

## Effects of cultivation and stubble retention on soil and stubble - borne pathogens of wheat in Victoria

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Reduced cultivation and stubble retention are steadily gaining acceptance as techniques for the production of wheat (*Triticum aestivum* L.) in Victoria. This paper summarizes the results of field experiments from 1983 to 1986 which examined the effects of cultivation techniques on soil and stubble-borne pathogens of wheat in calcareous sandy loams in the Victorian Mallee (north-western Victoria), in grey self-mulching cracking clays in the Northern Wimmera (north-western Victoria) and in a solodic soil in the North-East of the state.

Rhizoctonia root rot (*Rhizoctonia solani*) was up to 90% more severe on wheat sown after an uncultivated herbicide fallow (direct drilled) than on wheat sown after a traditional cultivated fallow (several cultivations with a tined implement) in a fallow/wheat rotation practiced on calcareous sandy loams. The severity of this disease was affected by the time and number of cultivations. In comparison to direct drilling, cultivation (depth 8 - 10cm) of a sandy loam with a rotary hoe either 20 wks before or just before sowing reduced rhizoctonia root rot by 50% and 75%, respectively. A combination of two such cultivations, one 16 wks before and the other just before sowing, reduced the disease severity by 92%. The severity of rhizoctonia root rot was similar after cultivation with a rotary hoe and after cultivation with a tined implement. When seed was direct drilled using 13 cm shares the disease severity was up to 38% less than when seed was direct drilled using 4cm shares.

The incidence and severity of take-all (*Gaeumannomyces graminis* var. *tritici*) was generally unaffected by cultivation treatments in experiments in the Northern Wimmera and the Mallee. At one site in 1986 in the Mallee however, the incidence and severity of take-all were 3 times higher in wheat sown after a cultivated fallow than after a uncultivated fallow. Similarly, the disease was more frequent and severe in cultivated soil than in uncultivated soil in experiments in the North-East from 1984 to 1986. Common root rot (*Bipolaris sorokiniana*), and which occurred in experiments on sandy loams, was also more frequent in cultivated soil than in uncultivated soil.

Yellow leaf spot (*Pyrenopeziza tritici-repentis*) and eyespot (*Pseudocercospora herpotrichoides*), stubble-borne diseases occurring in experiments the North-East, were aggravated by retaining stubble from the previous wheat crop on the soil surface compared to treatments where stubble was burnt. The incidence and severity of take-all in direct drilled wheat on the other hand were the same in stubble-burnt and stubble-retained treatments.

These results show that changes in cultivation techniques in Victoria can result in changes in the importance of soil and stubble-borne diseases of wheat. Rhizoctonia root rot in particular, may become more common and severe in the sandy calcareous loams of the Mallee if direct drilling without prior cultivation is adopted on a large scale in this region.