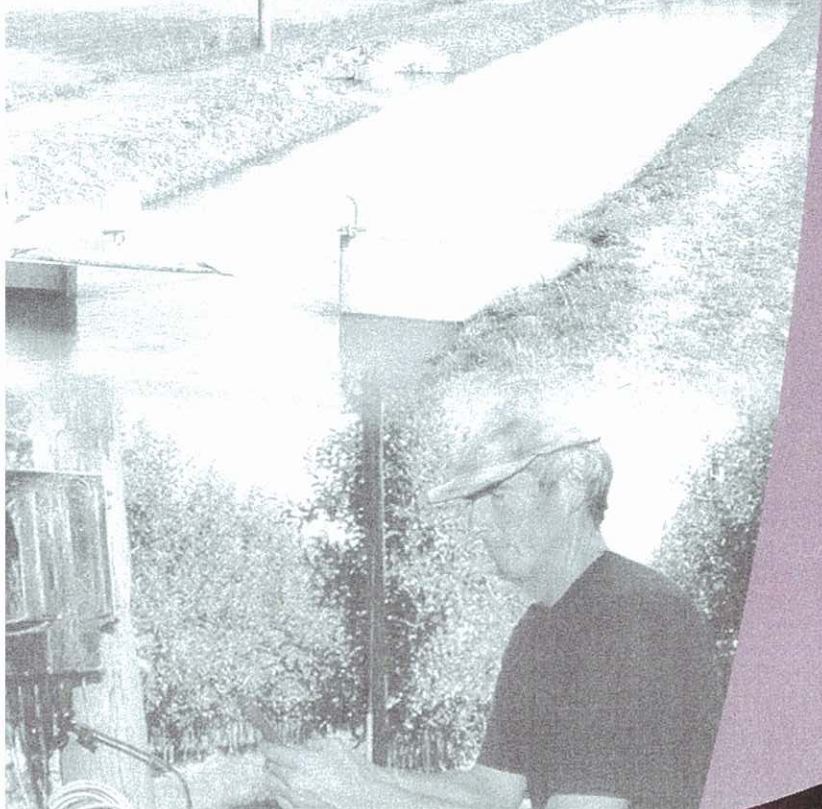


5.1.4

**SOIL MOISTURE
MONITORING**



Soil Moisture Monitoring Services for Irrigation Management

Special Features/Benefits

- Soil moisture monitoring service to assist with irrigation management.
- Skilled and experienced staff.
- Regular (5-7 day) visits to measure soil moisture.
- Precise soil moisture measurement at 10cm intervals from 0.2 – 2.0+m.
- On farm reporting once measurements are completed
- Prediction of next irrigation and the amount (depth) to apply.
- Ensure irrigation starts on time beginning of the seasons.
- Ensure irrigation stops on time at the end of the season.
- Management of moisture requirements depending on crop growth stage and agronomic requirements
- Precise determination of crop root zone.
- Identification of soil compaction.
- Service provided in irrigating areas of both North and South Island.



December 2001

Contact Details

Dr Anthony Davoren
Hydro-Services Ltd
317/2 Blenheim Road
P.O. Box 3132
Christchurch
Ph/fax 03 341 0970
Email hydro@caverock.co.nz

Irrigation Scheduling and Soil Moisture Measurement Tools

Wharepuna Testing Ltd can provide you with a range of tools to help you monitor soil moisture.

Features:

Comprehensive Service

We provide not only irrigation scheduling services but also soil moisture measurement probes.

Flexible approach:

We can provide the tools to allow you to do your own soil moisture measurements. We can provide a full scheduling service or flexible plans to meet your specific needs.

Benefits:

Efficient use of irrigation systems will:

- **Save 1000's of Dollars in costs:** Water usage can be reduced by ten percent or more if soil moisture monitoring and prediction systems are used.
- **Increase Yields:** Yields can be increased through soil moisture monitoring. Plant stress is reduced and fertiliser more effectively used when overwatering is reduced.
- **Reduce Fertilizer Waste:** Over- watering leaches expensive fertiliser from the soil. Monitored irrigation reduces pollution and saves money.
- **Save time:** Have a holiday on the time and money saved.

Contact Details:

Wharepuna Testing Ltd.

P.O. Box 32 Kirwee. Canterbury

Ph. 0800 101 617

fax.: 03 318 1644

email Wharepuna@paradise.net.nz

December 2001

Aquaflex

Proven soil moisture measurement for every application

Aquaflex sensors measure both soil moisture and temperature.

Each sensor is a 3m long flexible tape that averages soil moisture over a 6 Litre volume. Aquaflex overcomes the problems of measuring soil moisture at one point only in a relatively small amount of soil.

Aquaflex sensors are suitable for almost all soil types including sandy, clay and stony soils.

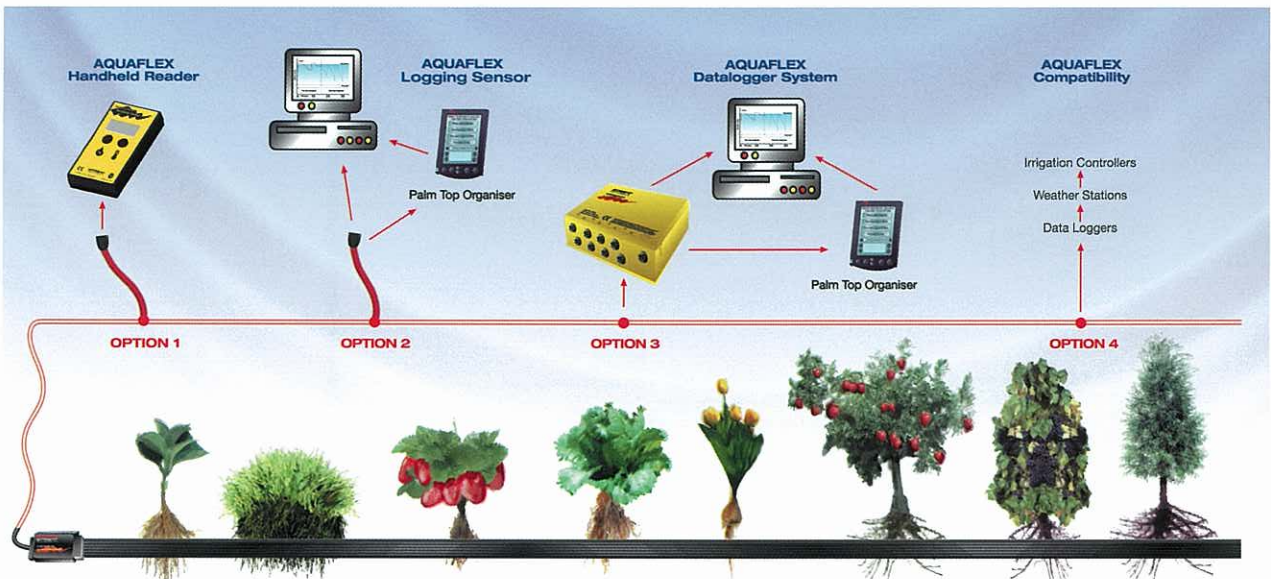
Moisture Measurement Range: 0 to 60% Volumetric Moisture Content (VMC)

Measurement Precision: +/- 0.5% VMC

Temperature Measurement Range: -10 to +50°C



The Soil Moisture Sensor that Speaks VOLUMES



Palm is a trademark of Palm, Inc.

Aquaflex sensors are very easy to use; just bury them at the depth where you want to measure, then find the soil moisture and temperature via a handheld reader, continuous logging, or with 4-20mA and frequency outputs for connection to third party equipment.

Sensors can be installed at any depth. They are usually buried horizontally in the rootzone. They can also be buried at different levels to estimate a depth profile of the soil moisture. Burying the sensor at an angle provides an average soil moisture over a range of depths.

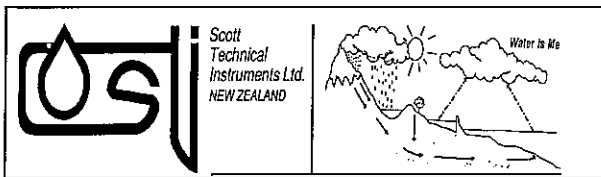
If set to log continuously, the data can be transferred to a PC with a Palm™ handheld computer. On the PC, the soil moisture and temperature can be graphed to spot trends, analyze water use and determine optimum irrigation. These graphs can be printed out. The PC software displays soil moisture in % volumetric, mm/100, and inches/foot.

AQUAFLEX is a vital tool enabling users to optimise their irrigation management allowing them to:

- ¥ Improve crop and turf quality
- ¥ Improve crop and turf yields
- ¥ Reduce water usage
- ¥ Reduce pumping costs
- ¥ Minimise nutrient loss through leaching
- ¥ Balance turf appearance and root structure
- ¥ Meet environmental requirements and regulations
- ¥ Minimise groundwater contamination by eliminating leaching


AQUAFLEX's spatial averaging (over the 3m sensor length) provides an accurate and representative soil moisture reading to ensure the above requirements are achieved.

Proven Soil Moisture Measurement - Measure Where It Matters!



Scott Technical Instruments Ltd,

29 Sandyford St, Sydenham, P O Box 623, Christchurch
PHONE : 03 374 2101 **FACSIMILE**: 03 374 2102 or
14 Bandon St, Hamilton 2001,
PHONE: 07 8470646 **FACSIMILE**: 07 8460647
Info@scottech.net www.scottech.net


GIESEN

28 August, 2001

Dr Blair Miller
Scott Technical Instruments (SI) Ltd
29 Sandyford Street
Sydenham
Christchurch

Dear Dr Miller

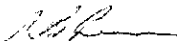
In November 1999 we installed four Aquaflex Sensors to help with monitoring soil moisture levels in our difficult Lismore stony silt loam vineyard. In the past our pump would run throughout summer, from October to April, rotating every twelve hours around the eight blocks of grapes, with consequent waste of water. With the aid of the Aquaflex hand held reader we were able to take readings before, during and after irrigation to determine soil moisture content in volumetric %, and so irrigate accordingly. The power savings alone have been quite considerable.

1998	there were 20,585 units used
1999	4,882 units used
2000	4,873 units used
2001	4,709 units used, during one of the worst droughts for many years.

The installation of Aquaflex soil moisture monitors not only tells us exactly the soil moisture available but also saves time, money and electricity. A highly recommended tool in any management plan.

Kind regards

Bruce Green
Vineyard Manager
Giesen Wine Estate



Giesen Wine Estate Location: Burnham School Road Burnham Postal Address: P O Box 11-066 Christchurch New Zealand

December 2001