

## **Case Study 6: Leighton Pye**

### **Purpose:**

To describe the nature of vegetable production operations in Canterbury and demonstrate what are doing in terms on managing potential leaching on nitrogen to inform the rule framework in the Plan.

### **1. *Base information***

I farm approximately 4,000 hectares in Mid and South Canterbury with a mix of dairy, cropping and grazing operations. The evidence I have given below relates to our cropping operation in Rakaia.

**Area of growing operation:** My growing operations are approximately 885 hectares. I also occasionally undertake dairy grazing on this property.

**Number of properties/ sites that it is undertaken on:** I grow across 2 main cropping blocks that are 587 hectares and 298 hectares.

**Ownership of sites – owned/ leased/ shared:** I own all of the blocks I grow on.

**General location in Canterbury:** I grow mostly on land south of Christchurch with a concentration of land east of Rakaia.

**Water zone location** These farms are in the Ashburton water management zone.

**Number of staff employed.**8 relating to this operation.

### **2. *Rotation***

**Description:** The rotation is a mix of arable, vegetable, seed and process potato and carrot production. Occasionally we graze dairy stock on these farms but not on a regular basis. There is no set rotation of crops as the ratio of area on the blocks can change due to economic conditions and the availability of cropping contracts/options. Vegetables are typically growing 1 in 5 – 6 years.

**Crops grown:** Potatoes / winter and spring wheat / process carrots / spring barley / grass seed / vining peas. Sometimes clover is grown if needed instead of grass seed.

**Length of rotation:** The rotation runs over 5-7 years.

This season there I am looking at the benefits that a winter catch crop may offer my operation. A mustard crop has been established as a large scale trial to look at the potential advantages that this management tool may offer in disease control, nutrient capture, reduce wind erosion, improve soil organic matter.

### 3. *Irrigation*

Irrigation is all done under roto-rainer, laterals or pivots and has been a significant investment for the operation. The area under irrigation: 99% of the land managed for cropping is irrigated. Only ineffective hectares i.e. yards, laneways are not irrigated.

Irrigation is applied as required with around 25 to 35 mm supplied as a maximum per hectare in any one irrigation event and a seasonal irrigation amount per hectare of between 150 & 400 mm. Seasonal irrigation depends on the crop and the year.

### 4. *Fertiliser use*

Fertiliser management is complex and a specialist agronomist is used to advise on fertiliser use. Careful management of records is accompanied by a methodical testing programme. Fertiliser is applied according to a standardised test regime and is targeted to the crop and the yield being predicted.

Some key nutrient tools used on the operation are

- Deep soil nitrogen samples are taken on crops in the spring to aid nitrogen management
- Have just ventured into assessing the use of variable rate soil testing and nutrient application
- Leaf petiole samples are collected during the growing season to assist in nutrient management decisions (see attached)

### 5. *Management practices including practices to reduce potential for leaching.*

- Investment in very efficient irrigation equipment
- Soil testing and fertiliser recommendations by experts
- Proof of placement recording for operators (currently being trialled)

- Regular analysis of protein content and plant requirements, nutrients and nitrogen losses
- Use of GPS and variable rate application (currently being trialled)
- Careful management of crop residuals and some addition of compost to retain soil organic matter
- Use of specialist software to develop the management programme
- Use of specialist slow release fertilisers formatted as prills
- Applications of fertiliser are split over the crop growth period
- After crops harvested deep N test when necessary to establish fertiliser requirements for next season crop.

6. *NZ GAP*: Our vegetable crops are managed under NZGAP certification and we have been certified for 3 years

7. *Economic information*:

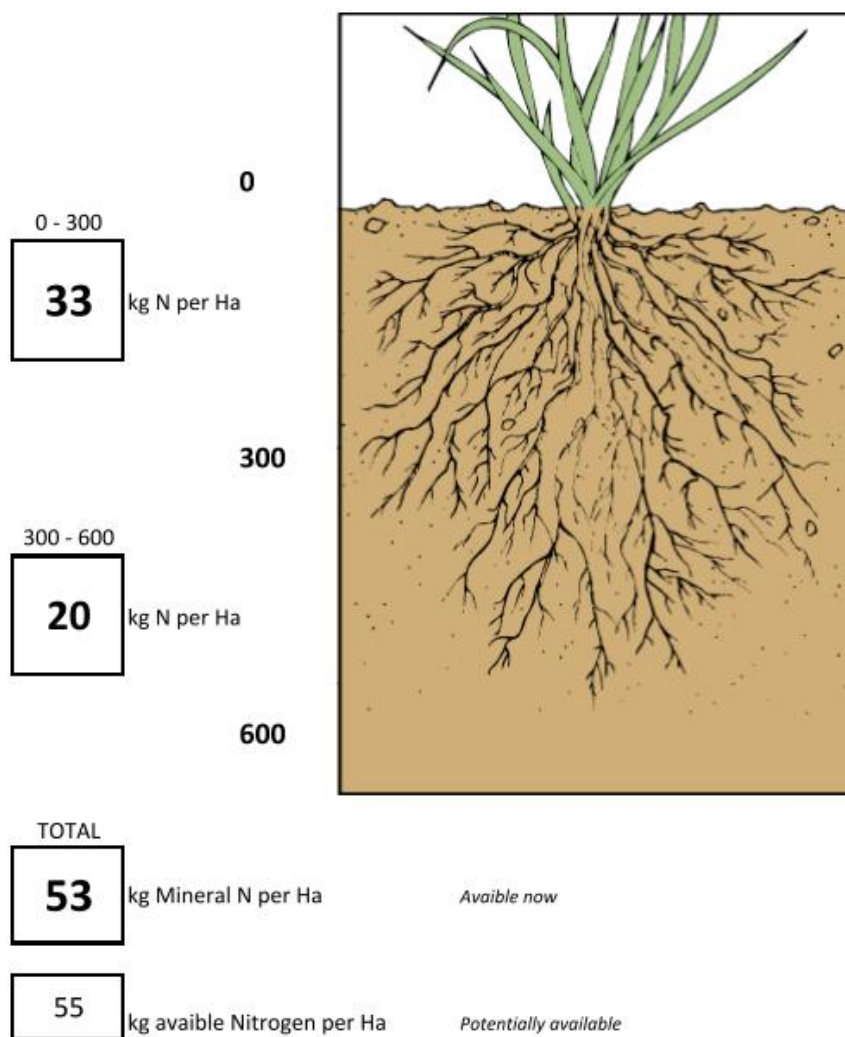
Irrigation and fertiliser account for significant costs for our cropping operation. For this reason there has been and continues to be significant investment and investigation to minimise waste any fertiliser and are careful to ensure that fertiliser applications match demand and will be well utilised by the crop.

New technologies and ideas are always coming on stream and I am not afraid to look at new approaches that may benefit the whole system. Current examples are variable rate fertiliser and cover crops which are currently being investigated. We are continually looking to ways to improve the businesses performance which also protect and enhance the environment.

# Appendix 1. Potato Crop Nutrient Management – Deep N Test

## Soil Mineral Nitrogen Report

2012			
GROWER	Long Lane Farm	CROP	Potatoes
		PREVIOUS	Wheat
FIELD	Paddock C1	DATE	20-Sep



# Appendix 2. Potato Crop Nutrient Management – Potato Petiole Analysis

