

Appendix A Maize inbred lines and the four tested traits

Note: a, NA indicates not available; b, “Yes” indicates these 292 inbred lines were used for candidate gene association mapping.

Line	MSE20	MSE10	RAT12 ^a	RAT6	Used for candidate association mapping ^b
ZHENG58	8.85921779	9.134518727	0.104959	0.064954	
ZHENG653	11.74537685	10.45525788	0.120082	0.047219	Yes
CIMBL58	10.10698252	10.04285894	0.135464	0.609049	
DAN340	10.26885697	9.32739662	0.145283	0.081324	Yes
B11	9.273122602	8.539393122	0.146427	0.156232	Yes
C8605	12.35881269	10.40851097	0.159434	0.078937	
CIMBL11	7.830387872	8.119249858	0.161894	0.633073	Yes
CIMBL79	8.704010773	8.806511375	0.163868	0.278707	Yes
ZONG31	10.95874779	10.5273722	0.166555	0.384619	Yes
CIMBL65	6.606166085	7.153604952	0.174791	0.504381	
BY843	10.16963544	9.697445282	0.187015	0.181728	
ZZ03	7.931699383	9.199326417	0.190495	0.483775	Yes
DH29	6.654089344	7.406721149	0.197896	0.296477	
CML430	8.483760777	8.890512978	0.201689	0.66657	
CML433	10.09180163	9.35688574	0.20957	0.21253	
YE107	11.3230378	9.44022981	0.224307	0.167306	
MO17	12.51577636	10.4733156	0.243068	0.756613	Yes
303WX	17.66373623	13.91588703	0.247445	0.326884	Yes
GEMS32	13.32506348	10.37408234	0.247465	0.208358	Yes
CML497	10.8329621	9.557091676	0.250036	0.270257	
ZHENG30	7.815205443	8.859983605	0.250786	0.431579	Yes
150	10.94318509	9.340616073	0.262812	0.224567	Yes
TY2	7.610345199	8.650255942	0.265735	0.287624	Yes
CIMBL3	5.006042268	5.631631802	0.269689	0.202087	Yes
TT16	9.753701992	8.959669225	0.269979	0.238798	
GEMS28	7.518477514	7.512983962	0.270271	0.471887	Yes
GEMS41	13.89250121	12.0069905	0.28508	0.60084	Yes
LIAO159	8.113455959	8.330593816	0.28575	0.286026	Yes
CIMBL26	8.676409536	8.820486723	0.287174	0.703321	
CIMBL150	7.543642234	8.927484443	0.287961	0.099887	Yes
TY4	11.39761785	11.37718762	0.293382	0.198758	Yes
CIMBL101	10.43439168	10.0358539	0.29483	0.658024	Yes
CIMBL60	10.43093078	9.471027189	0.32362	0.148454	Yes
CML121	8.727665434	9.136295809	0.327906	0.540505	Yes

B114	15.58313903	12.37563027	0.349066	0.78502	Yes
P178	9.623669561	9.289782598	0.353516	0.113798	Yes
CIMBL13	12.26912166	9.469057716	0.355552	0.382033	Yes
BY815	10.06537367	10.17816065	0.359579	0.133688	Yes
05W002	17.63924636	12.30616706	0.360969	0.782895	Yes
501	9.074649256	9.632663103	0.361868	0.49389	
CIMBL6	8.015984275	NA	0.363824	NA	Yes
CIMBL119	9.843995005	9.376584857	0.371529	0.166261	Yes
BY813	12.55872868	10.59622619	0.376145	0.582175	Yes
TX5	13.47350306	10.52097357	0.376907	0.634729	
04K5702	16.82026342	12.96862757	0.379651	0.679623	
LG001	6.021223829	7.499543912	0.389399	0.117318	Yes
GEMS59	12.53726436	10.05283091	0.404266	0.623206	Yes
238	11.38321187	10.02366963	0.406538	0.277486	Yes
CIMBL43	9.943026458	10.34331978	0.406813	0.449114	Yes
XI502	11.96212744	11.22361427	0.407582	0.140388	Yes
GEMS30	11.77626971	9.958467118	0.414253	0.649749	Yes
CIMBL57	12.57597571	11.11499363	0.41508	0.583523	
268	12.02115692	10.50069598	0.419455	0.739986	Yes
CIMBL2	7.263144671	7.895497449	0.421345	0.474003	Yes
CIMBL53	11.15148018	10.47250797	0.422285	0.683898	Yes
GEMS37	13.51324154	10.51338127	0.422335	0.549934	
YE8001	12.45247173	11.52345939	0.425297	0.18563	Yes
7884-4HT	21.481796	13.14683048	0.425927	0.461723	Yes
GEMS40	14.74934264	11.07123571	0.431826	0.650204	
YU87-1	14.17553539	10.00621542	0.441795	0.506936	
K12	9.412739635	9.632318167	0.443205	0.334418	Yes
QI319	14.60175028	12.80501486	0.446722	0.772034	
GEMS1	12.9701994	10.421736	0.447175	0.396542	Yes
1462	9.072680867	7.191803573	0.447465	0.65532	Yes
GEMS60	16.57938011	11.70960346	0.449423	0.551779	Yes
SC55	10.68100517	10.18867747	0.452226	0.394765	Yes
GEMS43	11.80692895	10.11451659	0.454408	0.491247	
RY684	7.872019476	8.512370296	0.456295	0.794228	
GEMS57	10.98528933	8.683999455	0.458401	0.649958	
GY1007	15.1055668	12.59589495	0.460335	0.642629	
GEMS10	13.84996446	11.05105356	0.467436	0.61145	Yes
CIMBL157	8.966878073	9.068292821	0.468899	0.665838	Yes
CIMBL88	11.01836251	9.486615233	0.473882	0.461674	Yes
B151	12.4897132	10.74496632	0.474963	0.590473	Yes
W138	10.08474355	10.21392943	0.475891	0.381124	Yes
GEMS51	12.81390213	9.310682624	0.476855	0.751253	Yes
DONG237	12.6092618	10.48396953	0.481776	0.744517	Yes

SI273	7.264212191	8.513101668	0.485481	0.4729	Yes
CML415	13.06971616	10.40266264	0.485911	0.08473	Yes
CML172	10.10228027	9.589821924	0.486731	0.543259	Yes
04K5686	9.349383603	9.965904499	0.492715	0.503768	
CML361	6.28961551	7.693566214	0.495328	0.335455	Yes
RY729	13.00154586	9.738779774	0.499675	0.402553	Yes
CIMBL105	11.05499062	11.21880288	0.500151	0.869889	Yes
GEMS3	8.634153792	8.247681399	0.50244	0.779453	Yes
CIMBL4	11.34752097	7.162232323	0.502615	0.76994	Yes
GEMS63	12.22053573	10.12814022	0.5069	0.544053	
CIMBL96	9.225112473	9.769094932	0.508616	0.583725	Yes
5213	10.50092536	9.698737568	0.516089	0.386964	
TY5	13.14184002	12.6739273	0.518943	0.585565	Yes
DE.EX	14.02034509	11.06168966	0.528475	0.137904	
GEMS61	13.12487518	10.24303687	0.528824	0.607767	Yes
GEMS20	19.6384168	12.64304665	0.529737	0.665004	Yes
TY3	11.10028359	10.92248736	0.532988	0.73884	Yes
LX9801	11.26642748	10.10122646	0.537176	0.185833	
K10	15.73978259	11.89978871	0.543107	0.160771	Yes
GEMS29	10.93710468	10.013839	0.547346	0.812089	Yes
CML166	13.04741659	10.22859531	0.548263	0.557432	
CIMBL87	5.949143789	7.460169212	0.549894	0.731744	
GEMS6	14.01420446	10.13786806	0.554734	0.719457	Yes
TIAN77	9.65910191	9.138209229	0.555132	0.605867	Yes
BS16	12.12942475	9.209337463	0.559747	0.746997	Yes
DH3732	13.64922206	12.05581401	0.562441	0.291032	Yes
Q1261	8.742161327	8.93681767	0.564676	0.634445	Yes
GEMS4	18.31159512	11.68986789	0.564699	0.797337	Yes
CML493	10.77424065	9.980818174	0.568615	0.834845	Yes
05WN230	8.945335068	8.96216876	0.569955	0.804426	Yes
WU109	9.689213511	9.135076055	0.570755	0.73534	Yes
GEMS16	12.15309183	10.05932378	0.573004	0.738776	Yes
DAN4245	12.01505744	9.857448402	0.575901	0.611315	Yes
ZHONG69	9.82324182	9.281046171	0.580411	0.578098	Yes
NMJT	14.33586321	10.75784318	0.581295	0.303287	
HB	12.41467153	11.49973775	0.582279	0.670855	
CML290	7.492984366	8.528314242	0.587691	0.680889	Yes
LK11	17.68344875	#VALUE!	0.587832	NA	Yes
MN	10.38270764	10.88093726	0.588656	0.769343	
YU374	15.30340071	10.61704134	0.599738	0.603853	Yes
CIMBL89	12.06020014	11.53965918	0.612297	0.665625	Yes
L3180	11.8472683	9.791475165	0.61549	0.739818	Yes
NAN21-3	14.02810543	12.19916624	0.61571	0.784342	Yes

ZHENG22	17.72504747	12.63030983	0.617848	0.64908	
CML51	10.28068553	8.952127148	0.618152	0.495719	
HYS	12.03830198	8.89670668	0.624562	0.823097	Yes
CIMBL66	9.568944956	9.964780399	0.625186	0.697959	Yes
XUN971	12.69703269	11.24210337	0.631717	0.519597	Yes
GEMS49	9.973709574	9.008054981	0.635851	0.88101	Yes
835B	16.51007629	12.88392805	0.636757	0.600485	Yes
SI444	11.28171368	11.16286321	0.637549	0.41086	
CML27	16.02586984	13.09759917	0.637642	0.8584	
8902	19.33619533	13.66477245	0.64017	0.289896	Yes
U8112	13.99774382	10.86800968	0.640499	0.765857	Yes
BY4960	11.66555842	10.79162384	0.641018	0.792419	Yes
GEMS25	16.73188038	12.28647313	0.642586	0.617538	Yes
GEMS35	17.08477666	11.18388787	0.64278	0.768334	Yes
GY923	11.71230179	9.63575849	0.643449	0.604835	Yes
GEMS46	16.05896314	12.51078873	0.643787	0.584638	Yes
CML325	8.566529831	8.665419246	0.644611	0.527382	Yes
BEM	17.56973873	12.69428532	0.644722	0.050129	
GEMS58	14.23911802	9.954359624	0.646714	0.530417	Yes
GY798	14.66276457	12.70257334	0.649807	0.649917	Yes
JJ846	13.65172179	10.63530813	0.650837	0.53583	Yes
TY8	9.777831911	10.14044461	0.65267	0.826161	
FCD0602	16.4300089	10.88304282	0.654134	0.461831	Yes
GEMS45	13.08404885	11.0914651	0.655216	0.450745	
B73	10.7992709	9.645576502	0.658272	0.699139	Yes
CIMBL8	9.5738539	9.666595844	0.658293	0.247678	
B111	13.39187942	11.16342984	0.65909	0.485491	Yes
GEMS31	12.5516845	10.19557702	0.660075	0.415639	Yes
GEMS39	17.18699488	11.5209769	0.660368	0.791449	Yes
CIMBL69	8.786455142	9.334569667	0.660659	0.918224	Yes
GEMS15	15.0456153	10.99726049	0.66414	0.710609	Yes
JH96C	13.97871763	11.68347731	0.66643	0.580002	Yes
DAN599	12.34903617	12.0401871	0.669469	0.803	Yes
GEMS44	13.05476094	10.99199812	0.674159	0.475301	Yes
SY999	12.52709592	11.52085579	0.674385	0.65174	
GEMS23	18.72564483	14.53357012	0.674984	0.810014	Yes
TY1	13.31430037	10.66691766	0.677102	0.704698	Yes
JJ853	9.661913219	9.245710424	0.678908	0.646387	Yes
CIMBL70	13.31179702	9.63950645	0.679108	0.495983	Yes
CIMBL56	8.150079862	8.760255904	0.6803	0.856561	Yes
GEMS62	11.7977882	9.692361079	0.68128	0.901119	Yes
3411	16.42076215	13.418142	0.682241	0.691031	
CIMBL16	10.86614187	9.648899772	0.682377	0.30265	Yes

ZHENG35	15.53118546	11.91218119	0.68308	0.627856	Yes
CIMBL61	7.5925383	8.625171573	0.683655	0.570969	
JY01	14.8588662	12.33595081	0.683751	0.324168	Yes
CIMBL106	13.03163057	11.74333356	0.684386	0.727889	Yes
GEMS48	14.85692056	10.2709691	0.684743	0.67071	Yes
CML116	9.677025789	9.460868954	0.688315	0.52797	
LIAO138	14.97165465	12.10454208	0.688315	0.30545	
A619	15.88603972	12.37516372	0.688556	0.731386	
7327	20.18252142	15.02209904	0.688703	0.354564	Yes
ZH68	18.62762613	14.60257391	0.689365	0.763343	Yes
CML162	8.145901784	8.93061115	0.69082	0.337108	Yes
CIMBL47	10.45765745	9.562827065	0.691406	0.770161	Yes
CIMBL121	11.56962651	10.60136619	0.692247	0.796521	Yes
7381	11.26586864	10.86326393	0.692876	0.754079	Yes
GEMS64	16.07201326	12.29893862	0.695328	0.789887	Yes
CML114	9.727859252	9.735509948	0.698877	0.640287	Yes
GEMS36	20.42658471	14.32522573	0.698901	0.811189	
GEMS18	18.07264811	12.71128089	0.701558	0.710932	Yes
YE52106	10.84369886	10.09062224	0.702075	0.648051	Yes
SI446	12.54665978	11.14558757	0.702675	0.328673	Yes
CIMBL19	7.678552844	8.165238886	0.705176	0.633768	Yes
BY4839	15.51594366	12.25939538	0.705397	0.813197	Yes
RY713	10.33540667	9.594376376	0.705919	0.64255	Yes
GEMS42	15.45992658	11.26492346	0.707266	0.76207	
812	18.07097528	12.5380076	0.710032	0.470433	
WMR	17.06348972	13.48453589	0.711996	0.589143	
CIMBL116	6.731358477	7.091172531	0.712423	0.851669	Yes
526018	10.67885385	9.213366148	0.713428	0.650472	Yes
LV28	13.94671677	10.96181091	0.715126	0.817111	Yes
GEMS52	13.53409903	10.72299479	0.715961	0.716778	
GEMS9	14.90852187	9.9259681	0.716312	0.826941	Yes
CIMBL38	17.42989973	14.94638524	0.716955	0.739947	Yes
GEMS65	17.90726639	11.67550898	0.719775	0.874845	Yes
CIMBL5	8.021727968	8.468890738	0.72034	0.857651	Yes
GEMS17	12.68264598	11.12224636	0.720781	0.853028	Yes
4019	8.410306745	7.718777382	0.721307	0.437262	Yes
CIMBL136	12.826581	11.05696326	0.722214	0.632438	
CIMBL145	10.40913836	8.999695034	0.724563	0.746701	Yes
CIMBL124	10.3365341	10.88317744	0.730445	0.872189	Yes
DONG46	20.57975169	13.49929915	0.730758	0.540043	Yes
SY1032	15.87496626	11.34837979	0.731139	0.830574	Yes
TIE7922	12.84357437	10.87978836	0.731406	0.571768	Yes
GEMS50	12.15292257	10.10038452	0.735401	0.824494	Yes

YAN414	12.1399907	10.29198475	0.735536	0.587418	
CIMBL109	11.55761988	10.87714255	0.736177	0.755641	Yes
CIMBL73	7.890416677	8.404785933	0.736904	0.834353	
CML134	11.14404046	10.3163134	0.740418	0.700114	Yes
CIMBL30	14.64695575	10.38215713	0.740753	0.664178	
SY1039	14.83968001	10.32188082	0.741909	0.438639	Yes
BY804	15.5137594	12.63911604	0.742308	0.678407	Yes
CIMBL85	12.02401217	9.957827387	0.743439	0.897885	
CIMBL127	11.80748687	10.94074047	0.746912	0.169943	Yes
CML122	16.38988359	11.66118415	0.750077	0.805901	Yes
CIMBL51	12.54250132	10.9279373	0.752641	0.926469	Yes
B110	18.14859731	12.52323243	0.752749	0.642122	Yes
CHANG7-2	20.18720171	12.54027795	0.754976	0.75995	
GEMS2	16.27036829	11.40226607	0.755802	0.905357	Yes
GEMS47	17.19137637	11.75948043	0.755932	0.888095	
GEMS66	14.58644455	9.949307438	0.756286	0.753329	Yes
DAN360	14.43821432	10.91618618	0.758627	0.375933	Yes
CIMBL99	8.375224214	8.495706391	0.760817	0.908253	Yes
CIMBL102	7.186074057	8.363940939	0.7621	0.72501	Yes
CIMBL15	9.758906529	9.328102364	0.763239	0.860708	Yes
CIMBL141	18.83375613	12.43698982	0.763483	0.75861	Yes
5237	9.653172632	8.754883561	0.763771	0.830672	Yes
CHENG698	16.56052753	13.4835728	0.764294	0.699657	Yes
CML20	15.00119006	11.14533178	0.767649	0.850358	Yes
GEMS21	17.43022016	13.4829322	0.767866	0.843249	Yes
GEMS33	14.96193153	10.89924292	0.769192	0.713368	Yes
R08	16.48728566	12.15648675	0.771336	0.592975	
GEMS24	15.98499668	10.75562464	0.773783	0.63838	
SY998	12.0720444	11.15283047	0.776371	0.808365	
CIMBL76	6.232744607	6.925234722	0.778045	0.832302	
JH59	17.9046475	13.27662707	0.778366	0.905252	Yes
CIMBL95	9.222701762	9.690905084	0.783388	0.840519	Yes
SW92E114	21.30657465	11.89202562	0.785036	0.808151	Yes
SY3073	15.30218673	9.904420619	0.785036	0.875717	Yes
CML323	9.273962793	9.624863291	0.790629	0.662495	Yes
DAN598	16.54193154	12.8619172	0.792876	0.375268	
J4112	21.60163157	14.86164536	0.794205	0.813338	
GY462	18.65609071	13.8774912	0.794965	0.836241	Yes
R15X1141	16.77323596	11.30215503	0.796369	0.824133	Yes
975-12	12.90895066	10.33631235	0.79681	0.906045	Yes
CA47	11.12021869	10.59420135	0.797447	0.888783	
CIMBL97	8.152378418	8.678142788	0.798469	0.822195	
SY1128	17.37594318	12.35439859	0.798494	0.714795	Yes

07KS4	11.99087642	9.829739594	0.803055	0.504301	Yes
177	8.262630134	8.939995654	0.803871	0.751607	Yes
1323	7.680054514	8.845011629	0.805825	0.845511	
ZB648	13.27116505	11.49234484	0.808821	0.805241	Yes
P138	10.68766872	10.79776338	0.811141	0.963685	
CIMBL117	13.18126883	11.64340067	0.811331	0.844401	
CF3	21.22254301	12.9358211	0.813963	0.860493	
CML170	10.40512143	9.949914466	0.814945	0.672276	Yes
HUA83-2	17.21809197	12.7314181	0.816328	0.802097	Yes
CIMBL137	16.68214309	11.02291329	0.818604	0.854375	Yes
CIMBL146	19.24467294	13.55376741	0.820134	0.865386	
GEMS54	16.97476036	10.89192218	0.821616	0.891054	Yes
CIMBL129	13.7328487	11.02216835	0.821893	0.652715	Yes
GEMS55	17.48491635	11.22899142	0.822495	0.855719	Yes
EN25	14.1571838	9.682461754	0.825474	0.84559	
GEMS14	14.91793736	11.67087983	0.826868	0.933961	Yes
LIAO5263	13.90756809	11.61783417	0.828371	0.314988	Yes
ZHENG32	17.70863389	13.63776511	0.828731	0.872755	Yes
GEMS13	11.12280701	10.31720614	0.8292	0.854788	Yes
YE515	14.66026713	10.84723408	0.830298	0.81864	Yes
CIMBL144	15.18505993	12.48849996	0.83089	0.672815	Yes
Z2018F	17.83442872	11.46630102	0.831541	0.906295	Yes
CIMBL27	10.18805625	9.477791252	0.836648	0.928284	
CML118	10.61387779	9.444942015	0.84307	0.54116	Yes
CI7	23.30858964	14.11667875	0.843236	0.972775	Yes
DAN3130	18.30544087	12.4822207	0.843779	0.791388	Yes
CIMBL10	11.0420616	11.06134674	0.844169	0.790676	Yes
CML115	9.282490571	9.386270236	0.846113	0.598568	
CML225	10.17728881	10.19272366	0.848085	0.923291	
CIMBL151	10.49035739	10.44391555	0.848658	0.733402	Yes
IRF314	17.56242438	11.95219568	0.85106	0.74265	Yes
M153	15.33721769	11.28799117	0.851123	0.137089	Yes
CIMBL133	9.443745081	9.385240444	0.851508	0.836213	Yes
LY042	18.07126132	14.11980677	0.852761	0.21889	Yes
CIMBL138	15.52084469	13.96536588	0.853016	0.828884	
CIMBL9	11.81525937	10.43866999	0.85663	0.775952	Yes
CIMBL155	13.68806106	11.33209125	0.860426	0.924047	
GEMS5	17.74836002	13.04253062	0.860816	0.893935	Yes
CIMBL107	12.94143409	11.31779188	0.865311	0.825568	
RY697	18.70231081	11.85867921	0.865903	0.744616	
B77	12.24551484	9.804817463	0.868785	0.677171	Yes
TY11	10.96804899	9.618487777	0.872307	0.936342	Yes
CML408	16.67203111	15.47023471	0.873781	0.949383	

GEMS53	15.50719634	11.97199033	0.875177	0.896289	
9782	9.645970048	10.01265114	0.875192	0.876156	
LIAO5114	17.18834492	13.46773155	0.875192	0.61569	Yes
CIMBL115	10.22865	9.449686111	0.875652	0.730492	Yes
CIMBL63	9.394780236	9.332245462	0.875751	0.67217	Yes
GY386B	15.60441856	12.3075994	0.876164	0.913984	
M97	17.10671639	13.58915243	0.878497	0.523746	Yes
CIMBL17	13.86735817	11.13966852	0.879472	0.650945	Yes
BY809	16.78783704	13.81799508	0.882349	0.776636	Yes
GY386	15.19902292	11.27409773	0.885072	0.882439	Yes
CML171	11.70081676	8.844809743	0.887906	0.800537	Yes
SI434	11.24997617	10.8484021	0.888868	0.576918	Yes
QI205	14.55912974	10.23642543	0.891334	0.83078	Yes
CIMBL154	10.58886936	9.998300468	0.893839	0.839086	
GY1032	18.49988524	14.47340091	0.8951	0.640188	Yes
4F1	12.71371968	10.54037719	0.916857	0.879609	Yes
ZZ01	16.50817541	12.51719676	0.916857	0.812142	Yes
CIMBL45	13.39312422	11.65862862	0.917865	0.865711	
CIMBL42	17.78805851	10.62984357	0.919971	0.468104	Yes
RY737	11.14218437	10.89913638	0.932759	0.921672	
CIMBL139	11.93170543	10.43262518	0.95116	0.850504	Yes
CML130	11.72649668	11.53310582	0.95116	0.900119	Yes
9642	9.523821431	9.091207549	NA	NA	Yes
B113	20.41486106	14.54870224	NA	NA	Yes
CIMBL1	15.41424324	14.18890065	NA	NA	Yes
CIMBL100	13.28380142	9.809711257	NA	NA	Yes
CIMBL111	14.83433945	11.87034728	NA	NA	Yes
CIMBL113	9.508536547	8.934395626	NA	NA	Yes
CIMBL114	11.9690302	9.059082407	NA	NA	Yes
CIMBL120	10.74981831	9.145559329	NA	NA	Yes
CIMBL122	14.27108975	12.14498574	NA	NA	Yes
CIMBL123	14.38788186	11.51563728	NA	NA	Yes
CIMBL125	13.97768774	9.074578064	NA	NA	Yes
CIMBL140	10.24250926	9.311422247	NA	NA	Yes
CIMBL143	12.33633344	12.29089459	NA	NA	Yes
CIMBL147	11.86203601	9.7488281	NA	NA	Yes
CIMBL149	13.35682318	10.84637412	NA	NA	Yes
CIMBL152	7.997718883	7.683370449	NA	NA	Yes
CIMBL18	7.743542433	6.647051166	NA	NA	Yes
CIMBL21	7.166034749	6.117553239	NA	NA	Yes
CIMBL22	13.04210367	9.700451416	NA	NA	Yes
CIMBL23	11.89738442	10.37209021	NA	NA	Yes
CIMBL25	8.988850463	7.264483794	NA	NA	Yes

CIMBL29	9.779611098	7.909506251	NA	NA	Yes
CIMBL40	14.74705801	13.13931901	NA	NA	Yes
CIMBL48	10.16466819	8.890210672	NA	NA	Yes
CIMBL52	6.782943343	6.135694496	NA	NA	Yes
CIMBL54	8.621267624	9.856713604	NA	NA	
CIMBL55	9.270688827	6.799362132	NA	NA	
CIMBL59	12.05775709	10.67781162	NA	NA	Yes
CIMBL62	11.79731757	13.51753673	NA	NA	Yes
CIMBL71	17.41921004	13.01123074	NA	NA	Yes
CIMBL74	12.51130809	13.5736097	NA	NA	Yes
CIMBL75	10.04287375	9.314949713	NA	NA	Yes
CIMBL77	13.62613539	10.08265471	NA	NA	Yes
CIMBL81	10.13447122	7.500824054	NA	NA	Yes
CIMBL83	11.10860303	9.052153455	NA	NA	Yes
CIMBL84	10.73102909	7.543531596	NA	NA	Yes
CIMBL86	13.83527735	11.18349914	NA	NA	Yes
CIMBL91	12.46903233	10.0893546	NA	NA	Yes
CIMBL92	10.64391541	8.172050548	NA	NA	Yes
CIMBL93	15.94365098	11.94089661	NA	NA	Yes
CIMBL94	11.54953467	11.72814914	NA	NA	Yes
CML139	19.12981233	11.79576655	NA	NA	Yes
CML163	14.62344871	11.57353616	NA	NA	Yes
CML189	14.56872814	10.25458435	NA	NA	Yes
CML191	17.93199929	13.30489234	NA	NA	Yes
CML304	13.47895314	13.79332047	NA	NA	
CML31	11.99343009	12.08107904	NA	NA	Yes
CML32	9.815166248	8.123673864	NA	NA	Yes
CML324	9.477966777	9.871144148	NA	NA	Yes
CML327	18.84693012	13.23799645	NA	NA	Yes
CML338	17.5455391	12.79958275	NA	NA	Yes
CML411	13.29680205	10.69368521	NA	NA	Yes
CML422	13.34273126	10.40713582	NA	NA	Yes
CML423	10.87194827	7.723054447	NA	NA	Yes
CML431	14.34443178	9.537180107	NA	NA	Yes
CML454	11.2657391	9.482756337	NA	NA	Yes
CML470	6.541032081	4.904608666	NA	NA	Yes
CML479	6.83461371	6.212794836	NA	NA	
CML496	13.88591065	11.16686966	NA	NA	Yes
CML69	11.39473709	8.455507682	NA	NA	Yes
D863F	15.30933673	11.73721977	NA	NA	Yes
GEMS11	14.82499229	11.40648542	NA	NA	Yes
GEMS19	14.96852108	11.35726123	NA	NA	Yes
HTH-17	15.01966953	12.897092	NA	NA	Yes

LXN	15.79472503	13.05607996	NA	NA	Yes
MO113	9.171523476	12.32186299	NA	NA	Yes
R15	15.58960933	12.66906649	NA	NA	Yes
TY10	15.80411964	11.64197817	NA	NA	
TY6	14.6110039	11.87355406	NA	NA	Yes
WH413	11.38865194	11.44984577	NA	NA	Yes
ZAC546	13.01157118	10.84335058	NA	NA	
ZHENG29	14.58843073	12.42328911	NA	NA	Yes