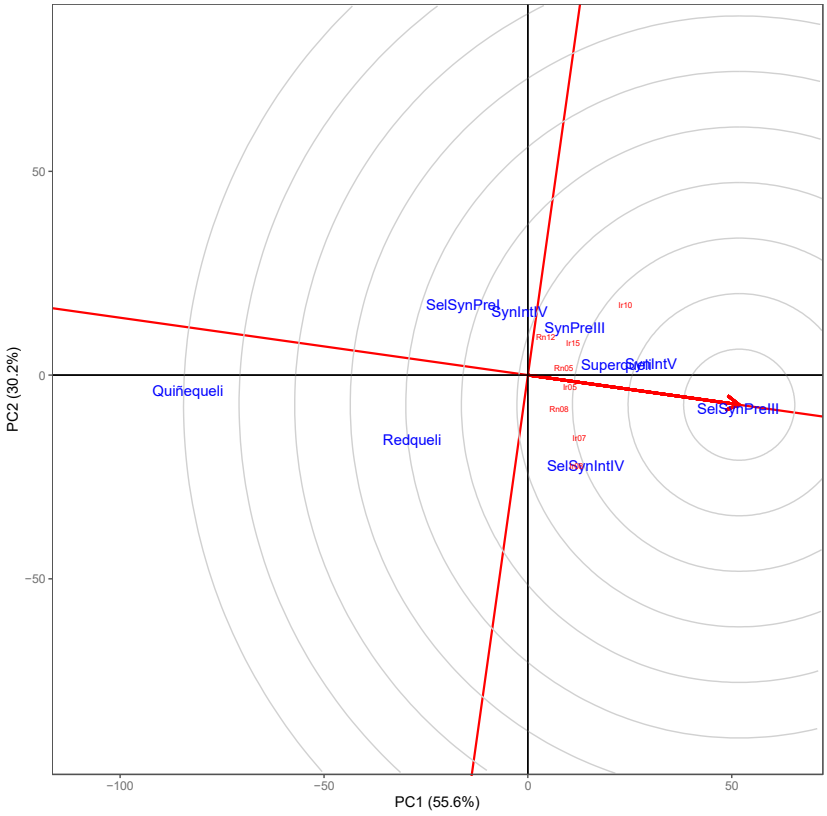

Figure S1. Ranking of persistence estimated according to the GGE biplot method of nine red clover populations developed by the Chilean breeding program. Persistence was evaluated in eight experiments managed under rainfed (Rn) and irrigated (Ir) conditions. Persistence was evaluated as plant survival at the end of the third and forth growing season in Rn and Ir experiments, respectively. Number in the environments (Ir and Rn) indicate the establishment year.

Biplot interpretation: figure displays the mean principal components value of the red clover populations (arrow). Which is an indicator of plant persistence of the 'ideal' population. It represents the best population for all environments. The center circumference indicates genotypes that are closer to the 'ideal' population. The advanced synthetic lines Sel Syn PreIII, Syn IntV and the modern cultivar Superqueli exhibited the highest persistence. In contrast, the oldest cultivar Quiñequeli showed the lowest persistence (plant survival).

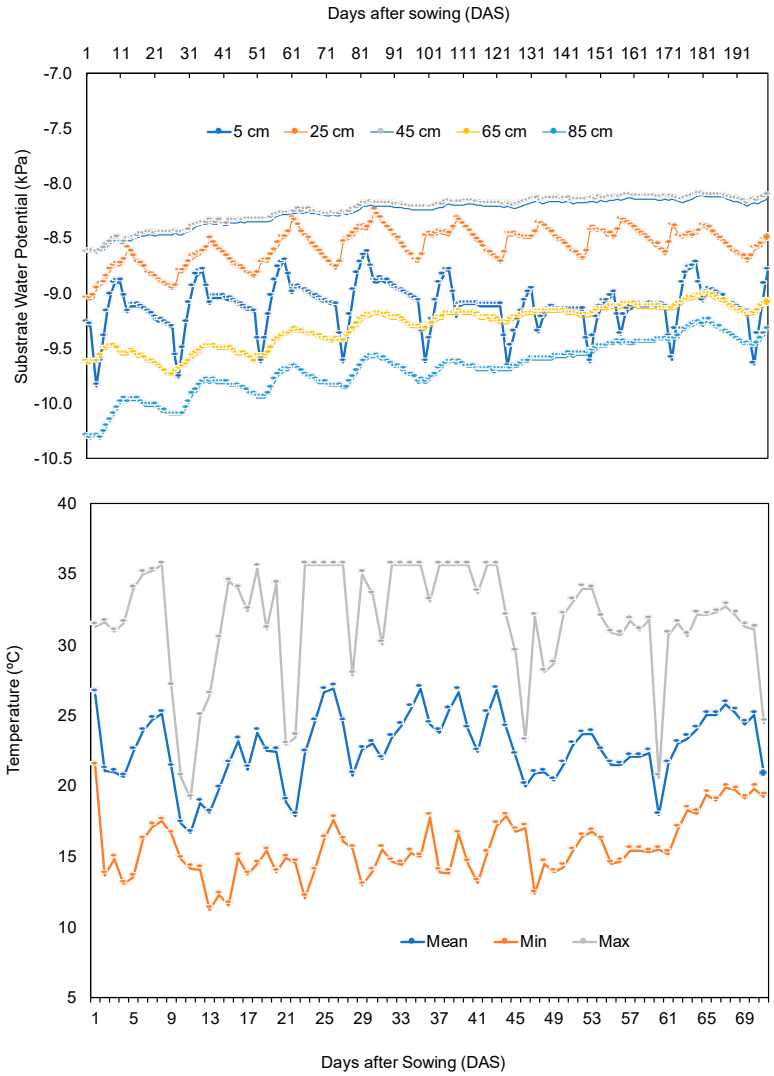

Figure S2. A) Daily substrate water potential (kPa) recorded at 1 h interval with capacitance sensors (MPS-2, Decagon, USA) located 5, 25, 45, 65, and 85 cm deep in two no-experimental unit mesocosms. **B)** Daily mean, maximum and minimum substrate temperatures recorded at 5 cm depth. Values correspond to the mean of five values recorded in five random selected experimental units. Sowing was performed on October 10th 2013.