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## Responses of annual medics to low temperature in Syria: growth and N<sub>2</sub> fixation

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### ► To cite this version:

Kholoud Sultan-Tubeileh, Christophe Robin, Michel Obaton, Gustave Gintzburger, Hayat Touchane, et al.. Responses of annual medics to low temperature in Syria: growth and N<sub>2</sub> fixation. Christen O., Ordon F. (Eds). Third International Crop Science Congress, Aug 2000, Hambourg, Germany. Book of Abstracts, pp.40. hal-04480409

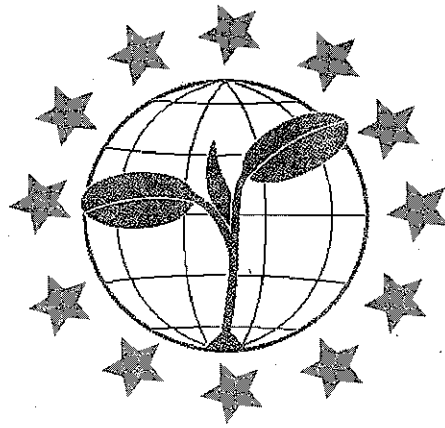
**HAL Id: hal-04480409**

**<https://hal.inrae.fr/hal-04480409>**

Submitted on 27 Feb 2024

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**3<sup>rd</sup> International  
Crop Science Congress 2000  
ICSC**

17 – 22 August 2000  
CCH - Congress Centrum Hamburg,  
Germany

**BOOK OF ABSTRACTS**



EUROPEAN SOCIETY FOR AGRONOMY

**21 POSTER 1-D**

**Responses of annual medics to low temperature in Syria: growth and N<sub>2</sub> fixation**

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Low night temperatures on pasture and rangelands of Mediterranean regions delay the germination and establishment of annual Medicago in winter. Finding medics capable to grow early and fix nitrogen at low temperature (7-9°C) is crucial in order to allow sheep to graze for a longer period. The objective of this paper was to study the growth and N<sub>2</sub> fixation of annual medics under low winter temperature.

A field experiment was conducted at the International Center for Agricultural Research in the Dry Areas (ICARDA) in Syria with two accessions of annual Medicago (*M. aculeata* acc. 5099 and *M. rigidula* acc. 716) inoculated by different native strains of Rhizobium from the Middle East. The trial was repeated for two consecutive years (1998 and 1999). Plant establishment, growth and nodule initiation were studied and the percentage of N derived from N<sub>2</sub> fixation was quantified by <sup>15</sup>N dilution technique. Results indicate a genotypic variation in the low-temperature tolerance of medics. At low temperature, *Medicago aculeata* performs better than *Medicago rigidula* after sowing, with faster establishment of nodules and higher biomass accumulation. During winter and in both accessions, herbage yield of N-fertilized and inoculated treatments were significantly higher than that of uninoculated one. *Rhizobium* strains play a key role in the improvement of growth and nodulation during the cold period. The percentage of N derived from fixation was high in both inoculated species, where it reached 72% for *M. rigidula*.

Thus, the pasture production in low-input based forage systems can be increased in winter by use of Medics - *Rhizobium* associations adapted to low temperature.