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Control of viruses of Lupins (*Lupinus spp.*) in South Africa.

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Introduction.

South Africa is unable to provide locally for its cattle industry protein needs. Lupins (*Lupinus spp.*) have been identified by The Protein Research Trust (PRT) as one of four crops (lupins, soybeans, canola and cotton) which can be cultivated locally to readdress the need for imported protein. A great deal of energy and funds are therefore being invested into optimisation of cultivation of each of these four crops to achieve increased yields. Two plant viruses, bean yellow mosaic potyvirus (BYMV) and cucumber mosaic cucumovirus (CMV) cause severe yield losses worldwide on lupins (Jones and McClean, 1989), and have resulted in declines in land used for lupin production in Eastern Europe (Ksiazek, 1962; Zschau, 1962; Balszczak, 1963; Porembskaya, 1964, Savvichev, 1979; Larionova *et al.*, 1984), the USA (Edwardson *et al.*, 1976) and Australia (Jones, 1987, 1988). These viruses tend to form epidemics in favourable seasons in which yield losses can be from 50 % to almost 100% (early infection by BYMV in the USA, Hackbarth, 1959; early BYMV infection in Australia, Harvey, 1956; BYMV epidemic in 1987 in Western Australia, Jones and McClean, 1989; CMV in Australia, Sandow, 1987). These two viruses have been detected on lupins in South Africa (Klessner, 1953, 1960, Lupuwana *et al.*, 1985, Pietersen unpublished results) along with soybean mosaic virus (SMV) (Vroon *et al.*, 1988) and the symptoms they induce are regularly encountered on *Lupinus albus* (white lupins) in the summer-rainfall production area (J. Van der Mey, personal communication), and on yellow lupin (*Lupinus luteus* L.) in the winter rainfall areas (Achenbach personal communication). Epidemics of viruses, presumably BYMV and CMV, devastated the South African *L. angustifolia* breeding program in 1984 (Pakendorf, cited by Jones and McClean, 1989), and also caused field trials in Natal to be abandoned in 1994 (B. Birch, personal communication). However, the importance of these two viruses in commercial lupin production in South Africa is unknown. The aim of the first phase of the current project is to assess the importance of CMV and BYMV on commercial lupin production (mainly *L. angustifolius* and *L. albus*) in the three major lupin production areas of South Africa, and to determine whether they serve as constraints to lupin production here. Should the viruses prove to be important, studies will continue on methods of virus control.