

附表 1 KASP 标记的特异性引物

Supplementary Table 1 Specific primers for KASP marker

标记 SNP	引物 Primer	引物序列 Primer sequence
SLG03_966208	F ₁	GAAGGTGACCAAGTTCATGCTATCTTCTTTCTTCCCTCTTACTTTT
	F ₂	GAAGGTCGGAGTCAACGGATTATCTTCTTTCTTCCCTCTTACTTTT
	R	CAGTCAAAACAAGATACCATGAGAAT

表中加粗的引物序列分别表示 FAM 和 VIC 两种通用荧光标签的核酸序列

The bolded primer sequences in the table represent the nucleic acid sequences of FAM and VIC universal fluorescent tags, respectively

附表 2 2022 年 279 份绿豆品种籽粒的蛋白质含量和苏氨酸相对含量

Supplementary Table 2 Protein content and relative content of threonine of 279 mung bean seeds in 2022

品种名称 Name	蛋白质含量 Protein content (%)	苏氨酸相对含量 Relative content of threonine (PA)	品种名称 Name	蛋白质含量 Protein content (%)	苏氨酸相对含量 Relative content of threonine (PA)
GWAS1	21.85	1036931.20	GWAS283	20.67	1512598.95
GWAS10	20.87	1151584.34	GWAS285	21.98	1947625.41
GWAS100	21.70	2456153.22	GWAS286	22.14	1708089.57
GWAS101	19.47	1496841.34	GWAS287	21.63	1954709.70
GWAS104	21.46	1156198.85	GWAS289	19.50	1746877.19
GWAS105	20.83	1249135.53	GWAS29	21.09	1353466.01
GWAS107	21.25	1121891.62	GWAS290	21.40	1268263.99
GWAS108	21.95	1256557.72	GWAS291	20.06	1485852.68
GWAS109	20.37	1405253.42	GWAS293	22.50	1358022.05
GWAS11	19.92	1106354.48	GWAS294	20.19	1760641.97
GWAS111	21.91	1103163.34	GWAS296	20.29	834158.43
GWAS112	21.29	1875307.73	GWAS297	21.30	1403919.51
GWAS113	22.05	1950251.09	GWAS298	22.82	1395269.15
GWAS115	21.86	1428831.57	GWAS299	22.75	1098215.57
GWAS116	21.52	1669444.97	GWAS30	21.31	871422.06
GWAS117	21.88	922915.72	GWAS301	20.92	1731738.62
GWAS119	22.10	1330024.46	GWAS302	22.18	1388736.86
GWAS12	21.62	1139053.31	GWAS303	21.23	1843051.59
GWAS120	23.27	1633639.77	GWAS304	21.92	1603939.53
GWAS121	22.01	1428319.48	GWAS305	21.81	1732318.64
GWAS123	19.55	1182119.19	GWAS306	21.34	2000248.29
GWAS126	22.59	1191915.21	GWAS307	20.64	1213405.69
GWAS128	22.23	3601595.23	GWAS309	21.18	1689453.91
GWAS129	22.68	1473890.64	GWAS31	22.65	1323881.24
GWAS13	21.14	1244760.18	GWAS310	20.68	1481415.72
GWAS130	20.97	1334292.33	GWAS311	22.57	1413054.48

GWAS132	21.02	1076063.78	GWAS313	21.15	1687642.17
GWAS133	20.91	1134939.02	GWAS315	21.22	2024951.99
GWAS134	19.57	1052736.78	GWAS316	19.91	902501.72
GWAS136	20.39	936985.81	GWAS318	20.47	1307243.32
GWAS137	21.71	2029783.84	GWAS319	21.44	1844897.93
GWAS139	22.92	1439933.46	GWAS321	22.14	1638444.98
GWAS14	20.92	1889766.94	GWAS322	21.95	1656422.51
GWAS140	21.17	1204090.87	GWAS323	21.22	1658579.84
GWAS141	21.04	1192239.80	GWAS326	22.07	886635.07
GWAS142	19.76	1665144.76	GWAS327	21.41	993430.54
GWAS146	21.64	1357690.43	GWAS329	19.73	1175213.72
GWAS147	21.36	1425491.74	GWAS33	21.90	2543970.19
GWAS149	20.34	1303282.38	GWAS330	21.67	1144583.25
GWAS15	21.50	1316378.73	GWAS331	21.72	1154408.99
GWAS150	22.11	1269308.00	GWAS333	21.23	1736587.55
GWAS151	21.73	1849262.45	GWAS334	21.65	1345655.01
GWAS154	21.18	1332326.37	GWAS337	22.07	1149685.91
GWAS155	19.90	1348859.74	GWAS338	21.75	1980924.34
GWAS157	20.73	1352627.81	GWAS339	21.73	1554583.01
GWAS16	22.98	1980621.67	GWAS34	21.48	1543325.97
GWAS160	19.45	918874.56	GWAS340	20.32	2533841.94
GWAS162	22.21	1037633.51	GWAS341	20.73	2431733.25
GWAS163	22.38	2074089.98	GWAS342	22.39	1544646.15
GWAS164	21.09	1632911.76	GWAS343	21.88	1452083.95
GWAS165	20.86	1754050.11	GWAS345	19.05	971965.27
GWAS167	21.80	1915068.74	GWAS346	23.04	1619063.02
GWAS168	22.69	1403918.61	GWAS347	21.27	1301133.82
GWAS169	20.14	1037283.58	GWAS349	22.12	1395616.25
GWAS17	21.67	910238.37	GWAS35	22.43	1457938.02
GWAS171	22.56	1513441.81	GWAS350	22.85	1694297.93
GWAS172	20.10	1252540.46	GWAS351	23.11	1535351.71
GWAS173	20.55	1472147.59	GWAS353	22.02	3011334.24
GWAS176	21.04	1374097.49	GWAS354	21.05	1235828.63
GWAS177	21.59	1585901.66	GWAS355	21.81	1876888.40
GWAS178	19.86	1288285.77	GWAS357	21.27	1943344.50
GWAS18	21.71	920047.56	GWAS358	21.87	1721227.08
GWAS180	19.33	1175723.24	GWAS359	20.89	2083458.14
GWAS181	20.49	1207581.75	GWAS361	21.30	1706716.24
GWAS182	20.32	1253947.50	GWAS363	21.90	1421598.85
GWAS184	21.03	928313.94	GWAS365	21.46	2208372.28
GWAS186	18.68	893686.97	GWAS367	22.29	2182763.62
GWAS187	19.64	1365946.72	GWAS368	22.86	1817650.53
GWAS190	19.90	1946305.57	GWAS37	23.01	1725826.38
GWAS191	21.40	1166894.88	GWAS371	21.17	1294432.32

GWAS192	20.86	1854794.88	GWAS372	21.81	1472630.21
GWAS194	22.06	2070675.19	GWAS374	20.35	2120916.70
GWAS195	20.90	1395337.52	GWAS375	21.41	1227744.27
GWAS196	19.65	1508357.20	GWAS376	21.56	1017674.87
GWAS198	21.55	1451940.73	GWAS377	21.87	1075690.92
GWAS199	21.24	1371347.02	GWAS379	22.61	1547760.86
GWAS2	23.42	2042162.93	GWAS38	21.08	1295356.50
GWAS200	21.84	1071866.55	GWAS380	22.15	1450811.58
GWAS202	20.27	1507618.00	GWAS382	21.77	1479306.42
GWAS203	20.54	1616032.69	GWAS383	20.82	1793206.02
GWAS204	19.98	1461381.22	GWAS384	23.79	1136574.25
GWAS206	20.83	1528911.89	GWAS386	21.24	1209014.99
GWAS207	21.57	1619452.22	GWAS387	21.05	1461187.20
GWAS208	20.55	1321524.94	GWAS389	20.45	1562031.95
GWAS21	21.93	2264695.26	GWAS39	21.58	2072496.27
GWAS210	21.69	2035133.04	GWAS390	21.81	1609689.55
GWAS211	21.46	1713941.84	GWAS392	21.61	2117597.97
GWAS212	18.45	1727621.20	GWAS395	20.61	1480143.73
GWAS214	22.66	3020369.17	GWAS396	22.13	1150236.58
GWAS215	20.62	1947071.46	GWAS399	19.64	1339167.58
GWAS218	19.54	1403195.15	GWAS400	20.46	1189964.49
GWAS219	19.45	1456214.08	GWAS402	22.34	1639826.72
GWAS22	19.82	1186295.53	GWAS403	20.79	1102347.21
GWAS220	21.34	1290738.09	GWAS404	21.50	1675784.55
GWAS223	21.65	1390279.46	GWAS406	21.34	1373588.25
GWAS224	20.55	1537725.32	GWAS407	22.65	2054674.51
GWAS226	20.00	878031.98	GWAS409	23.03	1280507.01
GWAS227	20.59	1391740.57	GWAS41	21.58	1647256.92
GWAS228	20.14	1148683.07	GWAS42	21.48	1249072.47
GWAS23	20.36	1326868.38	GWAS44	21.38	1116164.80
GWAS232	19.80	996549.73	GWAS45	23.61	2473620.71
GWAS233	22.18	1926424.27	GWAS46	21.95	1432884.69
GWAS234	19.76	1037409.11	GWAS47	21.58	1018537.72
GWAS236	21.29	2408308.53	GWAS48	20.42	1637534.89
GWAS237	21.48	915571.45	GWAS50	21.23	1642013.11
GWAS238	21.93	940390.15	GWAS51	21.98	1869893.77
GWAS240	20.56	1170912.56	GWAS52	21.57	2087580.91
GWAS241	19.67	1581888.94	GWAS54	23.19	2022701.16
GWAS242	21.26	1354358.47	GWAS55	22.14	955600.59
GWAS244	22.17	1530230.57	GWAS56	24.31	1120043.46
GWAS245	23.08	1561126.04	GWAS58	21.88	1305158.93
GWAS246	21.95	1317045.69	GWAS59	21.20	889792.89
GWAS247	21.10	1903665.29	GWAS60	20.70	1273227.69
GWAS249	20.03	1205955.46	GWAS63	20.61	1078932.66

GWAS25	21.14	1251039.91	GWAS64	21.15	1744971.76
GWAS250	21.68	1322941.14	GWAS65	23.44	1398827.83
GWAS252	20.74	1120188.59	GWAS67	21.92	2455927.61
GWAS254	21.51	1491046.89	GWAS68	20.61	1939350.37
GWAS255	19.98	1304593.98	GWAS69	22.24	2010347.60
GWAS258	20.55	1181635.84	GWAS7	21.01	1758215.75
GWAS259	20.45	1468208.45	GWAS71	21.73	1107125.54
GWAS26	20.61	1285810.08	GWAS72	21.85	1281947.24
GWAS261	19.51	1634980.68	GWAS73	21.04	1126164.63
GWAS262	21.27	1881029.18	GWAS75	21.55	1490084.71
GWAS263	20.49	1886750.88	GWAS76	20.92	1443819.86
GWAS265	19.93	1739161.91	GWAS77	20.43	1915020.73
GWAS266	22.30	2200354.43	GWAS8	24.38	2319824.58
GWAS267	20.14	1330059.08	GWAS80	21.94	1078501.13
GWAS27	20.41	1130208.86	GWAS81	20.50	1795629.53
GWAS270	22.49	1835955.01	GWAS83	23.21	1130321.24
GWAS271	22.42	1674026.35	GWAS85	20.43	1620478.11
GWAS272	22.79	1979089.45	GWAS88	20.99	1527981.06
GWAS274	20.38	2058484.68	GWAS9	20.99	914715.44
GWAS275	19.23	906312.53	GWAS91	20.40	2235222.19
GWAS277	20.46	1511351.52	GWAS92	19.95	2056470.67
GWAS278	20.85	1772027.44	GWAS95	20.92	1554372.58
GWAS279	20.56	1367273.16	GWAS96	20.80	2125955.38
GWAS28	21.65	1106182.58	GWAS97	19.85	1462211.15
GWAS281	20.52	1207817.65	GWAS99	18.86	1378269.31
GWAS282	19.92	1120101.90			

附表 3 KSAP 标记分型的 80 份绿豆品种的基因型和表型

Supplementary Table 3 The genotype and phenotype of 80 mung bean varieties classified by KSAP marker

品种名称 Name	SLG03_966208 位点的基因型	蛋白质含量	苏氨酸相对含量
	Genotype of SLG03_966208	Protein content	Relative content of threonine (PA)
	locus	(%)	
GWAS1	AA	21.85	1036931.20
GWAS100	AA	21.70	2456153.22
GWAS109	GG	20.37	1405253.42
GWAS11	GG	19.92	1106354.48
GWAS120	GG	23.27	1633639.77
GWAS128	GG	22.23	3601595.23
GWAS134	GG	19.57	1052736.78
GWAS136	GG	20.39	936985.81
GWAS139	GG	22.92	1439933.46
GWAS149	GG	20.34	1303282.38
GWAS150	AA	22.11	1269308.00

GWAS155	GG	19.90	1348859.74
GWAS16	GG	22.98	1980621.67
GWAS169	GG	20.14	1037283.58
GWAS17	GG	21.67	910238.37
GWAS171	AA	22.56	1513441.81
GWAS172	GG	20.10	1252540.46
GWAS178	GG	19.86	1288285.77
GWAS182	GG	20.32	1253947.50
GWAS187	GG	19.64	1365946.72
GWAS190	GG	19.90	1946305.57
GWAS194	AA	22.06	2070675.19
GWAS196	GG	19.65	1508357.20
GWAS2	AA	23.42	2042162.93
GWAS211	AA	21.46	1713941.84
GWAS214	AA	22.66	3020369.17
GWAS218	GG	19.54	1403195.15
GWAS219	GG	19.45	1456214.08
GWAS22	AA	19.82	1186295.53
GWAS228	GG	20.14	1148683.07
GWAS23	GG	20.36	1326868.38
GWAS232	GG	19.80	996549.73
GWAS236	AA	21.29	2408308.53
GWAS241	AG	19.67	1581888.94
GWAS245	AA	23.08	1561126.04
GWAS255	GG	19.98	1304593.98
GWAS259	GG	20.45	1468208.45
GWAS261	GG	19.51	1634980.68
GWAS265	GG	19.93	1739161.91
GWAS266	GG	22.30	2200354.43
GWAS27	GG	20.41	1130208.86
GWAS270	GG	22.49	1835955.01
GWAS275	GG	19.23	906312.53
GWAS277	GG	20.46	1511351.52
GWAS282	GG	19.92	1120101.90
GWAS291	GG	20.06	1485852.68
GWAS299	GG	22.75	1098215.57
GWAS31	GG	22.65	1323881.24
GWAS316	GG	19.91	902501.72
GWAS329	GG	19.73	1175213.72
GWAS330	GG	21.67	1144583.25
GWAS331	AA	21.72	1154408.99
GWAS34	AA	21.48	1543325.97
GWAS340	GG	20.32	2533841.94
GWAS345	GG	19.05	971965.27

GWAS346	AA	23.04	1619063.02
GWAS35	GG	22.43	1457938.02
GWAS351	AA	23.11	1535351.71
GWAS367	GG	22.29	2182763.62
GWAS368	GG	22.86	1817650.53
GWAS372	AA	21.81	1472630.21
GWAS379	GG	22.61	1547760.86
GWAS384	GG	23.79	1136574.25
GWAS389	GG	20.45	1562031.95
GWAS39	AA	21.58	2072496.27
GWAS402	GG	22.34	1639826.72
GWAS407	GG	22.65	2054674.51
GWAS45	AA	23.61	2473620.71
GWAS48	GG	20.42	1637534.89
GWAS51	AA	21.98	1869893.77
GWAS54	AA	23.19	2022701.16
GWAS56	GG	24.31	1120043.46
GWAS67	AA	21.92	2455927.61
GWAS69	GG	22.24	2010347.60
GWAS77	GG	20.43	1915020.73
GWAS8	GG	24.38	2319824.58
GWAS85	AA	20.43	1620478.11
GWAS91	GG	20.40	2235222.19
GWAS92	GG	19.95	2056470.67
GWAS99	GG	18.86	1378269.31
