



Legumes for a Sustainable World

ILS2 | Second International Legume Society Conference

11th - 14th OCT 2016
TRÓIA RESORT | PORTUGAL



UNIVERSIDADE
NOVA
DE LISBOA

P173 – S18

Development of a freezing test in controlled conditions for *Pisum sativum*.

Hascoët E.¹, Devaux C.², Beji S.³, Jaminon O.¹, Dufayet V.⁴, Lecomte C.⁴, Delbreil B.³, Lejeune-Hénaut I.¹

1 - USC ICV-AFP, INRA, 80203, Péronne, France

2 - USC ICV-AFP, Terres Univia, 80203, Péronne, France

3 - USC ICV-AFP, Université Lille1, 59655, Villeneuve d'Ascq, France

4 - UMR Agroécologie, INRA, 21065, Dijon, France

Freezing is a major environmental limitation to crop productivity for a number of species including legumes. In the context of global climate change, winter crops will experiment milder autumn temperatures that could be detrimental to the achievement of cold acclimation, which is the ability for plants to increase their level of frost tolerance (FT) in response to low but non-freezing temperatures. For the pea crop, a modelling approach has shown that climate warming will increase the occurrence of freezing damage events, even if these latter will be less severe (Castel et al., 2014). Thus, breeding for frost tolerant winter peas requires not only to improve their FT threshold, but also to raise their cold acclimation rate. In order to evaluate the genetic variability of both traits, we are adjusting a protocol in controlled conditions, which provides an indirect evaluation of FT by the measurement of tissues'electrolyte leakage (EL). Pea stem samples have been collected after variable durations of cold acclimation at 4°C day/2°C night in a climatic chamber. They have been then progressively cooled at 2°C h⁻¹ in a programmable temperature-test chamber to reach test temperatures ranging from +4°C to -36°C. After 14 days of cold acclimation, EL evaluation enabled the same ranking of genotypes according to their FT threshold as obtained in the Chaux-des-Prés field platform. Improvements of the protocol are however still needed to use it as a routine ranking test.