**FOCUS VINEYARD VINE WATER REQUIREMENTS – MARLBOROUGH**
**Clarification of processes**

**Summary**

**Irrigation Management:** Fruition Horticulture
**Objective:** to disseminate information to a wide group of growers on "current best practice" and current research being carried out that may influence current practices. This programme then could be "to make best use of the current water resource to balance sustainability" from existing research trials currently undertaken in the district.
**Summary of work to undertake:**

- Monitoring of current irrigation practices using Fruition Horticulture irrigation scheduling methodology to assist growers to improve their decision making.
- Dissemination of research results from the Squires trial and the Nautalis trial.

New research proposed by Marc Greven HortResearch.

**Year 2 proposal**

- Monitor each block/property (6 sites), select appropriate irrigation scheduling strategy based on other irrigation trials, particularly the reduced irrigation trial Nautalis (Fruition Horticulture).
- Monitor soil moisture and irrigation application and provide a recommendation on a weekly basis for two sites on each block.
- Prepare annual report analysing irrigation applications, compare with Nautalis trial and other Fruition Horticulture clients.

**Focus Vineyard Management Committee Strategy**

- On one Focus Vineyard site (Tyntesfield), an area that is under irrigation management will be managed by the grower and committee using his (growers) normal practice. The other area will be managed as under best practice irrigation management as provided by the proposer.

- The other two sites (Tohu and Stembridge), will be managed as best practice as provided for by the proposer.

- It should be noted in both cases the ultimate decision still remains that of the grower (Focus Vineyards - Tohu, Tyntesfield and Stembridge).

- The committee will also source other irrigation opportunities outside the bounds of this proposal (i.e. Netafim, Fruit Federation, Montpellier University and others) to ensure that best practices are maintained at the highest opportunity.

- Any practices discussed with the Irrigation Management (Fruition Horticulture) provider outside these provisions is between the grower and the provider.

**Reports**

- Weekly reports will be supplied to the Growers and the Focus Vineyard Co-ordinator within 24 hours of monitored data collection.
- Annual report will be completed by 15th July of each year.

**Budget**

2004-05
Contract fee $ $7,050 (excl. GST)
Inkind $2,500

Richard Hunter
Marlborough Focus Vineyard Co-ordinator.

# Focus Vineyard Project Marlborough
**Sustainable Farming Fund**

## Irrigation Management

***Key personnel***

The key personnel that will be involved with the irrigation component of the Focus Vineyard project are; Murray Neal (Primac Horticulture), Greg Dryden (Fruition Horticulture), Marc Greven (Hortresearch). Murray Neal will take the lead role in this group.

***Proposal***

The focus vineyard project is a three-year project. It is suggested the irrigation management component of the project be based on a current "best industry practice" model over these three years while incorporating information from existing research trials currently being undertaken in the district.

**Objective**

Our understanding of the focus vineyard model is to disseminate information to a wide group of growers on current "best industry practice" and current research being carried out that may influence the current practices. The objective for this programme then could be "to make best use of the current water resource to balance the sustainability of the resource and while producing high quality end product".

**Summary of work**

The irrigation portion of the focus vineyard can be divided into three parts:

1. Monitoring of current irrigation practices and using the Fruition Horticulture irrigation scheduling methodology to assist growers to improve their decision making
2. Dissemination of research results from the Squires trail and the Nautilus trial
3. New research proposed by Marc Greven

The three distinct focus vineyard properties do pose added costs for this part of the project. To be able to talk about the properties as part of the total focus vineyard project monitoring work will need to be carried out on each property and comparisons made between them. This is also a huge advantage in that growers will be able to relate the information to their own property much easier.

The big saving to the project is in part 2 (dissemination). All parties (Fruition, Primac and Hort Research) have agreed that there are good reasons not to charge the project for this area. The organisations have that this can be regarded as an "in kind" contribution to the project.

The total cost per year for the irrigation portion of the focus vineyard project is

| | Year 1 | Year 2 | Year 3 |
|---|---|---|---|
| Soil moisture monitoring | $6,990 | $7,050 | $7,050 |
| Dissemination | $0 | $0 | $0 |
| Research | $6,000 | $6,000 | $6,000 |

These quotes are GST exclusive

While there are three components to this work they are all interrelated and a key objective of the group will be to integrate the three components.

Details

*Part 1*

Case Study (repeated on each property)

Document existing irrigation system
Document existing irrigation scheduling decision making
Record existing water use on two sites (using in line water meters)
Install and monitor soil moisture and track irrigation recommendations.
It is suggested these recommendations are not given to the grower in the first year.
Prepare a basic annual report analysing irrigation application and comparing data with Nautilus trial and other Fruition Horticulture Irrigation scheduling clients

| **Description** | **Amount** | **Comment** |
|---|---|---|
| Document existing systems | $750 | Prepare std form, collect/collate data. |
| Site installation | $1,500 | 6 sites (includes water meters) |
| Seasonal monitoring | $3,240 | No reporting to grower (20% discount) |
| Data analysis & reporting | $1,500 | Basic summary and comparison |
| **Total Cash** | **$6,990** | |
| In Kind Contribution | $1,500 | From Nautilus project for dissemination |

***Year 2***

For each property/block monitored, select appropriate irrigation scheduling strategy based on other irrigation trials, particularly the reduced irrigation treatments as per Nautilus trial.
Monitor soil moisture and irrigation application and provide a recommendation on a weekly basis for two sites on each property.
Monitor block harvest yield, berry size distribution, brix, pH and T/A for the monitor blocks (price not included in our budget).
Prepare an annual report analysing irrigation application and comparing data with Nautilus trial and other Fruition Horticulture Irrigation scheduling clients

| **Description** | **Amount** | **Comment** |
|---|---|---|
| Seasonal monitoring | $4,050 | 6 sites weekly reporting to grower |
| Data analysis & reporting | $3,000 | 40hrs |
| **Total Cash** | **$7,050** | |
| In Kind Contribution | $2,500 | From Nautilus project for dissemination |

***Year 3***

For each property/block monitored, select appropriate irrigation scheduling strategy based on other irrigation trials, particularly the reduced irrigation treatments as per Nautilus trial.
Monitor soil moisture and irrigation application and provide a recommendation on a weekly basis for two sites.
Monitor block harvest yield, berry size distribution, brix, pH and T/A for the monitor blocks (price not included in our budget).
Prepare an annual report analysing irrigation application and comparing data with Nautilus trial and other Fruition Horticulture Irrigation scheduling clients

| Description | Amount | Comment |
|---|---|---|
| Seasonal monitoring | $4,050 | No reporting to grower |
| Data analysis & reporting | $3,000 | Two people * 20hrs each |
| **Total Cash** | $7,050 | |
| In Kind Contribution | $2,500 | From Nautilus project for dissemination |

*Part 2*

Report to field days a minimum of twice yearly on research work being carried out in the district. In reality this information is likely to be shared at most field days but it is prudent to set a realistic target so outcomes can be seen as being met. Contribute time to other dissemination as required by the focus vineyard project. The costs of this will be met by the Nautilus SFF project.

*Part 3*

**FOCUS VINEYARD RESEARCH APPLICATIONS 2004-2005**

| 1. NAME OF APLICANT | 2. RESEARCH ORGANISATION: |
|---|---|
| M. Greven | HortResearch, Marlborough |

3. RESEARCH PROGRAMME TITLE

How to determine water stress and irrigation need

4. EXISTING PROGRAMME OR NEW (please specify)

New programme based on French research: Xilem

5. OUTLINE OF RESEARCH PROPOSAL (one page only)

The basis for this research is a French research programme into ways of easily identifying the level of water stress a plant is experiencing. At INRA for 15 years, Professors Alain Carbonneau and Alain Deloire have done Leaf Water Potential measurements on vines and these measurements have been correlated to other environmental and plant measurements. This data has been put into a model that allows grape growers to do their own field measurements with cheap simple tools. The results of these measurements can than be entered into a web based programmes that use all the algorithms that have been developed over that time. The data required can be easily obtained by the growers as they are grape variety, canopy size, air temperature and humidity and leaf temperature at the particular time of measurement (between 1 and 4 PM). The grower can develop as many separate blocks for measuring, as he need. Since two years this university developed model has been made available commercially in France through Sferis, the commercial platform of AGRO Montpellier, under the name Xilem. Despite strong rules for irrigation under the French system, it is now being used by growers to monitor the hydration status of the vines. After my visit to INRA/AGRO earlier this year Sferis has allowed me to use their programme in exchange for feed back on the results we find here. In order to properly compare our data with theirs I have been sent the equipment that is part of the programme, for use here. However, before we would want to introduce the programme here to the local grape growers, we do need to do some ground truthing of the system under our conditions. For that we need to do LWP measurements before and during the measurements on the plants. As this will be very intensive, some extra field assistance will be needed. It is proposed that a part time job can be created for these measurements, which could be done by –preferably- a student at the NMIT in the V&O degree course. The student will need the supervision but should be able to work on his/her own to gather the LWP data needed to support the model used in Xilem.

6. FUNDING REQUIRED

$6,000.- for the wages (500 hours @ $12.-) of the student to do the measurements part-time (2-3 days per week) during the whole growing season. The support to the student by the local scientists will be funded through other research programmes.

7. WHAT REGIONAL ECONOMIC BENEFIT WILL BE PRODUCED FROM THIS RESEARCH.

With this research, the programme as outlined before can be checked against scientifically well established parameters of vine stress, both pre dawn and mid-day Leaf Water Potential. If it is found to be successful it will give the New Zealand growers a very easy way to determine the water status of their vines in as much detail as they feel is necessary and depending on the amount of measurements they are willing to do themselves.