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SUPPLEMENTARY DATA ON BASIC DENSITY OF MARITIME PINE PLANTED P82 TO P87

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SUMMARY

Supplementary data on basic wood density of pedigreed maritime pine (*Pinus pinaster*) planted in Gnangara, Pinjar and Yanchep plantations north of Perth from P82 to P87 were collected. The 12 mm diameter cores were cut into 35 mm sections, similar to the method used in the original survey in November 1998. Combining the supplementary data with the original showed that the mean basic density of the 70 to 105 mm section generally increased with the larger sample size.

INTRODUCTION

Previous reports that provided information on basic density of pedigreed maritime pine (*Pinus pinaster*) planted in Gnangara, Pinjar and Yanchep plantations north of Perth were by Siemon (1998) and Siemon (1999). These data were necessary as background information on resource quality, which was required for the LVL plant proposed by Sumitomo Corporation with Wesfi Ltd as a local partner.

The data in these reports showed a trend of decreasing basic density with decreasing age in the juvenile and adjacent wood. Wesfi were concerned about this trend, particularly as it affected the basic density of trees from P82 to P87. However, CALM considers that the trend results from continuing resin production after the initial heartwood formation. Similar trends have been reported in the southern pines (Koch 1972), and in South Africa (SA Forestry Department Annual Report 1963/4).

The other Wesfi concern was the lower density of veneers produced from the P82 logs sent to Japan for LVL trials, compared with the density data given by Siemon (1998). Further core samples were taken from P82 to P87 areas, and samples taken from immediately adjacent to plots sampled for the LVL logs for Japan.

METHODS

The additional sample taken was four trees per plot from each of five plots in each year P82 to P87, and taken from the same compartments as the original samples reported in Siemon (1988). Six trees were sampled from adjacent to the P80, P82 and P84 areas that provided the LVL logs for Japan. Sampling was done on 5 May, and the core volume estimates done in the laboratory the following day.

The same method was used to calculate basic density as used previously, i.e. the cores were cut into 35 mm long sections and the volume determined by immersion, and the sections weighed after being dried to constant weight (0 per cent moisture content) at 103°C overnight. Basic density was then calculated, and compared with results from the initial survey (Siemon 1998). Overall mean density and standard deviations were calculated.

RESULTS AND DISCUSSION

The additional sampling increased sample size from twenty to forty trees. The basic density results and those from the 1998 survey from the P82 to P87 planting years are given in Table 1, as well as the density from the six trees sampled adjacent to the LVL logs from P80, P82 and P84.

Table 1
Mean basic density and standard deviation of additional cores from P82 to P87, and cores from adjacent to LVL logs from P80, P82 and P84

YEAR	0-35 mm	35-70 mm	70-105 mm	105+ mm
1982	452 (39)	462 (34)	504 (53)	521 (-)
Previous data	445 (47)	450 (39)	479 (44)	
1983	438 (46)	449 (28)	500 (27)	
Previous data	425 (32)	447 (43)	461 (43)	
1984	399 (23)	440 (39)	479 (49)	
Previous data	422 (30)	465 (34)	512 (46)	
1985	417 (28)	464 (38)	487 (44)	
Previous data	414 (29)	433 (34)	450 (46)	
1986	398 (24)	435 (38)	469 (49)	
Previous data	393 (29)	434 (39)	459 (37)	
1987	388 (31)	439 (28)	486 (37)	
Previous data	388 (20)	437 (29)	410 (24)	
Near 1980 LVL logs	425 (18)	483 (33)	505 (44)	
Near 1982 LVL logs	413 (28)	432 (19)	484 (-)	
Near 1984 LVL logs	403 (26)	426 (18)	459 (9)	

The overall mean basic density and standard deviation of the P82 to P87 logs was calculated, with a sample size of forty trees in each planting year (Table 2). The mean was not the same as the average of the figure from the results in Table 1 if the sample size was different as occurred in the 70 to 105 mm sections.

Table 2
Overall basic density data for P82 to P87 maritime pine

YEAR	0-35 mm	35-70 mm	70-105 mm
1982	449 (43)	456 (37)	490 (49)
1983	432 (39)	448 (36)	476 (43)
1984	411 (29)	453 (38)	494 (49)
1985	416 (29)	451 (39)	463 (48)
1986	393 (27)	434 (38)	462 (40)
1987	388 (26)	438 (28)	442 (49)

The pedigreed material planted from P76 to P95 came from the Mullaloo seed orchard, and consequently the same genetic material was planted (Hopkins and Butcher 1994). Some culling over the years had removed some of the poorer parents, including those with lower than average basic density. Silvicultural systems have not changed, and the range of sites over Gnangara, Pinjar and Yanchep plantations is similar.

Comparison of matched routine and pedigreed trees growing adjacent in a P73 stand showed that basic density in both treatments was similar, although the pedigreed had produced about 30 per cent greater volume (Hill 1999). The cores taken from seven different heights in the tree (1.3 m, 2.4 m, 4.8 m, 7.2 m, 9.6 m, 12.0 m and 14.4 m) were measured in five ring sections (0-5, 6-10, 11-15, 15+), allowing the comparison.

The basic density survey by Siemon (1998) in Gnangara, Pinjar and Yanchep, which compared pedigreed material from P72 to P87 showed definite trends of increasing density with increasing age, using breast height samples. These trends are shown in Tables 1 and 2 above. The trend was most pronounced in the first 35 mm core sections, and can be explained by the resin content increasing with time. A similar trend has been reported in the southern pines by Koch (1972). An additional report by Siemon (1999a) confirmed the uniform trend of decreasing average basic density with increasing height in the tree (Table 2).

Wesfi's main concern came from the younger samples in the batches of logs from P72 to P84 which were sent to Japan for an LVL trial. When sampling additional trees adjacent to the areas logged, it became apparent that the low densities of logs from the younger stands (P80, P82 and P84), compared with the data from the Siemon (1998) survey, was the result of felling edge trees. The author was subsequently advised that these trees were larger than those in the main compartment, and were needed to achieve the minimum log diameter requirement for LVL production. The consequence was the logs had lower basic density, because edge trees grow faster and have lower wood density than trees inside the compartment. These edge trees are not representative of the stand.

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