

Supplementary Table 1. Information of 35 soybean landrace germplasm and control used in this study.

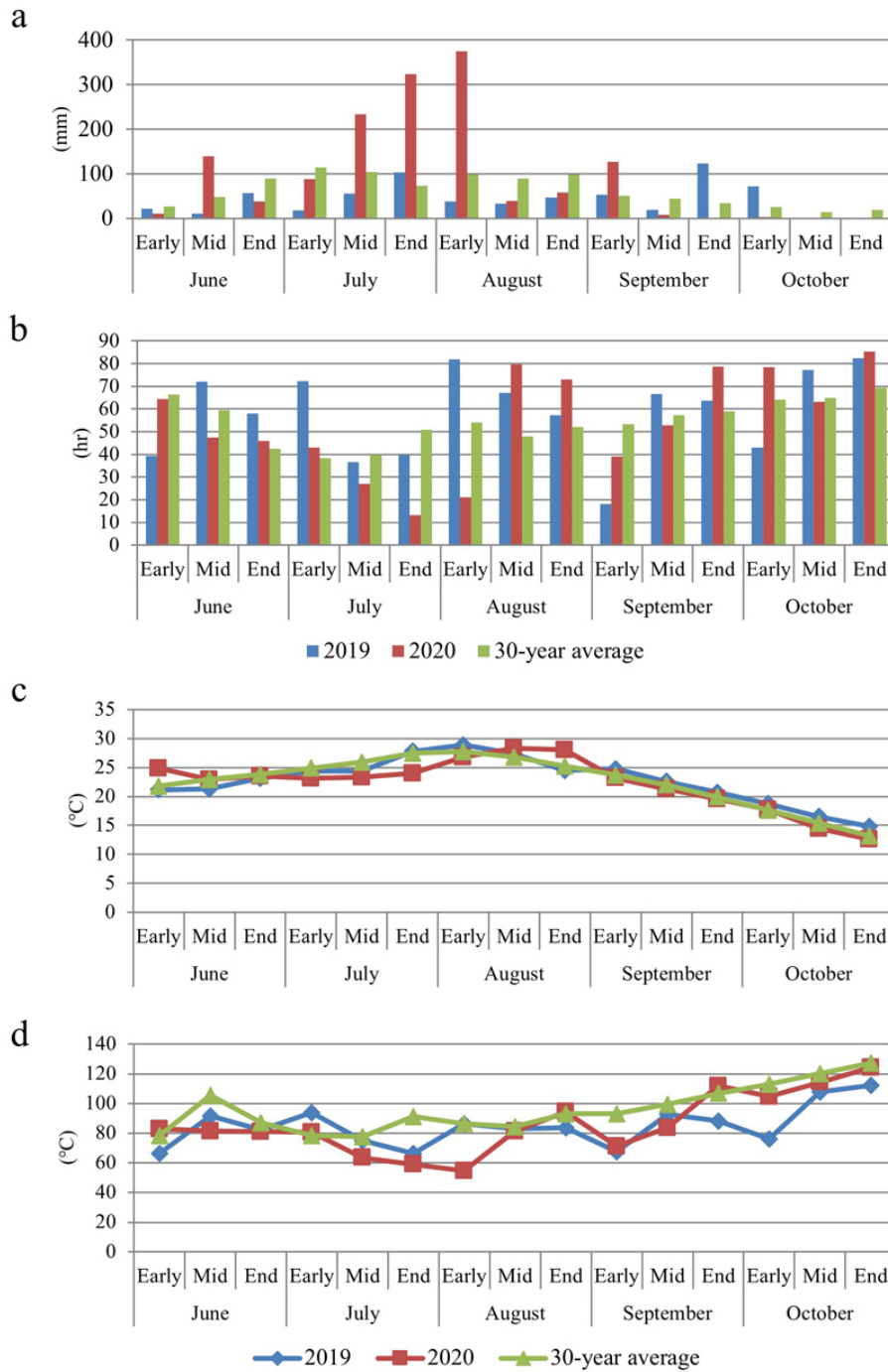
No.	IT Number	Accession name	Province	Seed coat color	Hilum color
1	24099	YJ208-1	-	Yellow	Yellow
2	104690	Kongnamul Kong	Gyeongsangbuk-do	Yellow	Yellow
3	113218	Kongnamul Kong	Gyeongsangbuk-do	Yellow	Yellow
4	143347	KLS86185	-	Black	Black
5	153844	KLS 87248	-	Yellow	Black
6	154351	KAS579-1	Jeollanam-do	Green with black dot	Black
7	154724	KAS651-21	Gyeongsangbuk-do	Green with black dot	Black
8	161904	PI 84578	-	Black	Black
9	177271	Geomjeong Kong-5	Gyeonggi-do	Black	Black
10	177573	Geomjeong Kong-5	Chungcheongnam-do	Black	Black
11	177709	Geomjeong Kong-4	Jeollanam-do	Black	Black
12	178054	Geomjeong Kong-1	Gyeongsangnam-do	Black	Black
13	178160	Geonjeong Kong	Gyeonggi-do	Green	Black
14	186048	Gangwonyanggu-1994-3709	Gangwon-do	Green	Black
15	186183	Kongnamul Kong	Jeollanam-do	Black	Black
16	189215	94yuja4	-	Black	Black
17	194558	Geomjeong Kong	Jeollabuk-do	Black	Black
18	194560	Geomjeong Kong	Jeollabuk-do	Black	Black
19	195514	Jang Kong	Gangwon-do	Yellow	Light brown
20	224192	Jeonbukgunsansujip	Jeollabuk-do	Black	Black
21	228822	409	Jeju-do	Black	Black
22	231360	Kongnamul Kong	Gangwon-do	Yellow	Brown
23	231544	Jwinuni Kong	Gyeongsangbuk-do	Black	Black
24	239896	Jwineori Kong	Jeollabuk-do	Black	Black
25	252252	Neoljeokseoritae	Chungcheongbuk-do	Black	Black
26	252748	294	Gyeonggi-do	Black	Black
27	252768	326	Gyeonggi-do	Black	Black
28	263852	Chungnamyeonggi-1997-3	Chungcheongnam-do	Yellow	Brown
29	263853	Geomen Kong	Jeollanam-do	Black	Black
30	274515	GNU-2007-14502	Gyeongsangnam-do	Black	Black
31	274571	GNU-2007-14613	Gyeongsangnam-do	Yellow	Yellow
32	274592	GNU-2007-14723	Gyeongsangnam-do	Yellow	Yellow
33	275005	197	Chungcheongbuk-do	Black	Black
34	308619	Junyeori Kong	Jeollabuk-do	Black	Black
35	311261	Jwinuni Kong	Gangwon-do	Black	Black
	Control	Cheongja 2	-	Black	Black

Supplementary Table 2. Variation (Mean±standard deviation) in 12 isoflavone contents for 35 soybean germplasm in 2019 and 2020.

IT Number	Aglycone (µg/g)												Glycoside (µg/g)												Malonyl glycoside (µg/g)												Acetyl glycoside (µg/g)												Total isoflavone contents (µg/g)				
	Daidzein			Genistein			Glycitein			Total aglycone			Daidzin			Genistin			Glycitin			Total glycoside			Malonyl daidzin			Malonyl genistin			Malonyl glycitin			Total Malonyl glycoside			Acetyl daidzin			Acetyl genistin			Acetyl glycitin			Total Acetyl glycoside			2019	2020			
	2019	2020		2019	2020		2019	2020		2019	2020		2019	2020		2019	2020		2019	2020		2019	2020		2019	2020		2019	2020		2019	2020		2019	2020		2019	2020		2019	2020												
24099	8	nd	±0.2	8	nd	±0.1	16	17	22	20	14	8	52	44	±11.7	89	351	126	117	±2.3	±0.2	±0.4	±0.5	±0.8	±1.2	±2.3	±7.4	±6.1	±5.7	nd	±2.4	±8.4	±15.3	12	9	nd	nd	nd	nd	nd	nd	22	nd	±10.2	±16.5								
104690	nd	nd	±0.1	8	nd	±0.2	18	32	23	34	14	11	55	77	±3.8	152	199	401	152	±3.8	±10.5	±10.4	±4.3	nd	±4.6	±14.2	±18.1	±0.2	nd	±0.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	20	±0.1	±15.1	±18.1								
113218	8	nd	±0.0	8	nd	±0.1	26	43	29	41	17	15	72	99	±1.4	±0.5	±1.3	±0.9	181	±5.5	±8.6	±16.9	±3.5	nd	±0.8	±22.4	±11.7	±0.2	nd	±0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	21	±0.2	±23.5	±10.9								
143347	9	nd	±0.1	8	nd	±0.1	40	65	51	67	13	11	104	143	±2.2	±2.1	±2.2	±1.7	218	±6.6	±8.8	±18.4	±5.4	nd	±1.3	±24.7	±15.0	±0.3	nd	±0.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	22	±0.3	±27.4	±18.9								
153844	9	nd	±0.1	8	nd	±0.1	27	75	25	60	15	18	67	153	±1.2	±1.0	±0.5	±0.7	270	±5.7	±7.0	±12.3	±10.7	nd	±4.4	±16.7	±13.2	±0.6	nd	±0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	29	±0.6	±17.8	±15.3								
154351	8	nd	±0.0	9	nd	±0.2	23	31	31	41	12	7	65	79	±0.9	±0.6	±1.1	±1.0	209	±7.9	±6.7	±21.8	±5.0	nd	±1.9	±29.4	±3.8	nd	nd	±0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	11	±0.1	±30.7	±3.6								
154724	nd	nd	±0.1	9	nd	±0.1	22	34	26	41	11	5	59	81	±0.5	±2.4	±0.2	±3.3	196	±2.2	±7.1	±7.2	±10.4	nd	±4.4	±9.4	±12.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	796	±9.2	±17.7								
161904	9	nd	±0.0	8	nd	±0.1	16	9	23	8	16	8	56	25	±0.5	±0.7	±0.2	±0.4	94	±2.2	±1.9	±3.2	±0.4	nd	±3.4	±4.1	±5.3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	397	±4.9	±6.3								
172721	nd	nd	±0.4	9	nd	±0.1	15	31	28	42	11	9	54	82	±0.1	±1.0	±0.3	±1.5	120	±1.7	±6.5	±8.5	±2.3	nd	±1.0	±10.1	±9.4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	669	±9.6	±11.3								
177573	2	8	±0.2	8	nd	±0.1	26	39	27	30	12	8	66	77	±0.4	±0.6	±0.4	±0.6	177	±2.3	±4.5	±8.2	±10.7	nd	±2.8	±10.5	±12.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	676	±11.2	±11.7							
177709	nd	nd	±0.0	8	nd	±0.0	21	17	31	17	16	11	68	45	±0.2	±0.7	±0.6	±1.8	151	±1.3	±5.8	±5.8	±14.1	nd	±3.4	±7.1	±23.2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	725	±7.8	±26.2							
178054	nd	nd	±0.1	8	nd	±0.1	32	23	54	29	14	7	100	58	±0.1	±0.6	±0.2	±1.1	206	±5.2	±7.8	±24.8	±12.6	nd	±1.7	±32.4	±19.9	nd	nd	±0.2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	12	±12.8	±67.9							
178160	8	nd	±0.0	8	nd	±0.0	34	19	35	16	13	5	81	39	±0.2	±0.6	±0.1	±0.7	158	±3.8	±1.3	±10.9	±3.6	nd	±2.7	±11.4	±8.5	nd	nd	±0.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	705	±14.8	±7.1							
186048	nd	2	±0.3	9	1	±0.3	34	18	31	11	11	8	77	37	±0.9	±0.8	±0.1	±0.2	167	±1.8	±2.8	±3.4	±11.7	nd	±2.3	±3.4	±15.8	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	665	±8.9	±15.6							
186183	nd	nd	±0.0	8	nd	±0.0	18	23	27	20	18	15	63	59	±0.3	±1.1	±0.4	±1.2	144	±0.6	±4.9	±2.2	±4.9	nd	±4.2	±2.4	±12.5	nd	nd	±0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	687	±4.4	±14.6						
189215	9	nd	±0.1	9	nd	±0.0	19	26	33	36	13	7	65	70	±0.2	±0.8	±0.8	±3.1	139	±0.7	±3.3	±2.3	±1.0	nd	±2.7	±1.5	±3.5	nd	nd	±0.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	850	±4.1	±3.7							
194558	10	nd	±0.1	9	nd	±0.1	15	14	21	15	11	8	47	37	±0.2	±0.6	±0.1	±0.6	78	±1.0	±2.6	±1.6	±1.8	nd	±3.6	±3.8	±3.0	nd	nd	±0.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	892	±5.1	±11.5							
194560	10	1	±0.2	9	nd	±0.0	24	20	29	19	12	8	65	47	±0.7	±0.8	±0.9	±1.8	167	±4.5	±7.7	±9.3	±1.3	nd	±0.1	±0.0	±13.7	±8.0	nd	nd	±0.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	734	±15.5	±8.5							
195514	8	nd	±0.0	9	nd	±0.1	15	14	21	15	11	8	47	37	±0.2	±0.6	±0.1	±0.6	78	±1.0	±2.6	±1.6	±1.8	nd	±3.6	±3.8	±3.0	nd	nd	±0.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	451	±2.7	±7.4							
224192	9±0.1	nd	±0.1	8	nd	±0.1	12	30	17	39	11	10	40	79	±0.3	±1.0	±0.2	±1.5	127	±0.6	±2.2	±1.3	±1.6	nd	±0.1	±1.4	±2.0	±5.0	nd	nd	±0.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	581	±2.7	±8.0							
228822	nd	nd	±0.0	9	nd	±0.0	10	22	18	24	11	7	39	53	±0.4	±1.1	±0.4	±0.6	96	±2.6	±5.9	±10.4	±4.4	nd	±3.2	±13.0	±6.3	nd	nd	±0.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	498	±13.9	±4.5							
231360	11	nd	±0.1	9	nd	±0.1	47	20	31	14	21	17	100	51	±0.8	±1.0	±0.3	±0.8	319	±5.4	±4.8	±8.4	±8.3	nd	±1.2	±13.4	±7.3	nd	nd	±0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	999	±14.1	±8.4								
231544	nd	nd	±0.1	8	nd	±0.1	14	13	24	19	12	7	50	40	±0.2	±0.7	±0.3	±0.6	104	±1.5	±5.6	±7.7	±7.9	nd	±1.8	±2.0	±3.2	nd	nd	±0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	588	±9.9	±7.5							
239896	nd	1	±0.1	8	nd	±0.1	14	14	19	23	10	6	43	43	±0.3	±1.1	±0.5	±1.1	135	±7.3	±3.6	±26.7	±6.7	nd	±2.5	±1.6	±32.7	±10.7	nd	nd	±0.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	684	±33.2	±9.8							

Supplementary Table 2. Continued

IT Number	Aglycone (µg/g)												Glycoside (µg/g)												Malonyl glycoside (µg/g)												Acetyl glycoside (µg/g)												Total isoflavone contents (µg/g)									
	Daidzein			Genistein			Glycitein			Total aglycone			Daidzin			Genistin			Glycitin			Total glycoside			Malonyl daidzin			Malonyl genistin			Malonyl glycitin			Total Malonyl glycoside			Acetyl daidzin			Acetyl genistin			Acetyl glycitin			Total Acetyl glycoside			2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020																
252252	nd	±0.3	8	±0.0	±0.3	1	20	30	33	43	10	15	63	89	132	225	528	282	41	38	701	545	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	772	636	±24.4	±23.0												
252748	nd	nd	8	±0.1	±0.5	2	20	21	19	18	nd	nd	39	38	124	308	140	46	120	477	260	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	534	300	±9.4	±16.7													
252768	nd	nd	8	±0.1	nd	8	12	26	30	45	18	24	60	95	106	179	489	290	56	595	525	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	663	620	±14.6	±7.4													
263852	8	±0.1	9	±0.1	nd	18	24	39	26	47	10	7	60	93	221	206	639	241	21	859	467	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	948	560	±32.4	±20.9													
263853	9	±0.5	±0.0	8	±0.1	±0.5	20	52	23	54	11	14	54	119	202	268	509	255	49	26	760	549	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	842	670	±11.2	±0.7													
274515	9	±0.1	8	±0.1	±0.1	3	35	32	28	25	17	17	79	74	297	272	594	197	54	891	524	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	998	602	±0.3	±34.3													
274571	9	nd	8	±0.0	±0.7	2	28	21	33	15	13	10	73	46	229	180	650	100	50	39	929	319	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1029	366	±14.1	±10.9												
274592	9	±0.3	±0.0	±0.3	±0.2	11	18	22	18	18	12	10	47	50	191	167	423	119	34	613	320	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	720	373	±21.8	±10.8													
275005	9	nd	8	±0.1	±0.5	±0.9	±0.8	±0.8	±0.8	±0.8	±0.7	±0.5	±2.3	±2.2	±5.7	±1.5	±16.7	±1.9	nd	±0.3	±22.4	±1.4	±0.8	±0.4	±0.8	±0.4	±0.8	±0.4	±0.8	±0.4	±0.8	±0.4	±0.8	±0.4	±0.8	±0.4	±0.8	±0.4	±0.8	±0.4	±0.8	±0.4	±0.8	±0.4	±0.8	±0.4	±0.8											
308619	8	nd	8	±0.1	nd	26	13	14	23	18	11	6	47	37	124	102	495	104	24	619	231	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	702	268	±13.4	±10.5												
311261	nd	nd	8	±0.0	±0.2	2	13	21	23	27	11	6	47	54	119	129	483	130	24	602	283	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	667	338	±16.7	±8.2												
Cheungja 2	10	nd	9	±0.1	nd	19	24	28	31	41	13	10	67	79	171	162	548	209	25	719	397	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	816	475	±12.3	±5.2											



Supplementary Fig. 1. Local (Jeonju) meteorological data of year 2019, 2020, and 30-year averaged. a, sum of precipitation per ten days; b, sum of sunshine duration per ten days; c, average monthly temperature; d, sum of daily temperature difference per ten days.