Many weeds impede both pasture production and utilisation, and one of the most serious in New Zealand is Californian or creeping thistle \([Cirsium arvense (L.) Scop.]\) (Bourdôt and Kelly, 1986). This perennial thistle is widely distributed in the temperate agricultural zones (Holm et al., 1977), and is characterised by the production of often dense stands of adventitious shoots from a creeping root system. Initial establishment may be by seedlings or from root fragments. Traditional control methods utilising herbicides, cultivation and cutting have inherent problems. These include removal of the clovers from pasture when treated with phenoxy herbicides, and the general inadequate long-term control with the other methods. Intensive grazing can give long-term suppression of the weed (Mitchell and Abernethy, 1993) but the weed persists under normal rotational grazing. Thus, there have been several investigations and attempts at biological methods of control. The ‘classical’ approach with exotic phytophagous insects has met with limited success (see Jessup, 1989; 1990) and this host was the target for the first attempts at biological control of weeds in New Zealand, when Cockayne (1914, 1915) investigated the effect of the rust \(Puccinia punctiformis\) (Str.) Rhl. (as \(P. suaveolens\) Pers.) on the weed. Ten years ago, an alternative biological approach was investigated in the USA using \(Sclerotinia sclerotiorum\) (Lib.) de Bary applied to soil as mycelium in whole wheat grain (Brosten and Sands, 1986).

High application rates and perceived crop safety problems have seen the demise of research into this approach in the USA for the control of thistles in pastures and range lands. However, the development of containable auxotrophic mutant strains of the pathogen that require exogenous sources of specific micro-nutrients to allow infection to occur, has kept the project active for possible utilisation of the pathogen for the control of weeds in turf and amenity grasses (Miller et al., 1989b; Sands et al., 1990).

**A SURVEY OF DISEASES OF CALIFORNIAN THISTLE IN NEW ZEALAND**

To determine if, in New Zealand, there exist pathogens that could be utilised as biological control agents for Californian thistles, a survey of diseases was conducted in the summer of 1989/90. Farmers were asked in a newspaper and radio campaign to submit diseased plants from throughout the country. Table 1 lists the