

## Soil management in the Lockyer Valley

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The physical structure of some Lockyer Valley soils has deteriorated as the intensity of cropping has increased. Soil management problems include formation of clods, surface crusting and hard pan development resulting in restricted aeration, water infiltration and drainage, difficulty in seed bed preparation, poor seedling emergence, reduced crop production and harvesting difficulties.

Investigations have shown that soil structure deterioration has been influenced by loss of organic matter, compaction with heavy machinery, irrigation with sodic water and irrigation intensity exceeding infiltration rate.

The structure of Lockyer Valley soils can be improved or maintained by careful management. The following practices are utilized by farmers.

- Deep Ripping. Hard pan development is reduced by deep ripping (30-35 cm) annually. In some cases contractors with heavy machinery will deep rip to 60 cm. The soil must be dry for maximum effect.
- Gypsum. Where soil structural problems have occurred due to irrigation with water high in sodium, gypsum is used as a soil amendment. Application rates average 7 tonnes/hectare but may be as high 10 tonnes/hectare. Landholder response to soil physical problems can be partially gauged by the sales of gypsum. Each year some 4,000 tonnes of gypsum is spread in the Lockyer Valley.
- Organic Matter. The organic matter content of Lockyer soils is increased by using a rotation programme which either contains crops which return large quantities of plant material (eg. sorghum or sweet corn) or includes cover cropping with forage sorghum.
- Other Factors. Farmers are now paying greater attention to irrigation rates, compaction with heavy machinery, production of deep rooted crops such as lucerne and general crop rotation programmes.

### Research Activities in the Lockyer Valley

- Lockyer Soil Physical Improvement Trial. This trial investigates the long term effects of crop rotation, deep ripping, methods of weed control and applications of gypsum.
- Long Term Gypsum Plots. These are located on growers properties for investigation over a five year period. They comprise five 4 acre sites with gypsum applied at the rate of 7 tonnes/hectare.
- Salinity Investigations. A detailed study of the salinity/sodicity problems in the Lockyer Valley is being undertaken. This should enable better management practices to be developed for the use of sodic water for irrigation.
- Lockyer Valley Soil Survey. This will map and describe the soils and list their major limitations.

Information provided by the base resource surveys of soil and water combined with techniques based on soil management research and grower practise will permit the formulation of an integrated programme for effective soil management by growers.