

Table S5. NIRS prediction for Total Ash, Crude Protein and Total Carbon of the *bmr* mutant lines.

| Line | Ash (%) | | | Crude Protein (%) | | | Total Carbon (%) | | |
|---------------------|--------------|--------------|--------------|-------------------|-------------|--------------|------------------|--------------|--------------|
| | lsmean | Lower | Upper | lsmean | Lower | Upper | lsmean | Lower | Upper |
| BTx623 ^T | 11.60 | 11.13 | 12.06 | 5.46 | 4.19 | 6.73 | 43.28 | 43.09 | 43.47 |
| BTx623 ^N | 11.72 | 11.25 | 12.20 | 5.76 | 4.50 | 7.02 | 43.29 | 43.09 | 43.48 |
| RTx430 | 10.94 | 10.49 | 11.39 | 6.86 | 5.58 | 8.14 | 44.03 | 43.84 | 44.21 |
| BWheatland | 12.43 | 11.97 | 12.88 | 7.21 | 5.94 | 8.49 | 43.06 | 42.87 | 43.24 |
| BTx623 <i>bmr6</i> | 14.52 | 14.03 | 15.01 | 6.10 | 4.85 | 7.36 | 41.85 | 41.65 | 42.05 |
| BTx623 <i>bmr12</i> | 12.12 | 11.63 | 12.62 | 6.95 | 5.70 | 8.21 | 43.22 | 43.02 | 43.42 |
| OK11 <i>bmr2</i> | 12.59 | 12.13 | 13.06 | 6.66 | 5.39 | 7.93 | 42.82 | 42.63 | 43.01 |
| <i>bmr2-2</i> | 11.14 | 10.68 | 11.61 | 5.30 | 4.03 | 6.56 | 43.31 | 43.12 | 43.50 |
| <i>bmr6-23</i> | 12.28 | 11.84 | 12.71 | 7.19 | 5.90 | 8.49 | 43.03 | 42.85 | 43.21 |
| <i>bmr6-31</i> | 11.33 | 10.89 | 11.77 | 7.59 | 6.31 | 8.88 | 43.19 | 43.01 | 43.37 |
| <i>bmr6-32</i> | 10.85 | 10.38 | 11.31 | 6.98 | 5.71 | 8.25 | 43.63 | 43.45 | 43.82 |
| <i>bmr6-45</i> | 10.59 | 10.15 | 11.03 | 5.90 | 4.62 | 7.19 | 43.24 | 43.06 | 43.42 |
| <i>bmr6-307</i> | 13.26 | 12.77 | 13.75 | 8.48 | 7.22 | 9.74 | 42.48 | 42.28 | 42.68 |
| <i>bmr6-741</i> | 11.54 | 11.09 | 11.99 | 6.03 | 4.75 | 7.30 | 43.12 | 42.93 | 43.31 |
| <i>bmr6-971</i> | 11.91 | 11.43 | 12.39 | 6.32 | 5.06 | 7.58 | 43.00 | 42.80 | 43.19 |
| <i>bmr6-1103</i> | 11.66 | 11.19 | 12.14 | 6.21 | 4.95 | 7.47 | 43.04 | 42.85 | 43.24 |
| <i>bmr6-1277</i> | 13.33 | 12.89 | 13.77 | 7.03 | 5.74 | 8.31 | 43.17 | 42.98 | 43.35 |
| <i>bmr12-30</i> | 10.78 | 10.30 | 11.26 | 8.04 | 6.78 | 9.30 | 43.71 | 43.51 | 43.90 |
| <i>bmr12-34</i> | 9.76 | 9.27 | 10.25 | 6.58 | 5.32 | 7.83 | 44.10 | 43.90 | 44.30 |
| <i>bmr12-35</i> | 10.26 | 9.78 | 10.74 | 5.22 | 3.96 | 6.48 | 43.94 | 43.75 | 44.13 |
| <i>bmr12-820</i> | 9.85 | 9.31 | 10.39 | 7.57 | 6.32 | 8.81 | 43.68 | 43.46 | 43.89 |
| <i>bmr29</i> | 10.81 | 10.34 | 11.27 | 6.21 | 4.95 | 7.48 | 43.83 | 43.64 | 44.02 |
| <i>bmr30</i> | 10.53 | 10.02 | 11.03 | 7.63 | 6.38 | 8.88 | 43.84 | 43.64 | 44.04 |
| <i>bmr31</i> | 11.22 | 10.72 | 11.72 | 9.72 | 8.47 | 10.98 | 43.27 | 43.07 | 43.47 |
| <i>bmr32-1</i> | 7.92 | 7.45 | 8.38 | 5.22 | 3.95 | 6.50 | 44.65 | 44.46 | 44.84 |
| <i>bmr32-2</i> | 9.86 | 9.39 | 10.32 | 5.89 | 4.62 | 7.16 | 44.09 | 43.90 | 44.28 |
| <i>bmr32-3</i> | 10.43 | 9.96 | 10.89 | 8.23 | 6.96 | 9.49 | 43.77 | 43.58 | 43.96 |
| 4 | 11.50 | 11.02 | 11.98 | 7.20 | 5.94 | 8.46 | 43.47 | 43.28 | 43.67 |
| 25 | 7.41 | 6.90 | 7.91 | 4.97 | 3.72 | 6.22 | 44.48 | 44.28 | 44.68 |
| 39 | 10.49 | 9.98 | 10.99 | 7.83 | 6.58 | 9.08 | 43.94 | 43.73 | 44.14 |
| 40 | 12.23 | 11.75 | 12.70 | 6.93 | 5.67 | 8.19 | 43.28 | 43.08 | 43.47 |
| 41 | 10.80 | 10.32 | 11.27 | 6.11 | 4.86 | 7.37 | 43.47 | 43.27 | 43.66 |
| 163 | 10.18 | 9.70 | 10.66 | 6.03 | 4.77 | 7.29 | 43.99 | 43.80 | 44.18 |
| 247 | 12.14 | 11.62 | 12.66 | 9.94 | 8.69 | 11.19 | 43.39 | 43.18 | 43.60 |
| 371 | 11.12 | 10.64 | 11.59 | 5.00 | 3.74 | 6.26 | 43.59 | 43.40 | 43.78 |
| 372 | 11.36 | 10.89 | 11.84 | 6.35 | 5.09 | 7.61 | 43.40 | 43.21 | 43.59 |
| 485 | 10.14 | 9.67 | 10.60 | 4.47 | 3.20 | 5.74 | 43.49 | 43.31 | 43.68 |
| 492 | 9.31 | 8.81 | 9.82 | 6.60 | 5.35 | 7.85 | 44.14 | 43.94 | 44.34 |

| | | | | | | | | | |
|------|--------------|--------------|--------------|-------------|-------------|--------------|--------------|--------------|--------------|
| 557 | 10.87 | 10.40 | 11.35 | 7.48 | 6.22 | 8.74 | 43.48 | 43.28 | 43.67 |
| 666 | 8.29 | 7.84 | 8.75 | 4.95 | 3.67 | 6.23 | 44.87 | 44.68 | 45.05 |
| 706 | 11.07 | 10.61 | 11.54 | 7.68 | 6.42 | 8.95 | 43.20 | 43.01 | 43.39 |
| 924 | 12.18 | 11.72 | 12.65 | 7.27 | 6.00 | 8.54 | 43.70 | 43.51 | 43.89 |
| 934 | 11.70 | 11.25 | 12.15 | 9.04 | 7.77 | 10.32 | 43.46 | 43.27 | 43.64 |
| 1057 | 11.63 | 11.16 | 12.09 | 7.03 | 5.77 | 8.30 | 43.13 | 42.94 | 43.32 |
| 1074 | 11.24 | 10.77 | 11.72 | 5.90 | 4.64 | 7.16 | 43.20 | 43.01 | 43.39 |
| 1402 | 9.65 | 9.17 | 10.13 | 6.31 | 5.05 | 7.57 | 43.66 | 43.47 | 43.86 |
| 1492 | 10.67 | 10.16 | 11.17 | 6.96 | 5.71 | 8.21 | 43.63 | 43.43 | 43.84 |
| 1593 | 10.31 | 9.88 | 10.74 | 9.06 | 7.76 | 10.35 | 43.60 | 43.42 | 43.78 |
| 1605 | 9.82 | 9.39 | 10.25 | 6.13 | 4.83 | 7.42 | 43.85 | 43.67 | 44.03 |
| 1614 | 12.12 | 11.65 | 12.60 | 6.80 | 5.54 | 8.06 | 43.14 | 42.94 | 43.33 |
| 1634 | 10.53 | 10.05 | 11.00 | 7.41 | 6.15 | 8.67 | 43.53 | 43.34 | 43.73 |
| 1668 | 10.24 | 9.75 | 10.73 | 7.24 | 5.98 | 8.49 | 43.66 | 43.46 | 43.85 |
| 1827 | 9.63 | 9.16 | 10.09 | 5.14 | 3.87 | 6.41 | 43.73 | 43.54 | 43.92 |

Values for ash, crude protein and total carbon were determined by NIRS prediction based on the calibration equation (Table S1). Additional details are found in the Materials and Methods Section. Least Squares Means (lsmean) for mutant and check lines were generated, and means of all variables were ranked from highest (Upper) to lowest (Lower). **Bold text** indicates values that were statistically significantly different ($P \leq 0.20$) from the values of BTx623^T, the line used for mutagenesis. Additional details of the statistical analysis are described in the Materials and Methods section. BTx623^N is the line maintained by ARS in Lincoln, NE, which was included for comparison.