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## REFORMA,

Resilient, water- and energy-  
Efficient FORage and feed crops for  
Mediterranean Agricultural systems

### Context

Crop-livestock and feed systems have huge importance for Mediterranean regions in satisfying the increasing population's demand for animal products (milk, eggs, meat), to increase the economic stability of smallholders and to produce typical animal products with high added-value, while contributing in all cases to sustainable farming, environmental protection and efficient nutrient cycling. These systems are threatened, however, by the marked insufficiency of high-protein feedstuff, the over-exploitation of forage resources, the increasing costs and/or the decreasing availability of irrigation water and mineral fertilisers, and the increasing drought and heat stress arising from climate change.

### Objectives and workplan

The development of resilient, water- and energy-efficient forage and feed legume crops could definitely alleviate all of these constraints. This is the objective of the present project, which unites nine research institutions from Italy, France, Algeria, Morocco, Tunisia and the USA in a closely integrated manner to develop: 1) lucerne varieties with greater tolerance to severe drought, salinity, heat and grazing than the available varieties; 2) pea varieties with greater drought tolerance than the available varieties, targeted at grain and forage production; 3) cost-efficient marker-assisted selection procedures



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#### Partners:

- Institut National de la Recherche Agronomique (INRA), Unité de Recherche Pluridisciplinaire Prairies et Plantes Fourragères, Lusignan, France
- Institut National de la Recherche Agronomique (INRA), Unité Mixte de Recherches en Génétique et Ecophysiologie des Légumineuses à Graines, Dijon, France
- Institut National de la Recherche Agronomique (INRA), Centres Régionaux de Marrakech et de Rabat, Morocco
- Institut National de Recherche Agronomique (INRA), Division des Agrosystèmes de l'Est, Algeria
- Ecole Nationale Supérieure d'Agronomie (ENSA), Algeria
- Consiglio Nazionale delle Ricerche (CNR), Istituto per il Sistema Produzione Animale in Ambiente Mediterraneo, Sassari, Italy
- The Samuel Roberts Noble Foundation, Forage Improvement Division, Ardmore, United States
- Institut des Régions Arides (IRA), Médenine, Tunisia

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#### Project website:

<http://reforma.entecra.it>

for pea drought tolerance, lucerne tolerance to severe drought, salinity and grazing, and lucerne compatibility with grass companions (whose implementation by each partner will be favoured by a molecular breeding training workshop); 4) ecological breeding strategies for lucerne and pea; 5) lucerne-based and pea-based forage crops, taking into account the legume plant types, the associated grass or cereal species, the level of site drought stress, the acceptability by farmers, the forage quality and the target utilisation. Optimal diets including innovative forage crops or pea grain will be defined for different animal species and production levels in a final workshop and promoted, along with optimal cultivation methods, in a freely available electronic handbook. This and other dissemination actions will spread the project results among farmers and other stakeholders.

