

**Table S62** Surface soil properties ~~and management practices~~ for model operation.

Site name <sup>a</sup>	CS <sup>c</sup>	DY <sup>d</sup>	FQP <sup>e</sup>	SZ <sup>f</sup>	YTA <sup>g</sup>
Soil Texture <sup>b</sup>	L	SC	SL	L	L
Bulk density (g cm <sup>-3</sup> )	1.04	1.18	1.45	1.12	1.16
Clay (%)	20.6	42.3	10.0	19.5	18.0
Sand (%)	42.4	34.8	52.0	41.0	19.2
pH	7.1	5.4	8.8	6.1	5.8
Soil organic carbon content (g C kg <sup>-1</sup> )	25.5	17.0	4.9	20.8	18.0

<sup>a</sup> The sites are Changshu (CS), Danyang (DY), Fengqiu with rice paddy fields (FQP), Shenzhen (SZ), and Yingtian (YTA).

<sup>b</sup> The soil textures are loam (L), sandy clay (SC) and sandy loam (SL).

<sup>c</sup> Clay and sand fractions: 0–30 cm, cited from the Second National Soil Survey data (10×10 km<sup>2</sup> grid) provided by the Institute of Soil Science, Chinese Academy of Sciences (SNSS); Soil pH: 0–20 cm, observed (Song et al., 2004); Soil organic carbon content (SOC): 0–20 cm, estimated from the observed soil organic matter content divided by 1.724; Bulk density (BD): 0–20 cm, estimated from SOC using the algorithm in Li (2016).

<sup>d</sup> Clay fraction and soil pH: topsoil, observed (Cai et al., 1986); Sand fraction: 0–30 cm, SNSS; SOC: topsoil, estimated from the observed organic nitrogen (ON) multiplied by 10; BD: topsoil, estimated from SOC using the algorithm in Li (2016).

<sup>e</sup> Clay fraction and soil pH: topsoil, observed (Zhu et al., 1989); Sand fractions: 0–30 cm, SNSS; SOC: 0–15 cm, estimated from the observed ON multiplied by 10; BD: 0–15 cm, estimated from SOC using the algorithm in Li (2016).

<sup>f</sup> Clay and sand fractions: 0–30 cm, SNSS; SOC and soil pH: 0–30 cm, observed (Gong et al., 2013); BD: 0–30 cm, estimated from SOC using the algorithm in Li (2016).

<sup>g</sup> Clay fraction and soil pH: topsoil, observed (Cai et al., 1992); Sand fraction: 0–30 cm, SNSS; SOC: 0–15 cm, estimated from the observed ON multiplied by 10; BD: 0–15 cm, estimated from SOC using the algorithm in Li (2016).