

Saprophytic competence in four acid soils of strains of *Rhizobium meliloti*

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Strains of *Rhizobium meliloti* collected from Sardinia were shown to have a greater ability to colonize and persist in an acid (pH 5.0, CaC₁₂) and limed (pH 6.3) soil than commercially available inoculant strains used in Australia (1). Because of the likely implications for production from *Medicago* pastures on acid soils, this result needed to be confirmed over a wider range of soil conditions. This paper presents results from 8 trials at 4 locations on soil types suited to cultivation of *M. polymorpha*. Although each trial compared 30-60 strains of *R. meliloti*, only data for 3 strains are presented: WSM419, CC169 and WSM540.

Methods

The 'cross row' technique described fully previously (1) was employed for all trials. This method is a bioassay for the colonization by *R. meliloti* over 2 growing seasons of soil previously free of this rhizobial species. All sites were in the Merredin advisory district of the eastern wheatbelt of Western Australia on loamy-sand soils (15-25% clay) with the general characteristics of the Collgar association.

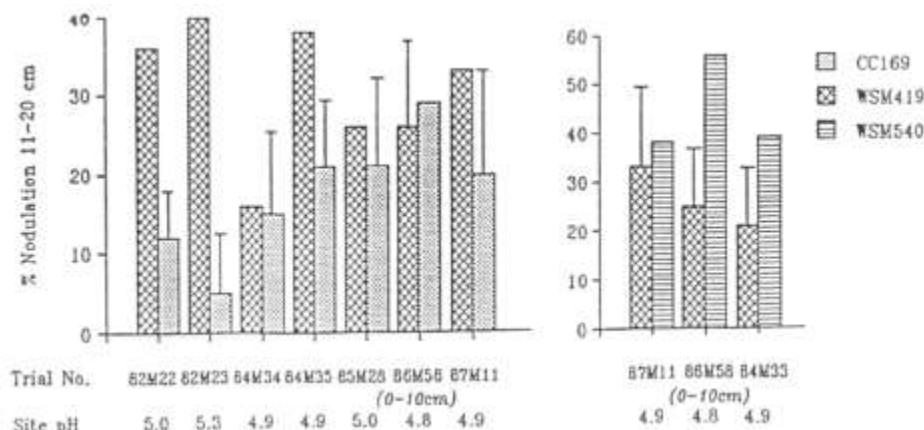
Results and discussion

The data presented is for the proportion of plants which nodulated in year 2 in the sampling region 11-20 cm from the point of placement of rhizobia in year 1. For trial 86M58, whose cross-rows were sown in a drought year, data is for the 0-10 cm sampling region.

In 6 of the 7 trials which incorporated both CC169 and WSM419, the latter strain produced a greater proportion of nodulated plants (Figure 1). In the 3 trials where comparison of WSM419 and WSM540 was possible, the latter strain produced a higher proportion of nodulated plants.

At all 4 trial locations WSM419 had a greater ability to persist in, and colonize the acid soil than CC169. Over the range of soils in which

M. polymorpha is expected to be sown in the eastern wheatbelt of Western Australia, both of the WSM strains collected in Sardinia are likely to produce superior nodulation to CC169 in regenerating stands. WSM540 is likely to be superior to WSM419 in this respect also.



(1) Howieson, J.G. and Ewing, M.A. (1986). Aust J. Agric. RES. 37,55-64.

