

In Vitro Selection for Herbicide Resistance in  
Lotus corniculatus

N. L. MacLean and W. F. Grant

Genetics Laboratory, P.O. Box 282, Department of  
Plant Science, Macdonald College of McGill University,  
Ste. Anne de Bellevue, Quebec, Canada H9X 1C0

Lotus corniculatus is a productive, high quality forage legume. It is especially useful on land which is not suitable for alfalfa production. The major drawback of this crop is that it is often difficult to establish because the seedlings grow slowly and offer little competition against weeds. Herbicide applications to control the broad-leaved weeds, which are particularly troublesome, would increase ease of establishment and subsequent forage yields. Such herbicides, though, are also toxic to L. corniculatus. For this reason, selection for resistance to the herbicides 2,4-D and chlorsulfuron was carried out.

The selection process consisted of introducing herbicide to suspension cultures of L. corniculatus cv. 'Leo' (2,4-D at 10 - 20 ppm and chlorsulfuron at 0.5 - 1.0 ppm). Selection proceeded for two, two-week passages in 20 ml of herbicide incorporated liquid B5M media in 125 ml flasks on a horizontal shaker. Callus was then produced by plating aliquots of suspension on agar-solidified media. Plantlets were regenerated from the callus, acclimatized in a mist frame and transplanted to soil in a greenhouse. Some 410 plants have been regenerated. Visual analysis of the regenerants revealed a wide variation in appearance particularly in regards to leaf size and shape. Cytological analyses are in progress and have indicated that polyploidy and aneuploidy exist among the regenerants. Cuttings and progeny from the regenerants will be tested for resistance to the respective herbicide.