

**Table S1.** Effects of different tillage practices and fertilization managements on the annual economic input, income and benefit of rice production over the four-year experimental period.

Treatment	Rice production input (CNY ha <sup>-1</sup> year <sup>-1</sup> )					Rice production income (CNY ha <sup>-1</sup> year <sup>-1</sup> )	Economic benefit (CNY ha <sup>-1</sup> year <sup>-1</sup> )
	biochar	tillage	fertilizer	activity costs	total		
RT-CK	/	4200	/	9150	13350	21870±634c	8520±634d
RT-FS	/	4200	2595	9150	15945	31234±397b	15289±397b
RT-FB	7020	4200	2595	9150	22965	34102±682a	11137±682c
RT-F	/	4200	2595	9150	15945	31349±867b	15404±867b
NT-CK	/	/	/	9150	9150	18026±536d	8876±536d
NT-FS	/	/	2595	9150	11745	30271±853b	18526±853a
NT-FB	7020	/	2595	9150	18765	31598±128b	12833±128c
NT-F	/	/	2595	9150	11745	29475±809b	17730±809a

Mean ± SE; different letters indicate significant difference at  $P < 0.05$ . The activity costs consisted of seedling production (250 and 200 CNY ha<sup>-1</sup> year<sup>-1</sup> respectively for early rice and late rice), pesticides (1500 and 1200 CNY ha<sup>-1</sup> year<sup>-1</sup> respectively for early rice and late rice), mechanical harvesting (2100 CNY ha<sup>-1</sup> year<sup>-1</sup> for both early rice and late rice), irrigation and field managements (450 CNY ha<sup>-1</sup> year<sup>-1</sup> for both early rice and late rice).

**Table S2.** The annual economic benefit of biochar application compared to local farmer's production over the four-year experimental period.

Treatment	Direct benefit (CNY ha <sup>-1</sup> )	Carbon compensation (CNY ha <sup>-1</sup> )	Total benefit (CNY ha <sup>-1</sup> )
RT-CK	-6769	928	-5841
RT-FS	0	0	0
RT-FB*	2868	1379	4247
RT-F	115	1267	1382
NT-CK	-6413	1536	-4877
NT-FS	3237	517	3754
NT-FB*	4564	1401	5965
NT-F	2441	1396	3837

RT-FS treatment was the same to local farmer's production. The asterisk (\*) indicated that the biochar input was not considered in the direct benefit calculation process for RT-FB and NT-FB with the value of 28080 CNY ha<sup>-1</sup>. The carbon compensation was computed on the basis of carbon-trade price (59.31 CNY t<sup>-1</sup> CO<sub>2</sub>-eq) on 10.07.2023 in China (Tianjin Climate Exchange, <https://www.chinatcx.com.cn/>) and the mitigated GWPs compared to RT-FS.