

DRAFT

FORESTRY COMMISSION
R&D DIVISION
SUMMARY EXPERIMENTAL RECORDSection SILV. (N)

Form 11A

Compt No: 10 Forest/Expt: SPEYMOUTH 31/75Grid ref: 295567 Series and Sheet No: 1st Series Sheet 28

PROJECT: 349 - Nutrition of crops on ironpan soils.

PREAMBLE: There is considerable evidence that S.P. responds to fertilizers on ironpan soils, probably mainly to N with some P effect. There may be a threshold of about Y.C. 8 above which crops do not respond.

There is evidence to suggest that urea and ammonium nitrate produce similar B.A. response although this has not been proved conclusively. Urea is cheaper on the base of price per Kg of N and also in aerial application. Urea does not leach like ammonium nitrate but it volatilizes instead. A further complication is that ammonium nitrate is an explosive and its use may be prohibited as is the case in many European countries. As urea is less energy intensive in its manufacture than ammonium nitrate the price difference is closely allied to the cost of energy. When there is enough room an experiment will have a urea/ammonium nitrate comparison although there is a risk that the result will merely reflect the weather at the time of application.

OBJECT: To quantify the basal area response of 30-40 year old S.P. to high rates of nitrogen and standard phosphorus.

SPECIES: Scots Pine. P.28. G.Y.C. 8-10

SITE DETAILS: Geology : Middle Old Red Sandstone.
Lithology : Conglomerate.
Site Region : Moray Firth.
Soil : Podzol
Vegetation : Calluna/Erica/Deschampsia/Mosses.
Elevation : 120 m.
Rainfall : 800 mm/annum.
Exposure : Moderate

EXPERIMENTAL
TREATMENTS:Basal

- 1/ No thinning.
- 2/ Dead and small diameter suppressed trees will be removed.

Fertilizer Treatments

- 3/ 0 - Control, no fertilizer.
- 2NU - 300 kg N/ha as urea.
- P - 50 kg P/ha as unground rock phosphate.
- 2NUP - 300 kg N/ha as urea and 50 kg P/ha.

Demonstration plots containing;

- 2 NUP - 300 kg N/ha as urea and 50 kg P/ha.

INITIALS A.M.W.DATE 11/78Sheet No 2

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FURTHER
TREATMENTS:

Even if no response is obtained 150 Kg N/ha will be applied to 2NU and 2NUP plots in the spring after the third growing season after original application. The same source of N will be used in this second N application. No further P will be added. This second N application is necessary because the first may possibly be a "pump priming" operation.

DESIGN:

Treatment plots size 0.05 ha square or rectangular.
Assessment plot size 0.02 ha square, rectangular or circular.
4 treatments x 4 randomised blocks = 16 plots + 2 demonstration plots.

DURATION:

6 - 8 years.

SUBSEQUENT
TREATMENTS:

4/78 N applied as Urea to 2N treatments @ 330 kg/ha giving 150 kg element N/ha.

INITIALS A.M.W.

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RESEARCH BRANCH

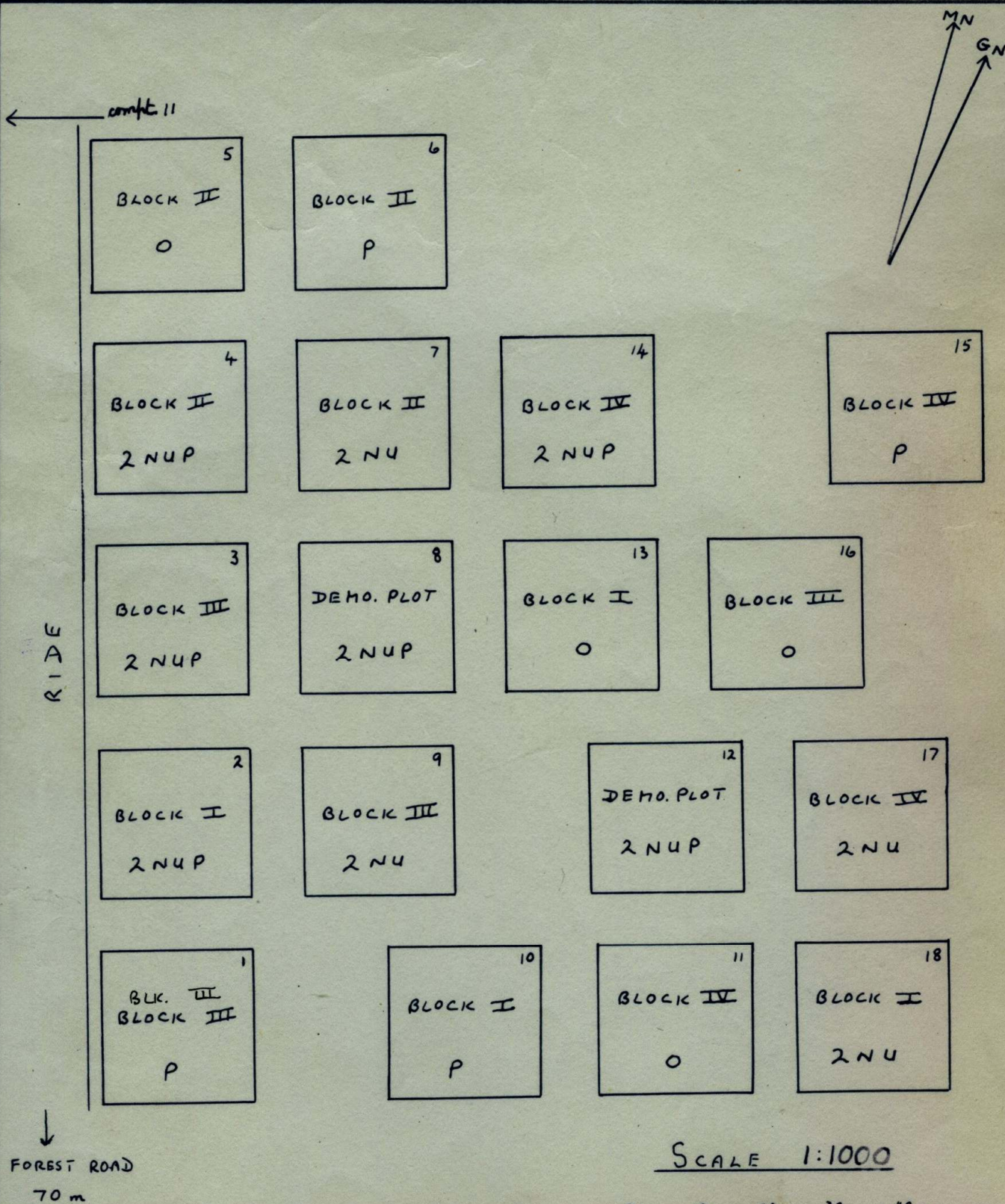
Section SILV. (N)

SUMMARY EXPERIMENTAL RECORD

Form IIA

Compt. No: 10
Grid ref.: NJ 295567

Forest/Expt.: SPEYMOUTh (T-18-4) 31/75
ST
Series Sheet No.: 28



Sheet 1

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FORESTRY COMMISSION
R&D DIVISION
SUMMARY EXPERIMENTAL RECORDSection SILV. (N)
Form IIACompt No: 10 Forest/Expt: SPEYMOUTH 31/75Grid ref: NJ 295567 Series and Sheet No: 1st Series Sheet 28NOVEMBER 1978Kg nutrient applied per ha

Treatment	Years After Expt. Established				Total To Date	
	0		3		N	P
	N	P	N	P		
0	-	-	-	-	-	-
2NU	300	-	150	-	450	-
P	-	50	-	-	-	50
2NUP	300	50	150	-	450	50

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FORESTRY COMMISSION
R&D DIVISION
SUMMARY EXPERIMENTAL RECORD

Section Silv(N)
Form 11B

Forest/Expt: Speymouth 31/75

Date	Summary of Reports and Assessments																																							
12/80	<p>BA Data m² ha</p> <table border="1"> <thead> <tr> <th>Treatment</th> <th>Number Trees/ ha</th> <th>Start BA/ha</th> <th>Current Cumulative BA/ha</th> <th>% Improvement in Performance</th> </tr> </thead> <tbody> <tr> <td>O</td> <td>900</td> <td>28.58</td> <td>35.27</td> <td>+ 23.4</td> </tr> <tr> <td>2NU</td> <td>850</td> <td>29.01</td> <td>37.79</td> <td>+ 30.3</td> </tr> <tr> <td>P</td> <td>975</td> <td>28.59</td> <td>35.56</td> <td>+ 24.4</td> </tr> <tr> <td>2NUP</td> <td>900</td> <td>30.01</td> <td>38.78</td> <td>+ 29.2</td> </tr> <tr> <td>2NUP (Demo)</td> <td>550</td> <td>18.70</td> <td>23.88</td> <td>+ 27.7</td> </tr> <tr> <td>2NUP (Demo)</td> <td>1100</td> <td>37.54</td> <td>48.67</td> <td>+ 29.6</td> </tr> </tbody> </table> <p>The good initial response to N application was not enhanced by the inclusion of initial P. Additional N to Treatments 2NU and 2NUP in spring 1978 again resulted in favourable basal area growth - 2NUP best.</p> <p>The original P treatment in spring 1975 has shown marginal improvement over 6 growing seasons. Number of trees/ha may or may not have a bearing on results. Demo plot figures are included for comparison.</p> <p>Analysis of the basal area increment from 1975 to 1978 (4 years) has shown a significant response to N (P = 0.01) but no response to P.</p>					Treatment	Number Trees/ ha	Start BA/ha	Current Cumulative BA/ha	% Improvement in Performance	O	900	28.58	35.27	+ 23.4	2NU	850	29.01	37.79	+ 30.3	P	975	28.59	35.56	+ 24.4	2NUP	900	30.01	38.78	+ 29.2	2NUP (Demo)	550	18.70	23.88	+ 27.7	2NUP (Demo)	1100	37.54	48.67	+ 29.6
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10/82	<p>Response trends continue. N plots still show benefit from the additional N in 1978.</p> <p>P plots have shown no response.</p>																																							
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GM
12/80 9/83

Sheet 2.

FORESTRY COMMISSION
R&D DIVISION
FINAL/INTERIM REPORT

Section Silv(N)
Form IID

Compt No: 10

Speymouth 31/75

Grid ref: NJ295567

Series and Sheet No: 7th series, sheet 29

Description

To quantify the basal area response of polestage SP (P28) to the application of high rates of nitrogen and standard rate of phosphorus.

Abstract

Basal area increment (m^2/ha)

<u>Treatment</u>	<u>1972-82</u>
O	8.9
N	11.6
P	9.2
NP	11.8

Significant response to N. Two unreplicated demonstration plots of NP did indicate that stocking density might influence N response.

Conclusions

There has been a significant response by this polestage SP stand to the application of nitrogen, which confirms results in similar experiments. Results from this experiment have been included in Forest Record 127.

Recommendations

1. Value of results: major.
2. Future: close and return to Conservancy.
3. File code: FR-85-Cons.

Comments of P Silv(N)

Conclusions and recommendations agreed.

Report drafted by: C M A Taylor, 1 March 1985

Report approved by: Alan J Low, 27 March 1985

SPEYEMOUTH 31/75

