

Table S1. Primers list.

Primers	Sequence (5'–3')	Protocols	Reference
Eub338	CCTACGGGAGGCAGCAG		[48]
Eub518	ATTACCGCGGCTGCTGG		[49]
Flic-F	GAACGCCAACGGTGCGAACT	2 min at 95 °C,	[50]
Flic-R	GGCGGCCTTCAGGGAGGTC	followed by 40 cycles	[50]
ITS1f	CTTGGTCATTTAGAGGAAGTAA	of 10 s at 95 °C, 20 s at	[51]
ITS2R	GCTGCGTTCTTCATCGATGC	53 °C and 30 s at 72 °C	[52]
ITS1f	CTTGGTCATTTAGAGGAAGTAA		[51]
AFP346	GGTATGTTACACAGGGTTGATG		[53]
ITS1f	CTTGGTCATTTAGAGGAAGTAA	2 min at 95 °C,	[51]
		followed by 40 cycles	
AFP308	CGAATTAACGCGAGTCCCAAC	of 10 s at 95 °C, 15 s at	[54]
		58 °C and 20 s at 72 °C	

Table S2. Physicochemical properties of each PS–Soil and OA–Soil.

Sampling site	Cultivation system	pH	EC ($\mu\text{S cm}^{-1}$)	$\text{NH}_4^+\text{-N}$ (mg kg^{-1})	$\text{NO}_3^-\text{-N}$ (mg kg^{-1})	TOC (g kg^{-1})	AK (mg kg^{-1})	AP (mg kg^{-1})	Moisture (%)
Nanmiao	PS –Soil	4.21±0.21	425.4±157.8	16.44±8.87	155.0±63.3	37.07±4.77	378.0±108.7	82.28±18.56	17.56±0.91
	OA–Soil	5.06±0.09	26.90±1.24	3.40±3.15	1.40±1.00	40.67±39.66	107.6±9.45	10.14±3.05	28.06±2.07
Xicun	PS –Soil	4.24±0.32	598.5±189.7	9.63±8.67	214.7±68.9	34.99±3.85	435.7±55.1	50.99±5.71	19.80±1.17
	OA–Soil	5.74±0.05	43.87±11.89	2.50±0.15	3.43±1.19	36.61±11.37	124.0±12.49	18.21±4.46	28.71±2.96
Xinfang	PS –Soil	6.88±0.22	405.8±184.9	12.93±15.14	76.44±50.55	31.16±3.41	418.3±118.0	122.1±14.4	22.28±2.95
	OA–Soil	5.09±0.49	82.31±28.63	2.38±0.55	12.40±7.71	33.61±4.59	164.3±61.0	18.12±11.25	25.19±1.33

Values: means ± standard deviations. EC: electrical conductivity; TOC: total organic carbon; AK: available potassium; AP: available phosphorus. PS–Soil and OA–Soil represent the plastic shed and open–air cultivation soils, respectively.

Table S3. Microbial properties of each PS–Soil and OA–Soil.

Sampling site	Cultivation system	Microbial abundance (log ₁₀ 16S rDNA or ITS copies g ⁻¹ soil)					Microbial proportion (%)			
		Bacteria	Fungi	<i>F. oxysporum</i>	<i>F. solani</i>	<i>R. solanacearum</i>	Fungi /bacteria	<i>R. solanacearum</i> /bacteria	<i>F. oxysporum</i> /fungi	<i>F. solani</i> /fungi
Nanmiao	PS–Soil	9.35±0.15	8.45±0.12	7.23±0.28	6.99±0.33	5.67±0.33	13.84±0.22	0.02±0.00	6.82±2.83	4.51±2.82
	OA–Soil	9.81±0.05	8.01±0.11	5.76±0.71	4.11±0.32	6.13±0.11	1.60±0.28	0.02±0.00	1.13±1.53	0.01±0.01
Xicun	PS–Soil	9.37±0.06	8.33±0.14	6.79±0.07	7.35±0.64	5.58±0.22	9.76±3.57	0.02±0.00	3.17±1.51	31.05±42.87
	OA–Soil	9.71±0.14	7.44±.27	5.20±0.45	5.47±0.31	5.85±0.09	0.55±0.09	0.01±0.01	0.66±0.36	1.19±0.59
Xinfang	PS–Soil	9.81±0.05	8.22±0.27	6.85±0.16	7.37±0.26	6.07±0.19	3.25±2.35	0.02±0.00	4.66±1.82	20.60±21.57
	OA–Soil	9.73±0.08	8.07±0.22	6.02±0.79	5.99±0.61	5.92±0.18	2.55±1.71	0.02±0.00	2.21±1.87	1.12±1.01

Values: means ± standard deviations. PS–Soil and OA–Soil represent the plastic shed and open air cultivation soils, respectively.

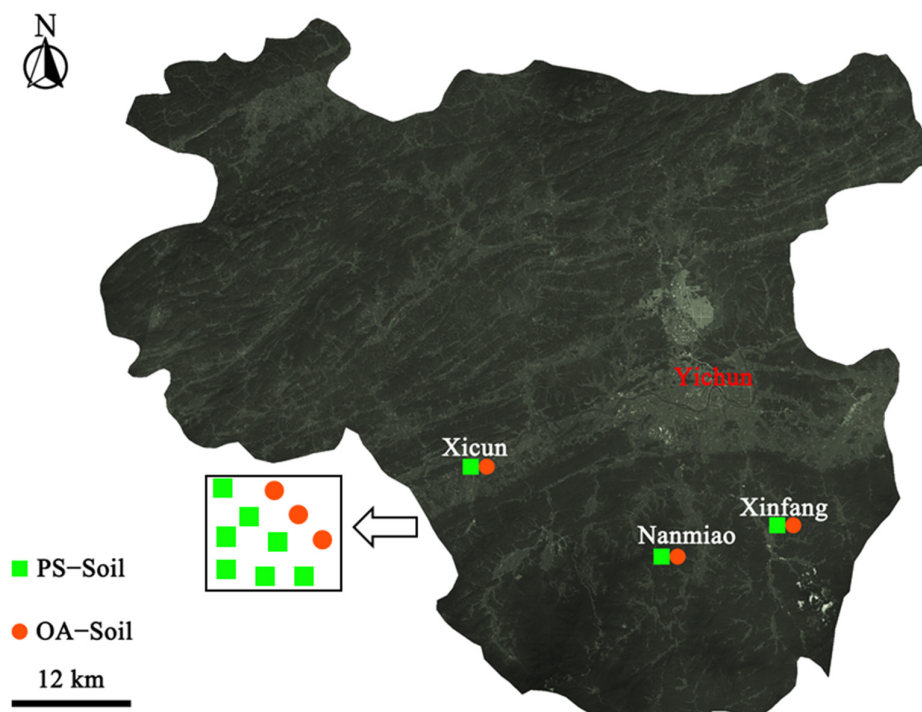


Figure S1. Map of soil sampling sites. PS-Soil and OA-Soil represent the plastic shed and open air cultivation soils, respectively.

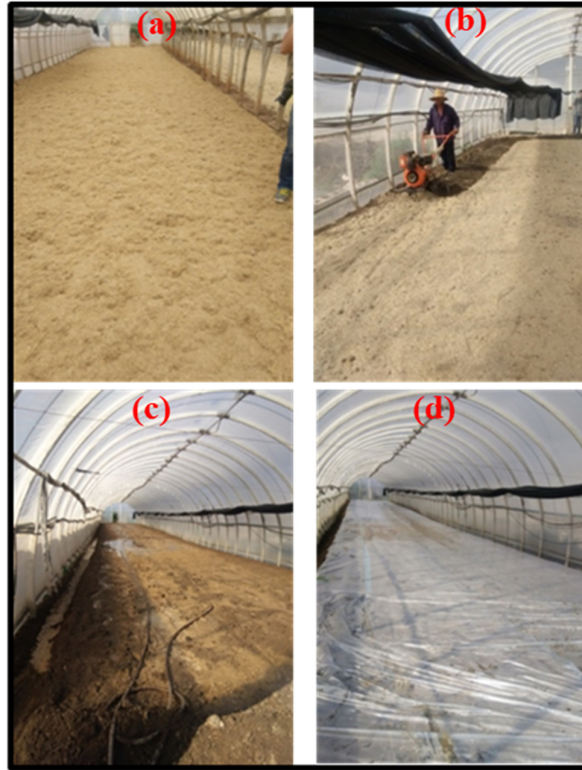


Figure S2. The operation processes of RSD treatment. (a) soil incorporated with organic material; (b) the fully mixed of soil and organic material using a rotary cultivator; (c) soil irrigated to saturation; and (d) soil covered with a plastic film. This illustration was taken from our previous RSD experiment rather than from this study, but it was not published anywhere.