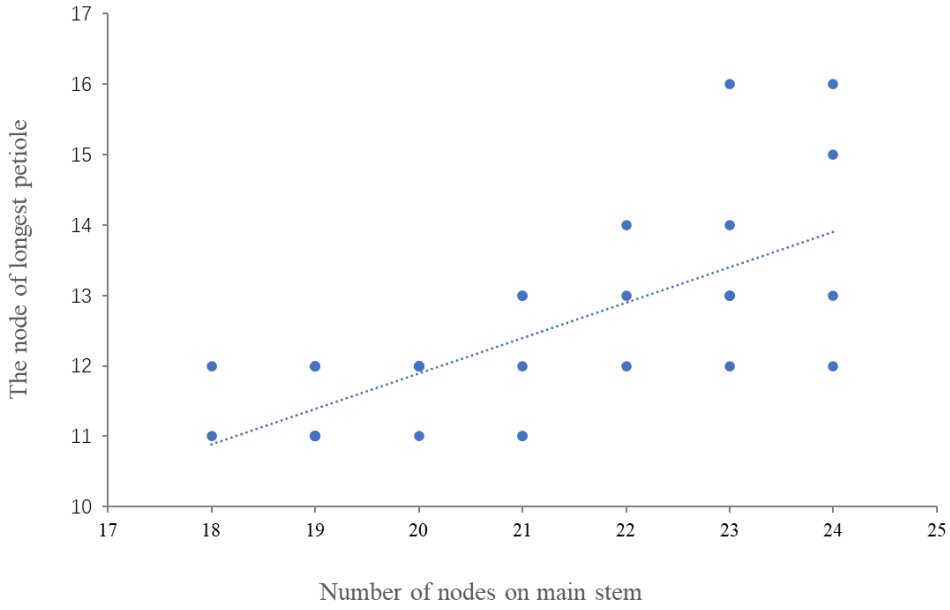
Appendix A Soybean Germplasm Resources for Research

No.	Accession Name	Origin	Eco-region and Sowing season type
1	Heinong 44	Haerbin, Heilongjiang	Northern Spring
2	Kenfeng 22	Haerbin, Heilongjiang	Northern Spring
3	Dongnong48	Haerbin, Heilongjiang	Northern Spring
4	Jiyu 701	Gongzhuling, Jilin	Northern Spring
5	Heinong 66	Jiamusi, Heilongjiang	Northern Spring
6	Beijiangjiu 1	Haerbin, Heilongjiang	Northern Spring
7	Shundou 5	Qiqihaer, Heilongjiang	Northern Spring
8	Longken 306	Haerbin, Heilongjiang	Northern Spring
9	Beidou 36	Heihe, Heilongjiang	Northern Spring
10	Huajiang 1	Heihe, Heilongjiang	Northern Spring
11	Huajiang 2	Heihe, Heilongjiang	Northern Spring
12	Mengdou 37	Hulunbeier, Neimenggu	Northern Spring
13	Neidou 4	Hulunbeier, Neimenggu	Northern Spring
14	Zhonghuang 901	Beijing	Northern Spring
15	Heihe 43	Heihe, Heilongjiang	Northern Spring
16	Dengke 1	Hulunbeier, Neimenggu	Northern Spring
17	Keshan 1	Qiqihaer, Heilongjiang	Northern Spring
18	Mengdou 15	Hulunbeier, Neimenggu	Northern Spring
19	Heihe 38	Heihe, Heilongjiang	Northern Spring
20	Suinong 26	Suihua, Heilongjiang	Northern Spring
21	JH13	Shijiazhuang, Hebei	Huang-huai Summer
22	M657	Liaocheng, Shandong	Huang-huai Summer
23	Jidou 12	Shijiazhuang, Hebei	Huang-huai Summer
24	Jidou 17	Shijiazhuang, Hebei	Huang-huai Summer
25	Zhongpin 661	Beijing	Huang-huai Spring
26	Jidou 16	Shijiazhuang, Hebei	Huang-huai Summer
27	Zhonghuang 35	Beijing	Huang-huai Summer
28	Hedou 12	Heze, Shandong	Huang-huai Summer
29	Zhonghuang 37	Beijing	Huang-huai Summer
30	Zhonghuang 59	Beijing	Huang-huai Summer
31	Zhonghuang 13	Beijing	Huang-huai Spring
32	Kefeng 14	Beijing	Huang-huai Summer
33	Tianlong 1hao	Wuhan, Hubei	Southern Spring
34	Zhongdou41	Wuhan, Hubei	Southern Summer
35	Nannong 99-6	Nanjing, Jiangsu	Southern Summer
36	Gandou 5hao	Nanchang, Jiangsu	Southern Autumn
37	Tianlong 2hao	Wuhan, Hubei	Southern Spring
38	Spry	Illinois,USA	Spring (MG-IV)



Appendix B S Linear regression analysis of nodal position for longest petiole and number of nodes on the main stem of 37 domestic soybean. Y representing nodal position of longest petiole, X representing number of nodes on the main stem, and Scatter plot was formed.

Appendix C Averages and variation in traits for 20 characteristics of short petiole M657 and wild-type JH13

Items	JH13	M657	Variation (%)
Petiole length(cm)	31.5±2.57	12.22±0.89**	-61.21
Total area of leaf(cm^2)	75.38±11.05	26.82±4.27**	-64.42
circumference of leaf (cm)	43.88±3.32	26.16±2.45**	-40.38
long mean of leaf (cm)	17.68±1.17	10.67±0.88**	-39.65
wide mean of leaf (cm)	6.63±0.78	3.76±0.35**	-43.29
Growth duration(d)	103	109	+5.83
Plant height (cm)	114±8.38	83.76±3.94**	-26.53
Pod height at bottom(cm)	21±3.44	13.5±4.87**	-35.71
Root length(cm)	17.77±2.61	15.16±3.22**	-14.69
Number of nodes on main stem	20.46±1.69	20.33±2.09	NS
Effective branch number	0.15±0.36	2.4±0.71**	+1500
Pod number per plant	55.15±13.82	63.73±10.69	NS
Seed number per plant	129.46±40.67	138.07±20.71	NS
Seed weight per plant(g)	20±6.28	15.97±2.4**	-20.15

Crude protein content in seed (%)	43.49±0.62	43.58±0.55	NS
Crude fat content in seed (%)	19.5±0.49	19.22±0.39	NS
100-seed weight(g)	15.45±1.54	11.57±1.24**	-25.11
length mean of seed (mm)	6.90±0.5	6.45±0.36**	-6.52
width mean of seed (mm)	6.27±0.63	5.7±0.43**	-9.09
Diameter of seed (mm)	6.58±0.15	6.08±0.16**	-7.60

** indicates $p < 0.01$; NS indicates no significance between M657 and JH13