Trial #	8
Location	Wether Hill Forest
Province	Southland
Farm Type	Forest
Product Trial	FPF Pre Planting Pine Trees
Date	1995 – 1996

Introduction: This was a followup trial to the previous one. On this site, FPF was applied to the soil just **prior to planting** in Pinus Radiata. Blocks were selected for treatment at different altitudes – low slope (LS), midslope (MS) and high slope (HS). Untreated plots were used as a control. Needle analysis from both the treated and untreated areas was compared. Fertiliser treatments were applied to each of the blocks in July 1995.

Treatment:
The treatments were based on the following blend applied at 120kg/ha.

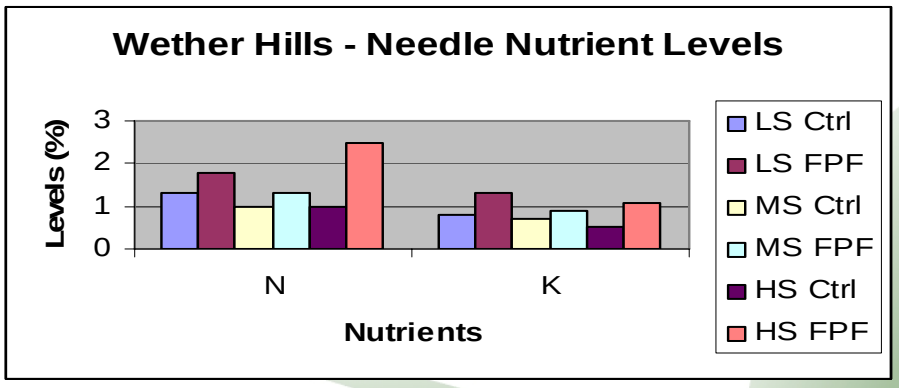
DAP	59.5kg/ha
LF	65kg/ha
Trace Elements	7.55kg/ha
Humic Extra	1.5litres

"Humic Extra" manufactured by BioStart is a special fermentation product based on humic acids which plays a role in soil biology and chemistry.

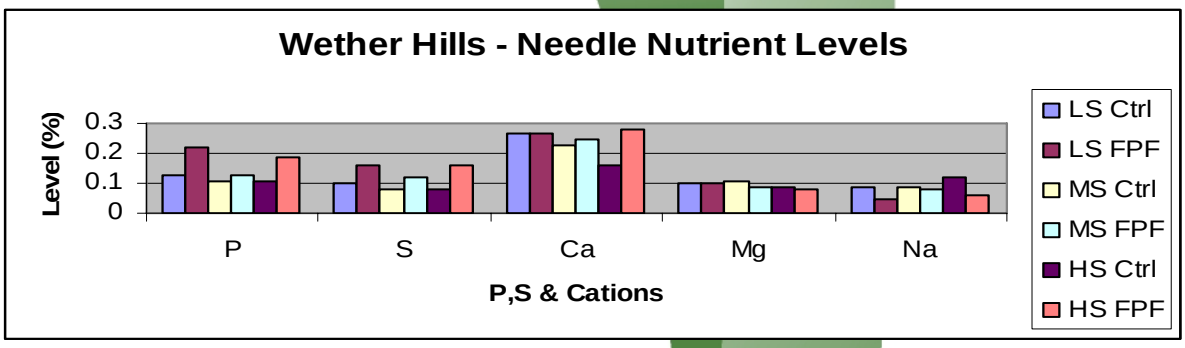
Results:
Needle analyses were performed on the various samples up to 23 months after the application of FPF. The results showed consistent increases for a number of nutrients in the FPF treated blocks compared with the untreated area.

Herbage Analysis												
	Macro Nutrients (%)							**Trace Elements (mg/kg)**				
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Fe**	**Mn**	**Zn**	**Cu**	**B**
Desired Range	1.5-2.0	0.14-0.20	0.5-0.8	0.10-0.20	0.10-0.30	0.10-0.20	0.0-0.10	30-200	20-200	20-40	4-10	12-25
LS Ctrl	1.3	0.13	0.8	0.1	0.27	0.1	0.09	166	79	36	4	10
LS FPF	1.8	0.22	1.3	0.16	0.27	0.1	0.05	64	345	43	5	13
MS Ctrl	1	0.11	0.7	0.08	0.23	0.11	0.09	127	89	35	2	10
MS FPF	1.3	0.13	0.9	0.12	0.25	0.09	0.08	190	107	29	2	12
HS Ctrl	1	0.11	0.5	0.08	0.16	0.09	0.12	132	75	34	3	8
HS FPF	2.5	0.19	1.1	0.16	0.28	0.08	0.06	151	132	35	6	15

It appears that the Low Slope (LS) and High Slope (HS) show more significant increases than does the Mid Slope (MS) area.

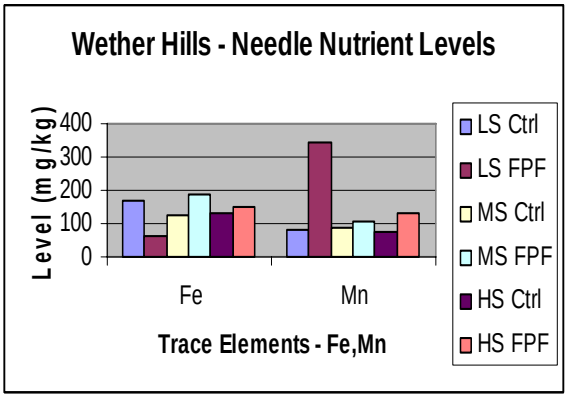


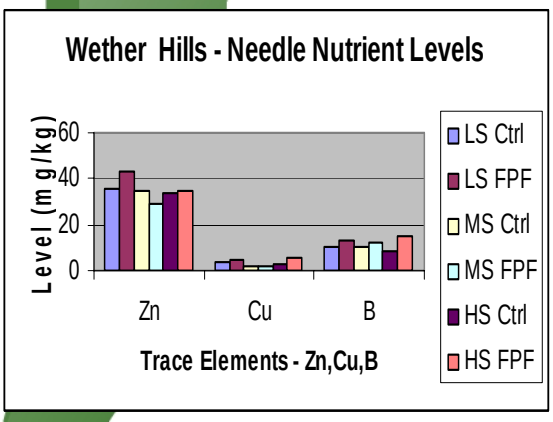
FPF application lifted the nitrogen (N) content of the needles from marginal into the desired range, with an average increase of 73%. This is likely to be the result of increased soil nitrogen mineralisation. Phosphorus (P) levels increased by 53% on average. Sulphur (S) levels improved by 70%.



Calcium (Ca) levels increased by 28% but Magnesium (Mg) dropped by 10%. This may have been caused by the increase in Potassium (K) levels.

Of the trace elements, Manganese (Mn) levels increased substantially. Often an increase in Nitrogen uptake can result in an increase in Manganese uptake as well. Zinc (Zn) levels were variable but Copper (Cu) levels increased. The Boron (B) levels in the control samples were all below the desired range but in the FPF applied areas,





Boron was lifted by an average of 46%. This is a significant result as B is a important trace element for Radiata Pine.

In addition to the increase in nutrient status on the FPF treated samples, there was a significant visual increase in vigour and appearance of the seedlings on these samples. The FPF treated sample trees were deep green while the control trees were pale green.