

## Society Activities

1988 ANNUAL STUDY TOUR 24-26th MAY

NORTH TIPPERARY

### DAY 1

The Tour began with a visit to Urlingford forest. At Kilcooley property Matt Fallon welcomed the Tour to Urlingford and gave an introduction to his forest.

Urlingford was established in 1936 on lands leased for 150 years from the Ponsonby family. A wide variety of soil types occur, from cutaway midland peat to dry mineral soils, to carboniferous gleys. Norway and Sitka spruce are the dominant species. Recent planting programmes are composed almost entirely of reforestation on clearfell sites and 60% of harvested timber comes from clearfellings.

Both stops during the morning were concerned with reforestation under the headings "Plant handling techniques" and "Options for reforestation". Matt Fallon spoke of the very low survival rates experienced on reforested sites. It was this that prompted Forest Service District Inspector, Pat O'Sullivan and himself to set up an experiment in plant handling last year in order to improve the situation.

There are numerous reasons for high mortality in young trees, but the one discussed here was poor handling. Rough handling and drying can reduce survival to as low as 46%. From the outset, the forester should be aware of the time of arrival of the plants and be on site to supervise careful handling during unloading. At Kilcooley the plants are trenched in a specially prepared peat bed. This medium has proven ideal and is easily worked in wet weather. Prior to dipping for pine weevil control plants are kept dry using a frame covered with corrugated iron. Emphasis was placed on dipping.

A bundle of 25 to 30 plants is arranged so that the root collars are at the same level. These are then placed foliage first (including up to ¼th of the main root) in a 2.5% solution of Gammacol and held in this position for approximately 10 seconds. They are then positioned on a draining board so that surplus dip runs to the tip of the plants and is kept *completely* away from the roots. Surplus solution returns to the dipping tank. Plants are left to drain for

about an hour, wetting the roots with a mister if necessary. Enough plants for two days planting are treated at a time. The plants are then placed in wooden boxes with a layer of peat in the bottom which helps to keep the roots moist. They are covered to keep the foliage dry, and transported to the planting site by tractor.

The use of Gammacol requires certain safety precautions. The worker doing the dipping wears an oil-skin suit, an apron, elbow length rubber gloves and rubber boots. A face shield is also worn. Peat moss is placed on the ground around the dipping area to soak up splashes. Disposal of solution requires digging a 1m x 1m x 1m hole on a site away from watercourses. Out on the site it may be advisable for workers to wear a mask against dust coming from treated plants.

At the second stop, "Options for reforestation", the rain was coming down in torrents. The site in question was reforested in 1987 with Norway spruce and present observations reveal a 95% survival rate – a result of good handling and planting. Should Norway spruce have been planted here? What other species could be used? Why not a hardwood crop? These were some of the questions raised at the stop. From this stop Mr. Peter Ponsonby took the group on a guided tour of the ruined Kilcooley Abbey. Shelter from the rain was very welcome indeed.

Translated from Irish, Kilcooley means "Church in the corner" or "Church in the angle" from its location in a corner of Co. Tipperary under the shadow of the Slieveardagh Hills. The Abbey was founded by the Cistercians in 1184 as a daughter house of the better known Jerpoint Abbey in Kilkenny. Of particular note are the chancel, transpets, and a six-light east window with a good trancery. Various tombs in the chancel include a 16th century Butler effigy. In more recent times the Abbey served as a dwelling for the inhabitants of Kilcooley House when it went on fire in the 1800s. All in all it was a most interesting visit. The Chairman for the day, Michael O'Brien, thanked Mr. Ponsonby for the tour of the Abbey and shelter from the rain. Fortunately the skies broke back and the sun came out for us to enjoy our lunch back at the forest yard. Before leaving Urlingford, the Chairman thanked Matt Fallon and his staff for a most interesting morning and providing the facilities for lunch. And so we departed Urlingford bound for nearby Littleton Forest, location of all the afternoon stops.

Denis O'Connell, Forester-in-Charge at Littleton, met us on our arrival at Longfordpass North property. Welcoming the group he went on to explain that the forest was established in 1970 from outlying properties of Urlingford and Dundrum forests to comprise an area of 840 ha. This has increased to 1,456 ha and is made

up of numerous scattered properties ranging in size from 298 to 7.7 ha. Most of the forest is growing on low-lying midland peat. There is no new land coming in at present. However, in 1990 it is expected a sizeable portion of adjoining cutaway Bord na Mona bog will be handed over for planting. The main species are Norway spruce/Scots pine mixtures (47% of area), Sitka spruce (14%) and lodgepole pine 14%. Forty-five ha of the Norway spruce/Scots pine mixtures are thinned annually by contract harvesting. The aim is to remove all the pine from the mixture to leave stands of pure Norway spruce.

In the 1950s and 1960s considerable areas of the midlands were planted with mixtures of Norway spruce and Scots pine, the latter to act as a nurse for the spruce. By the early 1980s it was evident that the spruce was becoming suppressed due to nutrient deficiency and the pine was becoming dominant. In 1982 a process of rehabilitation commenced in Littleton. A selected area was treated by applying phosphate by helicopter at 72.5kg P/ha. The area was given an application of potash in the following year at 125kg K/ha. In 1984 all the Scots pine was removed (36 m<sup>3</sup>/ha) and 750 stems/ha of the spruce were high pruned.

As a result of the course of action growth rates of the spruce have increased dramatically. It is estimated that basal area has increased by 75% since the treatment began. Costs of the treatment were as follows (1987 values):

Phosphate materials and spread	£69.00/ha
Potash materials and spread	£50.00/ha
Felling	£8.50/m <sup>3</sup>
Extraction	£6.25/m <sup>3</sup>
Prune (to 3m)	50p/tree

It was impressive to see what had been done to a crop which could easily have gone by the wayside. The land soon coming in from Bord na Mona, could, depending on peat depth, produce high quality Norway spruce, which, when coupled with a pruning programme could fetch premium prices.

A short way down the road we moved to our next stop. There John Twomey, from Development Section of the Forest Service, Limerick, demonstrated the Farmi-Trac mini forwarder. Manufactured by Normet of Finland, it has a four stroke diesel engine producing 40 H.P. It is 1.7m wide, weighs 4.25 tonnes and is 2.7m high. A grab is fitted to the tractor unit and has a maximum reach of 4.5 metres with a 1m hydraulic extension onto the crane.

Between tractor and trailer there is a system whereby weight can be transferred from one section to the other thus increasing traction or ground clearance. The trailer is also equipped with an auxiliary hydrostatic drive. The cab gives all round visibility to the driver. The layout of the controls and driving position are not ideal when driving out loaded from the wood, as the operator has to concentrate more on the trailer than on forward driving.

The Farmi-Trac is limited to slopes of from 1 in 5 to 1 in 8 depending on ground roughness. On slopes greater than 1 in 5 track slip is likely to occur. On side slopes it is very unstable and is liable to come off the track or turn over. Due to ground clearance the machine is only capable of extracting across the plough ribbons. Trials have shown that the maximum economic haul distance is 300m. When transferring, a rear entry low loader is required because at present the units cannot be easily split. Careful layout of extraction racks is required. It has potential on low ground pressure sites, especially gleys and peats where it can extract 4-6 m<sup>3</sup>/hour and it does very little damage to the soil compared to heavier machines such as the Mini-Bruunett.

Our final stop of the day was at Grallagh property. Here John Twomey demonstrated a Goliat mini-skidder/mini-tractor. Powered by a 7 H.P. petrol engine it can get in and out of trees and stumps. It is ideal for distributing plants, manures or fencing materials. It travels at walking pace and is controlled by the operator walking along side. By removing the flat load area it can be used to haul and carry timber up to a half tonne load size. We were given a demonstration of both of its capabilities.

On the same site Eugene Hendrick introduced us to the tunnel moulder. It is a development of the tunnel plough and like this it provides a covered drainage tunnel in peat and deposits a planting medium on the surface. However, the unit in the tunnel moulder breaks this medium into definite mounds, this giving an output similar to double mouldboard ploughing. An auger is fitted behind the tunnel opening which cuts the peat and moves it vertically through an enclosed pipe. A bend at the top of the pipe extrudes the peat into reciprocating boxes which deposits the peat in mounds 1 metre on either side of the centre slit. The peat over the tunnel closes back in leaving a covered drain 30cm below the bog surface. Combined with a ditcher to open the ends of tunnels the moulder provides a good method of ground preparation. The unit is mounted directly on the three point linkage of a tracked 100-120 H.P. tractor. the ditcher can also be attached and worked by the tractor.

Chairman, Michael O'Brien, thanked all those responsible for arranging the afternoon's stops which, like those in the

morning, were most interesting and gave plenty of food for thought.

On a bright sunny evening we made our way northwards back to Tour headquarters in Thurles.

Richard D. Jack

## DAY 2

Hollyford Forest.

Leader: Dr. J. J. Gardiner; Forester: Pat Carroll.

*Stop 1* – Rehabilitation of Lulu island lodgepole pine.

A number of treatments were seen including an untreated area:

- (1) Heavy mechanical thinning and prune
- (2) Heavy selection thinning and prune
- (3) Chemical thinning

Approximately 40% of the volume was removed in thinnings.

## DISCUSSION

On being asked about applying fertiliser P. O'Sullivan said he would apply it if he were sure there would be an economic response. J. Fennessy felt the only response to fertiliser would be the production of extra flowers and branches. Promising results had been achieved through fertilising by M. O'Sullivan in his area. In contrast J. Dillon had found little response to fertiliser application in Littleton forest. E. Hendrick mentioned research results where 500kg of phosphate had given good results in Lulu island crops which had received a spot application of phosphate at establishment. M. O'Brien drew attention to the unproven applicability of inland lodgepole pine volume to stands of Lulu island lodgepole pine. He also wondered if the crop would ever be capable of producing sawlog material. P. O'Sullivan replied that the objective was to produce small sawlog of high value. Doubt was cast on whether even this more modest ambition was possible.

The disparity between the price paid for spruce and pine sawlog was fully discussed. P. O'Sullivan felt that the present superior price paid for spruce might not obtain in the near future. As the discussion progressed the question of pruning arose. T. Purcell questioned the wisdom of pruning small areas as the sawmilling trade would only pay a premium for material if there were regular supplies of large amounts available. The consensus of the group was that it was admirable to attempt to rehabilitate these unpromising crops rather than simply give them up as hopeless.

### *Stop 2 – Sitka spruce on unstable sites*

A stand of Sitka spruce, 14 years old, YC 18, had been thinned by Finsa of Scariff, Co. Clare. Every fifth line had been removed with a “mechanical selection” of the remaining lines. No marking was carried out. The objective was to remove 46% of the volume – 42% was actually removed. M. O’Brien commented that he was glad to see that local management were realistic about going into thin early and that selection thinning was being done. Attention was drawn to the difficulty that may arise with second thinning due to the unavailability of slash. It was hoped by some that extraction techniques might have improved sufficiently by then so as to eliminate this problem.

Extraction in this case was by horse. Finsa were quite happy to use horses in this situation as they were felling approximately 60 m<sup>3</sup>/ha. Further co-operation was urged between the Forest Service and the pulpwood users to tackle the kind of problems that the stand in question represented.

R. Tottenham suggested for stands like this to start at about 12 years of age by taking out 2 lines for a rack. Later felling could be done on to the rack. This would give the requisite brash. Removing a double line was felt to be unsafe by many. It was also pointed out that 80% of the volume would need to be removed with this treatment to make it attractive to contractors. On the question of future thinnings, the situation would be looked at in 3 years time and a decision made then.

### *Stop 3 – Chemical thinning*

Three different applications of this treatment were looked at and discussed:

1. Removal of competing coastal lodgepole pine in Sitka spruce crops.
2. Thinning of high YC Sitka spruce which is inaccessible.
3. Low YC pine – avoiding the cost of mechanical thinning.

At the site visited the soil was a peaty gley with severe side slope and contour ploughing. Kevin Collins stated that chemical thinning would only suit small areas on unstable sites to allow a “selection thinning” to be carried out. He then outlined the economics of the various thinning options available including the respacement option. The best was selection thinning provided there are no physical constraints to this. Second best was no thinning.

With respacement a break even point was reached when the crop reached a height of 13m. Between the heights of 13m and

23m respacement is the best option because:

1. Larger sizes are realised earlier.
2. The cost of respacement begins to become less important.

However, respacement with pruning was found to be unprofitable.

#### *Stop 4 – Respacement Plots at Kilmore*

The crop was respaced at age 10 and the following reductions of stocking were carried out – 33, 50, 66 and 75%. Pruning was done to 2m at time of respacing and to 4m at age 14 years.

#### **COST**

Pruning 23p/tree 2m; 23p/tree 2-4m.

Respacing: 3 SMH/100 stems removed.

*Results:* The 66% removal will give all sawlog and an NDR of £265/acre. This assumes the crop will stand to full rotation.

The question was asked, would the 66% removal give greater or less stability than the 33% removal. E. Hendrick suggest that the 66% removal would be more stable due to a greater root plate. J. Dillon drew attention to the alternative approaches to these kind of crops and the important consideration that they avoided, the problem of losing the pulpwood production. He pointed out that this kind of treatment was of only limited application and in that sense similar to chemical thinning.

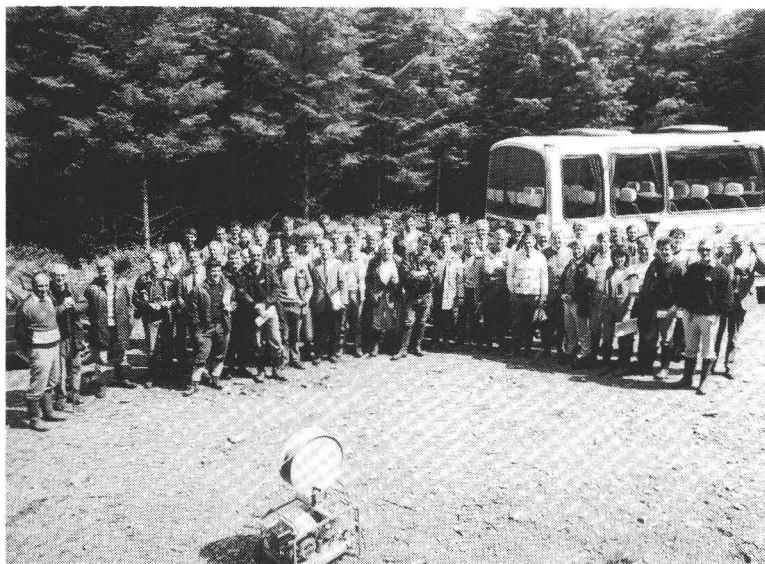
#### *Recovery of sawlog:*

Seamus Heaney, Research Forester, Forest Service, reported on sawn material he had produced from material felled in the respaced stands. From among the large amount of technical data given to the group a number of interesting points emerged.

1. The enormous disparity between the amount rejected by visual as opposed to machine grading – the latter being far lower.
2. The relation between YC and rejection – the higher the YC the greater the amount of rejection.
3. Finish: with sharpened knives the finish achieved was quite good.

J. Gardiner recommended that a one day meeting to cover the points brought up by Mr. Heaney's project would be well worthwhile. Most especially in view of the great interest shown by the group, the enormous importance of the subject and the limited time that was available to the members on the day.

Paddy O'Kelly



Study tour group at Killeen property, Silvermines forest.

(Photo courtesy Nenagh Guardian).

### DAY 3

The final day of the study tour took us to the Silvermines forest where the Convenor introduced us to the local foresters, Mr. Michael Boland and Mr. Jim Rochford. The forest was established in 1955 and is situated in the Arra and Silvermines Mountain ranges. It has a total area of 2457 ha with an annual timber production in the region of 10,000m<sup>3</sup>.

The first stop was a guided tour through a respacing experiment given by Mr. Ted Lynch and Mr. Arthur Buckley (Research Branch, Forest Service). Respacing is seen as a solution to the problem of producing sawlog on unstable sites which would be susceptible to windblow if thinned. In order to maximise quality pruning is essential. The respacing was carried out in 1976 on a crop of Sitka spruce planted in 1966. The original spacing of the crop was 1.8m x 1.8m (3088 stems/ha). The experiment



consists of 5 treatments.

1. *Control Treatment*: This is the where nothing is done to the plantation. The stocking here is 3088 stems/ha and it has a small mean diameter of 15.5 cm. This would indicate a high percentage of pulpwood. Mortality is about 3-3.5% but is expected to rise to around 10-15%.

2. *50% Respacing*: This was done systematically taking out every second line leaving 1520 stems. It has a mean diameter of 20.2 cm. The top height of the crop is 12m and this is unaffected by respacing.

3. *66% Respacing*: This is where two trees were removed and one tree left on a systematic basis. This left 1184 stems/ha with a present mean diameter of 21.8 cms. In terms of volume production 66% respacing shows a positive return after about 10 years if the Yield Class is high.

4. *75% Respacing*: Here every 2nd line and every 2nd tree on the line were removed, leaving 760 stems/ha with a present mean diameter of 22.8 cm.

5. *Oceanic*: This is a selection treatment where 100 of the best stems/ha were retained and the remainder are topped off at about 4 foot high. This treatment is difficult to carry out and there is the added problem of the topped stems beginning to grow again in some cases.

Having gone through the different treatments, Ted Lynch gave us results from a similar respacing experiment at Drumkeeran:

Treatment	Stems/ ha	DBH	Volume	Large Sawlog	Length to 14cm top diam.	Taper mm/ metre butt/ 14 metres
Control	2669	18.0	440	65	6.4	14.0
50%	1376	23.6	414	248	8.4	18.3
66%	969	26.1	343	232	8.5	20.2
75%	750	28.5	247	223	8.6	23.5
Selection	998	26.0	353	223	8.3	18.6

1. Height growth is unaffected by respacing.
2. At 75% respacing total production is reduced by about 140m<sup>3</sup>/ha.
3. Mean tree size is increased as is sawlog production by respacing.

4. Merchantable length is increased by 2m on average over control.
5. Branch size increases as does rate of taper and ring width with increasing intensity of respacing.

After this visit we drove northwards to Killeen property in Silvermines forest. The soil in this property is a brown podzolic with considerable leaching. Here we looked at the thinning of Sitka spruce on stable sites. Mr. Pat O'Sullivan told us that due to the increased pressure to fill timber quotas they have adopted intensive thinning regimes on selected stable sites.

The plantation in question was Sitka spruce planted in 1961 at 1.7m spacing and had a YC of 24. The first thinning was carried out in 1983 removing 75m<sup>3</sup>/ha (1 in 3), the 2nd thinning was carried out in 1986 removing 35m<sup>3</sup>/ha (selection) and a heavy thinning has been marked that will remove 96.9m<sup>3</sup>/ha with an average of 0.258m<sup>3</sup> and 19cm dbh, this corresponds to removing 100.9% of YC on a 4 year cycle. All timber has been extracted by horse.

After that it was over to Mr. John McLoughlin from Development Division, Forest Service who discussed pruning and showed us different pruning machines. Pruning should only be carried out on stable sites and about 400 to 500 stems/ha should be selected. To justify pruning a 20% premium for pruned timber is needed. In the Forest Service pruning increased from 17,722 stems pruned in 1975 to 642,233 in 1986. In 1987 there was a decline to 496,684 stems pruned and in 1988 1,185,001 stems are programmed to be pruned. From these figures it is hoped that pruning will increase as it makes good economic sense especially with pine.

Recently, Development Division have been working with mechanical pruning equipment. Three types were demonstrated:

1. KS 31
2. Yanmar AG 230
3. Pneumatic Pruning Saw

The KS 31 and Yanmar AB 230 automatically climb up the tree to a desired height while cutting the branches cleanly. After reaching the desired height it returns to the ground where it stops. Two machines can be operated at the same time. The pneumatic pruning saw is powered by a 5.5 H.P. engine and compressor (usually situated on the road) and has a 200m long air line going into the wood. From the end of this line it is possible to have 2 connections so that two men can prune at the same time. Various extensions can be put onto the pruner to get up to the desired height. The cost of pruning is reduced by 30%

by using the climbing machines and they can also prune up to 6m if the tree is straight. Studies done on the pneumatic pruning system on coastal lodgepole pine in 1987 indicated that the cost is comparable to manual pruning.

After lunch we went closer to Neanagh where we visited Jack Bayly's farm. The first stop was the pastoral forestry plot. This system of forestry and agriculture is designed to maximise economic returns from the land by utilising a two storey canopy system. The returns are expected to be greater than either of the crops on their own. The forestry portion of the system "the upper storey" is based on trees which can produce high value timber for joinery and veneer using species such as *Nothofagus*, *Pinus radiata*, *Prunus avium*, *Fraxinus excelsior*. The plot was laid down in 1986. The trees were planted in rows 13m apart. A 12m sprayer can be used between the rows. Trees were planted 7m apart in the rows, protected by Correx tree shelters and netting. By using this system grass production is reduced by 40% but as everything produced on his farm is in surplus except timber Jack considers it a worthwhile proposition.

The next stop on the farm was a Sitka spruce stand planted in 1971 with a YC of 28. The average tree volume was  $0.107\text{m}^3$  giving a volume per hectare of  $90\text{m}^3$ . It had already been thinned, 1 line in 4 in 1986. The advice given here was to prune the final crop trees at this stage.

Next we looked at an old woodland site which had been restocked with Sitka spruce, oak, beech, ash and *Nothofagus*. The advice given here was that the area should have been mounded, this would have helped to alleviate the competing vegetation problem, also the competing scrub be cut and the regrowth treated with Roundup.

The final stop was at the pheasant release pen. Here, Jack buys and rears 100 six-week poults each year. On maturity the birds leave the pen and avail of the ample cover and food (cereals) on the farm. Two or three formal shoots are held each year which bring down 70/80 of the birds. Woodcock are also becoming common on the farm due to the planting of Sitka spruce.

After this we adjourned to the Bayly's residence where we enjoyed some light refreshment before returning to our hotel in Thurles for the annual dinner where we were joined by the Minister for Forestry, Mr. Michael Smith. An enjoyable evening was had by one and all.

Padraig Egan

*Leaders:*

Jim Dillon, Forest Service, Limerick.

Pat O'Sullivan, Forest Service, Nenagh.

*Convenor:*

Eugene Hendrick.

*Participants:*

Peter Alley, Denis Bergin, Pacelli Breathnach, John Cleary, Liam Cleary, Euphemia Collen, Lyall Collen, Jim Crowley, William Dick, Jim Dwyer, Padraig Egan, John Fennessy, Jack Gardiner, John Gilliland, Tony Glynn, Eugene Griffin, Eugene Hendrick, Dermot Houlihan, Richard Jack, John Kelly, Eamon Larkin, Edgar Lee, Jimmy Lehart, Joss Lowry, John Madden, Paddy McAuliffe, Frank McAuliffe, Sean McNamara, Tom Noonan, Mick O'Brien, John O'Brien, Tim O'Brien, Christy O'Dea, Tom O'Donovan, Pat O'Kelly, Joe O'Neill, Tim O'Regan, Michael O'Sullivan, Robert Percy, John Prior, Tom Purcell, Mary Ryan, Fred Topping, Robert Tottenham, Ari van der Wel, Donal Whelan, Richard Whelan, Coleman Young.