

Table S1 Phenotypic variation for GNS in the RIL population

Nu	2019	2020			2021	
	E1	E1	E2	E3	E1	E2
1	40.67	57.00	84.67	55.00	32.00	37.67
2	44.67	66.00	67.00	67.00	83.00	32.67
3	45.00	60.00	47.67	55.00	75.00	50.33
4	55.67	43.00	47.00	53.00	66.00	52.67
5	56.00	69.00	43.67	63.00	50.00	28.33
6	45.67	42.00	45.67	44.00	49.00	34.33
7	50.33	53.00	42.00	59.00	73.00	55.00
8	37.33	46.00	34.67	47.00	62.00	41.00
9	65.00	55.00	60.33	45.00	65.00	49.00
10	46.33	42.00	58.67	67.00	48.00	51.67
11	45.33	35.00	45.00	54.00	62.00	57.33
12	37.67	43.00	45.33	49.00	49.00	39.00
13	46.67	45.00	41.67	49.00	62.00	46.00
14	65.00	62.00	68.00	80.00	74.00	37.00
15	66.00	55.00	54.00	59.00	78.00	43.67
16	58.67	62.00	68.67	57.00	89.00	34.33
17	54.67	68.00	68.33	59.00	80.00	46.67
18	46.33	49.00	43.00	53.00	-	24.33
19	62.00	57.00	57.00	69.00	77.00	62.67
20	40.33	49.00	42.67	41.00	-	24.67
21	40.67	37.00	44.00	38.00	54.00	47.00
22	57.00	63.00	55.67	54.00	41.00	31.67
23	53.33	60.00	53.00	58.00	49.00	37.00
24	69.33	85.00	57.33	83.00	-	45.33
25	61.67	74.00	59.33	64.00	-	48.33
26	43.33	65.00	40.67	59.00	58.00	45.67
27	80.33	95.00	61.33	77.00	77.00	56.33
28	42.67	32.00	25.00	38.00	78.00	58.33
29	45.33	52.00	51.00	69.00	73.00	57.33
30	55.67	65.00	40.33	66.00	82.00	41.33
31	70.00	68.00	47.33	52.00	60.00	43.33
32	73.33	62.00	52.67	71.00	-	42.00
33	58.33	48.00	59.00	55.00	80.00	38.33
34	54.00	44.00	46.67	35.00	110.00	43.33
35	51.00	70.00	56.33	58.00	85.00	57.00
36	60.33	61.00	49.67	46.00	77.00	44.00
37	47.33	61.00	50.33	45.00	50.00	59.00
38	50.33	61.00	43.00	50.00	-	50.67
39	47.67	71.00	59.00	58.00	57.00	47.67
40	77.33	75.00	55.00	72.00	117.00	37.00
41	41.00	49.00	44.67	43.00	55.00	58.00
42	58.00	72.00	62.67	80.00	72.00	46.33
43	56.67	49.00	48.33	43.00	60.00	47.33
44	71.00	79.00	50.00	77.00	92.00	38.33
45	45.00	55.00	57.33	68.00	72.00	49.00

46	41.00	74.00	56.00	50.00	64.00	45.33
47	63.67	89.00	69.33	66.00	86.00	41.67
48	61.67	62.00	48.00	50.00	73.00	54.67
49	39.67	51.00	51.33	52.00	44.00	52.67
50	39.67	67.00	48.67	55.00	-	54.00
51	42.33	56.00	51.67	44.00	73.00	34.67
52	65.00	77.00	51.00	62.00	71.00	37.00
53	50.00	69.00	55.67	53.00	-	48.67
54	57.00	67.00	56.33	63.00	69.00	31.00
55	45.33	52.00	42.67	46.00	51.00	51.00
56	59.67	67.00	65.67	69.00	75.00	32.33
57	36.00	55.00	43.33	47.00	48.00	45.67
58	59.33	72.00	61.00	61.00	71.00	46.67
59	41.67	53.00	51.00	73.00	-	56.33
60	51.00	59.00	67.00	62.00	-	54.67
61	65.00	54.00	50.00	69.00	-	45.00
62	54.67	49.00	62.00	60.00	22.00	41.00
63	91.67	61.00	56.67	79.00	49.00	112.00
64	60.33	68.00	49.00	46.00	51.00	50.67
65	47.67	62.00	56.00	67.00	56.00	64.00
66	63.00	68.00	58.67	86.00	84.00	34.33
67	54.33	63.00	46.33	52.00	49.00	58.67
68	68.33	64.00	53.67	66.00	66.00	28.67
69	46.00	56.00	55.33	64.00	58.00	48.00
70	56.00	72.00	70.67	65.00	92.00	40.67
71	58.00	93.00	69.67	73.00	95.00	52.00
72	52.33	66.00	71.33	69.00	84.00	45.67
73	54.33	78.00	68.33	54.00	80.00	45.67
74	57.67	61.00	77.67	68.00	46.00	43.00
75	53.00	86.00	58.00	53.00	69.00	62.00
76	46.00	47.00	55.33	45.00	87.00	49.00
77	50.00	72.00	55.33	62.00	35.00	50.00
78	64.67	56.00	52.00	67.00	107.00	47.67
79	68.67	79.00	64.67	72.00	88.00	68.67
80	67.33	61.00	51.00	66.00	67.00	52.33
81	55.67	113.00	54.33	50.00	80.00	67.00
82	50.00	51.00	44.67	66.00	76.00	23.33
83	49.67	78.00	62.00	58.00	79.00	77.00
84	46.33	45.00	35.67	49.00	53.00	28.00
85	80.33	47.00	79.00	90.00	106.00	71.00
86	46.33	63.00	52.00	55.00	85.00	31.67
87	62.67	71.00	69.33	57.00	-	38.67
88	56.67	55.00	42.67	60.00	61.00	47.33
89	75.33	71.00	69.00	83.00	101.00	77.00
90	71.67	75.00	60.00	71.00	123.00	41.67
91	65.33	92.00	62.00	77.00	127.00	62.00
92	65.33	79.00	60.00	78.00	95.00	75.67
93	48.33	57.00	40.33	71.00	-	55.67

94	40.00	45.00	42.67	50.00	59.00	56.33
95	60.00	65.00	53.67	52.00	87.00	51.33
96	51.00	50.00	48.67	36.00	43.00	39.33
97	71.33	50.00	55.67	58.00	125.00	32.00
98	72.00	57.00	41.33	58.00	76.00	44.67
99	50.00	52.00	48.33	60.00	85.00	52.67
100	50.67	44.00	46.00	35.00	55.00	45.00
101	42.33	72.00	50.33	47.00	45.00	45.67
102	91.00	65.00	62.00	78.00	62.00	37.00
103	45.67	40.00	45.33	39.00	36.00	53.67
104	56.33	55.00	56.00	56.00	73.00	46.67
105	59.00	37.00	51.00	43.00	73.00	35.00
106	46.00	47.00	43.00	54.00	71.00	46.67
107	54.67	68.00	62.67	58.00	75.00	49.67
108	52.33	60.00	46.67	52.00	71.00	30.00
109	60.00	56.00	76.33	63.00	83.00	41.67
110	49.67	51.00	46.00	56.00	72.00	32.33
111	49.00	56.00	56.67	46.00	55.00	28.33
112	36.67	40.00	34.33	37.00	36.00	46.00
113	66.67	77.00	52.00	55.00	71.00	53.33
114	51.67	48.00	51.33	53.00	56.00	73.67
115	55.33	59.00	40.00	47.00	64.00	30.00
116	49.00	54.00	44.00	61.00	79.00	52.67
117	55.33	43.00	59.67	60.00	81.00	52.00
118	50.00	49.00	35.33	36.00	48.00	52.00
119	57.33	74.00	57.33	58.00	84.00	58.67
120	44.00	44.00	43.33	34.00	58.00	51.67
121	52.33	53.00	60.67	71.00	72.00	55.33
122	57.00	59.00	49.67	31.00	71.00	44.00
123	35.67	54.00	28.00	44.00	44.00	61.00
124	61.33	43.00	43.33	50.00	-	58.33
125	35.67	32.00	34.33	36.00	51.00	40.33
126	65.33	57.00	60.67	51.00	115.00	44.00
127	52.00	61.00	61.00	53.00	77.00	54.67
128	63.33	67.00	48.33	63.00	-	39.67
129	66.67	55.00	60.33	59.00	120.00	35.00
130	41.67	28.00	54.00	24.00	-	36.67
131	67.00	48.00	56.33	52.00	-	43.67
132	41.67	43.00	54.00	51.00	55.00	72.33
133	46.67	49.00	56.33	64.00	70.00	35.67
134	44.67	39.00	42.67	45.00	-	44.67
135	55.67	55.00	57.67	46.00	75.00	39.67
136	62.33	66.00	53.67	79.00	118.00	61.00
137	40.33	59.00	67.00	43.00	-	52.67
138	63.67	65.00	47.67	58.00	68.00	33.00
139	63.00	67.00	52.67	75.00	-	57.00
140	76.00	66.00	48.00	63.00	-	77.00
141	65.67	64.00	41.33	57.00	93.00	39.33

142	44.67	42.00	43.67	56.00	53.00	35.33
143	52.33	54.00	56.67	45.00	74.00	48.00
144	48.67	61.00	51.33	65.00	69.00	19.67
145	63.33	46.00	55.67	57.00	-	44.00
146	86.00	76.00	56.33	93.00	133.00	62.00
147	63.33	64.00	53.33	60.00	68.00	52.33
148	93.67	110.00	63.33	88.00	71.00	64.00
149	39.67	58.00	48.67	41.00	52.00	41.00
150	95.00	105.00	70.33	75.00	114.00	56.67
151	48.67	48.00	65.67	53.00	80.00	51.67
152	84.67	69.00	65.67	85.00	121.00	73.00
153	56.00	54.00	47.67	42.00	80.00	59.33
154	95.67	98.00	75.33	81.00	87.00	82.33
155	55.00	79.00	68.00	63.00	97.00	33.33
156	41.00	55.00	55.67	52.00	34.00	84.67
157	77.33	56.00	78.00	61.00	97.00	43.33
158	37.67	53.00	50.33	43.00	64.00	61.00
159	62.67	53.00	42.00	67.00	-	33.00
160	47.67	52.00	48.33	49.00	42.00	38.00
161	39.67	41.00	44.67	35.00	58.00	45.67
162	44.67	50.00	43.33	43.00	83.00	47.67
163	78.00	82.00	66.33	81.00	93.00	45.00
164	57.00	53.00	40.67	42.00	99.00	42.00
165	79.33	45.00	48.00	62.00	74.00	47.00
166	53.00	67.00	49.33	58.00	119.00	43.33
167	56.67	58.00	53.33	65.00	-	55.33
168	61.67	58.00	50.67	50.00	59.00	62.67
169	45.67	56.00	62.67	62.00	86.00	56.67
170	74.00	73.00	56.67	61.00	98.00	56.67
171	48.67	63.00	52.67	63.00	-	28.33
172	45.67	56.00	50.33	56.00	45.00	63.00
173	44.33	69.00	41.33	73.00	60.00	32.33
174	42.00	46.00	57.00	45.00	-	42.00
175	30.67	44.00	55.00	65.00	93.00	46.33
176	47.67	42.00	54.67	43.00	60.00	60.67
177	29.50	30.00	31.00	55.00	62.00	38.33
178	50.00	37.00	39.67	39.00	48.00	54.67
179	39.67	46.00	50.67	51.00	41.00	53.67
180	68.00	72.00	61.33	79.00	106.00	37.33
181	43.00	50.00	57.00	53.00	57.00	67.00
182	62.33	67.00	50.33	72.00	98.00	50.67
183	43.00	48.00	49.00	54.00	66.00	59.33
184	74.67	85.00	56.67	70.00	90.00	47.33
185	54.33	69.00	60.00	65.00	-	49.00
186	65.67	75.00	60.67	85.00	140.00	42.67
187	53.00	62.00	55.33	54.00	87.00	53.00
188	44.33	78.00	67.67	50.00	112.00	55.00
189	42.33	40.00	53.33	46.00	57.00	48.67

190	68.67	39.00	82.67	59.00	80.00	38.67
191	47.00	41.00	43.00	46.00	83.00	38.67
192	46.67	67.00	56.67	46.00	-	37.00
193	55.33	49.00	60.67	52.00	101.50	49.00
194	51.00	56.00	49.00	66.00	-	34.00
195	67.00	111.00	72.67	97.00	55.00	45.33
196	61.67	75.00	49.33	66.00	81.00	60.67
197	56.00	65.00	40.67	63.00	55.00	51.33
198	52.33	59.00	49.00	61.00	-	68.33
199	59.00	53.00	49.00	41.00	-	51.00
200	52.67	62.00	53.00	58.00	-	59.00
201	56.33	48.00	79.00	79.00	44.00	64.00
202	42.00	86.00	61.33	84.00	45.00	53.33
203	34.33	43.00	34.67	52.00	-	27.33
204	73.67	65.00	64.33	74.00	131.00	25.33
205	45.33	44.00	37.33	44.00	86.00	43.33
206	47.00	52.00	60.33	55.00	-	32.33
207	43.33	56.00	55.00	45.00	95.00	34.67
208	45.67	53.00	61.33	55.00	75.00	44.33
209	75.00	57.00	56.00	76.00	-	25.00
210	67.33	77.00	70.00	54.00	127.00	40.33

Note: Nu refer to the No of lines for the RIL population. E1, E2, E3 refer to Pingdingshan, Yangling, Xianyang environments, respectively.