

**Table S1.** Statistical analysis of bud development and flowering

Treatments	Bud diameter (mm)	New branch length (cm)	Max leaf length (cm)	Flowering rate (%)	Initial flowering time
Control	20.40±0.15 a	19.93±0.34 b	15.43±0.69 b	81.86 a	October 8 <sup>th</sup>
GA treatment	9.92±0.21 c	33.10±0.78 a	18.80±3.70 ab	0.00 c	n/a
GA+Nutrient	14.64±0.52 b	31.71±0.33 a	20.56±1.08 a	62.57 b	August 29 <sup>th</sup>

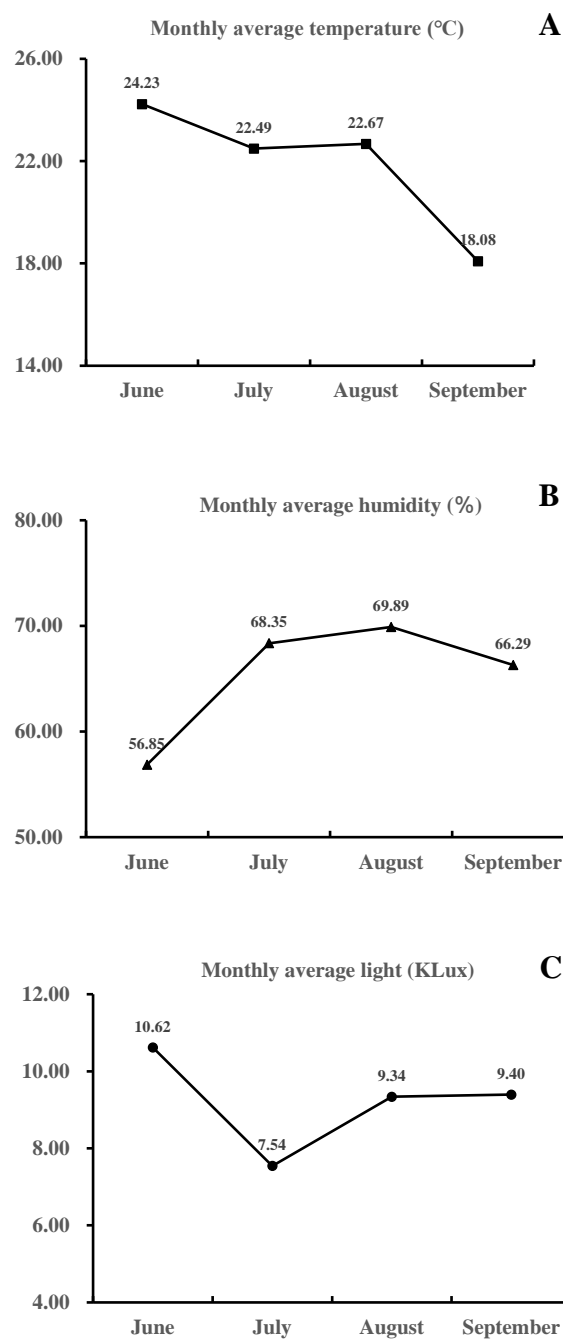
Note: error bars indicate the standard deviation (n = 5), and different lowercase letters indicate significant differences (Tukey's test,  $\alpha = 0.05$ ). n/a, not apply.

**Table S2.** Effect of various fertilizers on reflowering of tree peony in autumn

Fertilizer type	The ratio of N, P, K	Flower diameter (cm)	New branch length (cm)	Initial flowering period
Control	0:0:0	12.83±1.19b	22.32±1.59a	Sep. 23, 2019
Type I	1:1:1	15.86±1.27a	23.41±2.47a	Sep. 22, 2019
Type II	1:3:2	15.58±1.41a	22.77±1.75a	Sep. 19, 2019
Type III	3:2:6	15.34±1.13a	23.18±1.66a	Sep. 23, 2019

**Table S3.** The primer sequence information used for gene expression in this study

Gene name	Primer name	Sequence (5'-3')	Gene ID
<i>PsAPI</i>	RTAP1-F	AGAAGAAGGAAAGGGCAATC	KF113361.1
	RTAP1-R	TTCCTCCTCACTTCTGTTGG	
<i>PsFT</i>	RTFT-F	CCAAGCGACCCAAACCTA	KF113360.1
	RTFT-R	CGCCAACCTGGAGTGTA	
<i>PsLFY</i>	RTLTY-F	ATGAGAAGGAAGGAGGGGATG	psu.G.00032564
	RTLTY-R	CTTTGGCAATGGTCTGAACT	
<i>PsSOC1</i>	RTSOC1-F	CCAATGTCCGAGCAAGAAAG	KR779924.1
	RTSOC1-R	CCGTGCTTCTCGCATAACAT	
<i>PsSVP</i>	RTSVP-F	CGATGTTGAGCAAGGAGGTT	KC847164.1
	RTSVP-R	GCTCTAAATCAGCAGCGACA	
<i>PsGA20ox</i>	RTGA20ox-F	TGGGTGGTCTTCAAGTGT	MH546118.1
	RTGA20ox-R	AGCCCTGTAAATGTTTCTGTG	
<i>PsGA3ox</i>	RTGA3ox-F	TGATGTGGTTGATGTTGGGCT	MH546120.1
	RTGA3ox-R	GAGAAGAGTTGAATCTGTGTGTGC	
<i>PsGA2ox</i>	RTGA2ox-F	CTCCAAACCCGACACTAAACA	MH546119
	RTGA2ox-R	GCCCAATGTTCTTGTTCCTCA	
<i>PsGID1c</i>	RTGID1c-F	TGAAGAACCTCCACCAAG	MH546122
	RTGID1c-R	CCACAAGACGACGACAAA	
<i>PsGAI</i>	RTGAI-F	GAGTATGCTGTCCGAGTTCA	MH550803
	RTGAI-R	CAGGAGCAAGGAACGAAT	
<i>PsHXK1</i>	RTHXK1-F	ATAAGAAAAGCCGTGGTAGAGC	MT136704
	RTHXK1-R	AGTGTTTCATACAAGCCACCATC	
<i>PsSnRK1</i>	RTSnRK1-F	CACGAAGGAATGGCGAATA	MT136703
	RTSnRK1-R	CAAGGAAGGCAGCACAAAG	
<i>PsTPS1</i>	RTTPS1-F	CTCTCGACTTCCATGCCTTA	MT136702
	RTTPS1-R	CTGTGATGTTCCAAGGGTTC	
<i>Actin</i>	Actin-F	GAGAGATTCCGTTGCCAG	JN105298
	Actin-R	TCCTTGCTCATTCTGTCTGC	



**Figure S1.** Environmental conditions in the process of tree peony 'Qiu Fa No. 1' bud growth and development. A: Monthly average temperature; B: Monthly average humidity; C: Monthly average light.