



Manaaki Whenua
Landcare Research

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Attention: Glenn Stevens & Andrew Burton

VSA SOIL QUALITY MONITORING, “GLENDALE” FONTERRA DAIRY FARM, TAKAKA

Introduction

Tasman District Council, through the Envirolink Programme (funded by the Foundation for Research, Science & Technology), wanted to demonstrate soil quality assessment monitoring for dairy farmers in the Takaka Valley. This report covers the initiation of this soil quality monitoring programme.

Methods

Soil Quality Monitoring, using the Visual Soil Assessment (VSA) system (Shepherd, 2000; Shepherd & Janssen, 2000), was initiated at the Fonterra “Glendale” dairy farm, adjacent to the Takaka Dairy Factory on 13–14 November 2006.

Four replicate VSA assessments were made of the soil indicators and plant indicators for each paddock, located somewhat randomly to give representative sites within each paddock, but not adjacent to fence lines, gateways, or other obvious abnormal places.

Eight paddocks were selected to monitor, representing 6 soil types on the property and 2 effluent treatments (current dairy shed effluent and historical factory effluent disposal). The soil types were chosen from the soil mapping for Tasman District Council in 2005 by Iain Campbell and reported in *Soils of the Lower Takaka Valley* (2006),

Results

The location and average VSA scores for 8 paddocks and 6 soil types are given in Table 1 and GPS locations from about the middle of the sampling sites in Table 2.

All of the paddocks ranked as having good soil quality (> 20). However, there was variability between paddocks for some indicators, particularly soil porosity, earthworm counts, and surface relief (the result of pugging / hoof prints).

Plant scores similarly ranked good for all of the paddocks (>20).

The Tadmores hill soil had somewhat different soil and plant indicators than the flat paddocks and was ranked differently from the other soils, under the hill soils VSA system. It was also rated as being in good condition for a hill soil.

Table 1. VSA soil and plant scores for the selected monitor paddocks

SOIL TYPE	PADDOCK NO.	AV. SOIL SCORE	AV. PLANT SCORE
Karamea ¹	32	24.1	24.1
Karamea ²	12	24.6	20.5
Takaka	27	22.7	24.0
Hamama	5	20.0	23.0
Motupipi	41	28.8	25.5
Pisgah	38	22.3	22.5
Tadmores hill	38	31.5	12.5

¹ Dairy shed effluent applied ² Dairy factory effluent applied in the past

Table 2. GPS locations in the middle of the paddocks are:

PADDOCK NO.	SOIL TYPE	Easting	Northing
32	Karamea ¹	2494858	6038472
12	Karamea ²	2494036	6039070
27	Takaka	2494540	6038745
5	Hamama	2494033	6039339
41	Motupipi	2495396	6038025
38	Pisgah	2495204	6038202
38	Tadmores hill	2495145	6038112

Future Monitoring

This initial monitoring of soil quality can be used to demonstrate the VSA system to dairy farmers in the Tasman Bay area. Periodic monitoring (every year in the spring) of the selected paddocks by Tasman District Council, or farmers who are trained to use the VSA system, will demonstrate whether current management of the "Glendale" Monitor Dairy Farm is maintaining, improving, or degrading overall soil quality. Also,

significant changes in individual indicators will show the impact of paddock management on the soil and plant systems within that particular paddock.

References

Shepherd, T.G. 2000: Visual Soil Assessment. Volume 1. Field guide for cropping and pastoral grazing on flat to rolling country. HorizonsMW & Landcare Research, Palmerston North. 84p.

Shepherd, T.G.; Janssen, H.J. 2000: Visual Soil Assessment. Volume 3. Field guide for hill country land uses. HorizonsMW & Landcare Research, Palmerston North. 48p.

Campbell, I. 2006: Soils of the Lower Takaka Valley. Report to the Tasman District Council. 42p.

Yours faithfully

A handwritten signature in black ink, appearing to read 'C Ross', with a long horizontal stroke underneath.

Dr Craig Ross

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