



Resilient Cropping

Precision Recontouring - Waitatapia Case study

Reshaping sand dunes is removing constraints at Waitatapia, Dalrymples' farm in Bulls.

Soils at Waitatapia are deep sands in flat to undulating contour. Crops often suffer yield loss due to drought stressed dune tops, a high water table and ponding in depressions. Several belts of pine forested sand dunes hamper irrigation, preventing pivots from completing full irrigation circles.

To address the high and low area losses, and the limitations posed by sand dunes, land levelling has begun. Elevation data collected on-farm is fed into a software package that identifies best cut-and-fill options. In effect, the tops are put in the hollows, and a median grade established.

The process starts with the tractor driving lines at 10-metre intervals across the targeted paddock to capture RTK elevation data. This is fed into Trimble Multiplane software which optimises the final ground surface. Cut and fill then works to planned slope and direction of slope programmed into the GPS.

Re-contouring proceeds in a series of tiles of about one hectare, using GPS guided scrapers towed behind a



535hp tractor. Topsoil is removed by two bulldozers and stockpiled. The subsoil is contoured by two scrapers each with a separate GPS receiver controlled by Trimble AgGPS.

With the optimum surface achieved, an adjacent area is then stripped, and its topsoil spread on to the re-contoured area. A bulldozer is used to replace topsoil as it handles it best and results in less compaction than a wheeled machine.

Recontouring the farm gives better use of water and better crops

After re-contouring, open drains at about 100m spacings are dug to about 1.5m depth. A final seedbed is prepared using closely spaced discs and tines, and plant cover is established as rapidly as possible to counter the high risk of wind erosion.

Indicators of soil physical condition are monitored to compare levelling and restoration treatments, and early indications are good.

Crop rotation choices, cultivation practices, fertiliser programmes and composting are being explored to determine which give the best balance of soil structural improvements, fertility, organic matter and financial return.

This article extracted from Bloomer and Powrie, 2011 "A Guide to Smart Farming" published by LandWISE