

Supplementary Table S1. Days to heading and heading dates of the RGBM lines grown at different times under long-day condition

Line name	Designation	Days to heading			Heading date		
		15-Mar	31-Mar	15-Apr	15-Mar	31-Mar	15-Apr
PSH		-	-	-	-	-	-
RGBM1-1-1	<i>Gn1a</i> + WFP + Ehd-ST12-1	94±4	100±4	96±1	June 14~22	July 5~13	July 18~21
RGBM1-1-3	<i>Gn1a</i> + WFP + Ehd-ST12-2	94±1	97±1	92±3	June 16~20	July 5~7	July 15~21
RGBM2-1-1	<i>Gn1a</i> + WFP + Ehd-ST12-3	95±2	98±1	92±1	June 15~20	July 6~8	July 15~18
RGBM2-1-2	<i>Gn1a</i> + WFP + Ehd-ST12-4	99±4	101±3	97±3	June 17~22	July 7~14	July 16~23
RGBM2-1-3	<i>Gn1a</i> + WFP + Ehd-ST12-5	98±5	101±2	94±1	June 13~25	July 8~14	July 16~19
RGBM1-1-2	<i>Gn1a</i> + Ehd-ST12-1	96±2	102±2	96±2	June 6~22	July 8~13	July 18~22
RGBM2-1-4	<i>Gn1a</i> + Ehd-ST12-2	107±4	103±5	98±1	June 3~28	July 11~18	July 21~23

- indicates no data because PSH cannot heading in summer season.

Supplementary Table S2. Days to heading of the selected promising lines grown at different locations in the 2023 Dry and Monsoon seasons

Line name	Designation	Days to heading									
		Myaungmya		Latpadan		Yezin		Kyaukse		Average	
		23DS	23MS	23DS	23MS	23DS	23MS	23DS	23MS	23DS	23MS
PSH		-	148	-	149	-	128	-	149	-	143.5
RGBM2-1-1	<i>Gn1a</i> + WFP + Ehd-ST12-3	98	88	96	90	99	92	100	91	98.3	90.3
RGBM2-1-3	<i>Gn1a</i> + WFP + Ehd-ST12-5	100	92	99	93	101	92	101	91	100.3	92
RGBM1-1-2	<i>Gn1a</i> + Ehd-ST12-1	108	96	100	98	111	97	103	92	105.5	95.8
RGBM2-1-4	<i>Gn1a</i> + Ehd-ST12-2	110	99	105	98	114	104	107	97	109.0	99.5

- indicates no data because PSH cannot heading in summer season.

Supplementary Table S3. QTL analysis of days to heading in BC₂F₃ population derived from PSH/ST12

QTL name	Chr.	Left marker ^a	Right marker ^a	Peak marker ^a	Peak LOD	PVE (%) ^b	Additive effect ^c	Dominant effect	LOD threshold ^d
<i>qDTH6</i>	6	1,955,920	6,595,302	2,040,863	12.7**	66.08	-7.79	-5.07	3.6

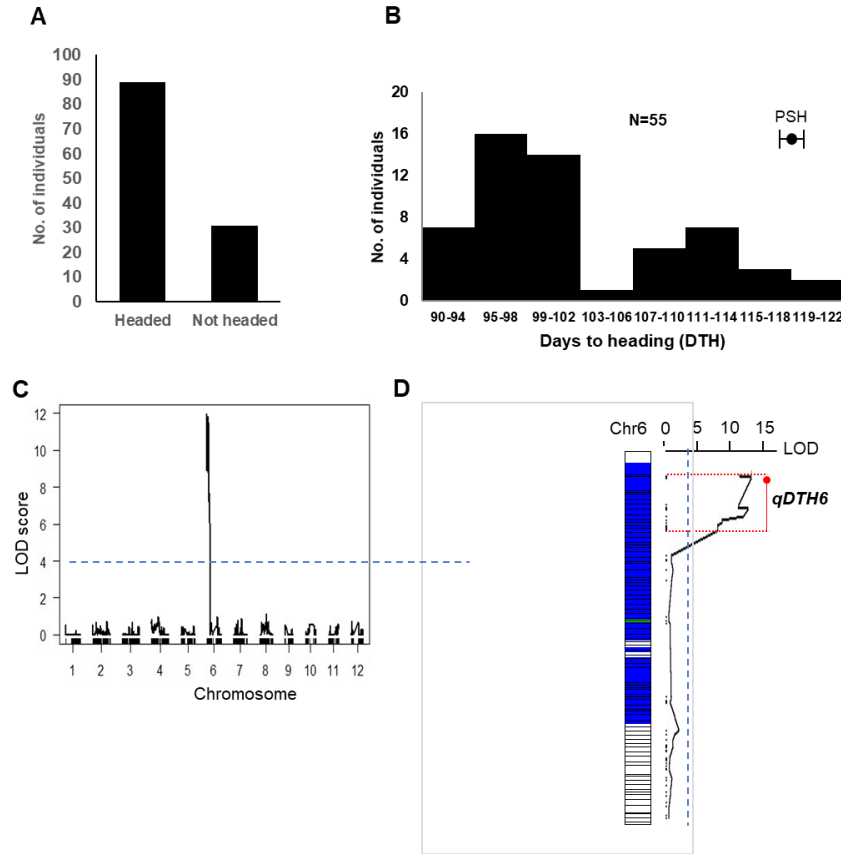
** : Significant at 1% level

^a: The physical position was estimated based on International Rice Genome Sequencing Project (IRGSP-1.0)

^b: Percentage of variance explained

^c: Genetic effect of ST12

^d: LOD threshold at 5% significant level



Supplementary Figure S1. Quantitative trait locus (QTL) analysis of days to heading in the BC₂F₃ population. Frequency distribution of days to heading (DTH) in the BC₂F₃ population in 2020DS (**A**) and 2020MS (**B**). DTH QTL detected from the BC₂F₃ population via genotyping-by-sequencing (GBS) showing all 12 chromosomes (**C**) and only chromosome 6 (**D**). Blue dotted lines indicate the limit of detection (LOD) threshold (5% level of significant). Red bar indicates the genomic region of QTL. Red dot indicates the peak single nucleotide polymorphism (SNP). For graphical genotype of chromosome 6, white, blue and green colored blocks indicate the recurrent parent, donor parent, and heterozygous regions, respectively.