

Supplementary Table 1. Cucumber's cultivation information of on-farm trial sites

On-farm trials location	Cultivation period (transplanting to harvest end)	Soil type	Greenhouse specification (Type, area, cover material)	Heating and insulation system
A (36o28'N 128 o13'E)	5. Oct., 2018 – 10. June, 2019	Clay loam	1-2W type ^z , 0.7 ha, polyolefin plastic film	Hot air heating with non-woven fabric screen
B (36o33'N 128 o09'E)	10. Oct., 2018 – 11. June, 2019	Clay loam	1-2W type, 0.2 ha, polyolefin plastic film	Hot air heating with non-woven fabric screen
C (36o34'N 128 o12'E)	14. Oct., 2018 – 31. May, 2019	Clay loam	1-2W type, 0.6 ha, polyolefin plastic film	Hot air heating with non-woven fabric screen

^z1-2W is the multi-span plastic greenhouse, each span is 7.0 m wide in the east-west direction, height of gutter and ridge 2.3 m and 4.6 m, respectively.