

A New Single Cross Maize Hybrid for Silage and Grains "Gangilok"

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Abstract : A single cross hybrid "Gangilok" is an yellow semi-dent maize (*Zea mays* L.) developed by the Maize Experiment Station at Gangwon-do Agricultural Research and Extension Services in 2005. "Gangilok" has high yield of dry matter, total digestible nutrients (TDN) and grain. It was developed by cross between two inbred lines, HF1 and HF2. HF1 is the seed parent and HF2 is the pollen parent of "Gangilok". Silking date of "Gangilok" is 1 or 4 days earlier than that of check hybrids. It is resistant to lodging because of its low ratio of upper ear height to plant height. Stay green of Gangilok is similar to that of check hybrid, "Kwanganok". It is moderately resistant to *Bipolaris maydis* (southern corn leaf blight), resistant to *Exserohilum turcicum* (northern corn leaf blight), and moderate resistant to corn borer. Regional yield trial was conducted at four locations for three years. The yields of "Gangilok" in dry matter, TDN, and grain were 18.6 ton, 13.3 ton, and 8.9ton/ha which were increased 10%, 12%, and 11% compared with check hybrid, respectively.

Key words : Maize(*Zea mays* L.), Single cross, Dry matter, TDN, Grain, yield

Year	♀'94 ♂'93	'95 ~ '00 '93 ~ '00	'00	'01~'02	'03~'05
Generation	—	S ₀ ~ S ₆ , S ₇	Lines	Cross & Multiplication	
Female (♀)	P3358	E95002-5-T2-2-1-1-2	HF1	HF1/HF2	Gangilok (Hongcheon 5)
Male (♂)	N2BE/ B73	93002-2-4-6-1-1-1-1	HF2		
Remark	Selection of lines		Cross	PYT&AYT [†]	RYT

[†]PYT: preliminary yield trial, AYT: advanced yield trial, RYT: regional yield trial

Fig. 1. Breeding procedures of "Gangilok".

Table 1. Color of silk, seed coat and grain type for "Gangilok".

Hybrid	Color of silk	Color of seed coat	Grain type
Gangilok	Light Purple	Yellow	Dent
Suwon19	Light Green	Yellow	Dent
Kwanganok	Light Purple	Yellowish white	Dent

Table 2. Agronomic characteristics of "Gangilok".

Hybrid	Days to silking	Plant height (cm)	Ratio [†] (%)	Ear(cm)		100 seed weight(g)	Stay green [‡] (1-9)
				Length	Diameter		
Gangilok	77	261	47	17.3	4.7	33.1	4.2
Suwon19	78	254	50	18.1	4.5	30.6	6.1
Kwanganok	81	250	54	16.4	4.6	29.1	4.4

[†]Ratio : height of insertion of upper ear to plant height

[‡]Stay green : 1(excellent) - 9(poor)

Table 3. Resistance to disease and lodging of "Gangilok".

Hybrid	Disease resistance			Corn borer	Lodging
	<i>B. maydis</i>	<i>E. turcicum</i>	BSDV [†]		
Gangilok	MR [‡]	R	M	M	R
Suwon19	MR	MR	M	M	R
Kwanganok	R	R	M	M	R

[†]BSDV : black streaked dwarf virus

[‡]MR : moderately resistant, R : resistant, M : moderate

Table 4. Grain yield of "Gangilok" in advanced yield trial.

(AYT, '02)

Hybrid	Grain yield(ton/ha)				Index (%)
	Hongcheon	Cheorwon	Yanggu	Mean	
Gangilok	10.33	11.20	9.44	10.32	114
Suwon19	9.22	10.23	7.75	9.07	100

Table 5. Dry matter yield of "Gangilok" in regional yield trial from 2003 to 2005.

Location	Gangilok(ton/ha)					Kwanganok(ton/ha)				
	'03	'04	'05	Mean	Index	'03	'04	'05	Mean	Index
Suwon	18.84	21.96	17.43	19.41	114	17.03	19.78	14.15	16.99	100
Hongcheon	19.88	17.01	18.61	18.50	103	19.38	17.37	17.08	17.94	100
Hwasung	20.51	20.56	21.91	20.99	115	18.51	18.71	17.75	18.32	100
Daegu	12.42	15.48	18.29	15.40	107	11.85	15.07	16.18	14.37	100
Mean	17.91	18.75	19.06	18.58	110	16.69	17.73	16.29	16.91	100

Table 6. Total digestible nutrients(TDN) of "Gangilok" in regional yield trial from 2003 to 2005.

Location	Gangilok(ton/ha)					Kwanganok(ton/ha)				
	'03	'04	'05	Mean	Index	'03	'04	'05	Mean	Index
Suwon	13.39	15.34	12.30	13.68	117	11.86	13.59	9.72	11.72	100
Hongcheon	14.58	12.39	13.79	13.59	105	13.92	12.35	12.63	12.97	100
Hwasung	14.72	14.03	15.69	14.81	115	12.99	13.01	12.72	12.91	100
Daegu	9.16	11.03	13.16	11.12	111	8.24	10.20	11.50	9.98	100
Mean	12.96	13.20	13.73	13.30	112	11.75	12.29	11.64	11.89	100

Table 7. Grain yield of "Gangilok" in regional yield trial from 2003 to 2005.

Location	Gangilok(ton/ha)					Suwon19(ton/ha)				
	'03	'04	'05	Mean	Index	'03	'04	'05	Mean	Index
Suwon	10.50	7.92	7.20	8.54	112	9.54	6.51	6.84	7.63	100
Hongcheon	9.98	9.19	9.76	9.64	116	8.88	8.25	7.84	8.32	100
Daegu	7.24	8.73	9.45	8.47	105	7.55	7.63	9.03	8.07	100
Mean	9.24	8.61	8.80	8.88	111	8.66	7.47	7.90	8.01	100

Table 8. Seed production trial of "Gangilok" in Hongcheon.

Planting rate (♀:♂)	Inbred	Tasseling date	Silking date	Pollen dispersal period	Ear length (cm)	Ear diameter (cm)	F1 seed
							Pruduction (ton/ha)
3:1	HF1(♀)	July 22	July 24	-	14.1	4.2	2.13
	HF2(♂)	July 20	July 22	July 19-29	-	-	-