

Effects of molybdenum on enzyme activity and blade cell submicro-structure of *Chamaecrista rotundifolia*

B. Q. Weng, D. F. Huang, Y. X. Wang, T. Luo, Z. Y. Ying
Fujian Academy of Agricultural Science, Fuzhou, Fujian 350013, China; E-mail: boqiweng@yahoo.com.cn

Key words: molybdenum (Mo), *Chamaecrista rotundifolia*, nitrate reductase; nitrogenase, submicro-structure

Introduction *Chamaecrista rotundifolia* was recently introduced from the Australian Centre for International Agricultural Research (ACIAR) and is suitable for growing in mountainous red soil (Ying et al, 2000). This paper mostly reports the effect of Mo on plant growth and related aspects, to provide a theoretical basis for applying Mo fertilizer to *Chamaecrista rotundifolia*.

Materials and methods Experimental materials were seeds of *Chamaecrista rotundifolia* CPI 34721 strains and the red soil. Pot experiments were conducted comparing five treatments.

Results Leaf nitrate reductase activity was highest with application of 1.0 mg Mo/kg soil and it was 113.1% higher than in the control plot. (Figure 1). The response of nitrogenase activity with the increase of Mo fertilizer was similar to nitrate reductase (Figure 2). In addition, applying Mo could promote granum formation, enhance stability of cell wall and cell membrane and reduce deposits of polymers like bags formed by primary wall and cell membrane (Figure 3).

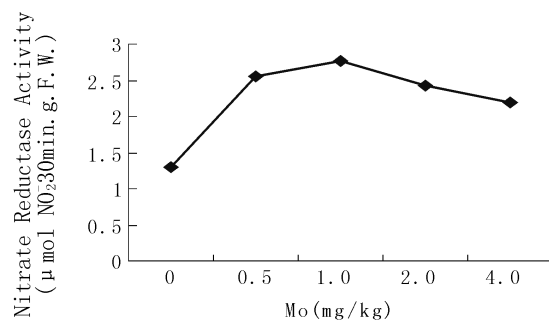


Figure 1 Effects of applying Mo on the leaves' nitrate reductase activity of *Chamaecrista rotundifolia*.

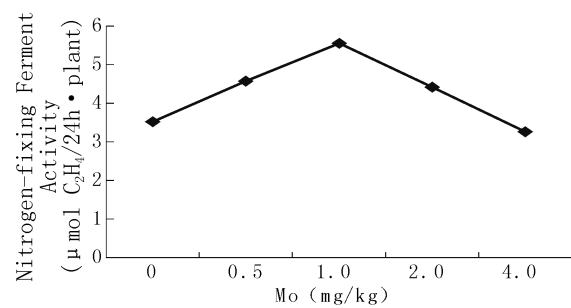


Figure 2 Effects of applying Mo on nodule nitrogenase activity of *Chamaecrista rotundifolia*.

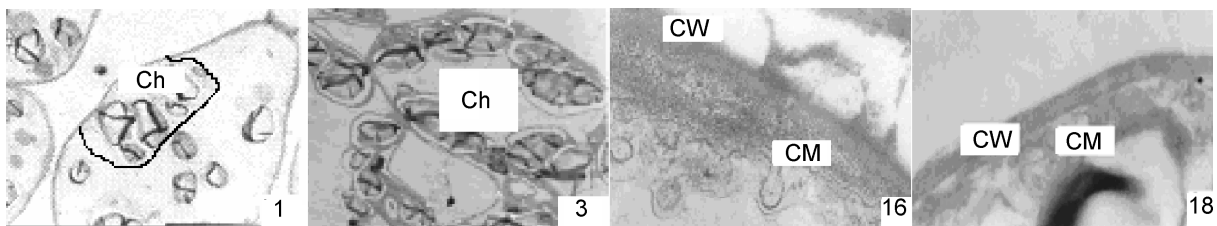


Figure 3 Effects of applying Mo on the blade cell submicro-structure of *Chamaecrista rotundifolia* (Photo 1 and 16 are the control. Photo 3 and 18 are the treatment of 1.0 mg Mo/kg).

Conclusion The proper amount of Mo fertilizer could promote the nitrogen metabolism and enhance the N-fixing ability. In addition, it could promote granum formation and enhance stability of cell membrane to enhance photosynthesis. In this experiment, 1.0 mg Mo/kg soil was the most effective and suitable application amount.

Reference

Ying Z Y, Huang Y B, Zhang M H, et al. Suitability of 40 accessions of *Chamaecrista* spp. in hilly red soil in north Fujian. *Journal of Fujian Agricultural University*, 2000, 29(2): 233-237.