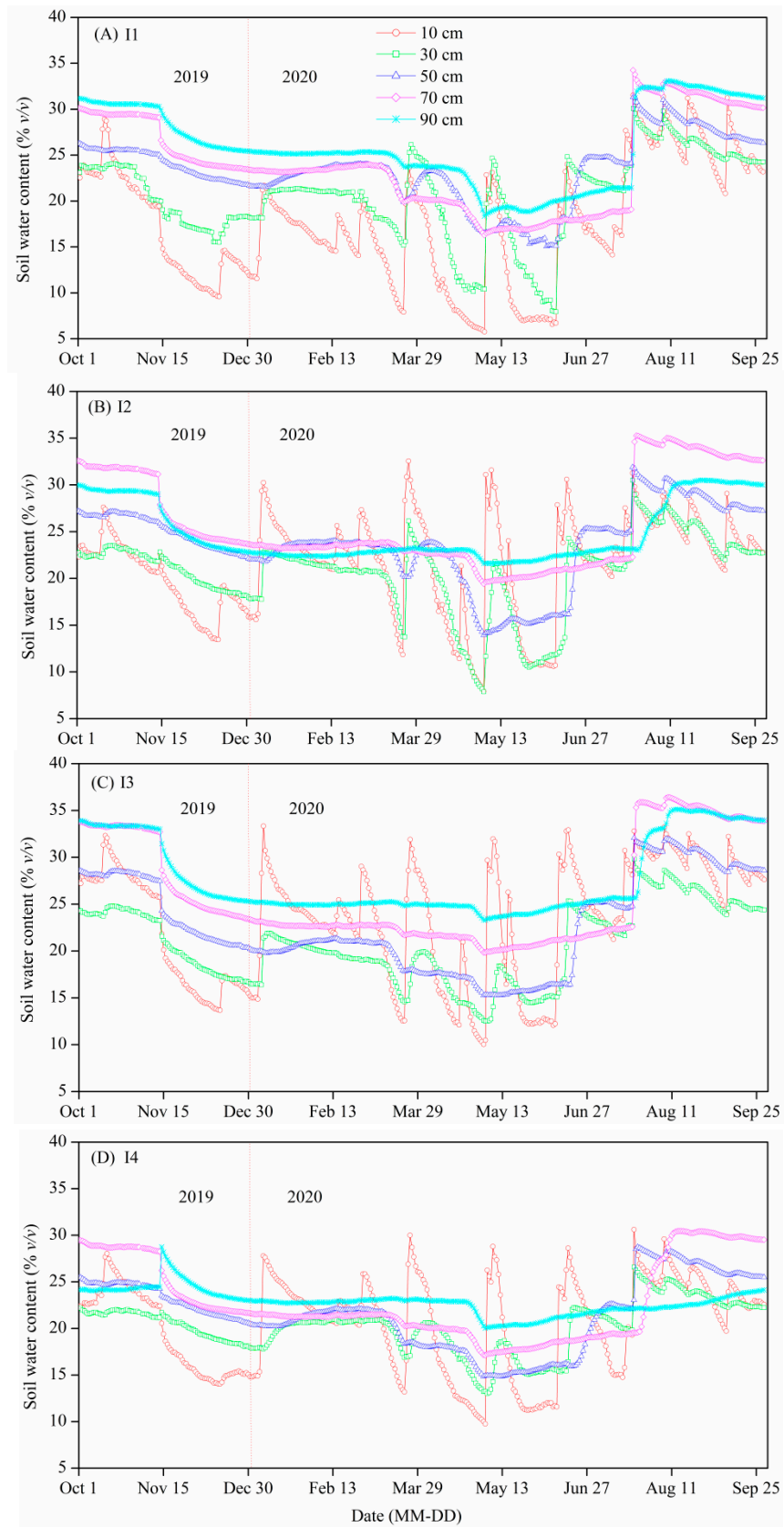


### Supplementary materials:

**Table S1.** Goodness of fit between soil water content (SWC, % *v/v*) measured using Insentek sensors and oven–dry method across different soil textures in the laboratory at the Xuchang Irrigation Experiment Station in 2017–2018.

Soil texture	SWC measured by Insentek sensor			Goodness of fit		Correlation	Significance
	Maximum	Minimum	Mean	RMSE	RPD	R <sup>2</sup>	<i>p</i>
Sand	3.46	28.6	18.1	1.044	6.78	0.997	0.0001
Silt loam	7.26	35.1	22.7	0.927	7.99	0.995	0.0001
Clay	17.7	33.7	25.4	0.897	5.61	0.997	0.0001

Note: RMSE is root mean square error; RPD is relative prediction deviation. SWC values measured by Insentek sensor are reliable with  $RPD \geq 4.0$ ; R<sup>2</sup> is coefficient of determination; *p* is probability.



**Figure S1.** Seasonal variations in soil water content (SWC, %  $v/v$ ) under (A) I1, (B) I2, (C) I3, and (D) I4 treatments in a winter wheat–summer maize cropping system during the 2019-2020 growing season.