**Additional File 1 – Information about the datasets used to develop the spiral grain angle models**

**Table 1. Summary of the studies in which spiral grain angle data were collected.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Site No. | Region | Forest | Age (yrs) | No. of trees | Heights | Rings |
| 1 | Auckland | Tairua | 11 | 60 | 0,1.4,6.4,11.4 | 2, 4, 6, 8, 10, 11 |
| 2 | Auckland | Mangakahia | 19 | 38 | 5, 10, 15 | 2, 4, 6, 8, 10, 15 |
| 3 | Auckland | Mangakahia | 23 | 40 | 0, 1.4, 5,10,15,20,25 | 2, 4, 6, 8, 10, 15 |
| 4 | Auckland | Aupouri | 25 | 10 | 0, 1.4, 5, 10,15,20, 25 | 5, 10, 15, 20, 25 |
| 5 | Auckland | Athenree | 25 | 10 | 0, 1.4, 5, 10,15, 20, 25 | 5, 10, 15, 20, 25 |
| 6 | Auckland | Woodhill | 33 | 20 | 1.4, 5, 10,15,20,25, 30 | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 |
| 7 | Auckland | Northland Forests | - | 83 logs | Varies - peeler logs cut in half | 2, 4, 6, 8, 10, 15, 20 |
| 8 | Rotorua | Rerewhakaaitu | 12 | 30 | 0, 1.4, 5, 10 | 2, 4, 6, 8, 10 |
| 9 | Rotorua | Rotoehu | 13 | 25 | 0, 1.4,5.5,10,15, 20 | 2, 4, 6, 8, 10, 12, 14 |
| 11 | Rotorua | Rotoehu | 15 | 25 | 0, 1.4,5.5,10,15,20 | 2, 4, 6, 8, 10, 12, 14 |
| 12 | Rotorua | Kaingaroa | 16 | 25 | 0,1.4,6,11,16,21 | 2, 4, 6, 8, 10, 12, 14 |
| 13 | Rotorua | Tarawera | 17 | 69 | 1.4, 5,10 | 2, 4, 6, 8, 10, 12, 14, 16 |
| 14 | Rotorua | Tikitere | 19 | 9 | 0,6,11,15 | 2, 4, 6, 8, 10, 12, 14, 16, 18 |
| 15 | Rotorua | Kaingaroa | 21 | 30 | 0,4.9,9.8,14.7,19.6, 24 | 2,4,6,8,10,12,14,16,18, 20 |
| 16 | Rotorua | Kaingaroa | 22 | 14 | 5.5 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 |
| 17 | Rotorua | Kaingaroa | 22? | 16 | 0, 1.4, 7, 12.5, 18, 23 | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22 |
| 18 | Rotorua | Tarawera Valley | 23 | 11 | 0, 4.9, 9.8, 14.7, 19.6, 24.5 | 2, 4, 6, 8, 10, 15, 20 |
| 19 | Rotorua | Tikitere | 23 | 20 | 0, 5, 10, 15, 20, 25, 30 | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22 |
| 20 | Rotorua | Puruki Exp Catchment | 24 | 33 | 0, 5, 10, 15, 20, 25, 30 | 2, 4, 6, 8, 10, 15, 20, outer ring |
| 21 | Rotorua | Kaingaroa | 25 | 7 | 0, 1.4, 7, 12.5, 17.5, 23 | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24 |
| 22 | Rotorua | Kaingaroa | 11 | 60 | 0, 1.4, 6.4, 11.4 | 2, 4, 6, 8, 10, 11 |
| 23 | Rotorua | Kaingaroa | 25 | 50 | 0, 6, 11, 16, 21, 26 | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22 |
| 24 | Rotorua | Kaingaroa | 25 | 20 | 0, 1.4, 6.4, 11.4, 16.4, 21, 26, 31 | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24 |
| 25 | Rotorua | Kaingaroa | 25 | 25 | 0, 5, 10 | 5, 10, 15, 25 |
| 26 | Rotorua | Kaingaroa | 25 | 10 | 0, 1.4, 5, 10, 15, 20, 25 | 5, 10, 15, 20, 25 |
| 27 | Rotorua | Kaingaroa | 25 | 10 | 0, 1.4, 5, 10, 15, 20, 25 | 5, 10, 15, 20, 25 |
| 28 | Rotorua | Kaingaroa | 26 | 30 | 0, 5, 10, 15, 20, 25 | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24 |
| 29 | Rotorua | Tikitere | 26 | 19+59 2nd log discs | 0, 5, 10, 15, 20, 25 | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22 |

**Table 1 continued**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Site No. | Region | Forest | | Age (yrs) | | No. of trees | | Heights | Rings | |
| 30 | Rotorua | Kaingaroa | | 27 | | 20 | | 0, 3.9, 8.8, 13.7, 18.6, 23.4, 28.2 | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26 | |
| 31 | Rotorua | Kaingaroa | | 27 | | 20 | | 0, 1.4, 5, 10, 15, 20, 25, 30, 35 | 2, 4, 6, 8, 10, 15, 20, 25, outer ring | |
| 32 | Rotorua | Kaingaroa | | 28 | | 22 | | 0, 2.5, 5, 7.5, 10, 12.5, 15, 17.5, 20, 22.5, 25, 30, 35 | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26 | |
| 33 | Rotorua | Northern Boundary | | 28 | | 20 | | 1.4 | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 27 | |
| 34 | Rotorua | Kaingaroa | | 30 | | 30 | | 0, 5, 10, 15, 20, 25, 30 | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 | |
| 35 | Rotorua | Kaingaroa | | 33 | | 19 | | 10 | 2,4,6,8,10,12,15,20,25 | |
| 36 | Rotorua | Tarawera Valley | | 35 | | 30 | | 0, 5, 10, 15, 20, 25, 30, 35 | 2, 4, 6, 8, 10, 15, 20, 25 | |
| 37 | East Coast | Ruatoria | | 25 | | 10 | | 0, 1.4, 5, 10, 15, 20, 25 | 5, 10, 15, 20, 25 | |
| 38 | East Coast | Confidential | 17-26 | | 95 | | 1.4 | | | 2,4,6,8,10,15,20,25 | |
| 39 | East Coast | Confidential | - | | 24 | | 0,5.5,11,16.5,20,24 | | | 2,4,6,8,10,15,20,25 | |
| 40 | East Coast | Confidential | - | | 22 | | 0,5.5,11,16.5,20,24 | | | 2,4, 6,8, 10, 15, 20, 25 | |
| 41 | Hawkes Bay | Mohaka | 25 | | 10 | | 0,1.4,5,10,15,20,25 | | | 5, 10, 15, 20, 25 | |
| 42 | Wellington | Lismore | 25 | | 6 | | 0,1.4,5,10,15,20,25 | | | 5, 10, 15, 20, 25 | |
| 43 | Wellington | Ngaumu | 25 | | 10 | | 0,1.4,5,10,15,20,25 | | | 5, 10, 15, 20, 25 | |
| 44 | Nelson | Confidential | 22 | | 15 | | 0,4.5,10.2,15.9 | | | 2, 4, 6, 8, 10, 15, 20 | |
| 45 | Nelson | Tasman Forest Nelson | 25 | | 30 | | 0,6,12 | | | 14, 20, 25 | |
| 46 | Nelson | Golden Downs | 25 | | 25 | | 0,5,10 | | | 5, 10, 15, 25 | |
| 47 | Nelson | Rabbit Island | 25 | | 10 | | 0,1.4,5,10,15,20,25 | | | 5, 10, 15, 20, 25 | |
| 48 | Nelson | Golden Downs | 25 | | 10 | | 0,1.4,5,10,15,20,25 | | | 5, 10, 15, 20, 25 | |
| 49 | Nelson | Waimea | 25 | | 10 | | 0,1.4,5,10,15,20,25 | | | 5, 10, 15, 20, 25 | |
| 50 | Nelson | Golden Downs | 33 | | 9 + 5X1.4m discs | | 1.4,5,10,15,20,25,30 | | | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 | |
| 51 | Canterbury | Ashley | 25 | | 10 | | 0,1.4,5,10,15,20,25 | | | 5, 10, 15, 20, 25 | |
| 52 | Canterbury | Eyrewell | 25 | | 10 | | 0, 1.4,5,10,15,20, 25 | | | 5, 10, 15, 20, 25 | |
| 53 | Canterbury | Waimate | 25 | | 10 | | 0,1.4,5,10,15,20,25 | | | 5, 10, 15, 20, 25 | |
| 54 | Southland | Confidential | 25 | | 10 | | 1.4, 5.7, 11.2, 16.7 | | | 2, 4, 6, 8, 10, 15, 20 | |
| 55 | Southland | Blackmount | 25 | | 2 | | 0, 1.4, 5, 10, 15, 20, 25 | | | 5, 10, 15, 20, 25 | |
| 56 | Southland | Rowallan | 25 | | 7 | | 0, 1.4, 5, 10, 15, 20, 25 | | | 5, 10, 15, 20, 25 | |
| 57 | Southland | Longwood | 25 | | 6 | | 0,1.4,5,10,15,20,25 | | | 5, 10, 15, 20, 25 | |
| 58 | Southland | Confidential | 26 | | 10 | | 1.4, 5.7, 11.2, 16.7 | | | 2, 4, 6, 8, 10, 15, 20, 25 | |

**Summary of unpublished reports**

**A list of unpublished reports that contain more information about the datasets used to develop the model is given below. Reports that are commercially sensitive are not included in the list below. Access to these reports is on a case by case basis. Permission to access reports produced for the Wood Quality Initiative will need to be obtained from WQI (**[www.wqi.co.nz](http://www.wqi.co.nz)**), while permission for reports produced for the Radiata Pine Breeding Cooperative (now Company) needs to be obtained from RPBC (**[www.rpbc.co.nz](http://www.rpbc.co.nz)**).**

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