

Soil benefits of controlled traffic in intensive vegetable production

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Intensive vegetable production relies on diverse crop rotations, frequent cropping schedules and intensive machinery use for incorporation of crop residue, seedbed preparation and harvest. Intensive random traffic, as is used in vegetable production, requires excessive tillage in an effort to remediate soil compaction. Controlled traffic farming (CTF) provides a number of system benefits including improved energy efficiency, soil health, crop yield, timeliness and economics. The adoption of CTF in the Australian grain and cane industries has been largely based on a limited equipment suite and flat to mildly sloping topography. The Tasmanian vegetable industry faces a very different scenario, with a wide diversity of machinery, and topography ranging from flat to steeply undulating. Machinery diversity issues are often a challenge to CTF adoption in mixed cropping enterprises, such as cane and vegetables or grain, and cotton and grain, although the vegetable industry appears to face the most challenges in machinery and crop integration.

Research in the vegetable industry has shown improvements in soil physical conditions can be achieved in a short time with the use of controlled traffic. The most obvious improvements have been in porosity, soil structure score and infiltration. The implementation of controlled traffic leads to a change in tillage management, resulting in fewer, less energy intense, operations. The role of tillage becomes largely one of managing residue to provide seeding and subsequent harvest conditions appropriate to the crops grown. The need to remediate soil compaction largely disappears, apart from some remedial deep tillage at the interface of the wheel track and the crop bed to prevent excessive encroachment of wheel track compaction into the bed.

