PROJECT SX 80101 Q
BULLET PLANTING TRIAL
LIKELY, BRITISH COLUMBIA

1980-06-02 to 1980-06-12

DATE: August 1980
FILE: 400-6-5
BY: R.W. Lane

Engineering Branch
Ministry of Forests

NOTED BY: K. Apt
NOTED BY: K. W. Rieche

SILVICULTURE BRANCH
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Introduction:

This report deals with an operational planting project using an experimental planting tool, the PAL-2 gun. The trial took place in the Cariboo Region in June 1980 with the following points in mind:

i) Compiling production and planting quality data.

ii) Assessing PAL-2 gun capability with respect to operation and construction.

iii) Finding if theoretical ergonomic improvements of the gun are realized in the field.

The trial involved the planting of approximately 43,000 CBW 211 container grown seedlings with sufficient sampling to assure reliability of results in excess of 95%. The results are tabulated and commented on in the following report.

Personnel:

Likely Ranger Station - G. Plews, W. Henky
Engineering Branch - R. W. Lane
Planting Foreman - D. Benner
Timing Crew - Likely Regeneration Crew

Locations:

All three sites are in Likely Ranger District, Cariboo.

A) Sellers Creek CPJ Block 6 (19,000 Pine Planted).

B) Black Bear Creek CPF Block 11 (9500 Pine Planted).

C) Winkley Creek TS A08980 (14,800 Fir Planted).
Sites:

Site A - Sellers Creek

About one-third of this site consisted of 50% slope of westerly exposure with the rest relatively flat on the bench below it. All of the site was windrowed and burned in 1979. The planting difficulty of the area was rated moderate, (see F.S. 703) but the soil was much more compacted on the flat, making planting harder.

Site B - Black Bear Creek

This site, rated moderate (see F.S. 703) was considerably more variable in terrain than Site A, but was not much harder to plant due to good soil. The breakage rate was higher because of a prevalence of rock in certain areas. Site treatment consisted of brush blading and burning in 1978.

Site C - Winkley Creek

Also a moderate site, the sidehills were found to have softer soil and therefore were more easily planted. This may be partly due to the reduced amount of heavy equipment traffic on the sidehills as compared to the flat areas. Site preparation consisted of windrowing and burning in 1979. (see photographs on page 3)
Planting Stock:

The trees planted at sites (A) and (B) were 1+0 PL, CBW 211, Seedlot 3253, characterized as tall, quite bushy with some yellow and red needles.

Site (C) used 1+0 Fir, CBW 211, Seedlot 2415. The trees were in good condition, although the planting medium appeared to be quite loosely packed.

Tools Used:

Forest Service PAL-2 Gun (See Figure 1).

PSB 211 Dibble with Screefer.

This is the standard tool for planting plugs and was used when the planting crew was greater than six in number.

Method:

Six PAL-2 planting guns were used on an operational trial with a Forest Service Planting Crew. When the number of crew exceeded six, dibbles were used by the extra crew. A small number of bullets were planted using modified PAL-1 Guns, but results were poor and their use was halted.

Planters were checked individually on two of the three sites ((A) and (C)), for quality and quantity of planting. On Site (B) a sample check was made after planting to determine planting quality and breakage and see if it compares with sites (A) and (C).
Results:

The field data can be summarized as follows:

**Trees Planted**

<table>
<thead>
<tr>
<th></th>
<th>Ok</th>
<th>Shallow</th>
<th>Crushed</th>
<th>Crushed in Gun</th>
<th>Clipped</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trees</td>
<td>3657</td>
<td>158</td>
<td>140</td>
<td>23</td>
<td>54</td>
<td>4032</td>
</tr>
<tr>
<td>%</td>
<td>90.7</td>
<td>3.9</td>
<td>3.5</td>
<td>.6</td>
<td>1.3</td>
<td>100</td>
</tr>
</tbody>
</table>

94.6  5.4

**OK:** Bullets are planted upright with tree undamaged and top edge of bullet level with or below the ground surface. Best chance of survival.

**Shallow:** Same as OK bullet except that top edge of bullet is slightly above ground level. Any bullets that were more than 10 mm above ground level were replanted, therefore, this classification really measures gun design performance more than planter performance. Good chance of survival.

**Crushed:** Bullets crushed beyond hope when planting was attempted into a medium of higher strength than the bullet (rock, wood, hard clay, etc.). No chance of survival.

**Crushed in Gun:** Bullet is crushed by gun mechanism, usually because of improper alignment in chamber. No chance of survival.
Clipped: The tree was severely damaged by the gun mechanism during the action of planting. No chance of survival.

<table>
<thead>
<tr>
<th>Time Breakdown</th>
<th>Planting</th>
<th>Reloading</th>
<th>Breakdown</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td>1044</td>
<td>353</td>
<td>25</td>
<td>1422</td>
</tr>
<tr>
<td>%</td>
<td>73.5</td>
<td>24.8</td>
<td>1.7</td>
<td>100</td>
</tr>
</tbody>
</table>

Planting: Time spent in the physical act of putting the bullets in the ground, walking and spacing between spots.

Reloading: Time spent walking to cache, reloading belt pouch and returning to planting area.

Breakdown: Time lost to planting due to tool breakdown, including walking to truck to get tool fixed and waiting.

Site B - Planting Check

<table>
<thead>
<tr>
<th>Ok</th>
<th>Shallow</th>
<th>Crushed</th>
<th>Clipped</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>81.7%</td>
<td>9.2%</td>
<td>7.1%</td>
<td>2%</td>
<td>100%</td>
</tr>
<tr>
<td>90.9%</td>
<td>9.1%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Production

The average production rate for all sites timed, including reloading, breaks and lost time due to break downs, was 170 trees/hr. In order to compare this rate with the previous report on the PAL-1, the planting time only should be considered, which gives an average production rate of 230 trees/hr. For comparison, on the Winkley Creek site, 5 planters worked with PAL-2 guns at the rate of 140/hr. for 7 1/2 hours, while 4 planters worked with dibbles and plug stock at the rate of 97/hr. for 7 1/2 hours. The difference in production was 44%.

Mechanical Performance:

The Forest Service PAL-2 planting gun (Figure 1) is a refinement of the PAL-1 gun tested in 1979. The gun works on the same principle of a circular ram sliding inside a rectangular tube to force the rectangular bullet into the ground using an action similar to that of a pile driver. The refinements are primarily of a technical nature to ease fabrication and reduce gun break-downs and gun derived bullet breakage. Problem areas still exist, the only major one being the slider material deforming on impact with the retaining pins during the up stroke. A minor design change can be made to remove the need for the pins and should reduce considerably or remove altogether the deformation of the slider, and should also make the tool somewhat quieter to use.
Design Aspects:

The PAL planting guns were designed with the planters' ergonomic needs in mind, thus the planter is probably the best critic as to the success or failure of the design. Also, the trial was the first in which the guns have been used long enough to find out if the theoretical benefits to the planter really exist.

All of the planters agreed that the PAL-2 gun was much easier, physically, to use than a Dibble, although one planter complained of sore wrists after a few days of planting. Upon watching the person use the gun, it was felt the soreness was caused by her technique of planting the bullets using many light strokes of the gun instead of the one or two more powerful strokes used by other planters. She changed her technique and did not have any further soreness in her wrists.

The noise caused by the action of the guns, greater than that of a Dibble, was a source of irritation.

Interestingly, the production rate did not change very dramatically from day to day, but did drop by up to 40% at times during the day. This would tend to indicate that excessive energy was being demanded in using this planting gun, but the drop was followed each day by an approximate 30% increase in production after a few hours so that the worker production was only 10% lower at the end of the shift relative to the start. A 10% drop through the shift is quite normal for strenuous physical effort. It should be noted that this planting crew was paid by the hour, had no incentive to plant at a higher rate, and yet improved production compared to dibble planting plug stock by a minimum of 30%.
Conclusions:

A) It can be expected that on a prepared site a crew could plant 30% more bullets using PAL-2 guns than they could plugs using standard dibles. Breakage depends greatly upon the amount of site preparation and prevalence of rock. An overall breakage rate of 5-10% was observed in this trial, but on the areas of the sites with good preparation and soft soil the breakage rate was as low as 1%, and production 50% higher.

B) The amount of physical effort required is less with the PAL-2 than with a dibble, especially with respect to bending over and resulting back strain.

C) The cost of fabricating the PAL-2 guns for this trial was approximately $130/each. The firm that fabricated these guns estimates costs at $80-$90/each in orders of 100 or more. The improvements noted earlier should not alter this cost by more than a few dollars, and may even reduce the cost slightly.
Recommendations:

A) Provided that CBW 210's are available in the appropriate quantity and species, a contract planting trial would provide more information and data on the practicalities and costs of the bullets and related planting.

B) If (A) is adopted, the existing PAL-2 guns should be modified or new PAL-2 guns with modifications be made in a number appropriate for the trial.

It should be noted that this trial was not intended to assess the biological or economic aspects of bullet planting as a whole, but only to look at the ergonomic, mechanical and planting concerns of the PAL-2 guns. It is impossible however to completely isolate the report's intended concerns from the biological and economic aspects, therefore the following attached comments are from the Silviculture staff of Likely Ranger District that supervised the trial.
APPENDICES
To: Engineering
Victoria

Attention: Bill Lane

Date: Sept. 11, 1980
File: 570-14-C93A 11-40 (c)

Re: Silviculture Aspects of Planting Gun in Horsefly (Likely) Forest Districts.

The overall performance of the planting gun and bullets was satisfactory in the experimental stage. However, before this tool can be used in production planting some minor modifications should be made to both the gun and bullets. I am sure you are aware of these.

Generally the crews production increased over conventional planting tools, but, we must also consider that the ground used was close to ideally prepared for planting. Production would have increased with conventional tools as well. At .12¢ per tree this was the cheapest area planted in Likely this year.

Production was hindered by the guns jamming and bullets shattering on subsurface rock. We also had some quality difficulties in that the bullets were not being planted deep enough, however, this would be easily rectified through crew supervision.

The silvicultural aspects of this tool are, of course, difficult to assess.

The root system is going to be the inhibiting factor in the trees growth. The roots in the bullets are supposed to break free of the plastic casing, but with the external pressure of the surrounding soil (especially compact soils) I am skeptical of the trees being able to break free and release the roots. Root systems on conventional stock appears to be the inhibiting factor on the plants growth and with the additional obstacle of the casing for the trees to overcome I feel the growth characteristics will be hindered. I don't know any possible solutions to this problem but perhaps you can come up with a casing that would be strong enough for the gun but would deteriorate in a couple of years to release the roots.
Quality of the stock was generally good. One problem we encountered was that the roots had grown through the holes in the casing. This caused the exposed roots to dry out, and, when planted, they would break off or be pushed up by the surrounding soil. This could be rectified in the nursery by insuring the roots don't grow to the point where they are coming out of the casing.

The Likely area has very limited potential for this tool because of the lack of suitable ground. The site must be free of rock and with relatively shallow duff and litter layers. Unfortunately most of the Likely district is quite rocky and in future our use of the gun will be limited to the sites that suit it.

We definitely feel there is a place for this tool in our reforestation program and we will be including trees for this gun in our future sowing requests.

Wayne Henke,
Resource Assistant

WH/1k
B.C. FOREST SERVICE
Reforestation Division
PLANTING INSPECTION REPORT

Project No.: C92A11-40(FS)
Unit No.: Contract
F.S. Lic. Contr. Bid Price
F.D. CAP B O 12 Area (unit) 17 A Spacing 28 28 m. S Y U.

PLANTING STOCK
Seeded: 3253 Age: Type: Balsam Fir Species: P1

Condition: Good Some yellowed needles
Storage & Handling (Remarks)
Cartons
Heel-in
Planting Bags

PLANTING EQUIPMENT
Guns (10) Dibblers

CREW ORGANIZATION
2 x 3

PLANTING QUALITY (From Inspection Plots)


1 5 5 4 1-3 (Ts)
2 4 4 2 1 1-3 c
3 3 3 2 1-3m
4 8 6 5 5
5 7 7 7
6 4 4 3
7 3 3 3
8 7 8 6 2-3 (Ts)
9 9 9 9
10 9 5 5
11 7 7 7
12 5 5

TOTAL FOR NAGEL BLOCK UNIT

Planting Difficulty Rating

1 2 3 4 5 6 7 8

10-20 points
21-30 points
31 plus points

Planted Trees:

Excess Trees:
Credit Sats. Ptd. Trees:
Unsat. Ptd. Trees:

Amount: $1 1 1 1 1

SPITEFUL

Total Points:

Forest Officer's Signature

5 704 (Rev. March/77)
**BC FOREST SERVICE**

**Reforestation Division**

**PLANTING INSPECTION REPORT**

Project No. C93A-11-39  
BLK: 11  
Contractor: D. Benner

**Site Characteristics and Points Rating**

<table>
<thead>
<tr>
<th>Site Characteristic</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetation</td>
<td>1</td>
</tr>
<tr>
<td>Infrquent grass, herbs &amp; low shrubs, Infrequent Natural</td>
<td>1</td>
</tr>
<tr>
<td>Continuous grass or other vegetation, natural planted trees</td>
<td>6</td>
</tr>
<tr>
<td>Thickness of duff or litter</td>
<td>0</td>
</tr>
<tr>
<td>Less than 5 cm (2 inches)</td>
<td>1</td>
</tr>
<tr>
<td>5-20 cm (2-8 inches)</td>
<td>0</td>
</tr>
<tr>
<td>Over 20 cm (8 inches)</td>
<td>6</td>
</tr>
<tr>
<td>Fine Debris</td>
<td>1</td>
</tr>
<tr>
<td>Scattered branches and tops</td>
<td>0</td>
</tr>
<tr>
<td>Grouped branches and tops, less than 1 m (3 ft) high, loose arrange</td>
<td>3</td>
</tr>
<tr>
<td>Piled branches and tops, more than 1 m high (3 ft) or in a continuous mat</td>
<td>6</td>
</tr>
<tr>
<td>Course Debris</td>
<td>1</td>
</tr>
<tr>
<td>Scattered logs</td>
<td>0</td>
</tr>
<tr>
<td>Frequent logs, some grouped and crossed, more than 1 m (3 ft) high</td>
<td>6</td>
</tr>
<tr>
<td>Stoniness</td>
<td>1</td>
</tr>
<tr>
<td>Infrquent stones or boulders</td>
<td>3</td>
</tr>
<tr>
<td>Frequent stones, boulders or coarse gravel</td>
<td>6</td>
</tr>
<tr>
<td>Definite hardpan or compact layer throughout</td>
<td>6</td>
</tr>
<tr>
<td>Compaction</td>
<td>1</td>
</tr>
<tr>
<td>Loosely packed</td>
<td>1</td>
</tr>
<tr>
<td>Occasional compact areas, e.g. landings</td>
<td>0</td>
</tr>
<tr>
<td>Slope</td>
<td>1</td>
</tr>
<tr>
<td>10 - 35%</td>
<td>0</td>
</tr>
<tr>
<td>25 - 65%</td>
<td>3</td>
</tr>
<tr>
<td>65% or over</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unplantable areas</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrquent patches of surface water, bedrock, etc</td>
<td>1</td>
</tr>
<tr>
<td>Frequent patches of less than 0.2 ha (2 ac)</td>
<td>3</td>
</tr>
<tr>
<td>Frequent patches of more than 0.2 ha (2 ac)</td>
<td>6</td>
</tr>
</tbody>
</table>

**Planting Difficulty Rating**

- 0-10 points: G1
- 11-20 points: G2
- 21-30 points: G3
- 31 plus points: G4

**Planting Difficulty Class:** G3 70%

**Plot Size:** sq.m.

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Plot No.</th>
<th>to</th>
<th>Line No.</th>
<th>Plot No.</th>
<th>to</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Bullets**

- Planing Spots:
  - 3253
  - Age & Type: 1-0 P
  - Species: PL

**Condition:** DRY, LUNG ROOTS

**Storage & Handling (Remarks):**

**Heel-In:**

**Planting Bag:**

**Crew Organization:** DIBBLES

1 x 1 - 5 Planters

**Planting Equipment:**

**Plots**

<table>
<thead>
<tr>
<th>Plot No.</th>
<th>Plantable Spots</th>
<th>No. of Trees Pltd.</th>
<th>Credit Spots.</th>
<th>Unstand. Spots. &amp; Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>5</td>
<td>6</td>
<td>3 3-3 SH</td>
<td>0 1110</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3 1-3 1-3 1-3</td>
<td>1 1111</td>
<td></td>
</tr>
</tbody>
</table>

**Credit Spots:**

<table>
<thead>
<tr>
<th>Plot No.</th>
<th>Plantable Spots</th>
<th>No. of Trees Pltd.</th>
<th>Credit Spots.</th>
<th>Unstand. Spots. &amp; Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2</td>
<td>9</td>
<td>9</td>
<td>0 1111</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5 1-2 1-2 1-2</td>
<td>1 1111</td>
<td></td>
</tr>
</tbody>
</table>

**Unplantable Trees:**

<table>
<thead>
<tr>
<th>Plot No.</th>
<th>Plantable Spots</th>
<th>No. of Trees Pltd.</th>
<th>Credit Spots.</th>
<th>Unstand. Spots. &amp; Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>4</td>
<td>4 1-2 1-2 1-2</td>
<td>1 1111</td>
<td></td>
</tr>
</tbody>
</table>

**Total for Page:** G1 1111

**Plant Quality Calculation:**

- Satisfactory Trees: 91
- Excess Trees: 0
- Unstand. Spots: 0

**Tolerance:** 1111

**Contractor's Signature:**

**Forest Officer's Signature:**
PLANTING SITE PRESCRIPTION

A. IDENTIFICATION

1. Forest District
2. R.D. No. and name
3. Location
4. S.Z.
5. PSYU/Other
6. UTM grid
7. Tenure
8. Project number and name

B. SITE FACTORS

1. Planting unit
2. Former stand: Spp
3. Biogeoclimatic subzone
4. Ecosystem
5. General soil texture: Clay, sand, loam, silt, gravel
6. Moisture: Dry, medium, wet
7. Soil nutrients: Poor, med., rich
8. Veget. compet.: N.L.M.H.
9. Grazing use: N.L.M.H.
10. Slash: % cover and height
11. Organic layer(s): cm
12. Disturbance symbol/year
13. Site prep.: Method/year
14. Aspect and % slope
15. Elevation: m
16. Planting diffic. class
17. Existing regen. per ha
18. Spacing: m
19. Plantable spots per ha
20. Net area to be planted: ha

C. ACCESS AND ACCOMMODATION

1. Access: Distances and means: Block II is 186 ft. from
2. Access problems
3. Other
4. Accommodation
5. W.D. is required
6. Date prescribed Oct 279 by Judy Siemens

D. EXAMINER'S RECOMMENDATIONS

1. Planting unit: Block II
2. Species: PSE
3. Type of stock: Plugs
4. Age or size class: 1-0
5. Type of planting tool: Dibble
6. Order of planting: 0
7. 000's of trees: 10 P
8. Season and year: Spring 30
9. Priority and reason: Also show on map
10. Access improvement and cost: Nil
11. Stock supplied to planters at: LILY RANGER STATION
12. To be planted by: F.S. Contract Other
13. Supervisor(s)
14. Crew
15. Vehicles
16. Estim. cost: Total $ Per tree
17. Duration of days 18. Start-up time days
19. Mandatory viewing? Leaving
20. Special clauses:
21. Advertise in:

E. STOCK ALLOCATED (by District Office)

<table>
<thead>
<tr>
<th>Unit</th>
<th>Spp.</th>
<th>Seed Lot</th>
<th>Stock Type</th>
<th>Age/Size Class</th>
<th>Nursery</th>
<th>000's of Trees</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approved Date Total
B.C. FOREST SERVICE—REFORESTATION DIVISION

PLANTING SITE PRESCRIPTION

A. IDENTIFICATION

Forest District... Caribou
2. R.D. No. and name... J-L Lively
3. Location... Winchey CRK
4. S.Z. 3690
5. PSYU/Other... Quewel... Lane 6. UTM grid...
6. Tenure... T.S. 9089.80
7. Project number and name... C93A.11-37(C9)

B. SITE FACTORS

<table>
<thead>
<tr>
<th>Factor</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planting unit</td>
<td>A</td>
</tr>
<tr>
<td>Former stand: Spp</td>
<td>Hc(8) 91-9</td>
</tr>
<tr>
<td>Biogeoclimatic subzone</td>
<td>CH 6</td>
</tr>
<tr>
<td>Ecosystem</td>
<td></td>
</tr>
<tr>
<td>General soil texture: Clay, sand, loam, silt, gravel</td>
<td>Si G</td>
</tr>
<tr>
<td>Moisture: Dry, medium, wet</td>
<td>MEO</td>
</tr>
<tr>
<td>Soil nutrients: Poor, med., rich</td>
<td>J</td>
</tr>
<tr>
<td>Grazing use: N.L.M.H.</td>
<td>N</td>
</tr>
<tr>
<td>Slash: % cover and height</td>
<td>57.0-32.0 m</td>
</tr>
<tr>
<td>Organic layer(s): cm</td>
<td>10.0 cm</td>
</tr>
<tr>
<td>Disturbance symbol/year</td>
<td>Winchey 79</td>
</tr>
<tr>
<td>Site prep: Method/year</td>
<td></td>
</tr>
<tr>
<td>Aspect and % slope</td>
<td>5.0-20.0%</td>
</tr>
<tr>
<td>Elevation: m</td>
<td>940</td>
</tr>
<tr>
<td>Planting diffic. class</td>
<td>1 M0</td>
</tr>
<tr>
<td>Existing regen. per ha</td>
<td>0</td>
</tr>
<tr>
<td>Spacing: m</td>
<td></td>
</tr>
<tr>
<td>Planted spots' per ha</td>
<td>137.1</td>
</tr>
<tr>
<td>Net area to be planted: ha</td>
<td>39.5</td>
</tr>
</tbody>
</table>

C. ACCESS AND ACCOMMODATION

Access: Distances and means... 10 MILE FROM RIVER B.S. ON WINCHERY CRK ROAD

Access problems... NO ONE

2. W.D. is required. 4. Accommodation

Other

Date prescribed... MAY 1980... By... L. Hone

D. EXAMINER'S RECOMMENDATIONS

1. Planting unit: A
2. Species: BULLETS + PLUGS
3. Type of stock: PLANTING GUN + PIECE
4. Age or size class: 1-0
5. Type of planting tool: PLANTING GUN + PIECE
6. Order of planting: 7
7. 000's of trees: 32
8. Season and year: 80
9. Priority and reason: LIVELY

10. Access improvement and cost: N/A

11. Stock supplied to planters at... LIVELY

12. To be planted by:
   F.S. [ ] Contract [ ] Type
   Licensee [ ] Name...
   Other [ ]

13. Supervisor(s): L. Hone

14. Crew: B PERSON CREW

15. Vehicles: 1 CRUMMY

16. Estim. cost: Total $... Per tree...

17. Duration... 2 WEEKS... days

18. Start-up time...

19. Mandatory viewing: N/A... Leaving...

20. Special clauses:

21. Advertise in...

E. STOCK ALLOCATED (by District Office)

<table>
<thead>
<tr>
<th>Unit</th>
<th>Spp.</th>
<th>Seed Lot</th>
<th>Stock Type</th>
<th>Age/Size Class</th>
<th>Nursery</th>
<th>000's of Trees</th>
</tr>
</thead>
</table>

Approved... Date... Total...
<table>
<thead>
<tr>
<th>FACTOR</th>
<th>SITE CHARACTERISTICS AND POINTS RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vegetation</td>
<td>Infrequent grass, herbs &amp; low shrubs.</td>
</tr>
<tr>
<td>2. Thickness of duff or litter</td>
<td>Less than 5 cm (2 inches)</td>
</tr>
<tr>
<td>3. Fine Debris</td>
<td>Scattered branches and tops.</td>
</tr>
<tr>
<td>4. Coarse debris</td>
<td>Scattered logs.</td>
</tr>
<tr>
<td>5. Stoniness</td>
<td>Infrequent stones or boulders.</td>
</tr>
<tr>
<td>6. Compaction</td>
<td>Loose</td>
</tr>
<tr>
<td>7. Slope</td>
<td>10 - 35%</td>
</tr>
<tr>
<td>8. Unplantable areas</td>
<td>Infrequent patches of surface water, bedrock, etc.</td>
</tr>
</tbody>
</table>

Circle one point rating in each of the eight factors and total: 16 points = EASY Planting Difficulty Rating

Planting Difficulty Class: Less than 10 points EASY 10 - 20 points 21 - 30 points 31 plus points
## PLANTING INSPECTION REPORT

**Reforestation Division**

**Planting Inspection Report**

**Project No.:** C93A11-37

**Unit No.:** A

**Contractor:** Darlene

**F.S.:** 94

**Lic. No.:** 894

**Contractor:** D. Benner

**Bid Price:** $100

**Contractor:** D. Benner

**Date:** May 26, 1980

---

**PLANTING STOCK**

**Seedlot:** 8

**Widely planted Species:** E

**Condition:** Good

**Storage & Handling:**

- Cartons: Yes
- Tree Placement: Yes
- Firmness: Yes
- Position of Stem: Yes

**PLANTING EQUIPMENT:**

- Shovels: 8

**CREW ORGANIZATION:**

- 3 crew members

---

**PLANTING QUALITY (From Inspection Plots):**

<table>
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<td>5</td>
<td>2</td>
<td>4</td>
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</tr>
</tbody>
</table>

**TOTAL FOR PAGE:**

- **PLANTING INSPECTION REPORT:**

  - **Widely planted Species:** E
  - **Condition:** Good
  - **Storage & Handling:**
    - Cartons: Yes
    - Tree Placement: Yes
    - Firmness: Yes
    - Position of Stem: Yes
  - **PLANTING EQUIPMENT:**
    - Shovels: 8
  - **CREW ORGANIZATION:**
    - 3 crew members
  - **PLANTING QUALITY (From Inspection Plots):**
    - **Line No.:**
    - **Plot No.:**
    - **No. of Trees Pltd.:**
    - **Excess Trees:**
    - **Credit Salts. Ptd.:**
    - **Unsat. Ptd.:**
    - **No. of Trees Pltd.:**
    - **Excess Trees:**
    - **Credit Salts. Ptd.:**
    - **Unsat. Ptd.:**
  - **CONTRACTOR’S SIGNATURE:**
    - D. Benner
  - **FOREST OFFICER’S SIGNATURE:**
    - J. Drimer
## B.C. FOREST SERVICE

**Restoration Division**

**PLANTING INSPECTION REPORT**

### Project No: C93AI 79

**WINNELL**

**Unit No:** GREEK

**Contractor:** D. RANLE

**Bid Price:** $ 1 Tree

**FD.**

**PSY.**

**S.Y.A.**

### PLANTING STOCK

<table>
<thead>
<tr>
<th>Seedlot</th>
<th>Age &amp; Type</th>
<th>Origin</th>
<th>Species</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>24/15</td>
<td>F-10 Bullets</td>
<td>Dry</td>
<td>Plugs</td>
<td>F-10 Species CBVW</td>
</tr>
</tbody>
</table>

**Storage & Handling (Remarks):**

- [ ] Canons
- [ ] Heel-in
- [ ] Planting Bags

**Exam.**

### CREW ORGANIZATION

<table>
<thead>
<tr>
<th>CREW</th>
<th>NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 CREWS</td>
<td></td>
</tr>
</tbody>
</table>

### PLANTING QUALITY (From Inspection Plots)

**PLOT SIZE:** 3.97 sq.m.

<table>
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<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>4</td>
<td>7</td>
<td>1-1 PP</td>
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<td>3</td>
<td>1-1 TC</td>
<td>3</td>
<td>1-1 TC</td>
</tr>
</tbody>
</table>

**TOTAL FOR PAGE:** 382

**COND.:** DRY, CASINGS ARE BREAKING

**CODE FOR UNSATISFACTORY TREES:**

1. Planting Spot Selection
2. Scaping or Screening
3. Planting Hole
4. Tree Placement
5. Firmness
6. Position of Stem or Crown

**NOTES:**

- Enter Code beside any trees in Unsatistactorily Planted Trees Column

---

**Contractor's Signature:** D. RANLE

**Forest Officer's Signature:** A. B. KAMMERS

---

**Note:** This report appears to be a detailed inspection report for the planting of trees, with specific details on the planting stock, quality of planting, and identification of unsatisfactory trees. The report includes columns for plantable spots, trees planted, excess trees, credit and unsatisfactory trees, and codes for unsatisfactory conditions. The calculations at the bottom indicate the overall quality score and provide a basis for the contractor's and forest officer's signatures.