Landcorp – Resource Management Field Trip (10)

Thursday 24th March 2011

Field Trip Leaders: Roy Evans, Geoff Dunham

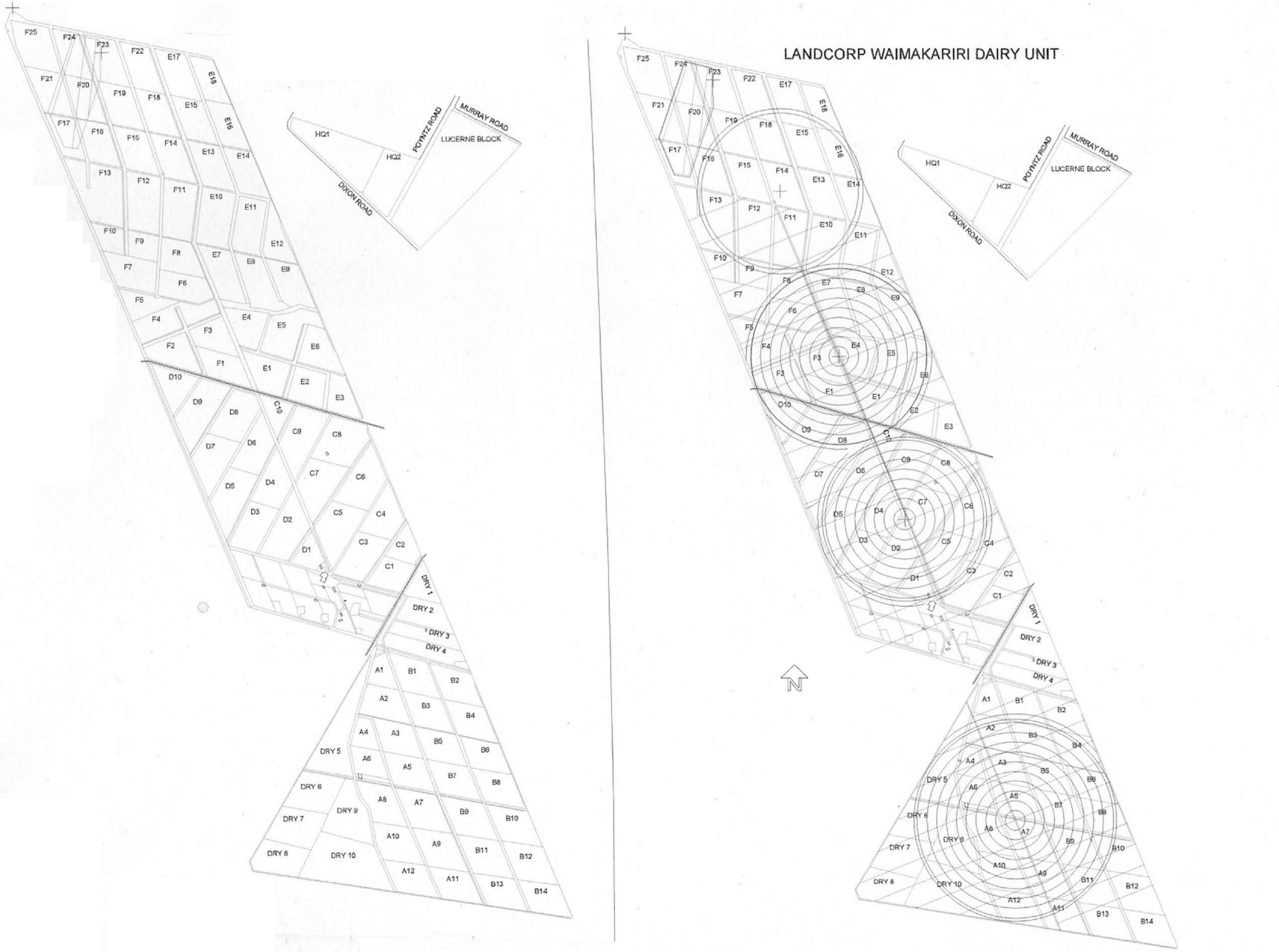
Focus for the Day: Irrigation efficiency and the NZ Emissions Trading Scheme (ETS)

Programme:

7.50 am	Depart Methven Resort
9.30 am	**Waimarariri Dairy Farm** – Landcorp Farming Ltd Intoductions and drive through farm to buffer pond. Topic 1 – Irrigation Efficiency Farm irrigation layout and storage - Kevin Clucas (Landcorp) The Pumping System - John Wicken (Waterforce) Irrigator Effiency - John Wicken & Jared Halstead (Waterforce) Irrigation efficiency and auditing – Ian McIndoe (Aqualinc)
10.30 am	Morning Tea Topic 2 – Effluent management Options (Kevin Clucas & John Wicken) The Bio digester; how the system works, viable or prototype?
11.30 am	Depart Landcorp Waimakariri Dairy Unit
12.00 pm	Lunch stop (Golf club or Woodstock Downs)
1.00 pm	**Woodstock Downs** – Turner Family, Oxford Introductions and Farm Details (Doug and David Turner)
1.15 pm	Topic 1 - The NZ Emissions Trading scheme (Katherine McCusker)
2.15 pm	Tour of Farm Topic 2 – Forestry as a Carbon Sink (MAFF)
3.15 pm	Final discussion and wrap up
3.30 pm	Depart Woodstock Downs
4.30 pm	Arrive Lincoln – BBQ dinner and entertainment
8.30 pm	Depart for Methven Resort
9.30 pm	Arrive Methven Resort

In the spirit of the OCCUPATION, HEALTH AND SAFETY ACT the Owners have taken all reasonable care in making your visit to the property as safe as possible, they clearly point out, you enter the property at your own risk.

The Owners and IFMA Congress organising committee will accept no responsibility for any incident or injury to any person or property that takes place while you are visiting the property.



(A)
Pre development

LANDCORP WAIMAKARIRI DAIRY UNIT

(B)
Post development

Waimakariri Dairy Farm (Eyrewell) – Landcorp Farming Ltd

Landcorp Farming Ltd

- Ownership is a SOE (State Owned Enterprise). NZ (New Zealand) government is the sole shareholder, separate board of directors, dividends paid. Landcorp owns 109 farms.

History of this Landcorp property (two farms)

- This property was originally part of a large firebreak area and wind tunnel 'gap' for the surrounding pine plantation forest, (which at the time was also government owned).

The Landcorp Waimakariri Dairy Unit

- 560 hectares milking 'platform' on this farm
- Replacement and dry dairy stock are grazed on the adjoining 600hectare Landcorp Eyrewell Farm, (along with stock from other Landcorp dairy farms),

Irrigation

- Irrigation water is supplied by Waimakariri Irrigation Ltd; a farmer co-operative company that holds water Resource Consents (water rights) to take irrigation water from the Waimakariri River, and also owns the irrigation supply races, and manages the supply and cost of water to the shareholders (irrigated farmers).
- The previous Landcorp irrigation system (on farm) was a border dyke irrigation system. I.e. irrigation water delivered by open water races (channels) to the farm boundary. Delivered on farm via headraces, then flood irrigated down leveled paddocks between "border dyke" raised earth strips. Partially automated with small moveable metal and concrete dams in the headraces which were closed by timed clocks in a sequence working upstream.

Redevelopment to spray irrigation from a buffer storage pond

- *Advantages:* 12 hectare (350,000m3) buffer pond, providing water storage for days when the Waimakariri Irrigation Ltd is required to stop taking water from the river, due to minimum river flow restrictions. Improved irrigation efficiency via more accurate water application rates based on soil water holding capacity, and with the flexibility to start and stop and vary application rates (*cv* the border dyke irrigation system). From the above efficiency gains more hectares can be effectively watered from the same irrigation supply, plus there are labour savings, and the option of incorporation of spray effluent application in conjunction with the irrigation system.
- *Disadvantages:* Higher power uses, irrigator depreciation, less aquifer recharge.

Some Statistics

- Buffer pond – 12 hectare (350,000m3). Provides enough water for; 4 Centre Pivot irrigators operating for 18 days, *or* 2 Centre Pivot irrigators operating for 28 days.
- Staff - five.
- Milking cows - was 700, reduced to 500 during the irrigation redevelopment. Aim is to increase to 1,000 cows in year one and two, and 1,200 cows in year three.
- Soil Type – Lismore Stony Silt Loam. This is a shallow free draining stony soil with a PAW (Plant Available Water) holding capacity of 40 to 75 mm.
- Climate - Rainfall 750mm. Frosts in winter (occasional light snow). Very limited pasture growth for 120 days in winter. Hot drying winds late summer/autumn. High daily evapotranspiration rates in summer (December 4mm/day, January 4.1mm/day, February 3.7mm/day). There is a late summer/autumn drought on these soils if they are not irrigated.
- Altitude 200m.

Woodstock Downs – Turner Family - Oxford

Woodstock Downs

- A substantial foothills property owned by Woodstock Farms Ltd. The shareholders are the Turner brothers and their families. One family (Doug & Helen) manage this property ('Woodstock'), which is run in conjunction with a coastal dairy farm property ('Rakaia Island') 75km distant, managed by David & Margret Turner.

History

- The original farm was purchased in 2005. Since then an additional 400 hectares has been purchased, plus an additional 237 hectares leased. Development since purchase has included the dairy farm including rotary cowshed, and irrigation.

Woodstock Downs comprises

500	hectares; flat - Deer Farm
370	hectares; flat - Dairy Farm
70	hectares; terraces - Forestry
693	hectares; flat - Dairy support (dry stock) Farm & fattening cattle grazing
1,633	***hectares Freehold***
300	hectares; easy hill & flats
1,500	hectares; steep hill
200	hectares; native (indigenous) bush regeneration
2,000	***hectares Crown Pastoral Lease*** *(Currently underway is 'Tenure Review', being negotiations to purchase this government owned lease).*
92	hectares; flat – Dairy support. *(Leased)*
136	hectares; flat – Dairy support. *(Leased)*
228	***hectares other leased land***
3,861	**HECTARES TOTAL** *(9,540 ACRES)*

Stock

- Dairy: 1,250 milking cows (budget 496,000kg MS)
- Deer: 1,000 hinds & 1,500 replacement and fattening weaners.
- Dairy support: 2,000 in calf heifers & 2,000 replacement calves.
- Other cattle: 500 carry over dairy cows & beef cows.

Irrigation

- 420 hectares irrigated by center pivot.
- Woodstock has a Resource Consent to take irrigation water from the adjacent Waimakariri River. Restrictions on the Resource Consent mean the irrigation water take is restricted when the rivers flow falls to 62 cumecs, and is cut off at 42 cumecs. Irrigation water restrictions of 10% to 25% occur at any time in most years, with total irrigation water cut off for two weeks every year (usually in the autumn.
- Turners are investigating the storing of hill rainfall runoff in a farm pond or lake, for improved irrigation reliability.

Management

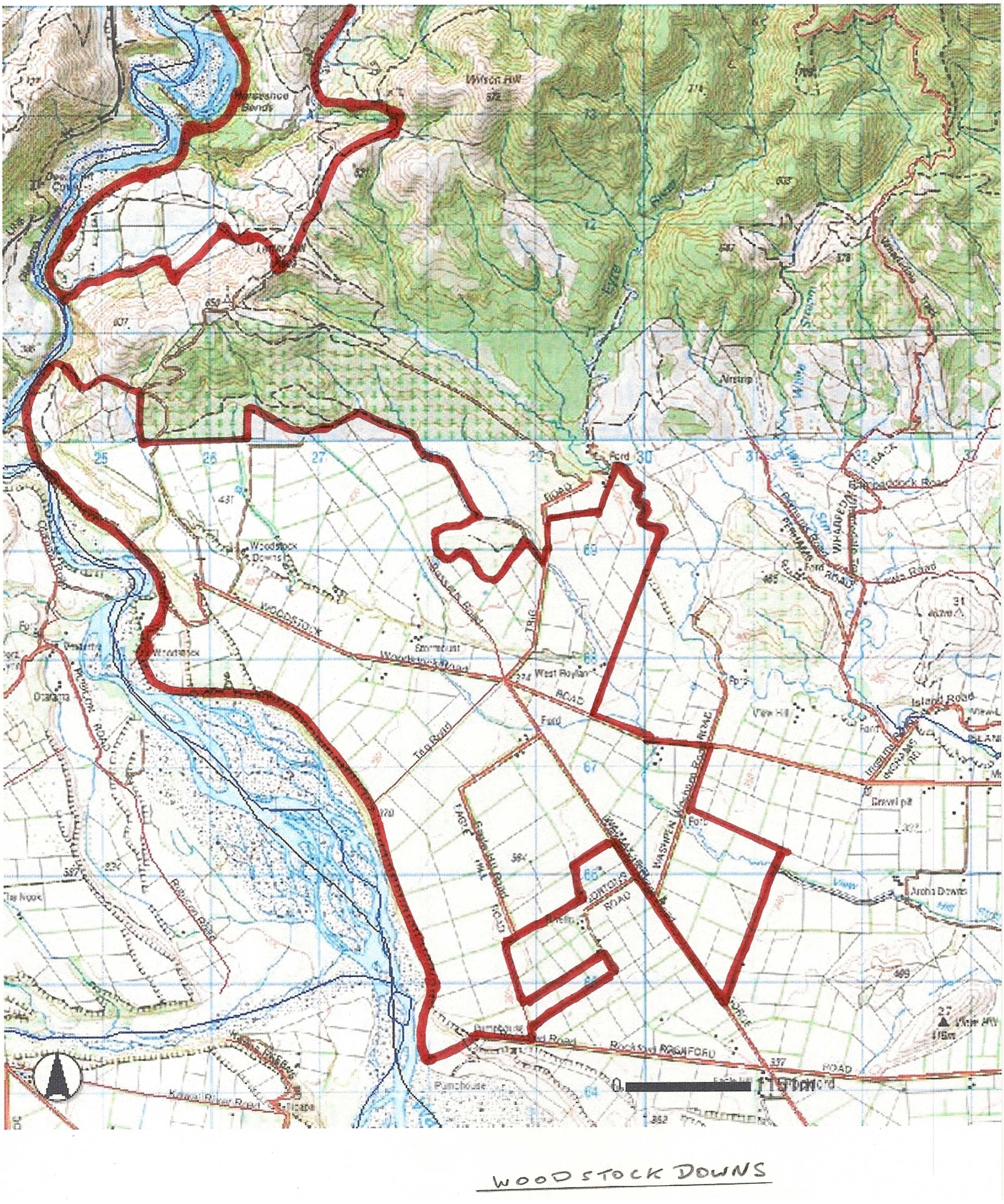
- 1,250 dairy cows on *Woodstock*, plus 5,000 cows at *Rakaia Island*, are managed as part of one herd totaling 6,250 dairy cows. Cows that calve early and/or suited to once a day milking, are farmed at *Rakaia Island*, those calving later and/or more suited to twice a day milking, are farmed at *Woodstock*. 4-500 cows winter and calve at *Woodstock*, the balance are wintered and calved at *Rakaia Island* with some then trucked to *Woodstock* after calving.
- Dairy calves (from both farms) at *Woodstock* after weaning. And then wintered at *Woodstock* or on contract grazing.
- All Rising 2yr dairy replacements mated and wintered at *Woodstock*.
- Deer Hinds mated by artificial insemination (A.I.). All fawns grazed, plus additional trading stock purchased.
- Other stock includes a small beef cattle herd, and a herd of dairy cows that failed to get in calf (called 'carry over' cows). There are no sheep on the property.

Other

- 10 staff (6 dairy farm, plus 4 deer and cattle).
- Altitude: Flats 350 – 400m, rising to 1,000m on the hill.
- Plantation (exotic) forestry: 70hectares of varying ages
- Regenerating native (indigenous) bush (forest) & scrub (gorse and broom): 200 hectares.
- Climate: Rainfall 1,000mm on flats to 1,400mm on the hill. Heavy frosts in winter, some snow. Very limited pasture growth for 140 days in winter. Irregular summer moisture deficits.

Forestry

- 70 hectares of forestry and woodlots.
- Majority *Pinus Radiata* species and 3.5 hectares *Douglas Fir* (*Oregon*).
- A large range in the ages of trees, (1940's to 2000).
- A central gully (small valley) area has been fenced to exclude stock grazing, and is now regenerating to indigenous forest.



WOODSTOCK DOWNS

AQUALINC RESEARCH LIMITED

IFMA CONGRESS FIELD DAY 24 MARCH 2011

Irrigation Efficiency & Irrigation Evaluations

By Ian McIndoe, Aqualinc Research Ltd.

For efficient irrigation, you need to:

- Have access to a reliable water supply (to allow just-in-time rather than just-in-case management).
- Ensure the design of your irrigation system is up to a standard that provides the potential for efficient and effective irrigation.
- Manage the system effectively and efficiently.

Waimakariri Irrigation water supply:

- Has sufficient flow capacity (0.58 liters/sec/ha) for effective irrigation.
- Can be unreliable, particularly in late summer/ autumn.
- Can be improved through the use of on-farm buffer storage (350,000 m^3 in this case).
- Requires efficient water application to maximise water use efficiency and prevent production losses.

An efficiently design system:

- Sets the platform for efficient use of water;
    - If the design & installation is up to standard, the potential for efficient operation exists.
    - If design is not up to standard, it is very difficult or impossible to achieve efficient irrigation.
- Follows INZ irrigation design COP & Standards.
- Takes account of latest information and research (INZ, Aqualinc, AgriBusiness Group)
- Reduces the probability of expensive technical failures.
- Helps to achieve optimum water use efficiency.
- Provides the means to use water in an environmentally responsible way.

An on-site irrigation system evaluation:

- Measures what is actually happening in the field
- Determines causes of low performance
- Allows cost-effective solutions to be found
- Should follow defined schedules and protocols (INZ Evaluation COP & Standards)
- Focuses on key performance indicators including distribution uniformity
- Demonstrates environmental responsibility from a design perspective

SUSTAINABLE FORESTRY TOOLKIT

Carbon forestry Options for landowners

There are opportunities for farmers, farm foresters and other landowners thinking about converting farm land to forestry under MAF's Sustainable Forestry Programmes.

There are different schemes to choose from including the Emissions Trading Scheme, Afforestation Grant Scheme, and Permanent Forest Sink Initiative.

This fact sheet provides a brief summary of each option and outlines some of the issues to be considered when selecting a scheme.

Option One: Afforest independently of a scheme

As a landowner, you don't have to join any scheme to plant trees on your property. You may wish to afforest independently of a scheme and then review your options once your forest is in place.

Advantages: You're in charge of what trees you plant and where you plant them and you can harvest or deforest any time you choose without liabilities.

Disadvantages: You have to pay for the trees yourself and you won't accrue credits (New Zealand Units or NZUs) for the carbon sequestered in your forests.

Option Two: Register to participate in the Emissions Trading Scheme (post-1989 forest land)

If you have more than one hectare of exotic or indigenous forest that was first established after 31 December 1989 you can voluntarily register to participate in the ETS.

Advantages: You will be entitled to receive NZUs for your forests as they grow and you can choose how much of your forest you register in the ETS (part or all); plus additional forest areas can be added at any time; you will be able to keep tabs on your "carbon stocks" (carbon stored in your forest) through regular reporting. Reporting is mandatory at least once every five years. If you join the ETS before the end of 2012 you can still claim all the NZUs for your forest from 2008. You can withdraw from the ETS at any time, but you must repay any NZUs issued to you.

Disadvantages: You will be required to surrender emissions units distributed under the ETS if the amount of carbon in your registered forest area falls below a previously reported level (for example, due to harvesting).

Important information for owners of pre-1990 forest

Participation in the ETS is mandatory if you deforest exotic forest planted before 1 January 1990 after 1 January 2008. (Note: deforesting is harvesting followed by a change to a non-forest land use.) In this case you must notify MAF by 31 January 2010, or if you deforest after 31 January 2010, notification must be within 20 working days. NZUs must be surrendered to the Crown for the carbon emitted as a result of the deforestation.

The exception to the deforestation rules above are:

- If you deforested 2 hectares or less in each 5 year period from 1 January 2008; or
- if you have obtained an exemption from the deforestation obligations of the ETS.

Option Three: Tender for a grant through the Afforestation Grant Scheme

The AGS is a grant for planting new forests on land that was not forested on 31 December 1989 ("post-1989 forest").
Landowners can apply for a grant through:

- a public pool via a competitive tender process (administered by MAF);

› a regional council pool (administered by 10 participating regional councils).

Advantages: You may receive a grant to plant your trees subject to a 10-year contract; you own the new forests and earn income from the timber; after 10 years you are free to deforest without any obligations and the forest is eligible to join the ETS or PFSI.

Disadvantages: The Government will retain the emissions credits generated under the Kyoto Protocol for carbon stored in your forests for the first 10 years; and there's always the possibility your application won't be successful.

Option Four: Register in the Permanent Forest Sink Initiative

The PFSI may be an attractive alternative to the ETS, especially if you want to plant land with trees to create a new forest that you have no intention of clearfelling – that is, your land will become permanent forest land. Under the scheme you will have a covenant registered against your land title for a minimum of 50 years.

Advantages: You earn carbon credits through the Kyoto Protocol (Assigned Amount Units or AAUs) for carbon sequestered in your forests which you can then hold on to or sell (trade) on the international carbon market; you can still harvest your forests but only on a continuous cover forestry basis.

Disadvantages: You won't be able to clearfell for a restricted period. The covenant commits you for a minimum of 50 years, and if you then exit, you are required to pay back the carbon credits you have received.

FOR MORE INFORMATION

- Website: **www.maf.govt.nz/sustainable-forestry**
- Email: **sustainableforestry@maf.govt.nz**
- Phone: **0800 CLIMATE (254 628)**

Or to speak to a MAF adviser, contact one of the Sustainable Programmes regional offices:

- Whangarei 09 430 7850
- Gisborne 06 986 8691
- Rotorua 07 921 3400
- Wanganui 06 348 7312
- Nelson 03 543 9183
- Christchurch 03 943 3700
- Dunedin 03 951 4725