

Appendix 9. Detailed annual rainfall (mm), tree and shrub foliage projected canopy cover (FPC%) for 77 land systems (Dawson 1974 and Mills and Lee 1990) encountered in the assessment of 20 grazing properties in south-west Queensland.

| Land System | Area (ha) | Rainfall (mm) | Tree (FPC %) | Shrub (FPC %) | Total (FPC %) |
|-------------|-----------|---------------|--------------|---------------|---------------|
| A1 | 6991 | 385 | 0.0 | 0.0 | 0.0 |
| A2 | 740 | 330 | 0.0 | 5.0 | 5.0 |
| A2 | 848 | 310 | 0.0 | 0.0 | 0.0 |
| A2 | 170 | 312 | 0.0 | 0.0 | 0.0 |
| A2/A3 | 1225 | 300 | 0.0 | 3.0 | 3.0 |
| A2/A3/W3 | 1776 | 320 | 0.0 | 0.0 | 0.0 |
| A2/M2/W3 | 1170 | 312 | 0.0 | 0.0 | 0.0 |
| A2/W3 | 2270 | 312 | 0.0 | 0.0 | 0.0 |
| A2/W4 | 4512 | 303 | 0.0 | 0.0 | 0.0 |
| A3 | 210 | 351 | 0.0 | 8.0 | 8.0 |
| A3 | 138 | 380 | 1.0 | 5.0 | 6.0 |
| A5/W4 | 5718 | 310 | 8.4 | 1.3 | 9.5 |
| A6 | 1654 | 300 | 12.0 | 0.0 | 12.0 |
| A6 | 2394 | 380 | 2.0 | 3.0 | 4.9 |
| A6 | 1969 | 340 | 18.0 | 5.0 | 22.1 |
| A6 | 1239 | 310 | 6.5 | 3.0 | 9.3 |
| A6 | 316 | 303 | 5.5 | 6.0 | 11.2 |
| C3 | 718 | 303 | 5.0 | 0.0 | 5.0 |
| D1 | 312 | 399 | 7.5 | 10.0 | 16.8 |
| D1 | 100 | 320 | 5.0 | 5.0 | 9.8 |
| D7 | 1270 | 351 | 18.0 | 19.0 | 33.6 |
| D7 | 1485 | 303 | 0.0 | 2.0 | 2.0 |
| D7/S2 | 1292 | 351 | 11.0 | 20.0 | 28.8 |
| D7/S2 | 9155 | 303 | 3.5 | 17.0 | 19.9 |
| E1 | 1694 | 415 | 5.0 | 1.3 | 6.2 |
| E1 | 176 | 450 | 13.0 | 0.0 | 13.0 |
| E2 | 1837 | 500 | 9.8 | 3.6 | 13.0 |
| E2 | 2269 | 425 | 9.2 | 5.0 | 13.7 |
| E2 | 1671 | 385 | 11.6 | 10.0 | 20.4 |
| E3 | 2090 | 490 | 11.0 | 5.0 | 15.5 |
| E4 | 1646 | 415 | 12.5 | 1.5 | 13.8 |
| E4 | 717 | 450 | 23.2 | 5.8 | 27.7 |
| E4 | 1262 | 399 | 11.7 | 1.7 | 13.2 |
| E4 | 2419 | 444 | 16.5 | 11.5 | 26.1 |
| E4 | 2747 | 399 | 6.3 | 0.5 | 6.7 |
| F2 | 132 | 340 | 0.0 | 0.0 | 0.0 |
| F2 | 115 | 310 | 0.0 | 0.0 | 0.0 |
| G1 | 110 | 351 | 20.0 | 18.0 | 34.4 |
| G1 | 4147 | 300 | 10.0 | 3.0 | 12.7 |
| G2 | 279 | 330 | 0.0 | 0.0 | 0.0 |
| G2 | 6690 | 340 | 2.0 | 12.0 | 13.8 |
| G2 | 262 | 340 | 6.0 | 5.0 | 10.7 |
| G2 | 346 | 303 | 3.0 | 17.0 | 19.5 |
| G2 | 1034 | 399 | 25.0 | 12.5 | 34.4 |

Appendix 9 Continued

| Land System | Area (ha) | Rainfall (mm) | Tree (FPC %) | Shrub (FPC %) | Total (FPC %) |
|-------------|-----------|---------------|--------------|---------------|---------------|
| G2/H2 | 4796 | 330 | 12.0 | 7.0 | 18.2 |
| G2/H2 | 501 | 330 | 0.0 | 12.0 | 12.0 |
| G2/H2 | 6985 | 310 | 7.5 | 1.5 | 8.9 |
| G2/H2 | 3644 | 310 | 6.9 | 1.0 | 7.8 |
| G2/H2/H4 | 785 | 303 | 5.0 | 0.0 | 5.0 |
| G3 | 2432 | 385 | 4.0 | 1.2 | 5.2 |
| G4 | 3849 | 310 | 5.0 | 0.0 | 5.0 |
| G5 | 134 | 330 | 15.0 | 10.0 | 23.5 |
| G5 | 122 | 330 | 16.0 | 15.0 | 28.6 |
| G5 | 1800 | 312 | 25.0 | 0.0 | 25.0 |
| G5/W6 | 1460 | 300 | 12.0 | 9.0 | 19.9 |
| G5/W6 | 1170 | 320 | 19.0 | 5.0 | 23.1 |
| H1 | 6640 | 500 | 15.5 | 0.0 | 15.5 |
| H1 | 3848 | 450 | 20.3 | 3.0 | 22.7 |
| H1 | 421 | 330 | 5.0 | 10.0 | 14.5 |
| H1cleared | 416 | 490 | 1.0 | 0.0 | 1.0 |
| H1natural | 4408 | 490 | 25.4 | 0.0 | 25.4 |
| H2 | 235 | 330 | 0.0 | 0.0 | 0.0 |
| H2 | 4559 | 351 | 4.0 | 6.0 | 9.8 |
| H2 | 3462 | 380 | 5.0 | 13.0 | 17.4 |
| H2 | 12457 | 425 | 11.4 | 6.0 | 16.7 |
| H2 | 2362 | 310 | 7.0 | 0.0 | 7.0 |
| H2 | 13669 | 385 | 3.7 | 14.1 | 17.3 |
| H2 | 4060 | 312 | 0.0 | 0.0 | 0.0 |
| H2/G2 | 4566 | 300 | 5.0 | 0.0 | 5.0 |
| H2/G2 | 4330 | 312 | 7.0 | 0.0 | 7.0 |
| H2/G2 | 9840 | 312 | 0.0 | 0.0 | 0.0 |
| H2/H4 | 3181 | 330 | 13.0 | 4.0 | 16.5 |
| H2/H4 | 7221 | 300 | 6.0 | 1.0 | 6.9 |
| H2/H4 | 928 | 380 | 6.0 | 6.0 | 11.6 |
| H2/H4 | 6032 | 330 | 5.0 | 2.0 | 6.9 |
| H2/H4 | 1310 | 312 | 0.0 | 0.0 | 0.0 |
| H2/H4 | 2060 | 303 | 9.0 | 0.0 | 9.0 |
| H2/M2 | 4065 | 300 | 15.0 | 0.0 | 15.0 |
| H2/M2 | 1540 | 312 | 0.0 | 0.0 | 0.0 |
| H3 | 15954 | 415 | 6.4 | 5.9 | 11.9 |
| H3 | 684 | 450 | 19.5 | 0.0 | 19.5 |
| H3 | 2606 | 351 | 1.0 | 15.0 | 15.9 |
| H3 | 536 | 303 | 12.0 | 9.0 | 19.9 |
| H3 | 12029 | 444 | 12.0 | 1.7 | 13.5 |
| H3/H4 | 4905 | 303 | 6.7 | 9.5 | 15.6 |
| H3/R3 | 3395 | 310 | 9.0 | 1.5 | 10.4 |
| H3/R5 | 4711 | 351 | 0.0 | 4.0 | 4.0 |
| H4 | 178 | 330 | 10.0 | 4.0 | 13.6 |
| H4 | 2175 | 300 | 15.0 | 5.0 | 19.3 |
| H4 | 553 | 399 | 6.0 | 0.0 | 6.0 |
| H4 | 2029 | 310 | 1.0 | 1.5 | 2.5 |
| H4 | 285 | 340 | 5.0 | 4.0 | 8.8 |
| H4 | 9613 | 399 | 4.2 | 19.5 | 22.9 |
| H4/G2 | 980 | 340 | 16.0 | 3.0 | 18.5 |
| H4/G2 | 1536 | 310 | 6.0 | 4.0 | 9.8 |
| H4/G2 | 6379 | 310 | 8.8 | 3.8 | 12.2 |

Appendix 9 Continued

| Land System | Area (ha) | Rainfall (mm) | Tree (FPC %) | Shrub (FPC %) | Total (FPC %) |
|-------------|-----------|---------------|--------------|---------------|---------------|
| H4/H2 | 565 | 330 | 4.0 | 2.5 | 6.4 |
| H4/H2 | 17024 | 340 | 7.0 | 3.0 | 9.8 |
| H4/R2 | 8745 | 380 | 20.0 | 8.0 | 26.4 |
| H4/R5 | 134 | 303 | 5.0 | 0.0 | 5.0 |
| L1 | 874 | 415 | 0.0 | 0.0 | 0.0 |
| L1 | 58 | 330 | 0.0 | 0.0 | 0.0 |
| L1 | 902 | 351 | 27.0 | 12.0 | 35.8 |
| L1 | 2640 | 399 | 0.0 | 0.0 | 0.0 |
| L1 | 613 | 303 | 0.0 | 0.0 | 0.0 |
| L1 | 1581 | 444 | 8.5 | 0.0 | 8.5 |
| L2 | 499 | 450 | 10.4 | 0.0 | 10.4 |
| L2 | 908 | 351 | 0.0 | 0.0 | 0.0 |
| L2 | 891 | 320 | 3.5 | 4.0 | 7.4 |
| L2 | 2576 | 399 | 5.2 | 0.8 | 6.0 |
| M1 | 9899 | 500 | 15.4 | 0.0 | 15.4 |
| M1 | 72 | 330 | 18.0 | 0.0 | 18.0 |
| M1 | 1399 | 300 | 15.0 | 19.0 | 31.2 |
| M1 | 678 | 380 | 13.0 | 5.0 | 17.4 |
| M1 | 386 | 340 | 6.0 | 0.0 | 6.0 |
| M1 | 1416 | 303 | 21.0 | 0.0 | 21.0 |
| M1/M2 | 775 | 340 | 24.0 | 6.0 | 28.6 |
| M1 | 3889 | 490 | 3.2 | 0.0 | 3.2 |
| M1 | 6972 | 490 | 16.9 | 4.0 | 20.2 |
| M1 | 3055 | 490 | 30.6 | 0.0 | 30.6 |
| M2 | 12324 | 415 | 10.9 | 5.1 | 15.4 |
| M2 | 1936 | 330 | 7.0 | 0.0 | 7.0 |
| M2 | 16648 | 450 | 19.9 | 0.3 | 20.1 |
| M2 | 1848 | 351 | 19.0 | 0.0 | 19.0 |
| M2 | 3920 | 380 | 12.0 | 2.0 | 13.8 |
| M2 | 26078 | 399 | 10.7 | 5.4 | 15.6 |
| M2 | 2684 | 330 | 14.0 | 2.0 | 15.7 |
| M2 | 253 | 310 | 15.0 | 0.0 | 15.0 |
| M2 | 4588 | 340 | 18.0 | 0.0 | 18.0 |
| M2 | 5050 | 312 | 14.2 | 0.0 | 14.2 |
| M2 | 13500 | 444 | 12.0 | 9.6 | 20.4 |
| M2 | 18958 | 399 | 12.2 | 13.3 | 23.9 |
| M2/H2 | 1105 | 330 | 10.0 | 27.0 | 34.3 |
| M2/H2 | 5913 | 351 | 12.0 | 5.0 | 16.4 |
| M2/H2 | 4698 | 300 | 10.0 | 0.0 | 10.0 |
| M2/H2 | 1126 | 380 | 7.0 | 5.0 | 11.7 |
| M2/H2 | 2481 | 320 | 9.0 | 14.0 | 21.7 |
| M2/M1 | 8414 | 351 | 19.0 | 0.0 | 19.0 |
| M2/M1 | 2500 | 340 | 13.0 | 4.0 | 16.5 |
| M2/M3 | 5203 | 380 | 12.0 | 8.0 | 19.0 |
| M2/S2 | 1893 | 351 | 10.0 | 8.0 | 17.2 |
| M2/S2 | 1964 | 303 | 14.5 | 2.0 | 16.2 |
| M2cleared | 2969 | 450 | 13.6 | 1.0 | 14.5 |
| M3 | 144 | 330 | 20.0 | 8.0 | 26.4 |
| M3 | 672 | 380 | 7.0 | 18.0 | 23.7 |
| M4 | 4822 | 425 | 11.8 | 2.8 | 14.2 |
| M4/H2 | 15302 | 340 | 13.0 | 6.0 | 18.2 |
| M5 | 1978 | 385 | 10.3 | 7.0 | 16.5 |

Appendix 9 Continued

| Land System | Area (ha) | Rainfall (mm) | Tree (FPC %) | Shrub (FPC %) | Total (FPC %) |
|-------------|-----------|---------------|--------------|---------------|---------------|
| N1 | 4953 | 450 | 6.0 | 26.3 | 30.8 |
| N1 | 9100 | 399 | 12.7 | 15.0 | 25.8 |
| N1 | 2200 | 444 | 11.3 | 18.4 | 27.6 |
| N1 | 1951 | 399 | 0.0 | 7.0 | 7.0 |
| R1 | 1124 | 490 | 30.0 | 0.0 | 30.0 |
| R2 | 1382 | 415 | 8.4 | 37.3 | 42.6 |
| R2 | 2681 | 425 | 10.3 | 38.3 | 44.7 |
| R2 | 64 | 340 | 0.0 | 0.0 | 0.0 |
| R2/H4 | 8375 | 300 | 0.0 | 7.0 | 7.0 |
| R2/H4 | 3161 | 340 | 6.0 | 13.0 | 18.2 |
| R3 | 5511 | 385 | 11.0 | 22.0 | 30.6 |
| R5 | 6671 | 310 | 10.0 | 5.0 | 14.5 |
| R5 | 280 | 312 | 0.0 | 0.0 | 0.0 |
| R5 | 556 | 303 | 9.0 | 0.0 | 9.0 |
| R6/H4/G5 | 7504 | 340 | 19.0 | 6.0 | 23.9 |
| S2 | 4820 | 330 | 6.0 | 27.0 | 31.4 |
| S2 | 6760 | 351 | 7.0 | 24.0 | 29.3 |
| S2 | 166 | 385 | 18.0 | 2.0 | 19.6 |
| S2 | 12635 | 320 | 10.6 | 20.6 | 29.0 |
| S2 | 9310 | 312 | 8.0 | 23.6 | 29.7 |
| S2 | 2505 | 399 | 5.3 | 14.0 | 18.5 |
| S3 | 3660 | 312 | 8.6 | 14.5 | 21.9 |
| W1 | 1064 | 415 | 5.0 | 0.0 | 5.0 |
| W1 | 1418 | 330 | 5.0 | 0.0 | 5.0 |
| W1 | 1878 | 330 | 5.0 | 0.0 | 5.0 |
| W1 | 1131 | 385 | 11.0 | 5.6 | 16.0 |
| W1/A3 | 1414 | 330 | 0.0 | 0.0 | 0.0 |
| W2 | 413 | 330 | 0.0 | 8.0 | 8.0 |
| W3 | 1172 | 330 | 0.0 | 24.0 | 24.0 |
| W3 | 404 | 351 | 0.0 | 0.0 | 0.0 |
| W3 | 584 | 340 | 0.0 | 0.0 | 0.0 |
| W3 | 2374 | 340 | 11.0 | 7.0 | 17.2 |
| W3 | 7310 | 312 | 0.0 | 0.0 | 0.0 |
| W3/A2 | 2610 | 312 | 0.0 | 0.0 | 0.0 |
| W3/A5 | 3230 | 312 | 0.0 | 0.0 | 0.0 |
| W3/A6 | 7507 | 330 | 14.0 | 7.0 | 20.0 |
| W3/G5 | 1280 | 340 | 15.0 | 7.0 | 21.0 |
| W4 | 1194 | 380 | 8.0 | 0.0 | 8.0 |
| W4 | 368 | 330 | 10.0 | 11.0 | 19.9 |
| W4 | 970 | 312 | 0.0 | 0.0 | 0.0 |
| W6 | 197 | 330 | 8.0 | 13.0 | 20.0 |
| W6 | 515 | 300 | 0.0 | 0.0 | 0.0 |
| W6 | 154 | 330 | 12.0 | 19.0 | 28.7 |
| W6 | 695 | 340 | 25.0 | 0.0 | 25.0 |
| W6 | 1151 | 385 | 20.0 | 0.0 | 20.0 |
| W7 | 2250 | 312 | 0.0 | 0.0 | 0.0 |
| Sum | 658325 | | | | |
| Average | 3393 | 357 | 8.7 | 5.6 | 13.7 |
| Maximum | 26078 | 500 | 30.6 | 38.3 | 44.7 |
| Minimum | 58 | 300 | 0.0 | 0.0 | 0.0 |

Appendix 10. Recent validation of the GRASP model to independent data from south-west Queensland.

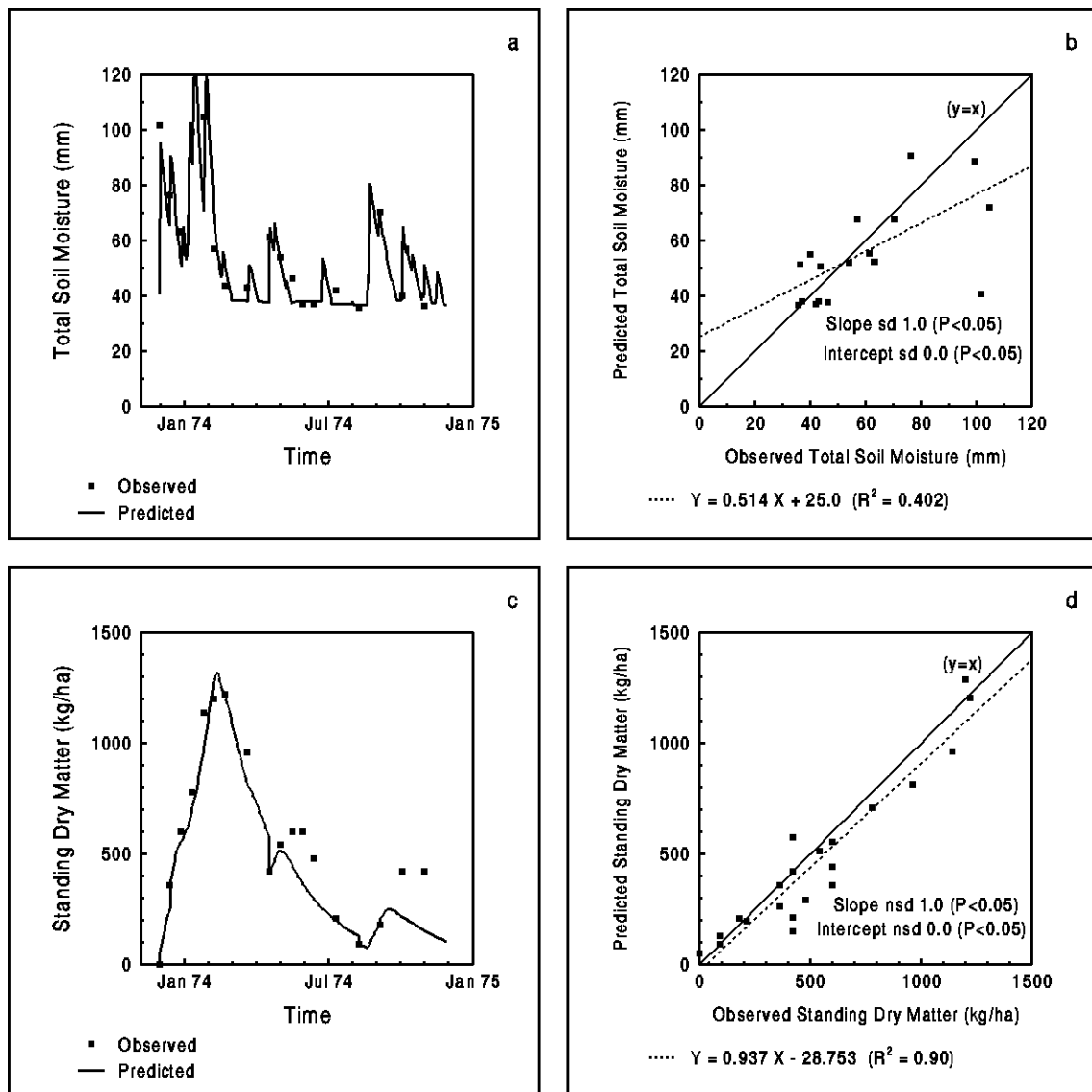


Figure 10.1 Predicted and observed standing dry matter and total soil moisture using the data of Christie (1978) to validate the GRASP model to mulga pastures near Charleville in south-west Queensland (Same data as Figure 4.14 on Page 68).

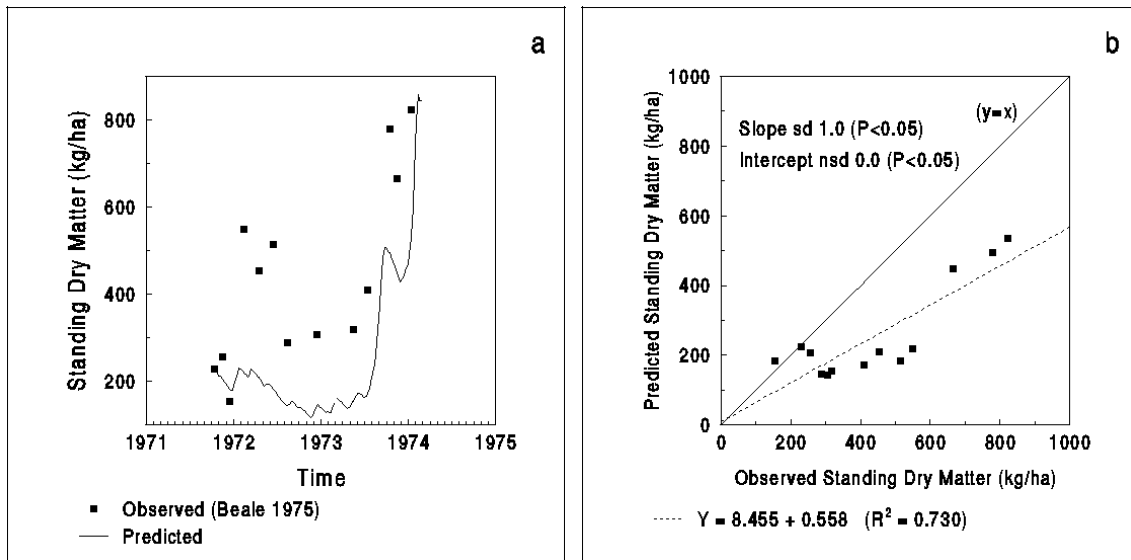


Figure 10.2 Predicted and observed standing dry matter using the data of Beale (1975) to validate the GRASP model to mulga pastures at 'Halton' near Charleville in south-west Queensland.

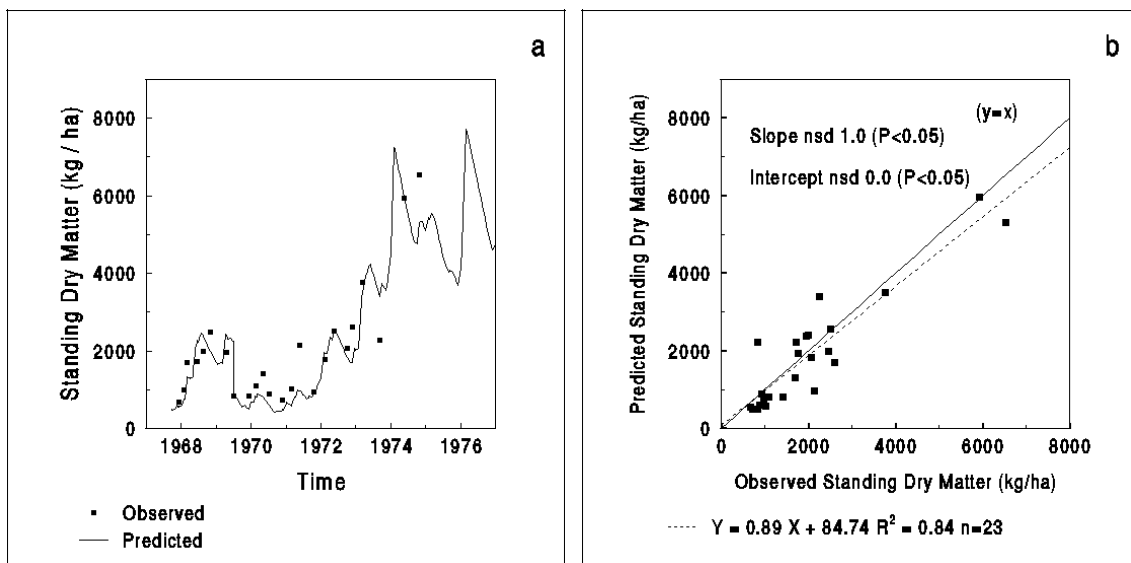


Figure 10.3 Predicted and observed standing dry matter using the data of Orr *et al.* (in prep.) to validate the GRASP model to buffel grass pastures on cleared gidyea country in the 'Eastwood' grazing trial (0.4 ha/DSE treatment) near Blackall in south-west Queensland.

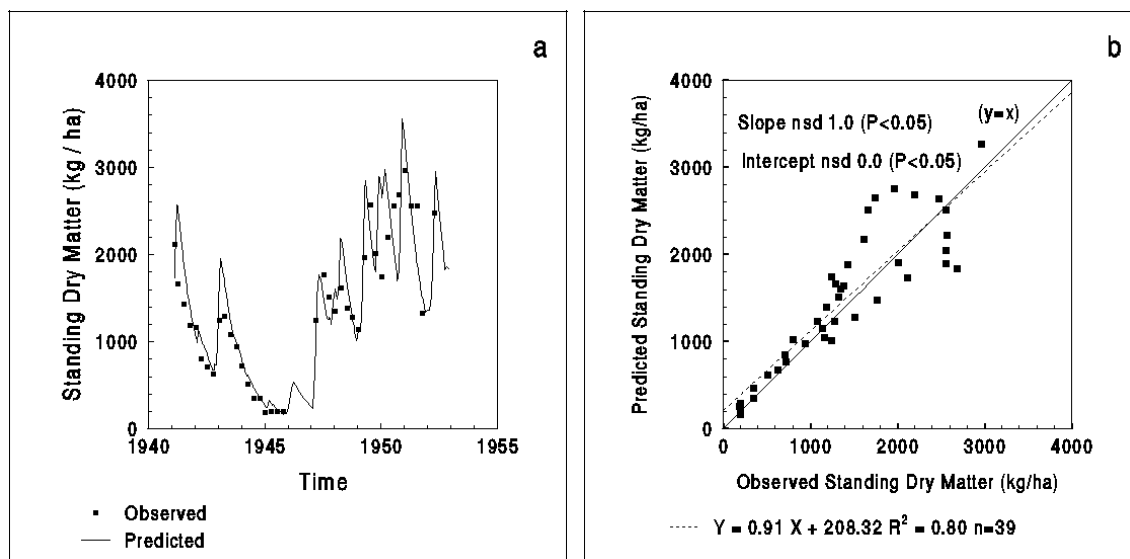


Figure 10.4 Predicted and observed standing dry matter using the data of Roe and Allen (1945,1993) to validate the GRASP model to mitchell grass pastures in the 'Gilruth Plains' grazing trial (1 DSE/2ha treatment) near Cunnamulla in south-west Queensland.