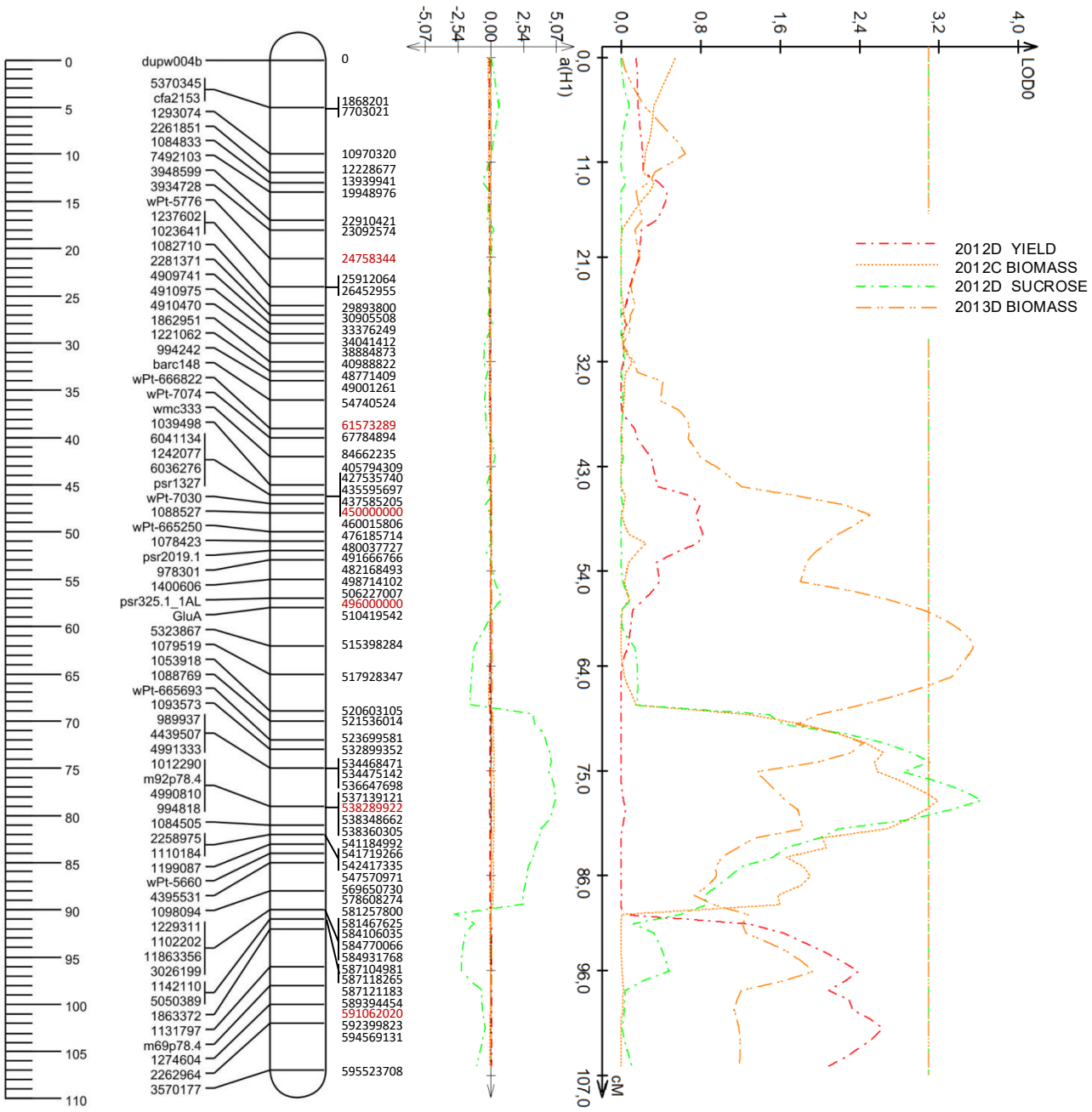
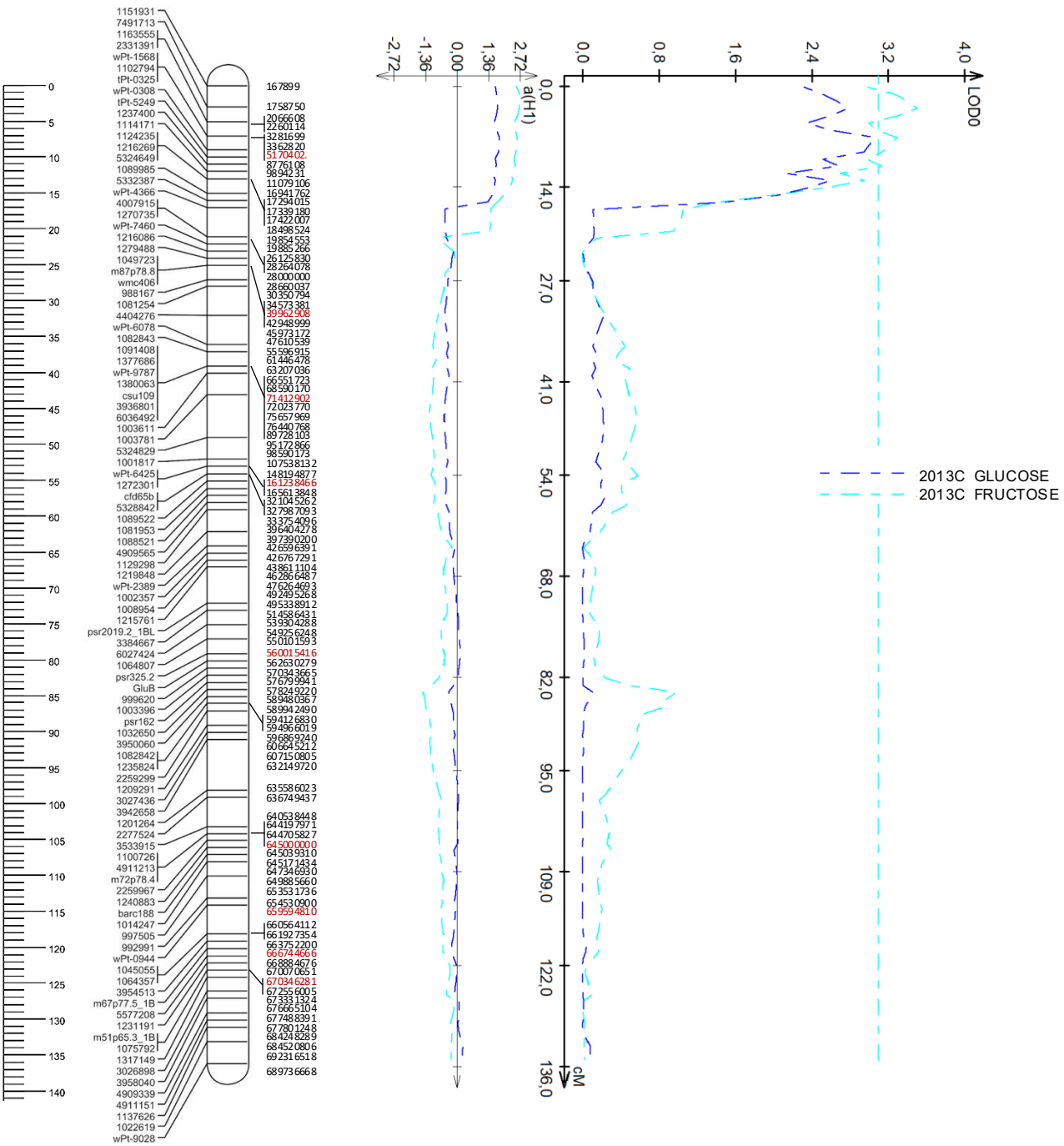
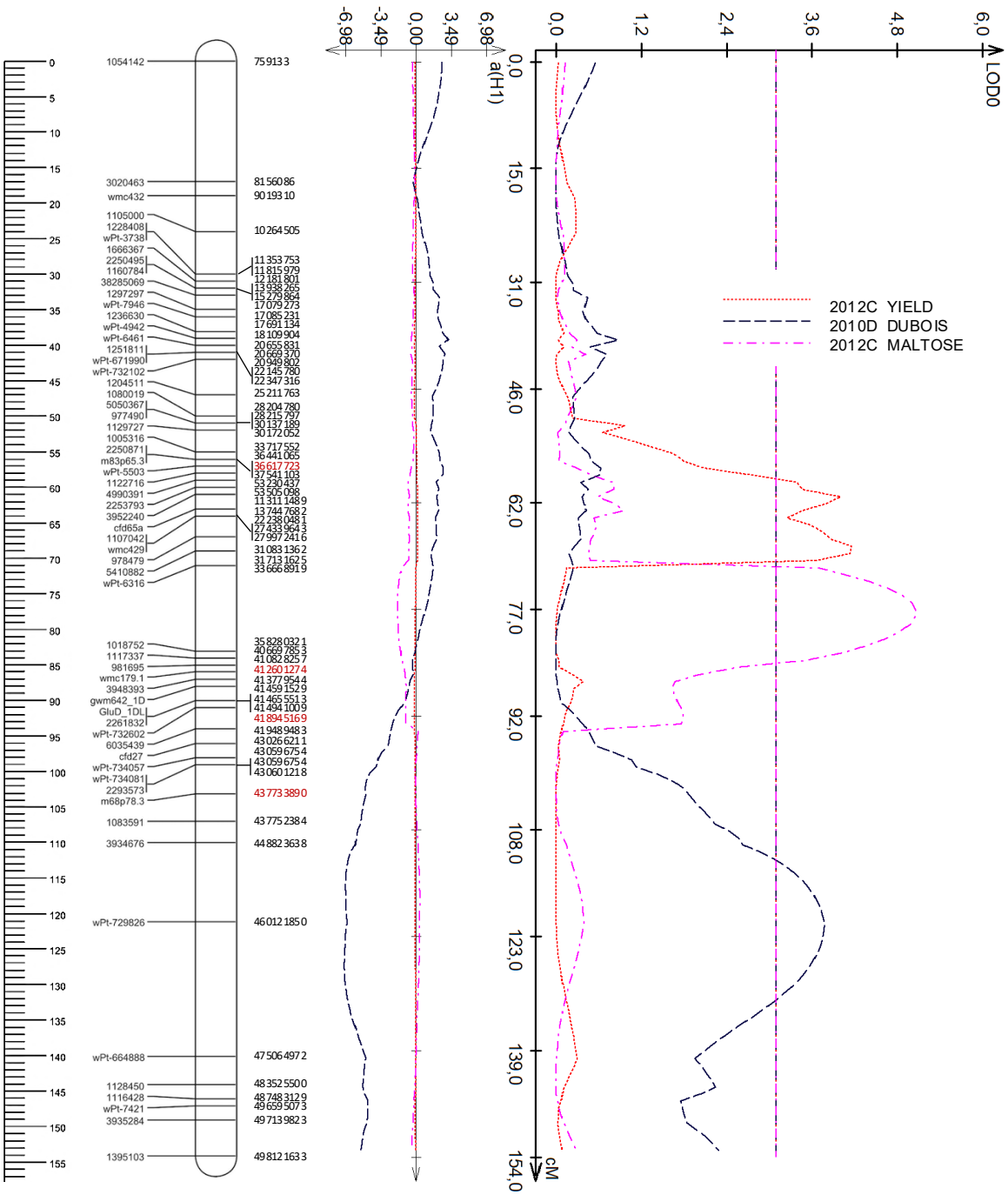
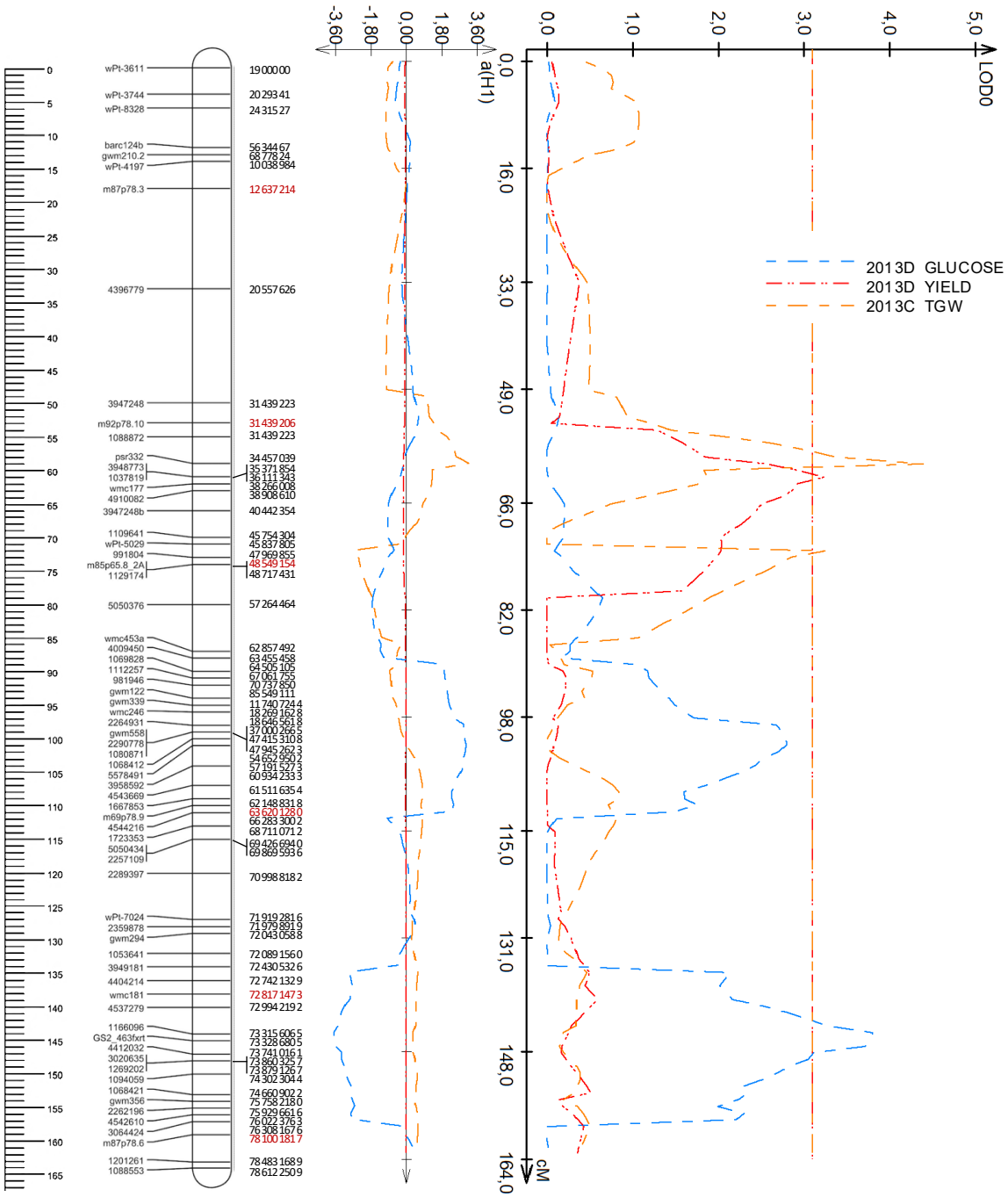
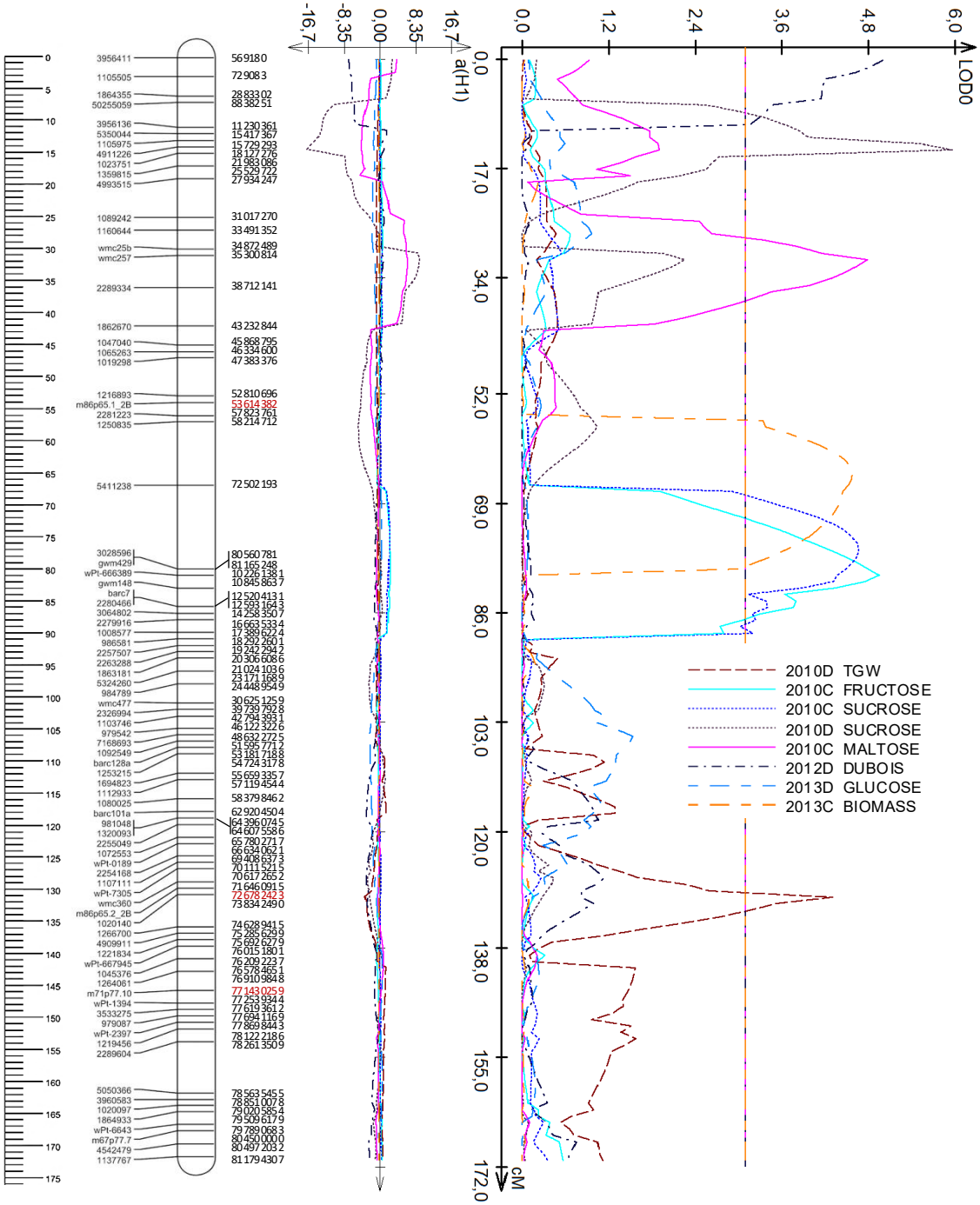
Figure S9: The location of markers in both the genetic map (cM) and physical map (bp), together with LOD score traces and additive effects along each chromosome for all QTLs detailed in Table 4 (together with LOD traces for chromosomes 3B and 3D which had no trait LOD scores reaching significance). Markers with bp locations in red text are estimated by linear interpolation from neighbouring markers. Positive additive effects indicate increasing alleles from Chinese Spring and negative additive effects indicate increasing alleles from SQ1.

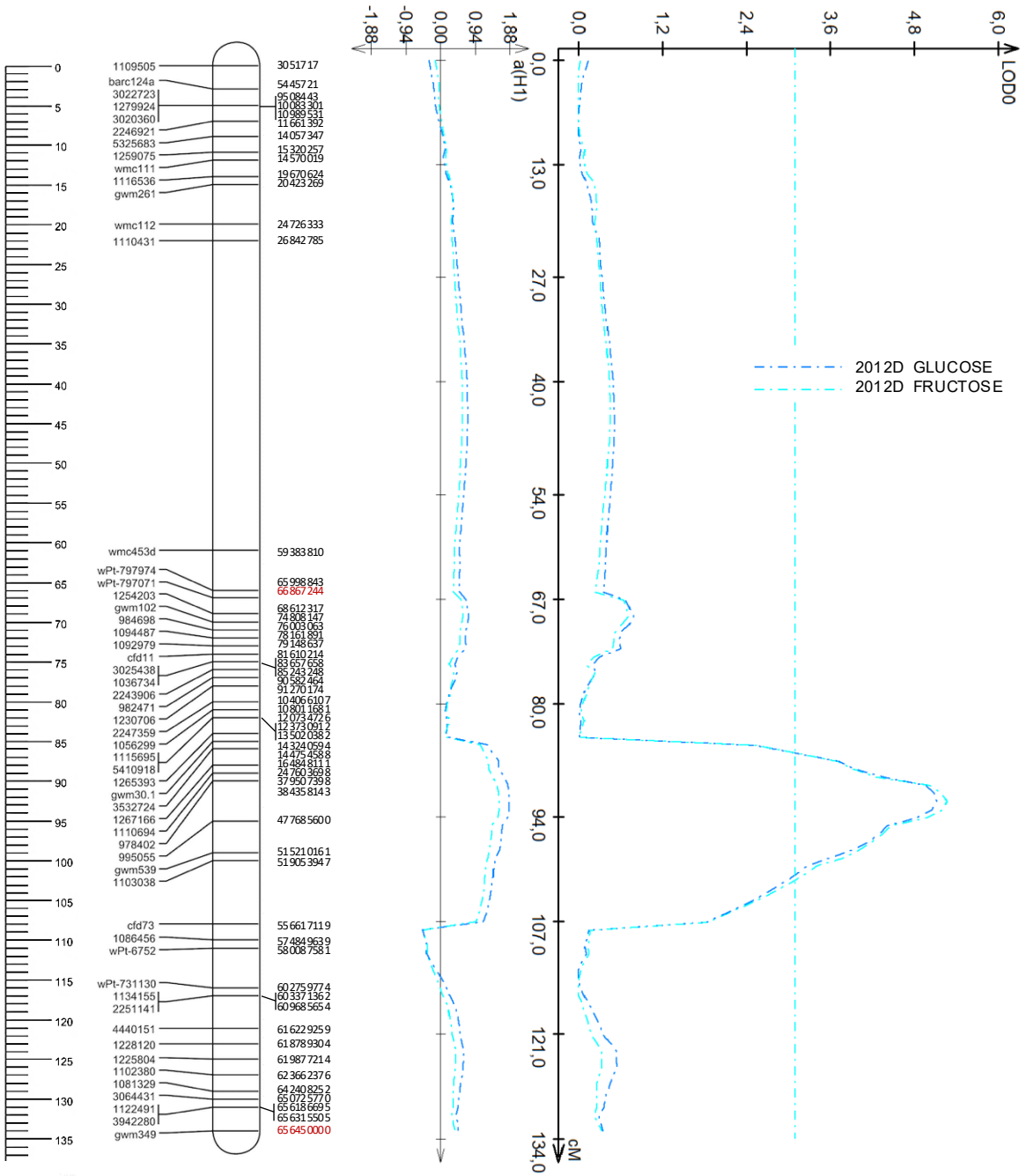


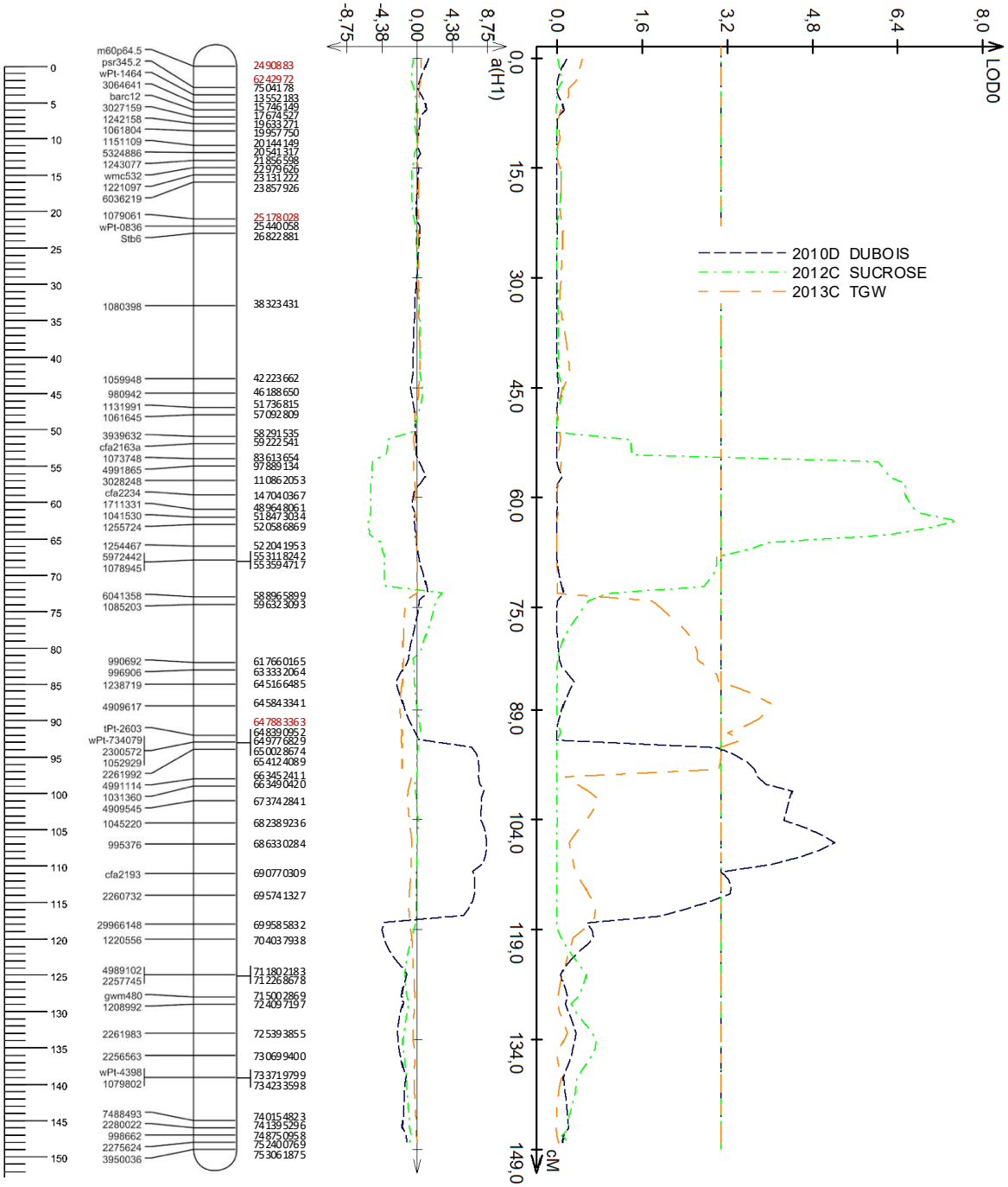

cM
1B map
1B CIM LOD+additive effects
LOD0
a(H1)
cM
2013C GLUCOSE
2013C FRUCTOSE
wPt-1568
wPt-0308
wPt-5249
wPt-4366
wPt-7460
wPt-6078
wPt-9787
wPt-6425
wPt-2389
wPt-0944
wPt-9028
psr2019.2_1BL
GluB
psr162
psr325.2
barc188
m72p78.4
m87p78.8
m67p77.5_1B
m51p65.3_1B
wmc406
csu109
cfd65b

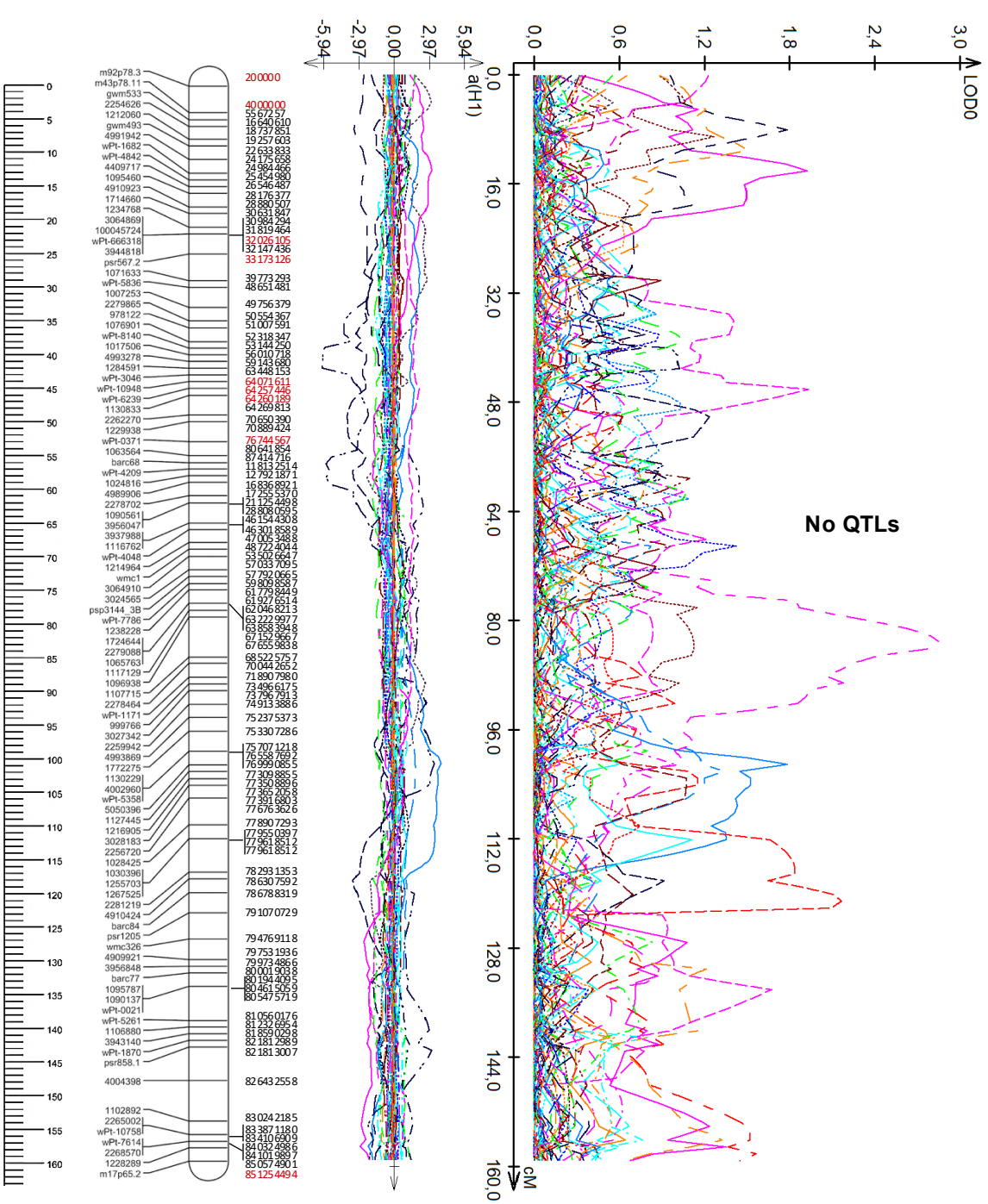

cM
1D map
1D CIM LOD+additive effects
LOD0
a(H1)
cM
2012C YIELD
2010D DUBOIS
2012C MALTOSE

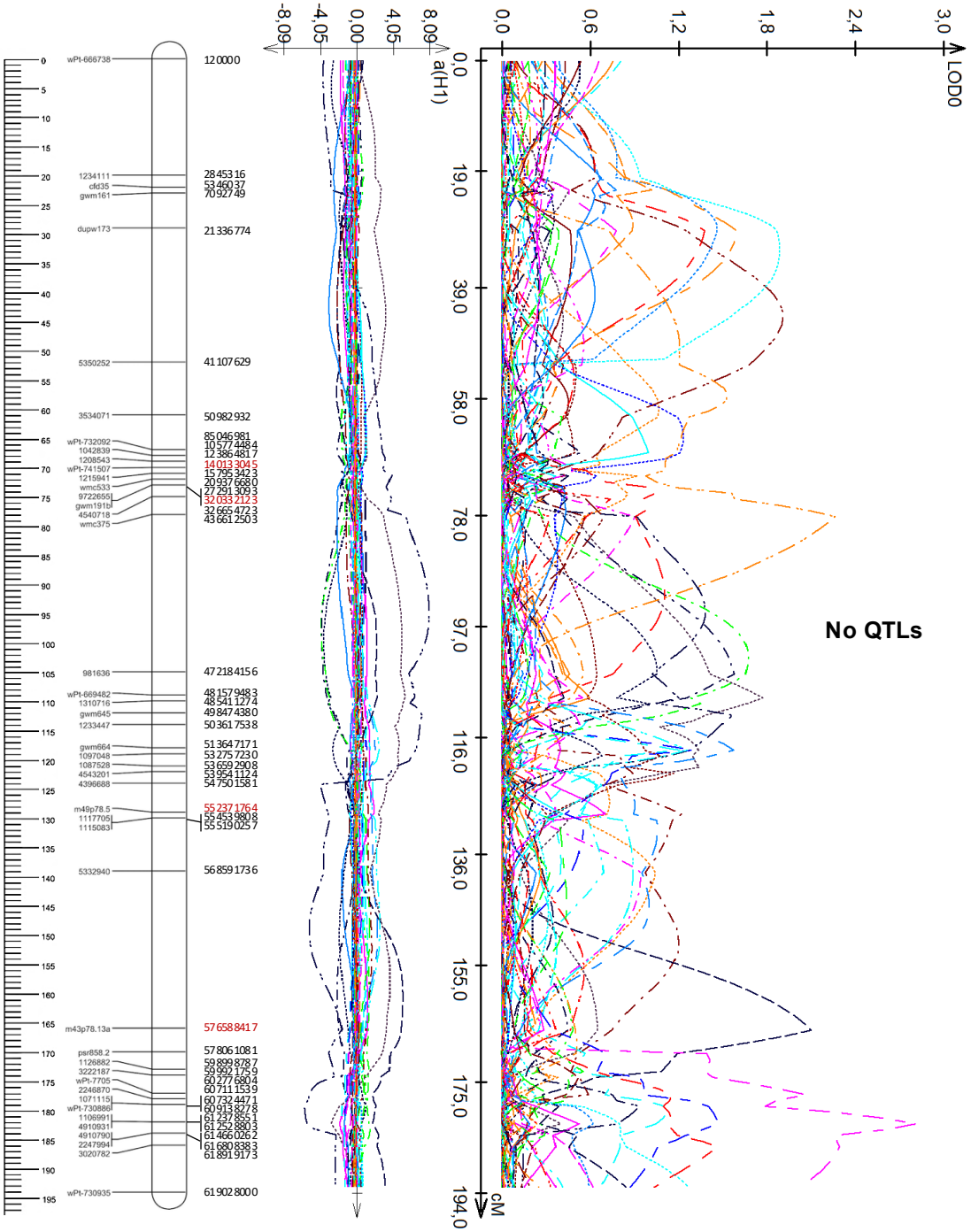

cM
2A map
2A CIM LOD+additive effects
wPt-3611 19000000
wPt-3744 20293441
wPt-8328 24315227
barc124b 56344467
gwm210.2 68778241
wPt-4197 100385984
m87p78.3 126372141
4396779 205576261
3947248 314392231
m92p78.10 314392061
1088872 314392231
psr332 344570391
3948773 353718541
1037819 361113431
wmc177 382660081
4910082 389086101
3947248b 404423541
1109641 457543041
wPt-5029 458378051
991804 479698551
m85p65.8_2A 485491541
1129174 487174311
5050376 572644641
wmc453a 628574921
4009450 634554581
1069828 645051051
1112257 670617551
981946 707378501
gwm122 855491111
gwm339 1174072441
wmc246 1826916281
2264931 1864652611
gwm558 1870002651
2290778 1874153081
1080871 1879452631
1068412 1946529021
5578491 1971915271
3958592 2009342331
4543669 2151163541
1667853 2214883181
m69p78.9 2362012801
4544216 2662833001
1723353 2687110121
5050434 2694269401
2257109 2698695931
2289397 2709988182
wPt-7024 2719192816
2359878 2719798819
gwm294 2720430588
1053641 2720891560
3949181 2724305326
4404214 2727421329
wmc181 2728171473
4537279 2729942192
1166096 2733150651
GS2_463fxrt 2733286805
4412032 2737410161
3020635 2738603257
1269202 2738791267
1094059 2743023044
1068421 2746609022
gwm356 2757582180
2262196 2759296616
4542610 2760223763
3064424 2763081676
m87p78.6 2781001817
1201261 2784831689
1088553 2786122509
-3,60
-1,80
0,00
1,80
3,60
a(H1)
0,0
1,0
2,0
3,0
4,0
5,0
LOD0
0,0
16,0
33,0
49,0
66,0
82,0
98,0
115,0
131,0
148,0
164,0
cM
2013D GLUCOSE
2013D YIELD
2013C TGW

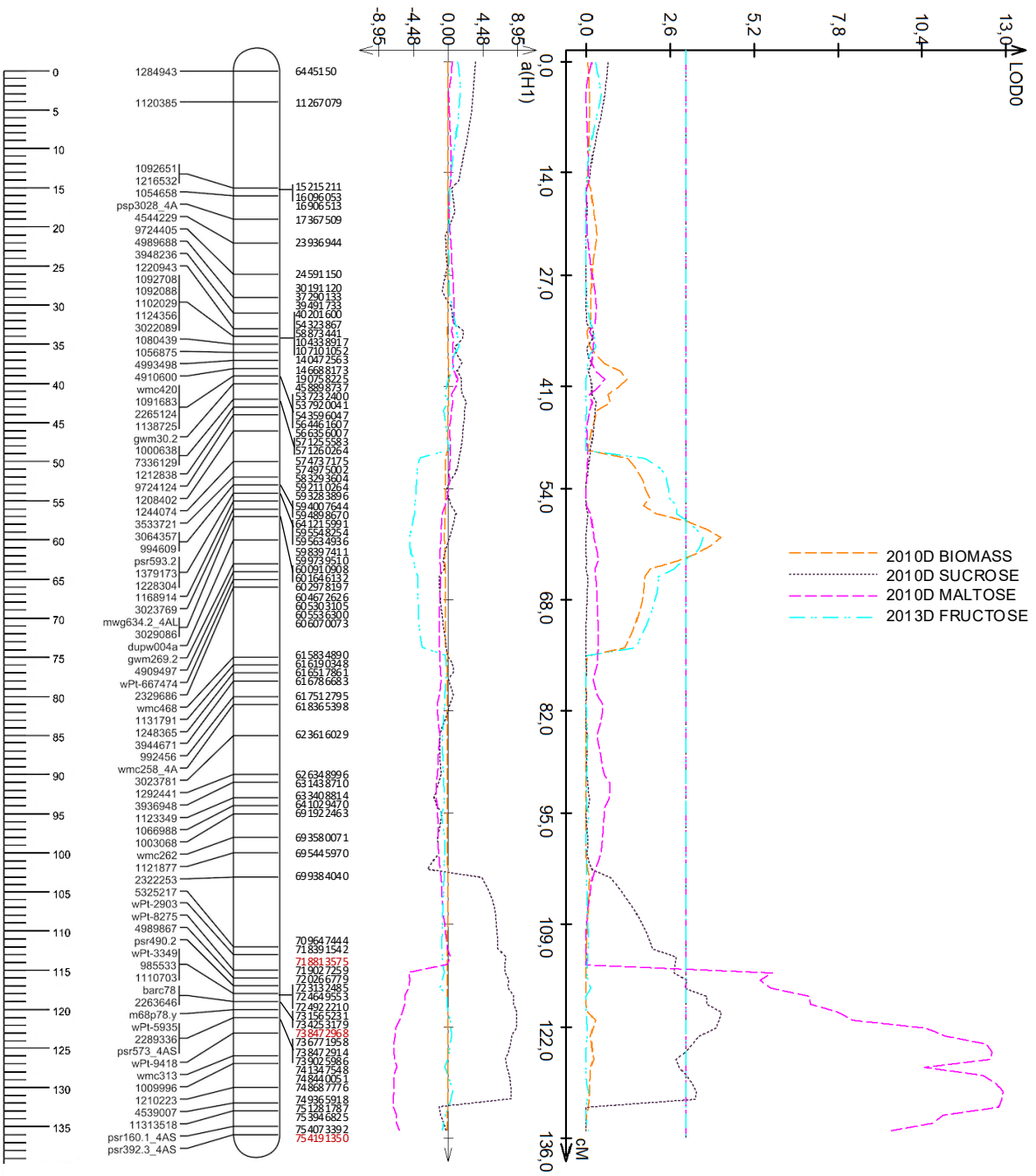

cM
2B map
2B CIM LOD+additive effects
LOD0
a(H1)
cM
2010D TGW
2010C FRUCTOSE
2010C SUCROSE
2010D SUCROSE
2010C MALTOSE
2012D DUBOIS
2013D GLUCOSE
2013C BIOMASS

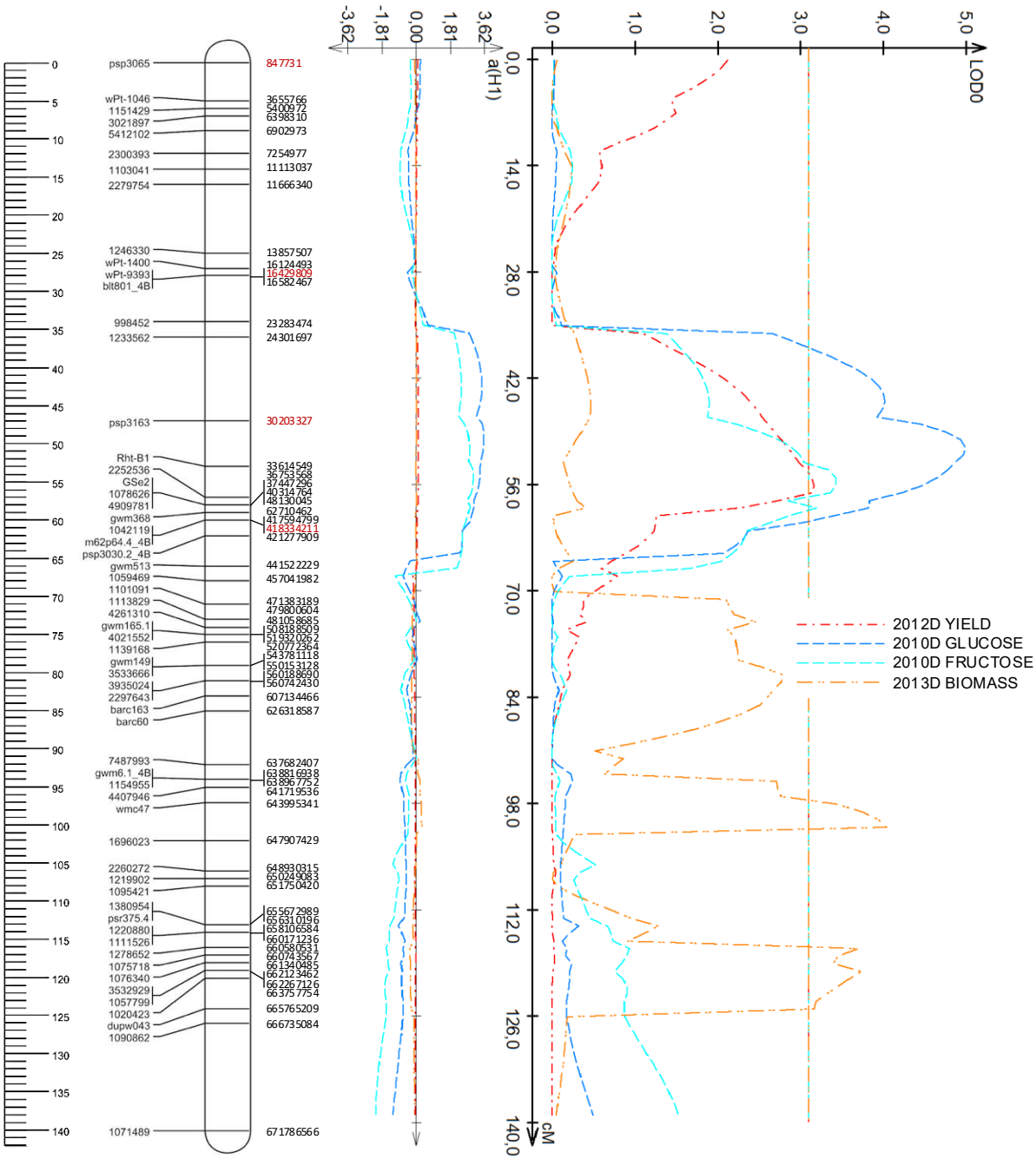

cM
2D map
2D CIM LOD+additive effects
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
130
135
1109505
barc124a
3022723
1279924
3020360
2246921
5325683
1259075
wmc111
1116536
gwm261
wmc112
1110431
wmc453d
wPt-797974
wPt-797071
1254203
gwm102
984698
1094487
1092979
cfd11
3025438
1036734
2243906
982471
1230706
2247359
1056299
1115695
5410918
1265393
gwm30.1
3532724
1267166
1110694
978402
995055
gwm539
1103038
cfd73
1086456
wPt-6752
wPt-731130
1134155
2251141
4440151
1228120
1225804
1102380
1081329
3064431
1122491
3942280
gwm349
30517117
54457121
95084443
100833011
109895311
116613921
140573471
153202571
145700191
196706241
204232691
247263331
268427851
593838101
659988431
668672441
686123171
748081471
760030631
781618911
791486371
816102141
836576581
852432481
905824641
912701741
1040661071
1080116811
1207347261
1373091211
1350203821
1432405941
1447545581
1648481111
2476036981
3795073981
3843581431
4776856001
5152101611
5190539471
5566171191
5748496391
5800875811
6027599741
6033713621
6096856541
6162292591
6187893041
6198772141
6236623761
6424082521
6507257701
6561866951
6563155051
6564500001
-1,88
-0,94
0,00
0,94
1,88
a(H1)
0,0
1,2
2,4
3,6
4,8
6,0
LOD
0,0
13,0
27,0
40,0
54,0
67,0
80,0
94,0
107,0
121,0
134,0
cM
2012D GLUCOSE
2012D FRUCTOSE

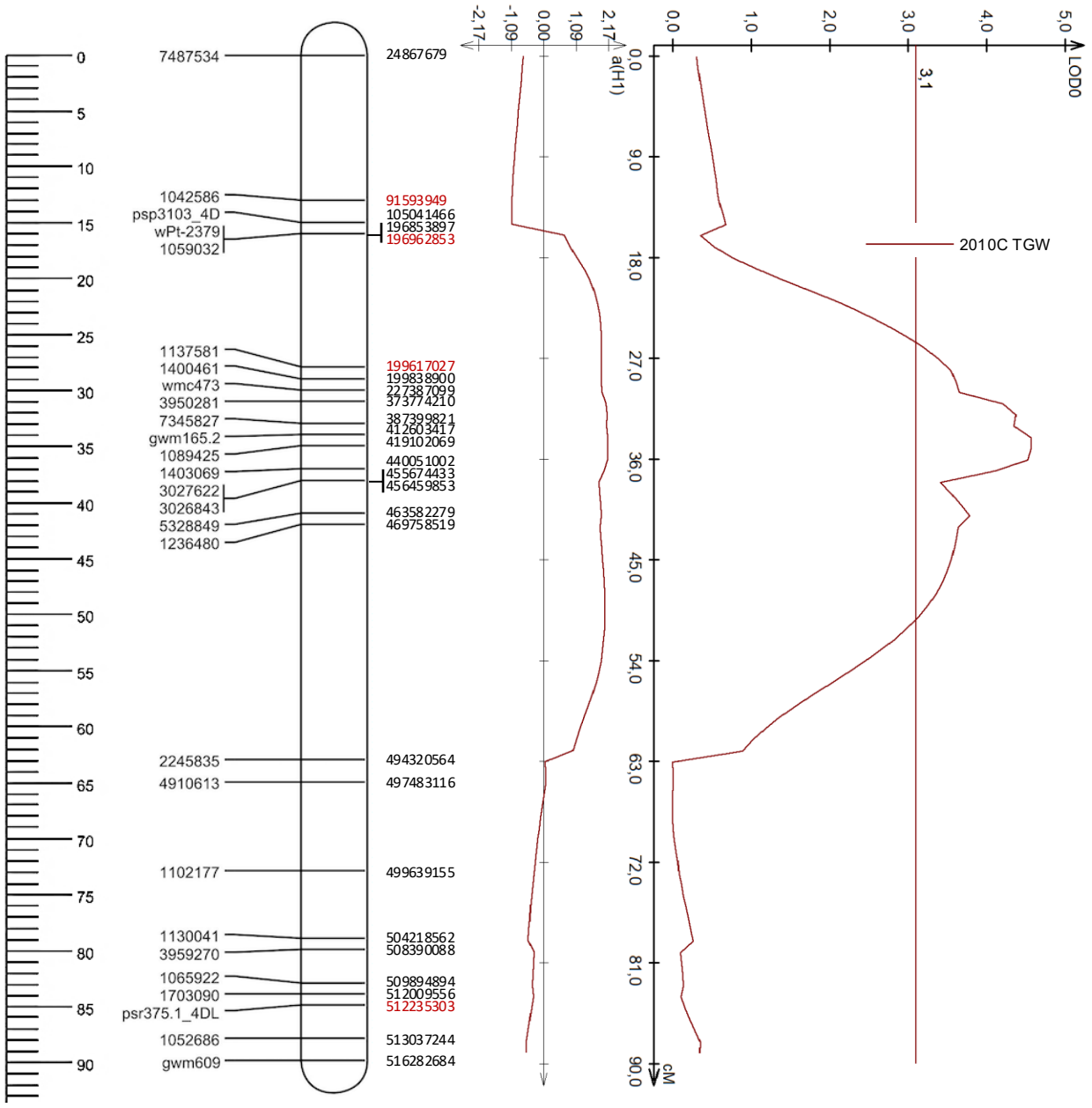

cM
3A map
3A CIM LOD+additive effects
m60p64.5
psr345.2
wPt-1464
3064641
barc12
3027159
1242158
1061804
1151109
5324886
1243077
wmc532
1221097
6036219
1079061
wPt-0836
Stb6
1080398
1059948
980942
1131991
1061645
3939632
cfa2163a
1073748
4991865
3028248
cfa2234
1711331
1041530
1255724
1254467
5972442
1078945
6041358
1085203
990692
996906
1238719
4909617
tPt-2603
wPt-734079
2300572
1052929
2261992
4991114
1031360
4909545
1045220
995376
cfa2193
2260732
29966148
1220556
4989102
2257745
gwm480
1208992
2261983
2256563
wPt-4398
1079802
7488493
2280022
998662
2275624
3950036
-8,75
-4,38
0,00
4,38
8,75
a(H1)
0,0
1,6
3,2
4,8
6,4
8,0
LOD0
2010D DUBOIS
2012C SUCROSE
2013C TGW
0,0
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30,0
45,0
60,0
75,0
89,0
104,0
119,0
134,0
149,0
cM

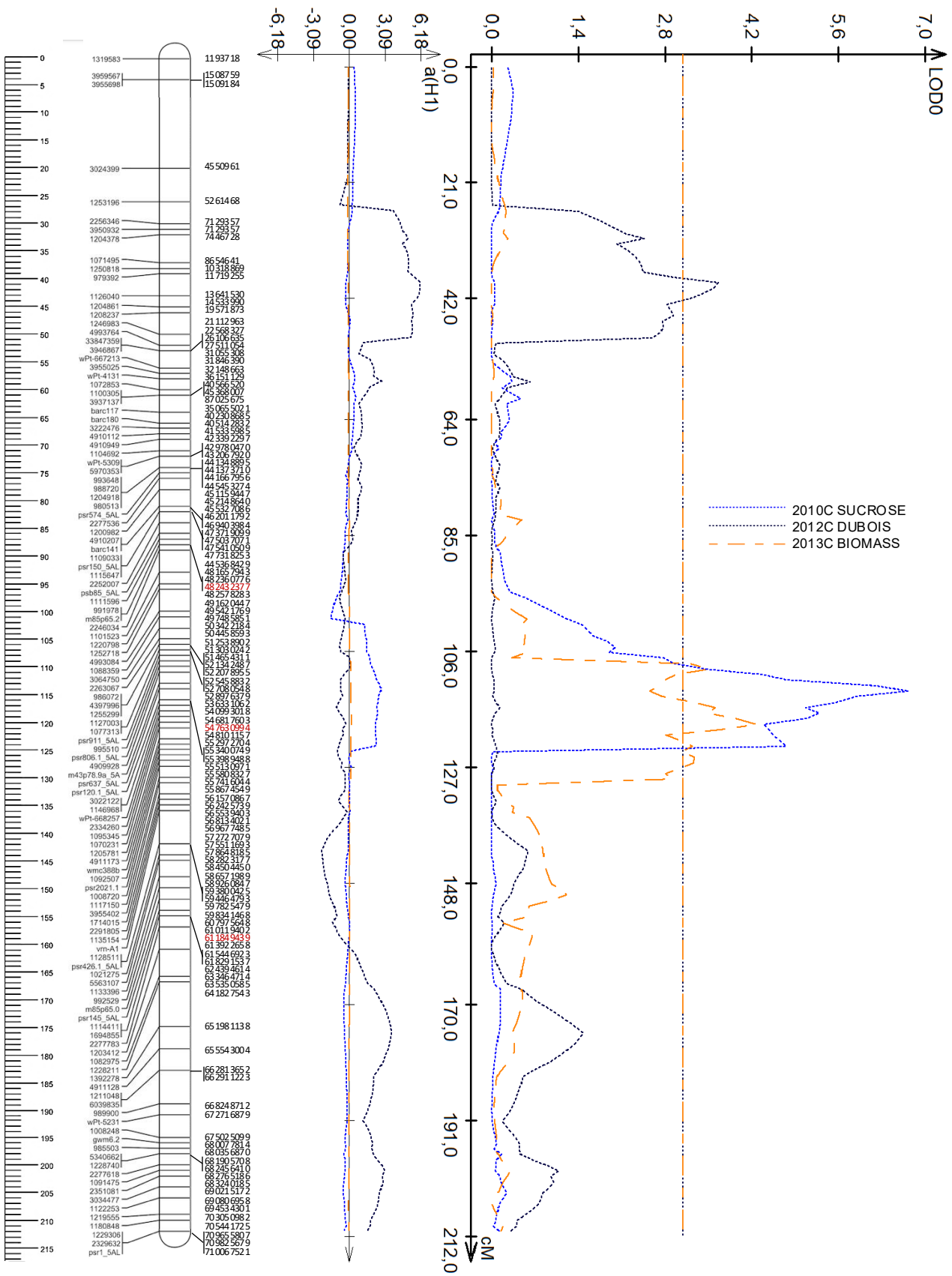

cM
3B map
3B CIM LOD+additive effects
LOD
a(H1)
cM
No QTLs

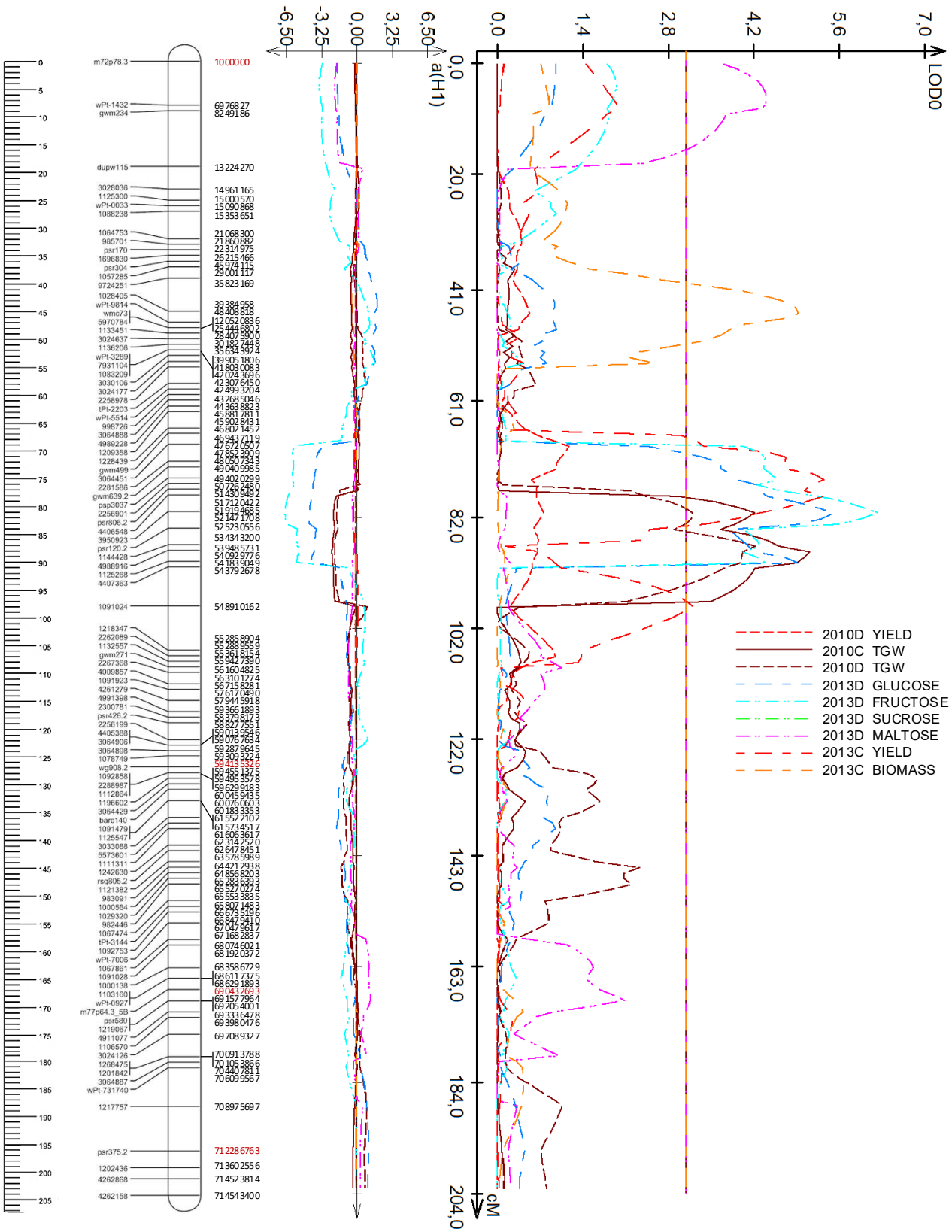

cM
3D map
3D CIM LOD+additive effects
-8,09
-4,05
0,00
4,05
8,09
a(H1)
0,0
0,6
1,2
1,8
2,4
3,0
LOD0
0,0
19,0
39,0
58,0
78,0
97,0
116,0
136,0
155,0
175,0
194,0
cM
No QTLs
wPt-666738
1234111
cfd35
gwm161
dupw173
5350252
3534071
wPt-732092
1042839
1208543
wPt-741507
1215941
wmc533
9722655
gwm191b
4540718
wmc375
981636
wPt-669482
1310716
gwm645
1233447
gwm664
1097048
1087528
4543201
4396688
m49p78.5
1117705
1115083
5332940
m43p78.13a
psr858.2
1126882
3222187
wPt-7705
2246870
1071115
wPt-730886
1106991
4910931
4910790
2247944
3020782
wPt-730935

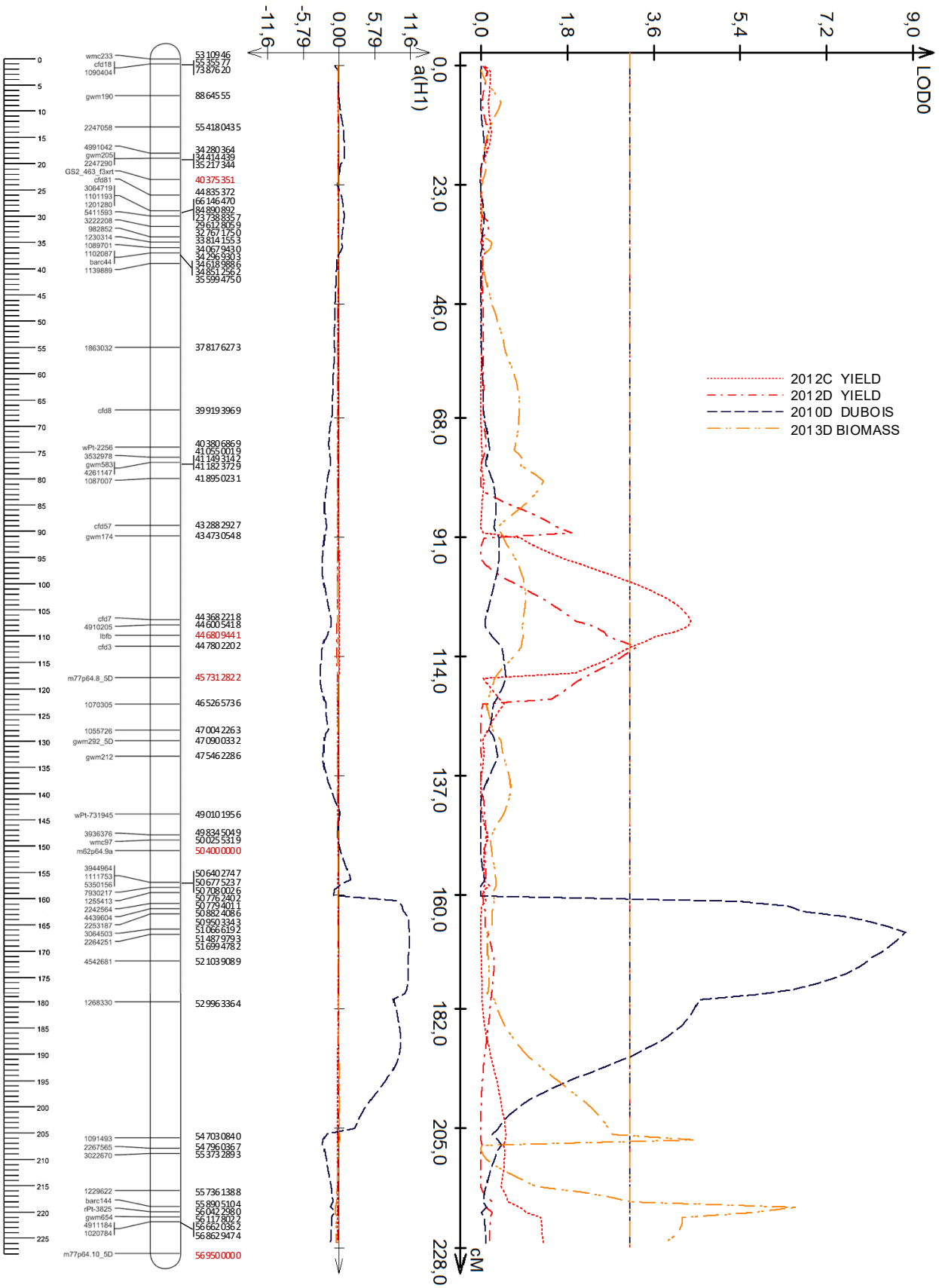

cM
4A map
4A CIM LOD+additive effects
LOD0
a(H1)
cM
2010D BIOMASS
2010D SUCROSE
2010D MALTOSE
2013D FRUCTOSE

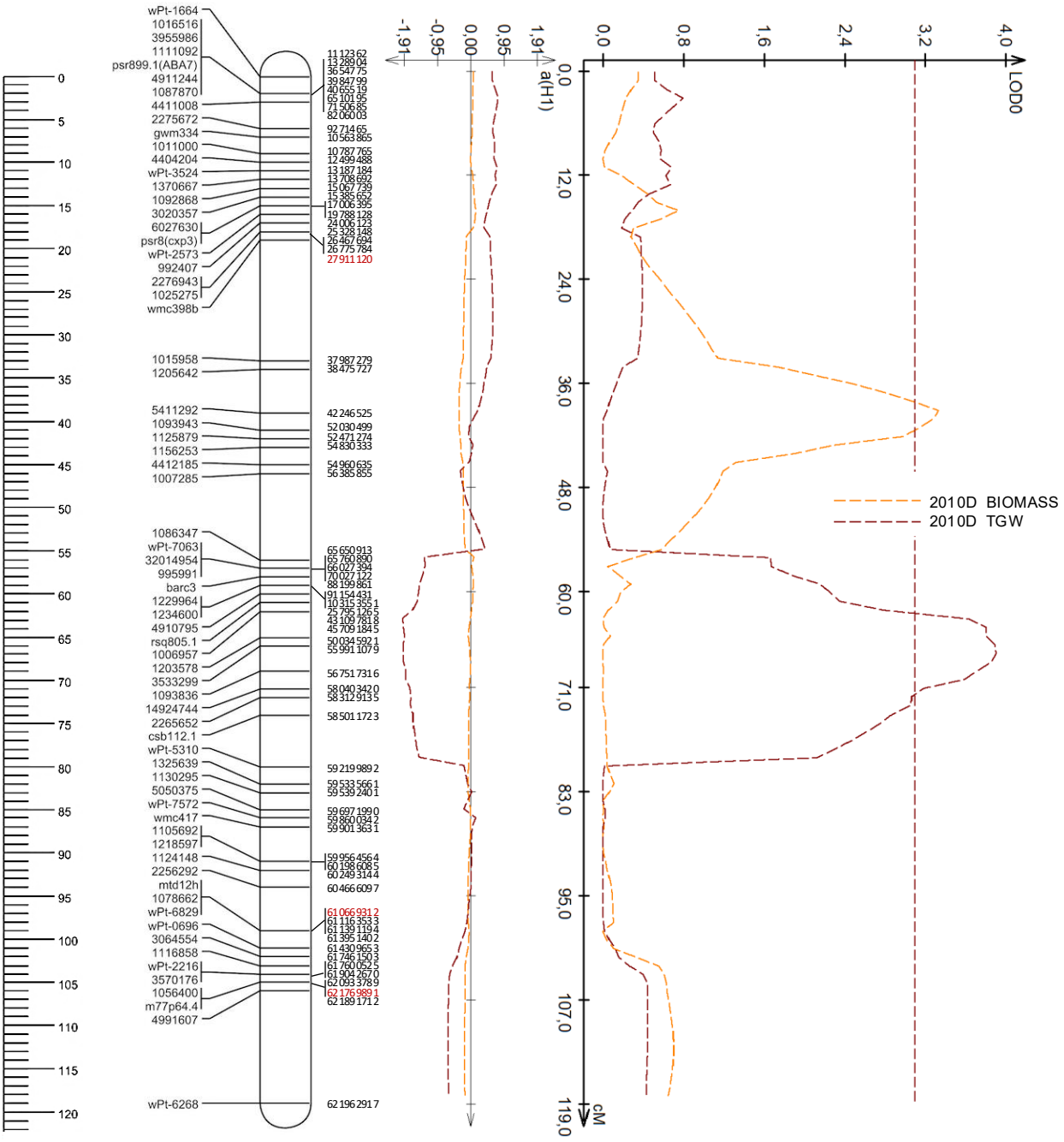

cM
4B map
4B CIM LOD+additive effects
psp3065
wPt-1046
wPt-1400
wPt-9393
bl801_4B
psp3163
Rht-B1
GSe2
gwm368
m62p64.4_4B
psp3030.2_4B
gwm513
gwm165.1
gwm149
barc163
barc60
gwm6.1_4B
wmc47
psr375.4
dupw043
a(H1)
LOD0
2012D YIELD
2010D GLUCOSE
2010D FRUCTOSE
2013D BIOMASS

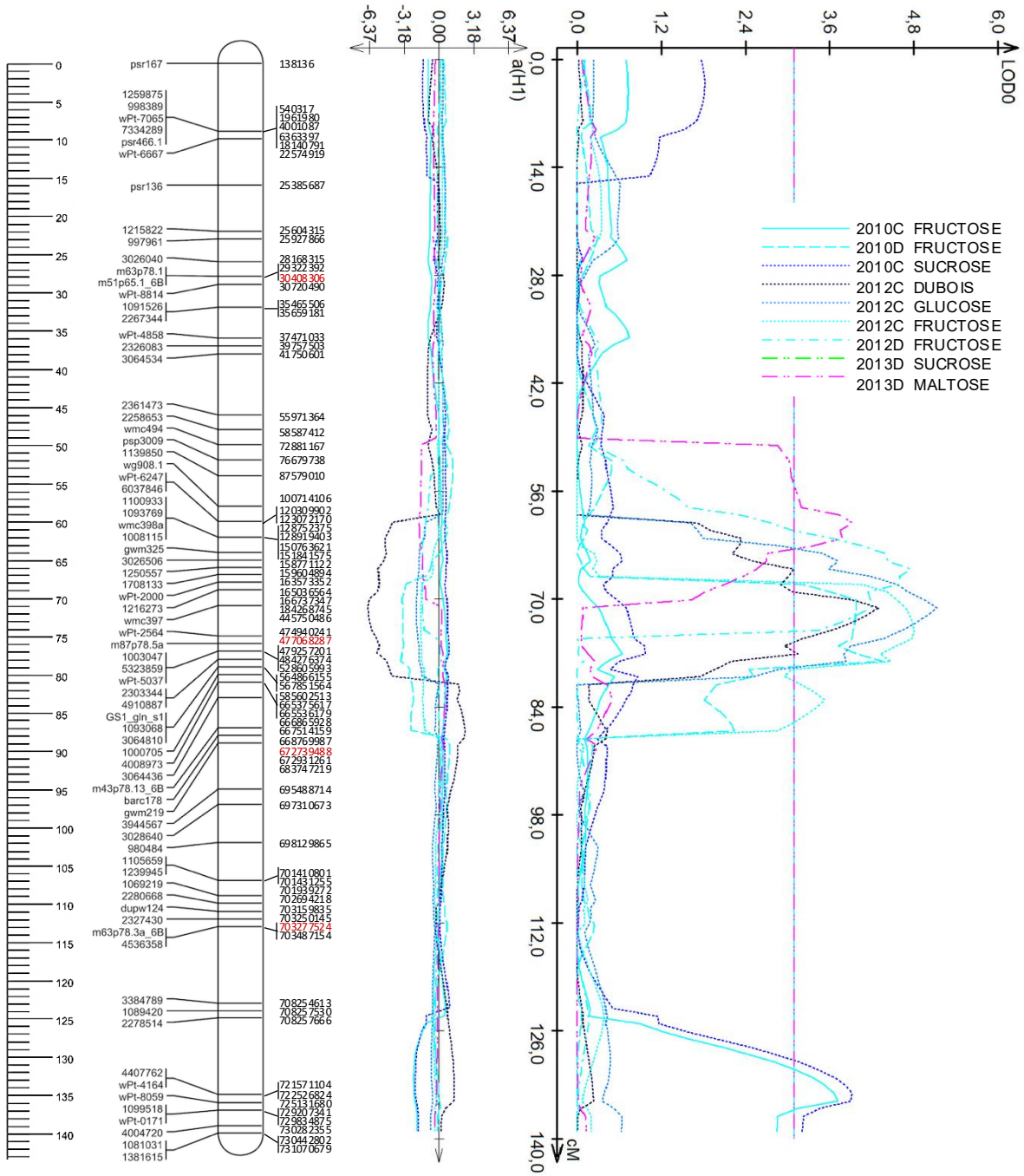

cM
4D map
4D CIM LOD+additive effects
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
7487534
1042586
psp3103_4D
wPt-2379
1059032
1137581
1400461
wmc473
3950281
7345827
gwm165.2
1089425
1403069
3027622
3026843
5328849
1236480
2245835
4910613
1102177
1130041
3959270
1065922
1703090
psr375.1_4DL
1052686
gwm609
24867679
91593949
105041466
196853897
196962853
199617027
199838900
227387099
373774210
387399821
412603417
419102069
440051002
455674433
456459853
463582279
469758519
494320564
497483116
499639155
504218562
508390088
509894894
512009556
512235303
513037244
516282684
-2,17
-1,09
0,00
1,09
2,17
a(H1)
0,0
1,0
2,0
3,0
4,0
5,0
LOD0
3,1
2010C TGW
9,0
18,0
27,0
36,0
45,0
54,0
63,0
72,0
81,0
90,0
cM

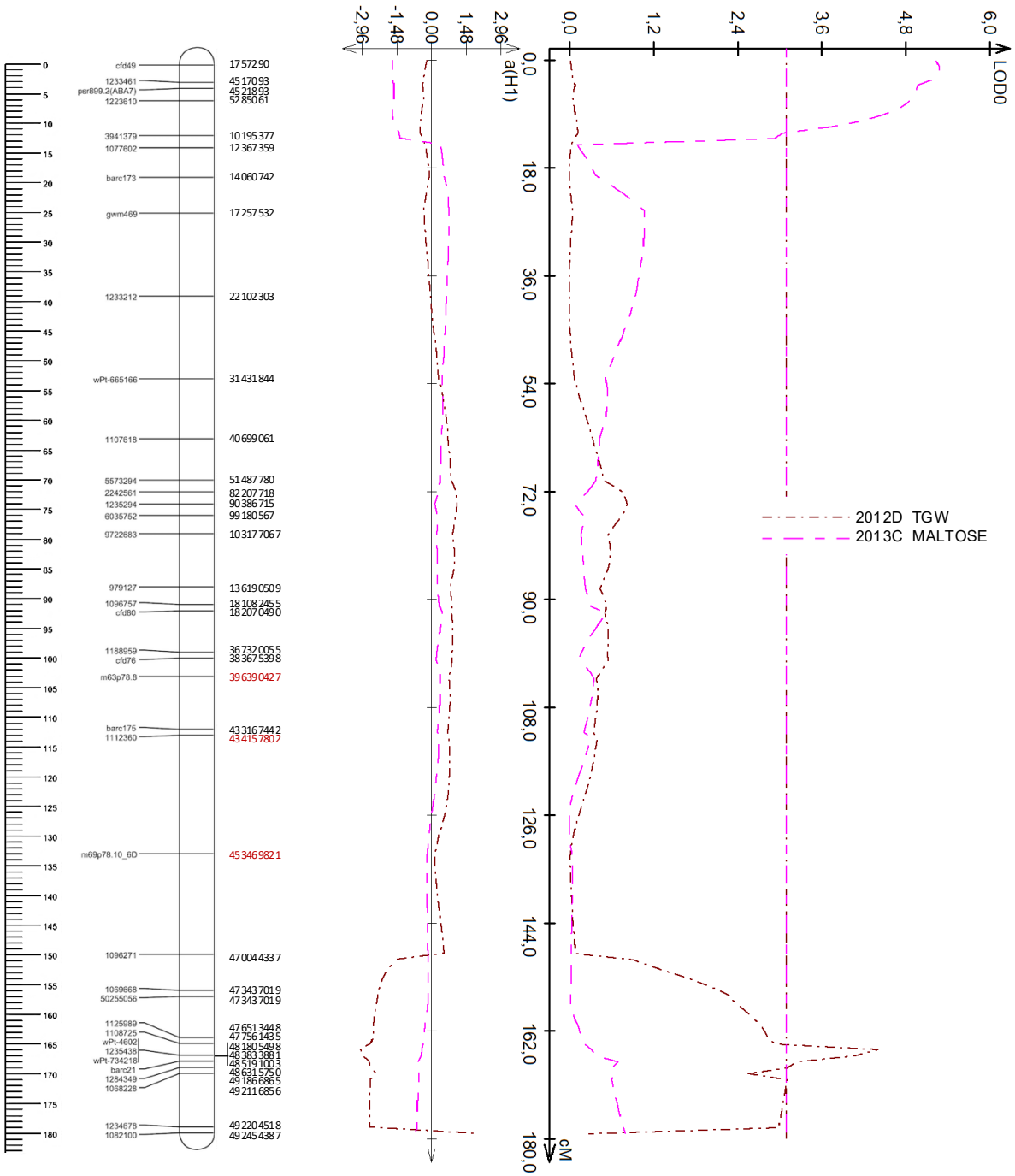

cM
5A map
5A CIM LOD+additive effects
LOD0
a(H1)
cM
2010C SUCROSE
2012C DUBOIS
2013C BIOMASS

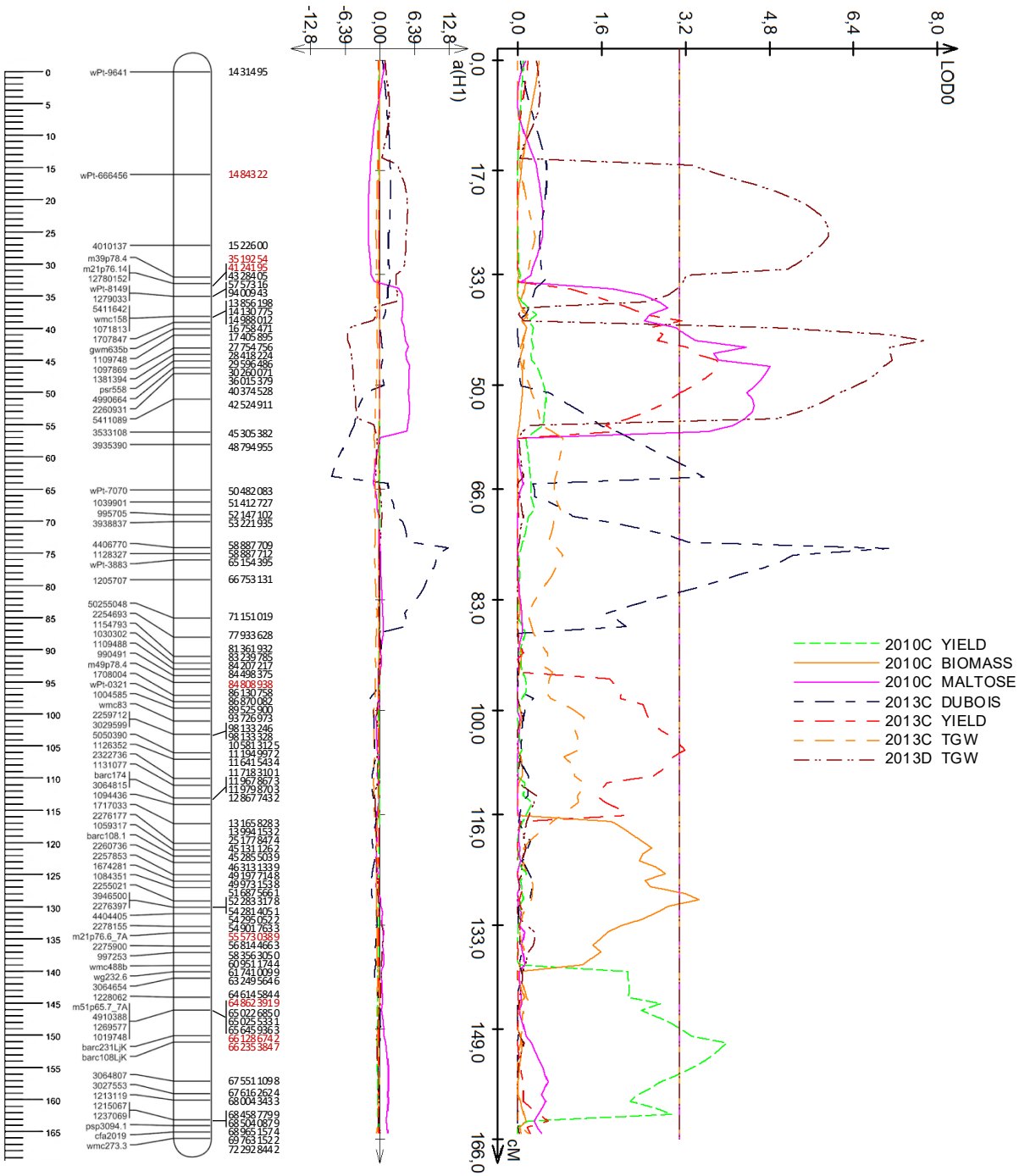

cM
5B map
5B CIM LOD+additive effects
a(H1)
LOD0
cM
2010D YIELD
2010C TGW
2010D TGW
2013D GLUCOSE
2013D FRUCTOSE
2013D SUCROSE
2013D MALTOSE
2013C YIELD
2013C BIOMASS

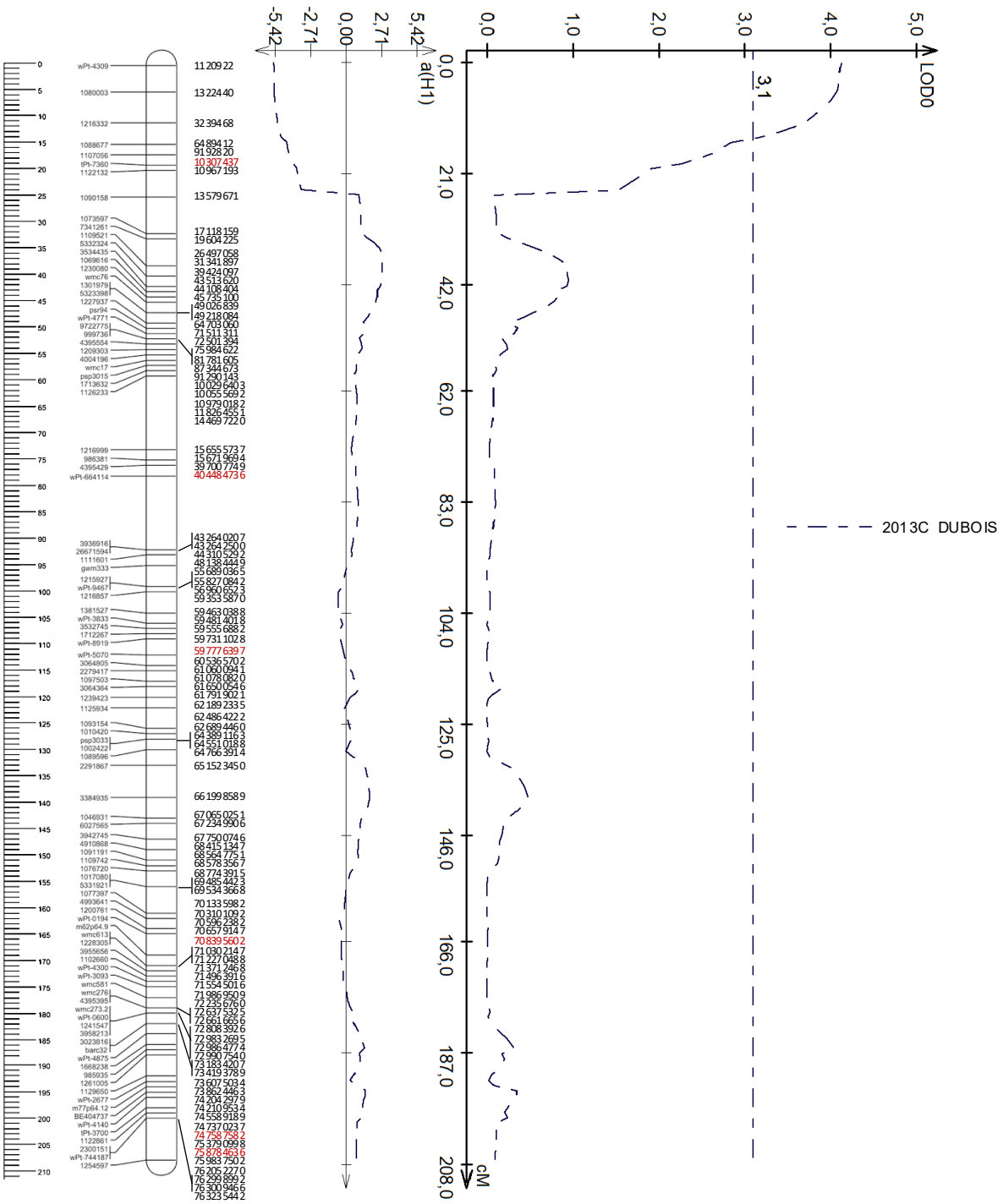

cM
5D map
5D CIM LOD+additive effects
wmc233
cfd18
1090404
gwm190
2247058
4991042
gwm205
2247290
GS2_463_f3xrt
cfd81
3064719
1101193
1201280
5411593
3222208
982852
1230314
1089701
1102087
barc44
1139889
1863032
cfd8
wPt-2256
3532978
gwm583
4261147
1087007
cfd57
gwm174
cfd7
4910205
lbfb
cfd3
m77p64.8_5D
1070305
1055726
gwm292_5D
gwm212
wPt-731945
3936376
wmc97
m62p64.9a
3944964
1111753
5350156
7930217
1255413
2242564
4439604
2253187
3064503
2264251
4542681
1268330
1091493
2267565
3022670
1229622
barc144
rPt-3825
gwm654
4911184
1020784
m77p64.10_5D
-11,6
-5,79
0,00
5,79
11,6
a(H1)
0,0
1,8
3,6
5,4
7,2
9,0
LOD0
0,0
23,0
46,0
68,0
91,0
114,0
137,0
160,0
182,0
205,0
228,0
cM
2012C YIELD
2012D YIELD
2010D DUBOIS
2013D BIOMASS

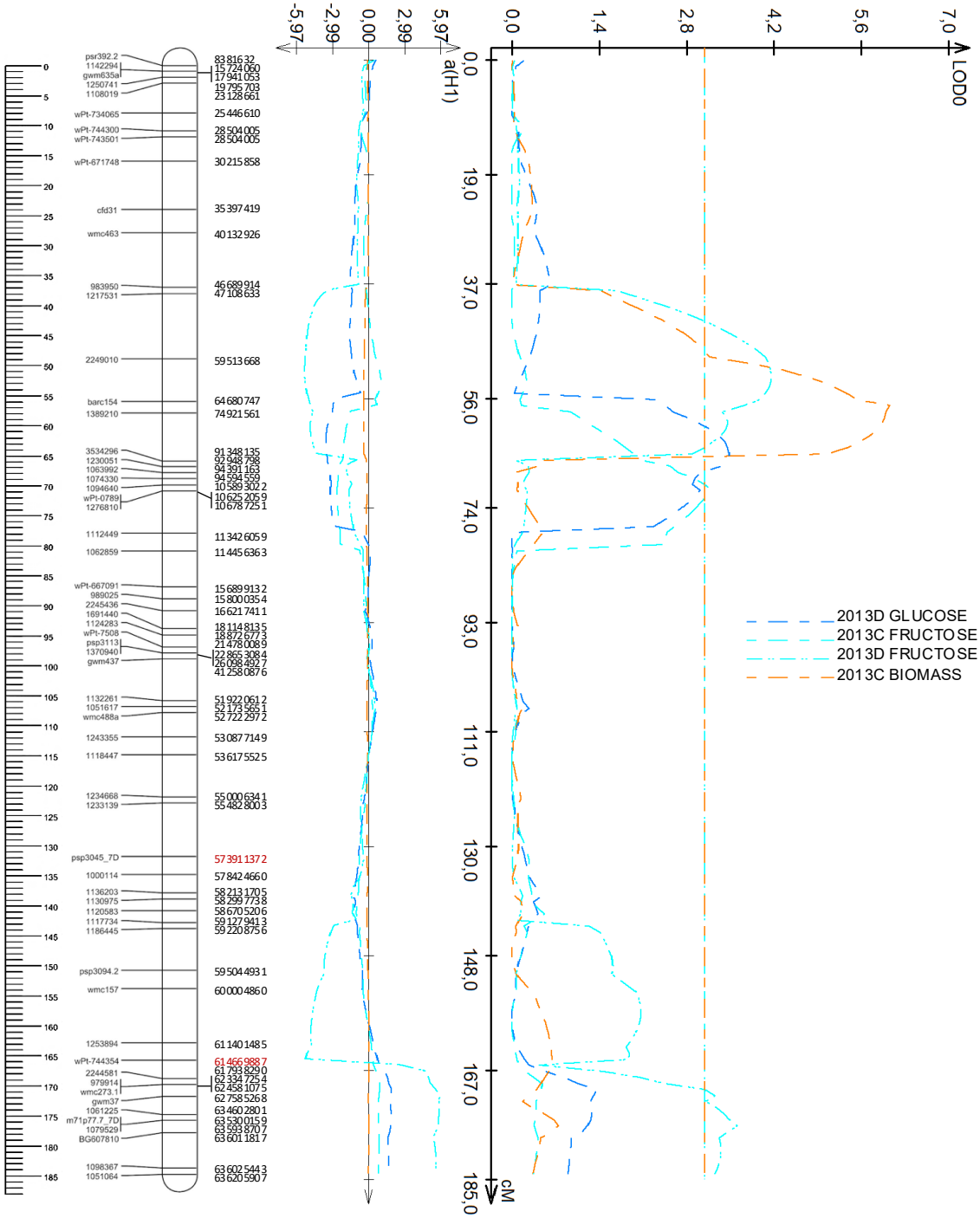

cM
6A map
6A CIM LOD+additive effects
wPt-1664
1016516
3955986
1111092
psr899.1(ABA7)
4911244
1087870
4411008
2275672
gwm334
1011000
4404204
wPt-3524
1370667
1092868
3020357
6027630
psr8(cxp3)
wPt-2573
992407
2276943
1025275
wmc398b
1015958
1205642
5411292
1093943
1125879
1156253
4412185
1007285
1086347
wPt-7063
32014954
995991
barc3
1229964
1234600
4910795
rsq805.1
1006957
1203578
3533299
1093836
14924744
2265652
csb112.1
wPt-5310
1325639
1130295
5050375
wPt-7572
wmc417
1105692
1218597
1124148
2256292
mtd12h
1078662
wPt-6829
wPt-0696
3064554
1116858
wPt-2216
3570176
1056400
m77p64.4
4991607
wPt-6268
-1,91
-0,95
0,00
0,95
1,91
a(H1)
0,0
0,8
1,6
2,4
3,2
4,0
LOD0
0,0
12,0
24,0
36,0
48,0
60,0
71,0
83,0
95,0
107,0
119,0
cM
2010D BIOMASS
2010D TGW


cM
6B map
6B CIM LOD+additive effects
LOD0
a(H1)
cM
2010C FRUCTOSE
2010D FRUCTOSE
2010C SUCROSE
2012C DUBOIS
2012C GLUCOSE
2012C FRUCTOSE
2012D FRUCTOSE
2013D SUCROSE
2013D MALTOSE


cM
6D map
6D CIM LOD+additive effects
cfd49 17572 90
1233461 45170 93
psr899.2(ABA7) 45218 93
1223610 52850 61
3941379 10195 377
1077602 12367 359
barc173 14060 742
gwm469 17257 532
1233212 22102 303
wPt-665166 31431 844
1107618 40699 061
5573294 51487 780
2242561 82207 718
1235294 90386 715
6035752 99180 567
9722683 10317 7067
979127 13619 0509
1096757 18108 2455
cfd80 18207 0490
1188959 36732 0055
cfd76 38367 5398
m63p78.8 39639 0427
barc175 43316 7442
1112360 43415 7802
m69p78.10_6D 45346 9821
1096271 47004 4337
1069668 47343 7019
50255056 47343 7019
1125989 47651 3448
1108725 47756 1435
wPt-4602 48190 5498
1235438 48383 3881
wPt-734218 48519 1003
barc21 48631 5750
1284349 49186 6865
1068228 49211 6856
1234678 49220 4518
1082100 49245 4387
-2,96
-1,48
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1,48
2,96
a(H1)
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1,2
2,4
3,6
4,8
6,0
LOD0
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18,0
36,0
54,0
72,0
90,0
108,0
126,0
144,0
162,0
180,0
cM
2012D TGW
2013C MALTOSE


cM
7A map
7A CIM LOD+additive effects
-12,8
-6,39
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6,39
12,8
a(H1)
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1,6
3,2
4,8
6,4
8,0
LOD0
0,0
17,0
33,0
50,0
66,0
83,0
100,0
116,0
133,0
149,0
166,0
cM
2010C YIELD
2010C BIOMASS
2010C MALTOSE
2013C DUBOIS
2013C YIELD
2013C TGW
2013D TGW
wPt-9641
wPt-666456
4010137
m39p78.4
m21p76.14
12780152
wPt-8149
1279033
5411642
wmc158
1071813
1707847
gwm635b
1109748
1097869
1381394
psr558
4990664
2260931
5411089
3533108
3935390
wPt-7070
1039901
995705
3938837
4406770
1128327
wPt-3883
1205707
50255048
2254693
1154793
1030302
1109488
990491
m49p78.4
1708004
wPt-0321
1004585
wmc83
2259712
3029599
5050390
1126352
2322736
1131077
barc174
3064815
1094436
1717033
2276177
1059317
barc108.1
2260736
2257853
1674281
1084351
2255021
3946500
2276397
4404405
2278155
m21p76.6_7A
2275900
997253
wmc488b
wg232.6
3064654
1228062
m51p65.7_7A
4910388
1269577
1019748
barc231LjK
barc108LjK
3064807
3027553
1213119
1215067
1237069
psp3094.1
cfa2019
wmc273.3


cM
7B map
7B CIM LOD+additive effects
-5,42
-2,71
0,00
2,71
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a(H1)
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1,0
2,0
3,0
4,0
5,0
LOD0
3,1
2013C_DUBOIS
cM
0,0
21,0
42,0
62,0
83,0
104,0
125,0
146,0
166,0
187,0
208,0


cM
7D map
7D CIM LOD+additive effects
-5,97
-2,99
0,00
2,99
5,97
a(H1)
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1,4
2,8
4,2
5,6
7,0
LOD0
0,0
19,0
37,0
56,0
74,0
93,0
111,0
130,0
148,0
167,0
185,0
cM
2013D GLUCOSE
2013C FRUCTOSE
2013D FRUCTOSE
2013C BIOMASS
psr392.2
1142294
gwm635a
1250741
1108019
wPt-734065
wPt-744300
wPt-743501
wPt-671748
cfd31
wmc463
983950
1217531
2249010
barc154
1389210
3534296
1230051
1063992
1074330
1094640
wPt-0789
1276810
1112449
1062859
wPt-667091
989025
2245436
1691440
1124283
wPt-7508
psp3113
1370940
gwm437
1132261
1051617
wmc488a
1243355
1118447
1234668
1233139
psp3045_7D
1000114
1136203
1130975
1120583
1117734
1186445
psp3094.2
wmc157
1253894
wPt-744354
2244581
979914
wmc273.1
gwm37
1061225
m71p77.7_7D
1079529
BG607810
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1051064