

**Table 4** Selected regression models to estimate grass fraction (GFRAC), based on the entire 2011 and 2012 dataset, and subsets split by year (2011 and 2012) and split randomly (Split 1 and Split 2 from pooled 2011 and 2012 datasets).<sup>a, b</sup>

| Eq. #                                          | N   | R <sup>2</sup> | RMSE                   | Model Equations: GFRAC =                                                                                          |
|------------------------------------------------|-----|----------------|------------------------|-------------------------------------------------------------------------------------------------------------------|
| <u>2011</u>                                    |     |                |                        |                                                                                                                   |
|                                                |     |                | kg kg <sup>-1</sup> DM |                                                                                                                   |
| 1                                              | 545 | 0.62           | 0.0997                 | 0.15 + 0.763*LBP                                                                                                  |
| 2                                              | 545 | 0.63           | 0.0986                 | 0.26 + 0.790*LBP – 0.0023*AMAX                                                                                    |
| 3                                              | 545 | 0.64           | 0.0977                 | 0.26 + 0.748*LBP – 0.0051*AMAX + 0.0031*GCPY -<br>0.00014*(AMAX-52.9)(GCPY*54.2)                                  |
| 4                                              | 545 | 0.72           | 0.0858                 | 0.30 + 0.670*LBP – 0.0065*AMAX + 0.0047*GPY + GSP                                                                 |
| 5                                              | 545 | 0.73           | 0.0849                 | 0.34 + 0.7*LBP – 0.0069*AMAX + 0.0043*GPY + LT + GSP                                                              |
| 6                                              | 545 | 0.79           | 0.0754                 | 0.18 + 0.790*LBP – 0.0042*AMAX + 0.0043*GCPY + LT + GSP<br>+ GSP*LBP + GSP*AMAX + GSP*GPY + LBP*AMAX              |
| <u>2012</u>                                    |     |                |                        |                                                                                                                   |
| 7                                              | 178 | 0.64           | 0.119                  | 0.17 + 0.795*LBP                                                                                                  |
| 8                                              | 178 | 0.72           | 0.105                  | 0.65 + 0.86*LBP – 0.011*AMAX                                                                                      |
| 9                                              | 178 | 0.73           | 0.104                  | 0.58 + 0.776*LBP – 0.013*AMAX + 0.0043*GPY                                                                        |
| 10                                             | 178 | 0.79           | 0.091                  | 0.046 + 0.692*LBP – 0.0068*AMAX + 0.0094*GPY + GSP                                                                |
| 11                                             | 178 | 0.81           | 0.086                  | 0.052 + 0.850*LBP – 0.0059*AMAX + 0.0073*GPY + GSP + LT                                                           |
| 12                                             | 178 | 0.86           | 0.077                  | -0.046 + 0.795*LBP – 0.0046*AMAX + 0.0082*GPY + GSP + LT<br>+ GSP*LBP + GSP*GPY + LBP*GPY                         |
| <u>Split 1</u>                                 |     |                |                        |                                                                                                                   |
| 13                                             | 362 | 0.62           | 0.106                  | 0.16 + 0.765*LBP                                                                                                  |
| 14                                             | 362 | 0.65           | 0.102                  | 0.37 + 0.803*LBP – 0.0044*AMAX                                                                                    |
| 15                                             | 362 | 0.66           | 0.101                  | 0.32 + 0.741*LBP – 0.0079*AMAX + 0.0048*GPY                                                                       |
| 16                                             | 362 | 0.73           | 0.090                  | 0.38 + 0.662*LBP – 0.01*AMAX + 0.007*GPY + GSP                                                                    |
| 17                                             | 362 | 0.75           | 0.087                  | 0.42 + 0.722*LBP – 0.0095*AMAX + 0.0056*GPY + GSP + LT                                                            |
| 18                                             | 362 | 0.79           | 0.080                  | 0.17 + 0.713*LBP – 0.0059*AMAX + 0.00098*GPY + GSP + LT<br>+ GSP*LBP + GSP*AMAX + GSP*GPY + LBP*AMAX              |
| <u>Split 2</u>                                 |     |                |                        |                                                                                                                   |
| 19                                             | 361 | 0.66           | 0.106                  | 0.13 + 0.819*LBP                                                                                                  |
| 20                                             | 361 | 0.68           | 0.103                  | 0.32 + 0.841*LBP – 0.0038*AMAX                                                                                    |
| 21                                             | 361 | 0.69           | 0.101                  | 0.29 + 0.778*LBP – 0.0067*AMAX + 0.0039*GPY                                                                       |
| 22                                             | 361 | 0.73           | 0.095                  | 0.33 + 0.734*LBP – 0.0078*AMAX + 0.0049*GPY + GSP                                                                 |
| 23                                             | 361 | 0.75           | 0.093                  | 0.37 + 0.784*LBP – 0.0082*AMAX + 0.0045*GPY + GSP + LT                                                            |
| 24                                             | 361 | 0.78           | 0.087                  | 0.19 + 0.828*LBP – 0.0043*AMAX + 0.0037*GPY + GSP + LT +<br>GSP*LBP + GSP*AMAX + GSP*GPY + LBP*AMAX +<br>AMAX*GPY |
| <u>Models from Full 2011 and 2012 Datasets</u> |     |                |                        |                                                                                                                   |
| 25                                             | 723 | 0.64           | 0.106                  | 0.14 + 0.792*LBP                                                                                                  |
| 26                                             | 723 | 0.67           | 0.102                  | 0.34 + 0.822*LBP – 0.0041*AMAX                                                                                    |
| 27                                             | 723 | 0.68           | 0.101                  | 0.31 + 0.759*LBP – 0.0073*AMAX + 0.0043*GPY                                                                       |
| 28                                             | 723 | 0.73           | 0.092                  | 0.36 + 0.697*LBP – 0.0089*AMAX + 0.0059*GPY + GSP                                                                 |
| 29                                             | 723 | 0.74           | 0.090                  | 0.39 + 0.750*LBP – 0.0089*AMAX + 0.0051*GPY+ GSP + LT                                                             |
| 30                                             | 723 | 0.78           | 0.084                  | 0.17 + 0.768*LBP – 0.0045*AMAX + 0.0049*GPY + GSP + LT +<br>GSP*LBP + GSP*AMAX + GSP*GPY + LBP*AMAX               |

<sup>a</sup> See Table 3 for descriptions of model variables.

<sup>b</sup> Parameter estimates for categorical variables (GSP and LT) and interactions are not shown in the equations.