

FORESTRY

COMMISSION

HISTORY

of

WHITERHAUGH

FOREST

1934 - 1951

EAST (SCOTLAND) CONSERVANCY

HISTORY OF NITINAGHAT FOREST

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HISTORY OF WHITEHAUGH FOREST

DIRECTOR'S COMMENTS

Whitehaugh has some disappointing areas. These were difficult to deal with originally when, for instance, suitable ploughs like the tine plough were not available. But these areas afford some useful lessons which are well written up on Page 11. It is good to read that the use of the tine plough is advocated for old arable land and that when two species are used, bands of each species should be planted rather than the more intimate mixtures that have been customary.

H. B. F.

28th January, 1952.

HISTORY OF WHITEHAUGH FOREST

COMMENTS BY STATE FORESTS OFFICER

Whitehaugh is high-lying. The arable land on the south side reaches up to over 1000 ft. and gives an impression that the plantable limit may be higher than it actually is. The southwest wind is funnelled by the valley south of Whitehaugh and exposure for a good distance either side of Knock Saul and Black Hillock is severe indeed.

Where our plantations have not thrived and exposure is not an obvious contributory factor, we know that by better ploughing and planting, use of phosphate and a revised choice of species we can get our trees away. Where exposure is the chief adverse factor we think that the above three factors together with careful choice of the type of tree used, will give satisfactory results; but we do not know this sufficiently well as yet. Until we do know we are going carefully on exposed sites. By this is meant that on such sites the following points receive attention.

1. The planting line is kept low.
2. Only ploughed ground is planted.
3. If the ground will carry Sitka which is our best tree for exposure, a nurse of pine or larch is used in a more reasonable proportion than one nurse to two spruce.
4. Phosphate is used.
5. The origin of the plant is considered when allocating to such sites. We hope to advance on this one by continual addition to and assessment of our seed stands.

We would like to know more about exposure and the use of shelterbelts. Our pilot plots will help us here.

Mr. Horne has dealt adequately with the failed areas at Whitehaugh and our proposals for treatment now and in the future. His recommendation for ploughing of old arable ground is probably sound and our new tine plough would do this work well, giving deep cultivation with a shallow slice.

T. H. WOLRING.

State Forest Officer.

HISTORY OF WHITEHAUGH FOREST

GENERAL DESCRIPTION OF THE FOREST

Situation

The property lies in the parishes of Leslie, Tullynossie and Forbes in the County of Aberdeen. It takes its name from the Estate of which it originally formed a part.

It is situated due north of the village of Alford.

Area and Utilization

Of the total area of 1576 acres at time of acquisition 350 acres were agricultural land and the remainder rough grazing and standing woods (13 acres only). Only 60 acres of agricultural land has been planted. The remainder is now under the management of the Department of Agriculture for Scotland with the exception of 10 acres which are let to forest workers as Forest Workers Holdings etc. The 13 acres of woodland were felled during the war and have since been replanted.

Tables I and II which follow show the utilization at time of acquisition and at 30th September, 1951, respectively.

/Table I

TABLE I

From	By	Date	Plantations Acquired	Plantable est. Col. 4	Rural est.	Agri- cultural	P. N. E.	Unplant- able est., Col. 4.	Other Land		Total
									Description	Acreage	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Lawrence McDonald Chalmers	Purchase	1934	13	1257		164	50	146			1650
Disposal to Frederick Charles Yellows-Gordon	Purchase	1935		15½				38½			54
Total			13	1272½		164	50	107½			1576

TABLE II

(a) <u>Plantations</u>			
Acquired	2 acres		
Formed by Forestry Commission	<u>1201 acres</u>	1203 acres	
(b) <u>In hand awaiting planting</u>			
	Nil		
(c) <u>Nurseries</u>			
		1.6 "	
(d) <u>Agricultural</u>			
8 tenancies (D.O.A.S.)	250.4 acres		
1 tenancy (F.C.)	2 "	252.4 "	
(e) <u>F.W.H.'s</u>			
2 tenancies		7.5 "	
(f) <u>Unplantable Land in hand</u>			
		111. "	
(g) <u>Other Land - Houses, Gardens, etc.</u>			
		.5 "	
Total area of Forest			<u>1576 acres</u>

The 2 acres shown above were not classified as woodland at the time of acquisition.

Meteorology.

The rainfall is approximately 35 inches p.a. The prevailing wind is South West but easterly winds are also important.

Severe winter frosts and snow are common.

Geology and Soils

The underlying rock over most of the area is Knotted Schist, there is a narrow band of Mica Schist at the north end. Glacial deposits swath the lower slopes.

The general soil type is a few inches of raw heather humus over 4-6 inches dark brown stony loam, on a bright yellow clay loam with boulders. On the higher land - over 1100 feet - there is up to 6 inches peat on a grey-brown schisty loam on a yellow-brown stony clay loam. There are a few areas of deeper peat, but these in all do not exceed 10 acres.

Physiography

The elevation varies from 800' in the south ~~and~~ 700' in the north to about 1350'. Knock Saul is a rounded hill and Suie Hill a ridge. The land slopes in all directions from them, forming a valley on the south and moderately steep on the north.

Aspects

The Principal aspects are North and South.

Exposures

Knock Saul and Suie Hill are severely exposed in all directions. The Scrub Pine and Larch on them indicate that they are above the economic line for these species. These areas are classified as unplantable but it might be worth while to plant the bare flats on Suie Hill with M.P. or P.C. after ploughing with the tine plough and to interplant later with S.S. The heather on these areas is short and interspersed with lichen. No burning has been done for many years.

Vegetation

The general vegetation type is Calluna - Vaccinium - Hypnum. Calluna is dominant with some Erica cinerea. Desch. Aira flexuosa comes in strongly after burning. On the lower slopes there was some whin and broom. This

/has

developed strongly since enclosure and has everywhere benefited the high spruce.

There is one small patch of Calluna - Scirpus - Sphagnum bog.

There were extensive plantations on Black Hillock on the north slopes and on the south-east of Knock Saul. These were felled after the 1914-18 War. The species were mainly pine and larch.

Risks - Fire

The fire risk is moderate - though we have had two fires entailing considerable loss. The main risk will be from adjoining moorland properties. The most dangerous march is with Knockespooh Estate but we are there now protected by a wide screefed fire trace. The forester's house is so situated that he can see little of the forest marches but there is a fire tower on Knock Saul connected by field telephone with the forester's house.

Trippers are uncommon.

Rabbits

Rabbits have ever been a nuisance. At the time of acquisition the area was over-run with rabbits. A neighbouring property is still over-run with them.

Heavy snow drifting which occurs every year lets rabbits in. Recent experience suggests that a team of trappers visiting the area periodically would be the most effective control. Intensive killing after snow storms had passed and breeding had not begun, would control numbers to a great extent.

Hares

Hares both brown and mountain are very troublesome.

Deer

Only roe-deer are present. They are fairly numerous and have increased since the war-time fellings on neighbouring estates.

Capercaillie

These are present in small numbers and some damage to last year's planting was recorded.

Squirrels

Not present.

Voles

No damage has been noted in recent years.

Insects

Pine shoot beetle has done some damage to Pinus contorta in the vicinity of the old scrub pine areas.

Fungi

Apart from Larch Canker no damage of importance has been noted.

Roads

The agricultural holdings were at the time of acquisition served only by the most primitive of cart tracks. These were repaired by the Forestry Commission in the early days. There were only hill tracks on the plantable land.

A roadmaking plan was prepared in F.Y. 50. Roadmaking is planned as follows:-

F.Y. 52	218 chains
F.Y. 53	205 "
F.Y. 54	230 "
F.Y. 62	230 "

This allows for a road to be provided for plantations approximately 15 years after planting.

<u>Existing Estate Roads</u> <u>and F.C. Roads as at</u> <u>10.3.51</u>	<u>To be made</u> <u>F.Y. 52-62</u>	<u>Total</u>	<u>Total</u> <u>Woodland Area</u>
557 chains	883 chains	1440	1203

Approximately 1½ miles to 100 acres.

Labour

The labour supply during the life of the forest has been adequate and of good quality. The present squad of 4 men will in future be employed on general maintenance work and on roadmaking. They will form a good nucleus for a strong squad if any of the nearby large areas of felled woodland and bare plantable moorland came into our hands.

No workers houses have been built on the area.

SILVICULTURE

Choice of Species

The present Director General remarked in 1942 after a visit to Whitehaugh - "The important point in my view is to plant nothing which might plough without first making a real effort to plough it." This sound advice was taken from that date onwards and the more exposed and less fertile slopes were ploughed and planted mainly with a mixture of Scots pine and Sitka spruce. The mixture used was usually in the ratio of two spruce to one pine. On the lower slopes where soil was deeper and more fertile the mixture has been a success. For example, in Compartments 44, 53 and 54 of P.43 and 44 both species are growing fast. The pine is up to 7 ft. in height and the spruce up to 6 ft. There is a strong growth of heather which the pine will soon suppress, but even now it seems to have made its presence felt as is illustrated by the fact that typical spruce of 5½ ft. in height show a growth of 4 ft. for the last 3 years. In these areas where broom has come in the growth of Sitka is exceptionally good.

On the exposed north west slopes of Knock Saul (Compartments 51 and 52) results have not been so encouraging. The pine has not done so well and has, at the time of writing, done nothing to help the spruce which are for the greater part in complete check. Exposure has slowed up the growth of the Scots pine. The slowness of their growth and the fact that they only represent a third of the crop is against their doing anything to create conditions suitable for the growth of spruce for many years. The proposal is to beat up with Scots pine at an early date to make two lines of Scots pine to one of Sitka spruce. This will be a slow cure, but it is thought that it will ultimately bring on the spruce. Both species including the originals will be matured.

In striking contrast to this disappointing area is the excellent growth of Japanese larch on adjoining similar, but unploughed, ground. Japanese larch and hybrid larch have everywhere created forest conditions in a very short time and both species could have been used more freely on the more intractable sites, both pure and in mixture by bands with Sitka spruce. There are certain areas, fortunately not great in extent where Sitka spruce was planted on turves in pure Calluna. It is not surprising that these areas are in complete check. The use of Japanese larch in bands of three

to five lines is thought to be the cheapest remedy. If the Japanese larch is planted on ploughed bands the cure will be the quicker.

There are extensive areas of mixtures of Scots pine and European larch and pure Scots pine planted direct on poor exposed situations. These occur mostly on the east side of the forest. Scots pine was an unhappy choice in such exposed places and development will be very slow. The poorest of these areas should be ploughed and replanted with Japanese or hybrid larch. Bands of these species planted at right angles to the prevailing wind might well provide the shelter necessary for the pine to form a useful crop.

There is one small area of a mixture of Scots pine and European larch (Compartment 22 P.38) which was ploughed. There is a very marked difference in growth between this and the adjoining unploughed part. In the ploughed area the larch are 10 ft. to 12 ft. in height and the pine 8 ft. to 10 ft. in height against the 4 ft. to 9 ft. and the 4 ft. to 6 ft. of the larch and pine on the unploughed land. In this region, die-back of larch is uncommon. The aspect is easterly. On the ploughed area little or no die-back is present, though canker on branches and stems is quite common.

On the west and north slopes of Suie Hill planting in P.40, 41 and 42 has been carried too far up the hill. Mixtures of Scots pine and Sitka spruce and mountain pine and Sitka spruce were the species used. The soil is poor, shallow and stony, and the exposure extreme. It seems best to spend no more money on these areas which do not extend to more than 30 acres.

Die-back of European larch has been widespread.

Pure European larch accounted for approximately 20% of the planting in the areas P.36 to P.40. In P.36 and 37, 84 acres were planted. The condition of these plantations is bad. It was thought three or four years ago that the trouble had passed its worst and that we could look forward to having at least a reasonable crop of larch, but during the last two growing seasons more die-back took place and now, in P.36 only a very small number of trees are unaffected.

About three years ago the stand of European larch in Compartment 9 P.37 looked very well but in F.Y.50-51 more and more trees have been affected and it seems likely that it will go the way of the others. Areas planted in F.Y.40 are not yet seriously affected.

The planting of Norway spruce has been confined to the lower slopes on the moister and more fertile land. Growth has everywhere been first-class and if the area near the forester's house in P.36 escapes butt rot it will soon be a very valuable stand.

The lessons to be learned at Whitehaugh are straight forward enough. The plough would today be used practically everywhere. The tine plough fitted with a mouldboard sufficiently big to throw out a fair quantity of spoil to smother heather and, at the same time be able to break up the hard packed layers to a depth of a foot or more would have given the pine nurses a better chance to do their work. If many of the Sitka spruce/Scots pine mixtures had been treated in this way after burning the heather and if the areas had been planted in a mixture of spruce and pine at not less than half and half, they would, in the writer's opinion, have been well on the way to firm establishment. Though Sitka spruce has gone out of favour a little, it will stand the exposure on the north-east moorlands and, when in close mixture with Scots pine it seems to be able to flourish on a lot less moisture than we had come to think. The use of Pinus contorta, mountain pine and Japanese larch would replace Scots pine where exposure was a more important factor.

The choice of a suitable strain of Scots pine.

The ploughing with the right plough - the tine.

The planting of pines in the "tined" areas at the bottom of the furrow - and manuring - would surely go a long way in mitigating the exposure factor.

The fear of butt rot in Norway spruce on old arable ground is unfortunately very real. The land is frequently most suitable for Norway spruce in that it is moist and fertile. The presence of a plough pan could be remedied by the use of a tine plough fitted with a mouldboard to give the shallow flat turf suitable for the planting of Norway spruce. With this treatment pure Norway spruce or Sitka spruce would again be planted on the same areas at Whitehaugh.

With the experience of the last few years we would not today have planted European larch pure on the same scale. Hybrid and Japanese larch have everywhere shown their great worth as pioneer species and they would today be more generally used - the former as a pure crop and the latter partly as a pure crop but mostly as a nurse for Sitka spruce in bands.

The use of Scots pine as a pure crop at Whitehaugh was not a wise choice. Areas where the exposure is not severe are moist and fertile enough for spruce. To-day we would use Scots pine on Whitehaugh almost exclusively as a nurse for spruce.

Planting

Planting progressed at the following rates:-

P. 36	75	acres
37	150	"
38	134	"
39	148	"
40	150	"
41	71	"
42	84	"
43	80	"
44	64	"
45	19	"
46	39	"
47	50	"
48	38	"
49	53	"
50	42	"
51	24	"
	1201	acres

All plantable land is now planted.

Age Class	Areas by Species (Acres)												Total Area
	S.P.	P.C.	M.P.	E.L.	J.L.	H.L.	D.F.	N.S.	S.P. S.S.	S.P. E.L.	S.P. S.S.	M.P. S.S.	
P.36 - 40	23	17	2	126	103	32	-	175	93	75	11	-	657
P.41 - 45	23	2	2	-	17	-	-	1	31	-	230	12	318
P.46 - 51				5	29	-	6	22	124	-	34	6	226
Totals:	46	19	4	131	149	32	6	198	248	75	275	18	1201

Spacings

The following spacings have been used throughout the life of the forest :-

Scots pine	4½ ft.
European larch	5 ft.
Japanese larch	5½ ft.
Hybrid larch	5½ ft.
Norway spruce	4½ ft.
Sitka spruce/Scots pine	5 ft.
Scots pine/European larch	4½ ft.

The type of plants used were on the following lines:-

<u>Scots pine</u>	P.36 to 39 mainly 1 + 1, thereafter for the most part 2 + 1
<u>European larch</u>	P.36 1 + 1; P.37 2 + 1 - thereafter mainly 2 + 1.
<u>Japanese larch</u>	mostly 1 + 1 but some 2 + 1. In P.40 Compartments 31, 32 and 35, 1 + 1 + 1 were used.
<u>Hybrid larch</u>	mostly 1 + 1, though a little 2 + 1.
<u>Norway spruce</u>	nearly always 2 + 2 but it is noteworthy that the very fine stand of Norway spruce P.36 Compartments 1, 2 and 3 were planted as 3 + 2's. This area of 37 acres was beaten up once only with .9m Norway spruce 2 + 2's. The then forester tells me that they were the only Norway spruce he ever planted which did not suffer from an initial check. The area was old arable and was ploughed with an agricultural plough.
<u>Sitka spruce</u>	In the earlier P. years the age of planting was mostly 2 + 1 - later 2 + 2's were in favour, while during the war years 2 + 2's, 2 + 3's, 3 + 2's and in P.46 2 + 1 + 3 and 2 + 3 were used

In the latter P. years the age was either 1 + 1 or 1 + 2.

No seedlings were used on Whitehaugh.

Plants were supplied in the first ten years of planting mainly from Craibstone and Newton. Later small nurseries within the district contributed small quantities. Only for the past year were any plants supplied from the small nursery at the forest.

Planting was done mainly by L notching with a garden spade. The planting on the ploughed furrows was almost always done on the hinge for both Scots pine and Sitka spruce in mixture. This amounts almost to planting in the bottom of the furrow. It was really the only place to plant for it was not customary to burn before ploughing and the sandwich layer, after ploughing was a dry springing mass of heather. Mattocks were used in P.Y.51 to plant Japanese larch on a tough area where ploughing was not possible because of stumps.

Very little manuring was done during the life of the forest. In F.Y.46 9 acres of Scots pine P.41 (46) were treated with ground mineral phosphate. This is the least fertile and probably one of the most exposed areas planted. It is earlier recorded as an area where further expense is not justified.

Ploughing

With the exception of mechanical turving by a horse drawn agricultural plough in P.36 to 38 no ploughing with tractor drawn heavy ploughs was done till F.Y.41. Deep ploughing was the aim but often the toughness of the subject made really deep ploughing too much for the ploughs and tractors available in these days. No complete ploughing was done. Ploughed ground was nearly all planted with a mixture of Scots pine and Sitka spruce, the plants used were mostly 2 + 1 Scots pine and 2 + 2 Sitka spruce.

The success of otherwise of the planting on plough is dealt with in the remarks under "Choice of Species".

Weeding

Norway spruce was mainly planted on grass areas and normally two weedings were necessary for three to four years after planting.

Broom and whin growth was common and much money was spent on keeping these under control. The whin areas would have been the better if taken care of by Japanese larch and the broom was doing more good than harm except where it was tall over very young plants.

Beating Up

In spite of the ever present menace of rabbits which invade from without and have at times in the life of the forest gained a foothold within, beating up has not been necessary on a very big scale as is shown by the following table. It is fair to say that before the forest can be said to be completely established, a considerable programme of beating up will be required. This will be in the nature of extensive repairs to checked areas of Sitka spruce and Sitka spruce/Scots pine mixtures and probably some replanting of die-back European larch areas.

Table showing Beating Up done F.Y. 37 - 50

P. Year	Area Acres	Beating up carried out	
		Plants used	Periods
36	75	39 thous.	F.Y. 37 - 48
37	150	12 "	38 - 41
38	134	43 "	39 - 44
39	148	12 "	40 - 43
40	151	13 "	41 - 45
41	71	16 "	43 - 44
42	84	63 "	44 - 47
43	80	- "	- -
44	64	- "	- -
45	19	- "	- -
46	39	- "	- -
47	30	7 "	48 - 49
48	38	11 "	50 - 51
49	53	28 "	50 - 51
50	42	4	51
Total:	1178	248 thous.	- -

Past Treatment of Established Plantations

Only Japanese larch is at the brashing and pre-thinning stage.
58 acres are scheduled for pre-thinning F.Y. 52.

Research

No research work has been carried out at the forest.

APPENDIX I

Notes from Inspection Reports

Visit of Assistant Commissioner to Whitehaugh Forest
6.1.42.

Present: Mr. A. H. Gosling, Acting Assistant Commissioner
Mr. L. A. Newton, Acting Divisional Officer
Mr. I. Gillespie, Acting District Officer
Mr. W. Mackay, Forester.

The Assistant Commissioner and Divisional Officer visited Whitehaugh Forest on the forenoon of Tuesday, 6th January, 1942. The area was first surveyed broadly from the Bogend road end, as this was the Assistant Commissioner's first visit, and the general layout explained. The Assistant Commissioner showed some interest in the size and quality of the farm holdings in view of the steadily mounting cry of poverty from the tenants.

The party then followed the service road to Knockhill Farm and entered the plantations by the track road at the north end of Compartment 12. The Assistant Commissioner at once expressed doubt as to the wisdom of a pure crop of Scots pine for all its present vigour, on an exposed site such as this, particularly since tractor ploughing would have been quite straightforward and, given that, Sitka spruce pure or in mixture would have thrived here. He felt sure the wind would eventually blast the Scots and was also convinced that the entire P.38 area, mostly mixed Scots pine and European larch could have been ploughed. The Divisional Officer agreed that with the improved equipment this might well be so.

A small area of sickly, unrounded Sitka (P.38) was seen in Compartment 22 and the Assistant Commissioner sternly warned the present District Officer and Forester not to copy that method with Sitka spruce elsewhere.

The Assistant Commissioner was eager to see some tractor ploughing and this was first encountered in an unplanted area in Compartment 28. The Assistant Commissioner thought this should be planted right away, regardless of the proposed sequence, as it was sufficiently weathered and heather was coming in again.

A small plot of experimental planting of a mixture of Sitka spruce and Scots pine gave proof of the stimulus which ploughing gives the Sitka spruce. The Scots pine was game-eaten and bushy but the Assistant Commissioner thought the mixture salutary.

He was thoroughly convinced that ploughing is the cheapest and easily the most effective preparatory measure and that there is still a considerable amount of land at Whitehaugh which a resolute driver and present day equipment could cope with.

The slopes of Compartments 51 and 52 were considered feasible for ploughing. The District Officer suggested diagonal ploughing as a useful compromise, and the Assistant Commissioner thought there would be no objection to that, the main thing being to plant nothing that might plough before a real effort had been made to plough it.

A good view was obtained of P.36 (Compartments 1, 2 and 3) in the distance and the Divisional Officer assured the Assistant Commissioner that he had seen very few plantations to equal the Norway spruce component at its age.

In view of the remoteness of Bin Forest, where the present forester lives, the Assistant Commissioner thought it would be more satisfactory to have a resident forester or foreman in charge at this unit, if a suitable man could be found.

Signed: I. GILLESPIE,
Acting District Officer.
7.1.42.

I think that on some of the steeper slopes, steepness combined with boulders will make ploughing very difficult.

L. A. NEWTON,
Acting Divisional Officer.

This report summarises very well the points discussed and my views. I agree with Mr. Newton that on some of the steeper slopes ploughing may be impracticable, but the important point in my view is to plant nothing which might plough without first making a real effort to plough it.

(Intd.) A. H. G.
18.1.42.

Comments

The importance of planting as soon after ploughing as possible is here stressed. The interval of a year or two between ploughing and planting and the fact that rank heather was not burned before ploughing have contributed to a great extent in the undue checking of Sitka spruce at this forest.

Visit of Chairman and Acting Assistant Commissioner
to Whitehaugh Forest on 5th August, 1942.

Present: Sir Roy Robinson, Chairman.
Mr. A. H. Gosling, Acting Assistant Commissioner
Mr. I. Gillespie, Acting District Officer
Mr. F. W. Mitchell, Forester.

This visit was a departure from programmes for the purpose of seeing the heavy plough in action on this difficult area. The visit was well timed as a new trouble had developed in the form of accumulations of deep moss and heather roots lifting the plough bodily out of the ground. This mossy layer was being lifted as much as 1½ ft. to the landward side of the side plate. The Assistant Commissioner countered this by treading heel to toe alongside the fore part of the plough. This gave a reasonably clean rupture of the top layer and the fitting of a coulter to do the same job was first considered.

The Chairman, however, thought it might fail to cut and merely aid in collecting the rubbish and recommended a form of mechanical foot to carry on Mr. Gosling's treatment to even better purpose. It should take the form of a short flat ski-styled plate pressing on the ground partly alongside and partly in advance of the side plate of the plough and attached by a stout arm to the beam of the plough. Sir Roy thought care would be necessary to avoid damage to this device by superficial boulders. Mr. Gosling at once agreed with the whole idea and he thought this plough was otherwise equal to the boulder risk.

Both Sir Roy and he strongly deprecated any waste of time in wrestling with the mossy furrow slice to get it laid out artistically as planting should be done in the pulverised mineral soil on the edge of the furrow.

The Assistant Commissioner insisted that there should be repeated modification of heavy plough types until an implement equal to all conditions was finally evolved. Sir Roy was satisfied that there was a steady advance towards that ideal. As regards the tractor, only very extreme conditions, he thought, would call for anything better than the D.4.

Sir Roy echoed the judgment of the Assistant Commissioner on a previous visit regarding the Scots pine in Compartment 13. He thought they were unlikely to live up to their promising start in view of the exposure.

From experience to date, the Sitka spruce/Scots pine mixture was pronounced the best choice after ploughing on this type

Signed: I. GILLESPIE,
Acting District Officer.
7th August, 1942.

No remarks
Acting Divisional Officer.

No remarks.
(Intd.) A. H. C.
20.8.42.

An interesting ploughing demonstration. Ploughing should make all the difference on the type of land under treatment.

(Intd.) R. L. H.
28.8.42.

Comments

The Scots pine (Compartment 13 P.38) have not done as well as was anticipated. The Sitka spruce/Scots pine mixture on similar but ploughed ground on the other side of the road has done extremely well. It is one of the best examples of the mixture in the forest.

Visit of Chairman to Whitehaugh Forest
on 1st September, 1945.

Present: Sir Roy Robinson, Chairman
Mr. L. A. Newton, Divisional Officer
Mr. E. H. Flentje, Australian Forest Service
Mr. I. Gillespie, District Officer
Mr. C. Duguid, Forester.

The party assembled at the Forester's House at 10.15 a.m. and a programme to suit a brief visit was first mapped out to include in particular the diseased P.36, European larch and some of the earliest ploughing on Calluna sites.

Entry was made to P.36 at Compartment 5 a vigorous Norway spruce crop being traversed before reaching the diseased European larch. The District Officer stated that the intensity of Chermes galling on the Norway spruce increased markedly as one approached the European larch. Turning to the European larch, Sir Roy agreed that the prospects of survival except of occasional trees seemed very slender and he was not surprised that the heavily thinned plot nearby had failed to show any response. He shared Mr. Newton's opinion that the trouble was too far advanced to be easily checked and thought that there was nothing to gain by delaying treatment with Sitka spruce. Mr. Newton suggested that where the damage was least advanced and the larch most leafy Norway spruce might stand the extra shading better than Sitka. Sir Roy thought that a large Sitka spruce transplant had the merit of starting away more quickly. (European larch in P.36 runs to 23.7 acres, all on old arable sites).

Sir Roy remarked on the extra severity of the die-back in depressions or on concave slopes as possibly lending some support to the frost theory. The District Officer claimed that the emphasis should be on susceptibility (due to too lush conditions, perhaps), if frost damage were found on northerly slopes such as this.

The vigour and relative immunity of European larch immediately adjoining Japanese larch was noted by Sir Roy as confirming a similar observation at Clashindarroch last year. The circumstances suggested even more strongly than at Clashindarroch, a nutritional rather than a shelter effect.

Sir Roy considered the Japanese larch typically rough but likely to

improve and was impressed by the heavy chermes attack in one or two cases (not suppressed trees), the bulk of the trees being practically immune. Mr. Newton also drew attention to the appreciable amount of shoot rot damage - not always obvious as such.

Signs of blasting were noted in the Japanese larch along the west boundary of the forest.

As a sample of the oldest European larch on non-arable sites, Sir Roy was shown the P.37 larch in Compartments 4 and 5 where whin growth is most obvious. He thought that if the survival of the larch was otherwise assured it had nothing to fear from the whin, but if it was found necessary some years hence to add Sitka spruce the whin would then have to come out at tremendous cost. Mr. Newton was not disposed to regard this larch as doomed.

Sir Roy challenged the District Officer to direct him, after due reflection and enquiry to a healthy stand of Scots pine/European larch about 40 years old in his district and so justify his advocacy of such mixed planting of European larch. The party returned to Wardhead and proceeded by car to Millburn Farm. The plantations were again entered by the road separating Compartments 34 and 50, and attention focussed on P.41, Sitka spruce on the plough furrow in Compartment 34. Having regard to the site and the fact of ploughing, Sir Roy thought the Sitka had made unsatisfactory progress. The District Officer suspected that ploughing had preceded planting by a year or two. Adjacent P.41, Scots pine on the plough furrow on a more heathery site had made a strong and even start.

With regard to the slopes of Compartment 50 and, indeed, all slopes in areas of moderate rainfall, Sir Roy advocated contour ploughing as securing improved conservation of moisture. He believed it was not beyond the latest models of plough to throw the furrow uphill as well as downhill except in face of rank unburned heather. Mr. Newton agreed that the water factor might be decisive on such slopes.

Sir Roy was not impressed by pure Pinus contorta on the plough furrow in Compartment 36 - P.40, and was glad to be assured that the acreage was small.

The adjacent P.42 planting of Sitka spruce/Scots pine on the plough

furrow in Compartment 50 showed disappointing progress, again, it was thought, partly due to a stale furrow. Sir Roy also suspected that inferior plants had been supplied. He investigated the shelter effect due to the scrub along the south-west margin of the ploughing but found no positive indications, the prevailing wind being really north-west in this district.

Sir Roy also remarked on the absence of natural regeneration in this vicinity.

Signed: I. GILLESPIE.
Acting District Officer.
8.9.45.

Divisional Officer's Observations

I am glad that Mr. Gillespie is puzzling out theories on the larch dis-back, though I cannot always subscribe to them.

I agree that on dryish hard soils, the ploughing should be across the hill and not up and down; also with the amount of exposure experienced at Whitehaugh the plants should be set halfway down and not on the top of the upturned furrow.

L. A. NEWTON,
Acting Divisional Officer.

No comments.
A.H.G.
13.9.45.

No observations.
R.L.R.
25.9.45.

Comments.

Though the European larch next to the Japanese larch in P.36 has suffered from dis-back it is not so badly affected as the remainder of the stand. The dividing line between the very bad and the not so bad is a clearly defined line running along the slopes.

The rough Japanese larch which the Chairman remarked upon are still very rough and crooked.

APPENDIX II

Supervision

Divisional Forest Officers and Conservators

Mr. H. M. Steven, Divisional Officer	1935 to 1938
Mr. F. Scott " "	1938 to 1939
Mr. L. A. Newton " "	1939 to April, 1946.
Mr. H. C. Beresford Peirce, Conservator	April, 1946 to May, 1947
Mr. F. Oliver "	May, 1947 continuing.

State Forest Officer

Mr. T. H. Woolridge	April, 1948 continuing.
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District Officers

Mr. A. Watt	1935 to 1938
Mr. T. H. Woolridge	1938 to 1939
Mr. I. J. Stewart	1939 to 1941
Mr. I. Gillespie	1941 to 1947
Mr. R. J. G. Horne	1947 to 1951
Mr. W. F. French	1951 continuing.

Foresters

Mr. C. McDowall	1935 to 1940
Mr. W. MacKay	1940 to 1942
Mr. F. H. Mitchell	1942 to 1945
Mr. G. Duguid	1945 continuing.

APPENDIX III

Schedule of Rates of Growth

The following table gives the rate of growth of the species used in the forest for the various types of ground.

Species	P. Tr.	Opt. No.	Ht. Growth	Current Height Growth	Geology, Vegetation and Soil	Altitude	Aspect	Exposure
S.S.	40	39	8' to 12'	One tree 9'5" had annual ht. growth for last 2 years of 5'2".	Geology:- Knotted Schist and mica schist. Soil:- 1 1/2" black peaty litter, 3" moist sandy loam with humus - below mottled moist compacted drift, with stones of mica and knotted schist. Vegetation:- Moist harp. - <u>Drosera flex.</u> <u>Desch. glandulosa</u> , <u>Calluna saxatilis</u> , <u>Ranunculus</u> with occasional <u>Calluna</u> .	1100	N.N.E.	Fair, N.W. to N.E.
SP/SS and J.L. pure but on same type of site on plough.	41	34	S.P. 5' to 9' S.S. 1' to 5' (In check) J.L. 7' to 12'	One stem of S.P. 8' in ht. had last 3 years growth of 3'4". One 5' tree had last 3 yrs. growth of 1'10". One of 12' had last 3 yrs. growth of 4'1".	Geology:- Knotted schist. Soil:- A podzol - 4" to 6" black peaty litter 1 to 2 inch bleached layer, - thereafter heavy stony layers of mottled coarse sandy drift.	1070	S.	Moderate to S.S.W.
SP/SS on plough	42		S.P. 5' to 7' S.S. 5' to 9'	Last 3 yrs. growth about 3'. One S.S. of 7'3"	Geology:- Knotted schist. Soil:- Probably very old agricultural with about 6" to 8" grey black medium sandy drift over an orange brown sandy drift with stones.	1000	S.W.	Moderate to S.W.

SP/SS on plough	42		S.P. 5' to 7' S.S. 5' to 9'	of 4'. Last 3 yrs. growth about 3'. One S.S. of 7' y. showed last 3 yrs. growth of 4'.	<u>Geology</u>: - Knotted Schist. <u>Soil</u>: - Probably very old agricultural with about 6" to 8" grey black medium sandy drift over an orange brown sandy drift with stones. <u>Vegetation</u>: - Trees abundant - mixed grasses, <u>Calluna</u>, silver weed and eco. <u>Prunella</u> with very eco. <u>Calluna</u>.	1000	S. N.	Moderate to S. N.
SP/SS not ploughed	43		S.P. surviving few over 3' S.S. dead or in complete check.	One plant of 2 1/2' had last 3 yrs. growth of 1 1/2'.	<u>Geology</u>: - Knotted Schist. <u>Soil</u>: - A pedol - 1 1/2" black peaty litter 1" bleached layer. 1 1/2" mixed layer with mineral and organic matter - then a very compacted layer of coarse sand and stones shading from dark red to orange in colour.	1150	S. S. E.	Exposed S. E. & W.
SP/SS on plough	46		S.P. 4' to 7' S.S. 3' to 6'6"	Last 3 yrs. growth about 2'. One of 6' shows growth for last 3 yrs. of 2'10".	<u>Geology</u>: - Knotted Schist. <u>Soil</u>: - A disturbed pedol. Old arable. Upper layer thin layer of peat on 1' or so of leaching - in bottom of furrow 1' of red/brown/loam over a yellowish moist drift.	1100	N.	Moderate only.
S.S. on plough	47		3'6" to 4'6"	One tree of 4'6" had last 2 yrs. growth of 2'10".	<u>Geology</u>: - Mica Schist. <u>Soil</u>: - Probably old arable. 9" grey brown loam - moist - over a reddish sandy drift. <u>Vegetation</u>: - Mixed grasses and herbs such as <u>Calluna</u>, stitchwort, <u>Prunella</u>, etc.	1050	N. E.	Exposed
K.L. Crop fairly healthy - some canker and only a very little die-back.	40	32	7' to 12'	Av. growth for last 3 yrs. 3'6"	<u>Geology</u>: - Mica schist. <u>Soil</u>: - 2" to 3" peaty litter with humus and living roots. 1 1/2" grey layer. 4" brownish layer, over reddish/orange heavy sandy drift shading to orange brown few stones. <u>Vegetation</u>: - Almost exclusively <u>Larula</u> silvatica	1100	N.	Moderate
J.L.	40	35	12' to 15'	Av. growth for last 3 yrs. 4'.	As above		As above	
J.L.	36	2	12' to 18'	Av. growth for last 3 yrs. 4' to 4 1/2'	<u>Geology</u>: - Knotted schist. <u>Soil</u>: - Old arable marginal. 1' of grey brown moist loam over a reddish compacted sandy drift - few stones - too good for Jap. Crop contains high proportion of <u>Prunella</u> trees.	950	E.	Exposed

Species	P. Ir.	Cpt. No.	Ht. Growth	Current Height Growth	Geology, Vegetation and Soil	Altitude	Aspect	Exposure
E.L.	37	9	6' to 10'	Last 4 yrs. growth on one tree of 8' in 3'6". (Last 5' with die-back)	Geology:- Knotted schist. Soil:- A brown forest soil with little sign of podsolization - below 5" fairly compacted with stones. Mica schist and quartz. Die-back is setting in and the prospects are gloomy.	900	N.W.	Moderate
H.L.	37	8	12' to 18'	One stem of 17' has last 3 yrs. growth of 4'.	Geology:- Knotted schist. Soil:- 1" black litter, 14" leached layer mixed with humus. 4" orange/brown medium sand with stones and pebbles over a yellow more compacted parent material of drift sand.	1100	E.	Moderate
N.S. on plough (Agric.)	36	1	18' - 22'	Last 3 yrs. growth av. 6 ft.	Geology:- Knotted schist. Soil:- Old arable, 1' grey brown loam with traces of clay - reddish brown parent material more compacted and stony with mottling. Vegetation:- Dying out under close canopy - traces of grass and moss remain.	800	E.	Sheltered
N.S. on plough (Agric.)	38	18	On Calluna 3' to 5' On grass 11' to 12'	One tree of 6' shows last 3 yrs. growth of 2'9"	Geology:- Mica schist. Soil:- Probably very old arable. A brown soil showing signs of podsolization. 6" grey/brown sandy loam over an orange/brown moist loam. Vegetation:- Under closed canopy grass and mosses, elsewhere Desch. flex. esp. Calluna and Polytrichum commune.	1000	S.E.	Moderate
SP/EL on plough	38	22	E.L. 10' to 12'	Last 3 yrs. growth on E.L. about 4'.	Geology:- Knotted schist. Soil:- 4'-6" sandy loam with much decayed grass roots	1100	E.	Slight

Die-back is setting in and the prospects are gloomy.					
E.L.	37	8	12' to 18'	One stem of 17' has last 3 yrs. growth of 4'.	Geology:- Knotted schist. Soil:- 1" black litter, 1/4" leached layer mixed with humus. 4" orange/brown medium sand with stones and pebbles over a yellow more compacted parent material of drift sand. 1100 E. Moderate
E.S. on plough (Agric.)	36	1	18' - 22'	Last 3 yrs. growth av. 6 ft.	Geology:- Knotted schist. Soil:- Old arable, 1' grey brown loam with traces of clay - reddish brown parent material more compacted and stony with settling. 800 E. Sheltered
E.S. on plough (Agric.)	38	18	On Calluna 3' to 5' On grass 11' to 12'	One tree of 6' shows last 3 yrs. growth of 2' 9"	Geology:- Mica schist. Soil:- Probably very old arable. A brown soil showing signs of pedolisation. 6" grey/brown sandy loam over an orange/brown moist loam. 1000 S.E. Moderate
SP/EL on plough (Agric.)	38	22	E.L. 10' to 12' S.P. 8' to 10'	Last 3 yrs. growth on E.L. about 4. S.P. slightly less.	Geology:- Knotted schist. Soil:- 4"-6" sandy loam with much decayed grass roots and litter over an orange brown rather heavy sandy loam. 1100 E. Slight

Vegetation:- Calluna, Desch. flos, Broom, Yucca, Galium and mosses.

Vegetation:- Under closed canopy grass and mosses, elsewhere Desch. flos, see. Calluna and Polytrichum growing.