

838 **Supplementary material**839 **Table 7** – Prediction results for organic matter for the three methods

Nodes	Rules of DT model	Rules of DT_Bag model	Rules of DT_Lsboost model
1	if $x_5 < 236.37$ then node 2; else node 3	if $x_5 < 236.37$ then node 2; else node 3	if $x_{11} < 0.555$ then node 2; else node 3
2	if $x_{15} < 192.5$ then node 4; else node 5	if $x_1 < 1801.5$ then node 4; else node 5	if $x_1 < 1801.5$ then node 4; else node 5
3	if $x_7 < 264.77$ then node 6; else node 7	if $x_9 < 433.25$ then node 6; else node 7	if $x_1 < 2650.5$ then node 6; else node 7
4	if $x_{14} < 518.565$ then node 8; else node 9	if $x_6 < 71.685$ then node 8; else node 9	if $x_6 < 71.685$ then node 8; else node 9
5	if $x_{17} < 0.01505$ then node 10; else node 11	if $x_{20} < 1949.5$ then node 10; else node 11	if $x_{20} < 1949.5$ then node 10; else node 11
6	fit = 9	fit = 9	fit = 4.62
7	if $x_4 < 135.975$ then node 12; else node 13	if $x_7 < 415.475$ then node 12; else node 13	if $x_3 < 7.73$ then node 12; else node 13
8	if $x_6 < 74.33$ then node 14; else node 15	if $x_2 < 9.47$ then node 14; else node 15	if $x_9 < 63.115$ then node 14; else node 15
9	if $x_2 < 0.744$ then node 16; else node 17	if $x_3 < 7.745$ then node 16; else node 17	if $x_5 < 98.195$ then node 16; else node 17
10	if $x_{20} < 1980$ then node 18; else node 19	if $x_2 < 3.035$ then node 18; else node 19	if $x_{17} < 0.0796$ then node 18; else node 19

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2	11 if x8<192.15 then node 20; else node 21	if x12<6.2625 then node 20; else node 21	if x5<242.48 then node 20; else node 21
3	12 fit = 29.2	if x3<7.9 then node 22; else node 23	fit = 29.2
4	13 if x3<7.9 then node 22; else node 23	fit = 29.2	if x3<7.9 then node 22 else; then node 23
5	14 if x2<14.75 then node 24; else node 25	if x12<37.12 then node 24; else node 25	if x5<76.52 then node 24; else node 25
6	15 if x14<462 then node 26; else node 27	if x17<0.02045 then node 26; else node 27	if x20<1003 then node 26; else node 27
7	16 if x8<68.015 then node 28; else node 29	if x5<100.2 then node 28; else node 29	if x3<7.68 then node 28; else node 29
8	17 if x5<156.31 then node 30; else node 31	if x5<98.195 then node 30; else node 31	if x3<7.745 then node 30; else node 31
9	18 if x2<3.035 then node 32; else node 33	if x20<1477 then node 32; else node 33	if x2<3.035 then node 32; else node 33
10	19 if x15<370 then node 34; else node 35	if x14<498.65 then node 34; else node 35	if x1<2017 then node 34; else node 35
11	20 if x20<1940 then node 36; else node 37	if x4<67 then node 36; else node 37	if x12<6.2625 then node 36; else node 37
12	21 if x6<54.675 then node 38; else node 39	if x7<231 then node 38; else node 39	fit = 9
13	22 fit = 21.7	fit = 21.7	fit = 21.7
14	23 fit = 24.3	fit = 24.3	fit = 24.3
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	24	if $x_7 < 195.25$ then node 40; else node 41	if $x_5 < 76.52$ then node 40; else node 41	if $x_3 < 7.64$ then node 38; else node 39
	25	if $x_{15} < 106.5$ then node 42; else node 43	if $x_4 < 52$ then node 42; else node 43	if $x_5 < 156.31$ then node 40; else node 41
	26	if $x_{15} < 37.25$ then node 44; else node 45	if $x_3 < 8.04$ then node 44; else node 45	if $x_{12} < 37.12$ then node 42; else node 43
	27	fit = 2.6	if $x_4 < 36.5$ then node 46; else node 47	if $x_1 < 1268.5$ then node 44; else node 45
	28	fit = 3	fit = 0.87	fit = 0.87
	29	if $x_{20} < 1438$ then node 46; else node 47	if $x_6 < 92.34$ then node 48; else node 49	29 fit = 1.49
	30	if $x_6 < 83.835$ then node 48; else node 49	fit = 1.49	if $x_1 < 1457$ then node 46; else node 47
	31	if $x_9 < 67.25$ then node 50; else node 51	if $x_2 < 0.826$ then node 50; else node 51	if $x_2 < 0.826$ then node 48; else node 49
	32	if $x_{14} < 549.4$ then node 52; else node 53	if $x_8 < 326.735$ then node 52; else node 53	if $x_{20} < 1486$ then node 50; else node 51
	33	if $x_{20} < 1060$ then node 54; else node 55	if $x_8 < 17.065$ then node 54; else node 55	if $x_{12} < 5.7865$ then node 52; else node 53
	34	if $x_6 < 68.04$ then node 56; else node 57	fit = 0	fit = 2.98
	35	fit = 4	if $x_5 < 206.41$ then node 56; else node 57	fit = 0

1	36	fit = 8.95	if $x_{16} < 9.35$ then node 58; else node 59	if $x_{16} < 9.35$ then node 54; else node 55
2	37	if $x_{14} < 854$ then node 58; else node 59	if $x_3 < 7.6$ then node 60; else node 61	if $x_7 < 231$ then node 56; else node 57
3	38	fit = 2.98	if $x_3 < 5.245$ then node 62; else node 63	if $x_1 < 531.5$ then node 58; else node 59
4	39	if $x_{14} < 741$ then node 60; else node 61	fit = 1	if $x_{17} < 0.0075$ then node 60; else node 61
5	40	if $x_1 < 835$ then node 62; else node 63	if $x_9 < 63.16$ then node 64; else node 65	if $x_7 < 29.825$ then node 62; else node 63
6	41	if $x_{20} < 960$ then node 64; else node 65	if $x_{20} < 1059$ then node 66; else node 67	fit = 4.1
7	42	if $x_6 < 21.87$ then node 66; else node 67	fit = 0.8475	if $x_2 < 6.96$ then node 64; else node 65
8	43	if $x_7 < 55.8$ then node 68; else node 69	fit = 0.296	if $x_2 < 0.221$ then node 66; else node 67
9	44	fit = 6.2	if $x_8 < 166.515$ then node 68; else node 69	fit = 2.085
10	45	if $x_3 < 7.895$ then node 70; else node 71	fit = 4.5	if $x_{20} < 1240.5$ then node 68; else node 69
11	46	fit = 1.285	if $x_7 < 149.25$ then node 70; else node 71	fit = 6.2
12	47	fit = 1.78	if $x_9 < 98.75$ then node 72; else node 73	fit = 7.5

1	48	fit = 7.5	fit = 6.2	if $x_2 < 0.5985$ then node 70; else node 71
2	49	fit = 8.4	fit = 7.5	if $x_1 < 1479.5$ then node 72; else node 73
3	50	fit = 4.1	if $x_2 < 0.5985$ then node 74; else node 75	if $x_8 < 326.735$ then node 74; else node 75
4	51	if $x_9 < 254.045$ then node 72; else node 73	if $x_3 < 7.89$ then node 76; else node 77	if $x_8 < 17.065$ then node 76; else node 77
5	52	if $x_{17} < 0.00055$ then node 74; else node 75	if $x_{16} < 9.5$ then node 78; else node 79	if $x_{14} < 915.5$ then node 78; else node 79
6	53	if $x_{15} < 230$ then node 76; else node 77	fit = 7.715	if $x_9 < 317.37$ then node 80; else node 81
7	54	if $x_{16} < 8$ then node 78; else node 79	if $x_1 < 2375$ then node 80; else node 81	if $x_9 < 208.36$ then node 82; else node 83
8	55	if $x_9 < 259.72$ then node 80; else node 81	if $x_2 < 0.1775$ then node 82; else node 83	if $x_1 < 2285$ then node 84; else node 85
9	56	if $x_7 < 11.5$ then node 82; else node 83	if $x_{12} < 3.12$ then node 84; else node 85	if $x_3 < 5.245$ then node 86; else node 87
10	57	fit = 1	fit = 5.1	fit = 1
11	58	fit = 2.1	fit = 4	fit = 0.264286
12	59	fit = 4.1	if $x_8 < 210.45$ then node 86; else node 87	fit = 0.514545
13	60	if $x_{20} < 1267$ then node 84; else node 85	fit = 5.1	if $x_9 < 51.79$ then node 88; else node 89

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2	61	if $x_{20} < 2100.5$ then node 86; else node 87	if $x_7 < 55.375$ then node 88; else node 89
3			if $x_1 < 584$ then node 90; else node 91
4			
5	62	if $x_6 < 3.645$ then node 88; else node 89	fit = 2.1
6			if $x_9 < 38.33$ then node 92; else node 93
7			
8	63	if $x_{18} < 0.02475$ then node 90; else node 91	fit = 1.78
9			if $x_2 < 66.75$ then node 94; else node 95
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11	64	if $x_5 < 72.145$ then node 92; else node 93	if $x_3 < 7.655$ then node 90; else node 91
12			if $x_9 < 94.365$ then node 96; else node 97
13			
14	65	if $x_5 < 162.305$ then node 94; else node 95	if $x_6 < 3.645$ then node 92; else node 93
15			if $x_9 < 92.245$ then node 98; else node 99
16			
17	66	if $x_7 < 120.75$ then node 96; else node 97	if $x_8 < 463.89$ then node 94; else node 95
18			fit = 0.296667
19			
20	67	if $x_{16} < 2.3$ then node 98; else node 99	if $x_2 < 0.338$ then node 96; else node 97
21			fit = 0.8475
22			
23	68	fit = 0	if $x_5 < 76.15$ then node 98; else node 99
24			if $x_1 < 1277.5$ then node 100; else node 101
25			
26	69	fit = 2	if $x_3 < 7.49$ then node 100; else node 101
27			fit = 1.12
28			
29	70	fit = 3.9	fit = 4.5475
30			fit = 2.6
31			
32	71	fit = 4.83	if $x_3 < 7.835$ then node 102; else node 103
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34	72	fit = 5.1	fit = 5
35			fit = 4.858
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37	73	fit = 6.2	fit = 1.4
38			fit = 3.9
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2	74	if $x_7 < 642.75$ then node 100; else node 101	fit = 2.6
3			if $x_{16} < 9.5$ then node 104; else node 105
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5	75	fit = 2.1	if $x_9 < 190.625$ then node 102; else node 103
6			fit = 7.715
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8	76	fit = 1.13	fit = 3.9
9			if $x_1 < 2375$ then node 106; else node 107
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11	77	if $x_{20} < 1365$ then node 102; else node 103	fit = 4.8575
12			if $x_{16} < 5.35$ then node 108; else node 109
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14	78	fit = 5.1	if $x_5 < 200.4$ then node 104; else node 105
15			if $x_3 < 7.7$ then node 110; else node 111
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17	79	fit = 2	fit = 7.38
18			fit = 5.1
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20	80	if $x_8 < 100.91$ then node 104; else node 105	fit = 7.38143
21			if $x_5 < 142.285$ then node 112; else node 113
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23	81	x $_7 < 64.55$ then node 106; else node 107	fit = 4.61
24			if $x_1 < 2415$ then node 114; else node 115
25			
26	82	fit = 2	if $x_{18} < 0.014$ then node 106; else node 107
27			fit = 5.1
28			
29	83	fit = 1.78	if $x_{16} < 4.4$ then node 108; else node 109
30			if $x_2 < 1.835$ then node 116; else node 117
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32	84	fit = 0.57	if $x_3 < 7.955$ then node 110; else node 111
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	85	if $x_3 < 7.83$ then node 108; else node 109	if $x_9 < 317.37$ then node 112; else node 113 fit = 2
	86	fit = 1.78	fit = 2
	87	fit = 2.6	fit = 2.5
	88	fit = 4.56	fit = 4.05
	89	if $x_5 < 66.13$ then node 110; else node 111	fit = 4.1
	90	if $x_6 < 29.16$ then node 112; else node 113	if $x_{20} < 259$ then node 114; else node 115 fit = 0.5
	91	fit = 4.5625	if $x_{17} < 0.0075$ then node 116; else node 117 fit = 0.81
	92	fit = 0.52	fit = 4.56
	93	if $x_9 < 62.445$ then node 114; else node 115	if $x_{18} < 0.02015$ then node 118; else node 119 fit = 1.85895
	94	if $x_{10} < 0.25$ then node 116; else node 117	if $x_9 < 94.365$ then node 120; else node 121 if $x_3 < 7.49$ then node 118; else node 119
	95	fit = 1.1	fit = 4.56
	96	fit = 1.75	if $x_4 < 59.5$ then node 122; else node 123 if $x_{17} < 0.0411$ then node 120; else node 121
	97	fit = 2	if $x_{20} < 1245.5$ then node 124; else node 125 if $x_{18} < 0.0717$ then node 122; else node 123

1	98	fit = 5	fit = 0.513333	if $x_{16} < 5.25$ then node 124; else node 125
2	99	fit = 4.53	if $x_4 < 48.5$ then node 126; else node 127	if $x_1 < 827$ then node 126; else node 127
3	100	if $x_7 < 15.45$ then node 118; else node 119	fit = 1.6	fit = 0.295
4	101	fit = 4.62	if $x_9 < 87.99$ then node 128; else node 129	fit = 0.565
5	102	if $x_3 < 7.825$ then node 120; else node 121	fit = 3.9	fit = 3
6	103	if $x_{14} < 590.5$ then node 122; else node 123	fit = 3	fit = 3.9
7	104	fit = 7	if $x_{18} < 0.02355$ then node 130; else node 131	if $x_4 < 87$ then node 128; else node 129
8	105	fit = 7.1	fit = 5.1	fit = 7.38
9	106	if $x_9 < 307.43$ then node 124; else node 125	fit = 2.76	if $x_1 < 1864.5$ then node 130; else node 131
10	107	fit = 8.95	fit = 2.98	fit = 4.61
11	108	fit = 1	fit = 2.73	if $x_1 < 1954$ then node 132; else node 133

1	109	fit = 1.4	if $x_5 < 176.35$ then node 132; else node 133	if $x_2 < 0.4465$ then node 134; else node 135
2	110	if $x_4 < 23.5$ then node 126; else node 127	fit = 7.1	fit = 7.08333
3	111	if $x_8 < 23.64$ then node 128; else node 129	fit = 7.02	if $x_7 < 90.4$ then node 136; else node 137
4	112	if $x_{20} < 1044.5$ then node 130; else node 131	if $x_5 < 142.285$ then node 134; else node 135	fit = 8.95
5	113	if $x_{20} < 1074$ then node 132; else node 133	if $x_6 < 123.015$ then node 136; else node 137	if $x_1 < 1932$ then node 138; else node 139
6	114	if $x_3 < 7.557$ then node 134; else node 135	fit = 0.2625	if $x_1 < 2280$ then node 140; else node 141
7	115	if $x_4 < 40.5$ then node 136; else node 137	fit = 0.513	fit = 8.14
8	116	fit = 0.56	if $x_9 < 49.665$ then node 138; else node 139	fit = 4
9	117	fit = 0.293333	if $x_6 < 47.385$ then node 140; else node 141	if $x_2 < 5.37$ then node 142; else node 143
10	118	fit = 6.2	if $x_7 < 26.8$ then node 142; else node 143	fit = 1.60637

1	119	if $x_2 < 0.3875$ then node 138; else node 139	fit = 1.4	fit = 1.28263
2	120	if $x_{15} < 300$ then node 140; else node 141	if $x_4 < 66$ then node 144; else node 145	fit = 1.8144
3	121	fit = 3.9	if $x_{14} < 330.5$ then node 146; else node 147	fit = 1.4
4	122	fit = 2.76	fit = 1.63	fit = 2.07343
5	123	if $x_2 < 2.17$ then node 142; else node 143	fit = 1.28	fit = 4.56
6	124	fit = 8.3	fit = 0.5625	fit = 4.28286
7	125	if $x_5 < 164.33$ then node 144; else node 145	if $x_7 < 301.5$ then node 148; else node 149	fit = 2.1
8	126	if $x_9 < 39.05$ then node 146; else node 147	if $x_6 < 29.16$ then node 150; else node 151	fit = 1.93125
9	127	if $x_3 < 7.815$ then node 148; else node 149	fit = 1.13	if $x_3 < 7.69$ then node 144; else node 145
10	128	if $x_5 < 98.195$ then node 150; else node 151	if $x_{16} < 2.15$ then node 152; else node 153	fit = 6.198
11	129	if $x_7 < 37.5$ then node 152; else node 153	if $x_9 < 113.595$ then node 154; else node 155	fit = 5.1
12	130	fit = 0.29	fit = 6.2	fit = 7.02

1	131	fit = 1.1	fit = 5.3	fit = 7.378
2	132	if $x_2 < 0.148$ then node 154; else node 155	if $x_1 < 2310$ then node 156; else node 157	fit = 4.1
3	133	fit = 0.553333	if $x_3 < 7.795$ then node 158; else node 159	fit = 2.75
4	134	fit = 1.60714	fit = 8.95	fit = 4.848
5	135	fit = 1.28125	if $x_5 < 150.3$ then node 160; else node 161	fit = 4.58429
6	136	fit = 1.8	if $x_{19} < 0.0096$ then node 162; else node 163	fit = 7.042
7	137	if $x_{14} < 245$ then node 156; else node 157	fit = 8.14	fit = 7
8	138	fit = 7.02	fit = 1.75	fit = 8.3
9	139	if $x_{16} < 4.05$ then node 158; else node 159	fit = 1.38	fit = 8.4
10	140	fit = 6.2	fit = 0.5	fit = 7.2
11	141	if $x_{15} < 400$ then node 160; else node 161	fit = 0.8125	fit = 7.38
12	142	if $x_9 < 340.2$ then node 162; else node 163	if $x_9 < 220.81$ then node 164; else node 165	fit = 4.1
13	143	if $x_9 < 318.605$ then node 164; else node 165	if $x_7 < 38.45$ then node 166; else node 167	fit = 4.05

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2	144	if $x_{20} < 1494$ then node 166; else node 167	if $x_7 < 33.45$ then node 168; else node 169 fit = 2.1
3	145	fit = 8.14	fit = 4.1 fit = 4.565
4	146	fit = 0.26	if $x_{18} < 0.032$ then node 170; else node 171
5	147	if $x_{14} < 20.465$ then node 168; else node 169	if $x_{17} < 0.00855$ then node 172; else node 173
6	148	if $x_6 < 26.73$ then node 170; else node 171	fit = 1.115
7	149	if $x_{17} < 0.004$ then node 172; else node 173	fit = 1.4
8	150	if $x_8 < 16.65$ then node 174; else node 175	fit = 2.1
9	151	fit = 2.1925	fit = 1.6
10	152	if $x_5 < 74.545$ then node 176; else node 177	fit = 1.87
11	153	if $x_7 < 144.175$ then node 178; else node 179	fit = 2
12	154	fit = 4.1	fit = 2.155
13	155	if $x_9 < 31.12$ then node 180; else node 181	fit = 2.04667
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1	156	fit = 2.066	if $x_2 < 2.4215$ then node 174; else node 175
2	157	fit = 1.8	if $x_{15} < 330$ then node 176; else node 177
3	158	fit = 7.72	fit = 4.38
4	159	fit = 7.432	fit = 4.1
5	160	fit = 7.38	fit = 8.3
6	161	fit = 7.7	fit = 8.4
7	162	fit = 4.61	fit = 7.2
8	163	if $x_{14} < 751.5$ then node 182; else node 183	fit = 7.38
9	164	fit = 4.38	fit = 1.82714
10	165	fit = 4.1	fit = 2.1
11	166	fit = 7.29	fit = 2
12	167	fit = 7	fit = 2.1375
13	168	fit = 1.38	if $x_8 < 389.79$ then node 178; else node 179
14	169	fit = 1.922	if $x_9 < 51.795$ then node 180; else node 181
15	170	fit = 0.265	if $x_3 < 7.395$ then node 182; else node 183
16	171	fit = 0.506667	fit = 1.39667

1	172	fit = 1.83333	if $x_2 < 0.7255$ then node 184; else node 185
2	173	fit = 0.813333	fit = 4.56
3	174	fit = 2.089	fit = 4.61786
4	175	fit = 2.01	fit = 4.38
5	176	fit = 1.37667	fit = 4.6
6	177	fit = 1.84567	if $x_9 < 330.915$ then node 186; else node 187
7	178	fit = 1.27667	if $x_9 < 38.34$ then node 188; else node 189
8	179	fit = 1.64778	fit = 4.1
9	180	fit = 2.6	if $x_6 < 43.73$ then node 190; else node 191
10	181	fit = 2.02123	if $x_2 < 1.0975$ then node 192; else node 193
11	182	fit = 4.62	if $x_8 < 258.945$ then node 194; else node 195
12	183	fit = 5.3	if $x_9 < 268.48$ then node 196; else node 197
13	184		fit = 2.1
14	185		fit = 2.175
15	186		fit = 5.1

1	187		fit = 5.3	
2	188		fit = 1.635	
3	189		fit = 1.83647	
4	190		fit = 1.28324	
5	191		if x9<40.17 then node 198; else node 199	
6	192		fit = 1.80444	
7	193		fit = 1.5	
8	194		fit = 2.2	
9	195		fit = 2.13667	
10	196		fit = 2.07098	
11	197		fit = 2.145	
12	198		fit = 1.28	
13	199		fit = 1.61275	
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