



*Research article*

## **Co-composted biochar amendments modulate soil microclimate and phenology to enhance saffron yield under saline field conditions**

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**Table S1.** Raw data for soil moisture (%) for the year 2020.

treatment	Non-saline soil 2020	Saline soil 2020
Control	17.9	13.3
Control	24.6	23.1
Control	21.3	16.6
Control	17.8	23.1
Control	23.1	22.4
Control	18.7	19.8
Control	14.9	14.5
Control	18.6	24.3
Control	17.7	16.7
Control	17.6	22.3
Control	18.5	18.1
Control	19.5	16.8
Control	14.3	14.7
Control	21.2	22.4
Control	23.3	17.4
Control	20.3	17.5
Control	16.2	17
Control	21.2	16.9
SG	13.3	17.7
SG	29.6	47.1
SG	21.6	22.2
SG	28.7	28.8
SG	18.1	25.9
SG	24.6	23.3
SG	20.4	15.5
SG	22.2	22.3
SG	21	15.2
SG	28.4	20.2
SG	22.1	21.8
SG	24.1	17.4
SG	15.3	14.3
SG	22.7	17.1
SG	16.2	15.1
SG	24.3	17.3
SG	16.1	14.4
SG	21.4	16.5
FYM	16.7	9.4
FYM	22.5	24.2
FYM	24.4	16.1
FYM	24.9	17.2
FYM	24.3	14.3

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treatment	Non-saline soil 2020	Saline soil 2020
FYM	22.4	20.1
FYM	17.7	14.1
FYM	37.7	20.1
FYM	24.7	21.6
FYM	25.1	21.1
FYM	25.4	20.2
FYM	21.7	20.3
FYM	15.7	16.9
FYM	18.4	20.7
FYM	17.5	17.4
FYM	16.4	22.2
FYM	14.2	18.1
FYM	22	17.4
PM	16.4	18.9
PM	22.3	49.9
PM	22.2	22
PM	20.8	20.4
PM	19.2	21.2
PM	18.7	18.9
PM	20.7	17.7
PM	24.8	25.5
PM	20.5	16.3
PM	20.6	23.4
PM	22.1	17.3
PM	22.5	21.4
PM	12.5	12.3
PM	24.2	24.8
PM	19.6	18.6
PM	17.3	21.2
PM	18.3	20.4
PM	20.4	17.5
SG-B	15.4	10.5
SG-B	18.6	24.5
SG-B	16.4	15.6
SG-B	18	20.5
SG-B	16.2	25.5
SG-B	21	15.5
SG-B	19.8	16.2
SG-B	47.9	24.1
SG-B	22.8	20.8
SG-B	24.7	23.2
SG-B	20.1	19.6
SG-B	25.1	21.9
SG-B	13.6	12.4

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treatment	Non-saline soil 2020	Saline soil 2020
SG-B	23.4	29.8
SG-B	19	17.8
SG-B	23.9	21.9
SG-B	20.2	15.8
SG-B	17.3	20.9
FYM-B	24.6	10.2
FYM-B	15.4	19.6
FYM-B	16.4	15
FYM-B	21.7	19.1
FYM-B	16.8	17.9
FYM-B	20.9	16.1
FYM-B	18.1	11.4
FYM-B	25.2	19.7
FYM-B	22.8	13.8
FYM-B	28.3	22.5
FYM-B	23.4	15.6
FYM-B	23.8	19.1
FYM-B	16.4	10.6
FYM-B	45.7	25.1
FYM-B	21.8	19.1
FYM-B	18.3	21.6
FYM-B	19.5	18.1
FYM-B	22	25.6
PM-B	20.8	17.4
PM-B	45.9	24
PM-B	23.2	19.1
PM-B	24.8	22.7
PM-B	20.1	20.2
PM-B	25.3	22.3
PM-B	14.5	22.1
PM-B	19.4	30
PM-B	18.5	20
PM-B	35	30.6
PM-B	16.6	21.3
PM-B	45.6	25.5
PM-B	13.4	10.6
PM-B	21.5	24.9
PM-B	23.9	20.3
PM-B	20.7	24.1
PM-B	21.7	21.4
PM-B	25	24.3

**Table S2.** Raw data for soil moisture (%) for the year 2022.

Treatment	Non-saline soil 2021	Saline soil 2021
Control	17.1	13.1
Control	18.3	15.2
Control	15.2	17.1
Control	16.1	18.8
Control	19.5	14.3
Control	18.5	19
Control	18	18.7
Control	17.7	17.1
Control	21.4	20.2
Control	19.2	14.7
Control	19.9	14.8
Control	12.2	21.2
Control	10.7	22
Control	16.4	16.1
Control	18.2	15.4
Control	19.4	15
Control	18.2	17.7
Control	15	14.8
Control	15.1	15.2
Control	18.1	15.5
Control	15.2	13.1
Control	17.5	14.4
Control	16.2	15.9
Control	19.3	13.9
Control	18.7	14
Control	16.5	18.5
Control	22.6	19
SG	22.1	15.4
SG	20.7	17.1
SG	12.2	17.1
SG	9.2	17.1
SG	17.8	16.7
SG	17.5	24.4
SG	17.4	22.7
SG	21.4	19.1
SG	18.2	18.8
SG	20	16.8
SG	19.9	16.7
SG	16.7	22.3
SG	15.7	23.2
SG	15.9	19.6
SG	14.6	19.3

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Treatment	Non-saline soil 2021	Saline soil 2021
SG	15.6	18.3
SG	19.6	21.9
SG	18	15.4
SG	20.3	19.7
SG	20.9	18.2
SG	21.2	17.3
SG	22.6	18.8
SG	17.1	15.4
SG	19.7	14.7
SG	21.2	14.7
SG	19.3	16.1
SG	18.6	15.4
FYM	18.1	15.5
FYM	19.1	16.7
FYM	11.5	15.3
FYM	12.5	14.1
FYM	19	14.5
FYM	23.4	19.7
FYM	20.3	20.1
FYM	15.7	15.7
FYM	17	21.5
FYM	17.7	17.2
FYM	18.7	17.3
FYM	15.5	13.2
FYM	14.5	15.4
FYM	15.3	16.1
FYM	16.9	15.4
FYM	17	16.6
FYM	16.9	19.6
FYM	20.1	15.3
FYM	19.1	20.9
FYM	19.3	21.2
FYM	14.5	14.1
FYM	15.8	15.6
FYM	19	21.6
FYM	16.7	14.9
FYM	16.5	15.4
FYM	18	17.7
FYM	17.3	22.4
PM	22.9	18.3
PM	23.7	19.1
PM	17.2	23.3
PM	16.2	24.3
PM	16.5	18

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Treatment	Non-saline soil 2021	Saline soil 2021
PM	20	18.7
PM	21	18
PM	17.1	18.3
PM	23.2	20.5
PM	19.1	22.9
PM	18.6	21.9
PM	16.3	24.3
PM	17	23.4
PM	19.1	21.9
PM	21.4	24.2
PM	20.4	22.2
PM	22.7	15.7
PM	24.8	17.8
PM	18	23.4
PM	19.3	22.8
PM	20.1	18.1
PM	19.1	15.8
PM	23.7	23.5
PM	18.7	22.5
PM	18.5	22.7
PM	17.8	17.7
PM	17.8	17
SG-B	19.7	13.7
SG-B	20.2	12.7
SG-B	20.3	17.1
SG-B	19.3	16.8
SG-B	18.5	14.2
SG-B	19.6	16.7
SG-B	19.5	17.6
SG-B	19.5	21.6
SG-B	16	17.6
SG-B	18	16.4
SG-B	17.7	17.7
SG-B	23.2	16.2
SG-B	24.1	15.5
SG-B	17.1	16.4
SG-B	18.1	16.3
SG-B	18.2	16.7
SG-B	18.5	17.3
SG-B	16.3	18.7
SG-B	17.1	20.2
SG-B	18.8	14.3
SG-B	15.5	18.8
SG-B	15.9	18.3

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Treatment	Non-saline soil 2021	Saline soil 2021
SG-B	22.7	19.5
SG-B	18.8	22
SG-B	18.5	21.8
SG-B	19.5	18.3
SG-B	15.7	21.7
FYM-B	20.3	17.7
FYM-B	19.9	18.7
FYM-B	26.1	16.1
FYM-B	25.1	15.8
FYM-B	20.4	17.2
FYM-B	25.7	14.6
FYM-B	22.7	15.3
FYM-B	18.5	22.7
FYM-B	19.9	16.2
FYM-B	17.1	16.5
FYM-B	18.2	17.7
FYM-B	22.2	15.3
FYM-B	21.1	13.6
FYM-B	19.5	16.8
FYM-B	18.4	16.2
FYM-B	18.2	14.7
FYM-B	22.3	18.3
FYM-B	17.8	22.2
FYM-B	22.2	18.7
FYM-B	21.8	18.6
FYM-B	17.3	13.5
FYM-B	16.3	16.4
FYM-B	17.8	18.2
FYM-B	20.4	21.6
FYM-B	21.4	20.7
FYM-B	21.4	18.8
FYM-B	15.8	14.1
PM-B	18.1	23.4
PM-B	19.9	18.7
PM-B	20.8	20.5
PM-B	21.9	21.5
PM-B	23.9	22.4
PM-B	24.9	20.2
PM-B	23.9	22.6
PM-B	20.1	18.7
PM-B	22.4	25.2
PM-B	20.2	18
PM-B	20.6	20.4
PM-B	15.2	20.3

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Treatment	Non-saline soil 2021	Saline soil 2021
PM-B	14.2	19.7
PM-B	19.2	17
PM-B	23.2	21.4
PM-B	24.7	20.1
PM-B	22.1	22.7
PM-B	15.4	22.2
PM-B	21.1	16.2
PM-B	20.4	16.2
PM-B	13.3	17.1
PM-B	12.7	15
PM-B	21	15.2
PM-B	22.3	22.7
PM-B	22.2	21.3
PM-B	18.3	16.7
PM-B	16.4	23.2

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**Table S3.** Soil temperature (°C) data taken on October 22, 2020.

Treatment	Low EC soil	High EC soil
Control	16	17
Control	19.5	16
Control	19	17
SG	16.5	17
SG	17	17
SG	16	16
FYM	16	18
FYM	16	16
FYM	18	16.5
PM	17.5	16.5
PM	17	17.5
PM	16.5	15
SG-B	17.5	16.5
SG-B	15.5	17.5
SG-B	18	16.5
FYM-B	16	17
FYM-B	17	18
FYM-B	15	17
PM-B	17	16
PM-B	17	17
PM-B	15	17

**Table S4.** Soil temperature (°C) data taken on October 10 and November 1 and 8, 2021.

Treatment	Low EC soil	High EC soil
Control	16	16.5
Control	15.7	13.5
Control	13	13.5
Control	16	17
Control	12.3	14
Control	13	12
Control	16.5	17
Control	13	15.2
Control	14	15
SG	17.5	16
SG	14.3	13
SG	12	12
SG	17	16.5
SG	14	14
SG	14	13
SG	17	16.7
SG	13.5	14.5
SG	15	14
FYM	16.5	16
FYM	13	14
FYM	13	14
FYM	16	17
FYM	13.3	13.5
FYM	12	13
FYM	16	17
FYM	14.1	13
FYM	13	11
PM	16.5	16.5
PM	15.5	15
PM	14	14
PM	16	16
PM	14	14.5
PM	13	15
PM	16	16
PM	14.5	15
PM	12	13
SG-B	15.5	16
SG-B	12.5	15.5
SG-B	14	13.5
SG-B	15	17.5
SG-B	14.3	15

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Treatment	Low EC soil	High EC soil
SG-B	13	11
SG-B	16	17
SG-B	14	15
SG-B	13.5	11
FYM-B	17.5	17
FYM-B	15.2	15
FYM-B	13	12.5
FYM-B	17	16
FYM-B	14.5	14
FYM-B	14	13
FYM-B	16	16
FYM-B	14	14
FYM-B	12.5	14
PM-B	16	16
PM-B	14.5	14
PM-B	14	13
PM-B	16	17
PM-B	14.5	15
PM-B	14	15
PM-B	16	16
PM-B	14.5	14
PM-B	13	13

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**Table S5.** Raw data of pH, electrical conductivity (dS m<sup>-1</sup>), potassium (mg kg<sup>-1</sup> soil), phosphorus (mg kg<sup>-1</sup> soil), sodium (mg kg<sup>-1</sup> soil) and total nitrogen (mg kg<sup>-1</sup> soil) of saline soil after two years of cropping.

Treatment	pH	EC	Potassium	Plant available		
				Phosphorous	Sodium	Total nitrogen
Control	8.32	1.25	69.26095	1.376731	235	0.27
Control	8.16	1.56	83.8666	1.792244	245	0.42
Control	8.2	1.28	75.10321	2.595568	262	0.44
SG	8.03	1.46	124.7624	2.263158	239	0.35
SG	8.04	1.54	120.8676	3.177285	249	0.49
SG	8.33	0.99	134.4995	3.315789	233	0.38
FYM	8.26	0.86	135.4732	6.252078	244	0.41
FYM	8.21	1.69	124.7624	5.240997	254	0.37
FYM	8.17	1.38	142.2892	5.060942	229	0.39
SG+B	8.23	2.31	166.6319	6.556787	261	0.44
SG+B	8.05	1.52	153	7.747922	264	0.54
SG+B	8.33	1.3	153.9737	6.362881	254	0.57
FYM+B	8.17	1.04	184.1587	7.277008	255	0.61
FYM+B	8.23	1.04	179.2902	7.831025	237	0.59
FYM+B	8.28	0.75	186.1061	7.609418	234	0.64
PM+B	8.45	1.14	232.8442	7.637119	241	0.52
PM+B	8.23	1.92	200.7118	7.803324	237	0.38
PM+B	8.5	0.98	198.7644	7	264	0.53
PM	8.41	1.51	228.9494	9.105263	234	0.55
PM	8.09	1.79	202.6592	8.911357	244	0.76
PM	8.23	1.23	239.6602	9.160665	274	0.54

**Table S6.** Raw data of pH, electrical conductivity ( $\text{dS m}^{-1}$ ), potassium ( $\text{mg kg}^{-1}$  soil), phosphorus ( $\text{mg kg}^{-1}$  soil), sodium ( $\text{mg kg}^{-1}$  soil) and total nitrogen ( $\text{mg kg}^{-1}$  soil) of non-saline soil after two years of cropping.

Treatment	pH	EC	Potassium	Plant available Phosphorous	Sodium	Total nitrogen
Control	8.51	0.69	89.70886	1.930748	196	0.44
Control	8.87	0.54	83.8666	0.850416	155	0.68
Control	8.72	0.87	78.99805	2.67867	162	0.53
SG	8.69	0.86	146.184	2.567867	184	0.67
SG	8.74	0.89	157.8685	2.069252	186	0.39
SG	8.86	0.44	169.5531	2.67867	197	0.67
FYM	8.74	0.59	241.6076	6.473684	178	0.81
FYM	8.82	0.7	213.37	5.060942	197	0.47
FYM	8.43	1.4	223.1071	4.313019	168	0.69
SG+B	8.34	0.76	205.5803	6.778393	188	0.55
SG+B	8.44	0.64	173.4479	4.700831	154	0.67
SG+B	8.82	0.63	150.0789	6.418283	152	0.74
FYM+B	8.76	0.57	92.62999	8.412742	191	0.56
FYM+B	8.6	0.91	144.2366	7.554017	166	0.59
FYM+B	8.61	0.8	215.3174	6.916898	159	0.54
PM+B	8.79	0.89	228.9494	10.62881	174	0.49
PM+B	8.68	0.87	203.6329	9.160665	192	0.68
PM+B	8.62	0.79	192.9221	8.689751	167	0.69
PM	8.36	1.48	213.37	10.90582	196	0.55
PM	8.3	1.22	242.5813	11.29363	175	0.64
PM	8.66	1.58	173.4479	9.382271	169	0.57

**Table S7.** Raw data of number of saffron flowers emerged grown in various fertilizer-amended plots in non-saline and saline soils.

Crop grown in non-saline soil, first-year sampling																			
Sampling dates																			
	28.10	29.10	30.10	31.10	1.11	2.11	3.11	4.11	5.11	6.11	9.11	10.11	11.11	12.11	13.11	16.11	17.11	18.11	23.11
Treatments	Mean	Mean	mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
	±SD	±SD	±SD	±SD	±SD	±	±	±	±	±	±	±	±	±	±	±	±	±	± SD
					SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Control	0 ±0	0 ±0	0 ±0	2 ±0	3.6 ±0.5	5 ±2.6	4.1 ±0.5	4.6 ±2.8	4.3 ±2.08	2.6 ±2.3	5.3 ±2.08	1 ±1	0.3 ±0.5	0.6 ±1.15	1.6 ±1.5	0.3 ±0.5	0 ±0	0 ±0	0.3 ±0.5
SG	0 ±0	0 ±0	0 ±0	0.6 ±1.15	3 ±1.7	5 ±1.15	1.6 ±2.8	4.6 ±2.8	6 ±0	4.6 ±4.6	6 ±1	2 ±1	1.6 ±0.5	1 ±1	0.3 ±0.5	0 ±0	0 ±0	0 ±0	0 ±0
FYM	0 ±0	0 ±0	0 ±0	1.6 ±1.5	2.6 ±1.15	7.6 ±3.5	4.6 ±1.5	2.6 ±2.08	3.3 ±2.5	1 ±0	5.3 ±2.5	1 ±1.7	1.6 ±0.5	1.6 ±2.08	1.6 ±1.15	1 ±1.7	0 ±0	0 ±0	0 ±0
PM	0 ±0	0 ±0	0 ±0	2 ±2	3.3 ±1.5	5 ±4.3	4 ±2.6	3 ±1	4 ±3.4	2 ±1.7	4.3 ±1.5	0.6 ±0.5	2.3 ±1.1	1.3 ±1.5	0.6 ±0.5	1.3 ±0.5	0 ±0	0 ±0	0 ±0
SG-B	0 ±0	0.6 ±1.15	0 ±0	1.3 ±2.3	2 ±0	4.6 ±0.5	3 ±1	2 ±2.6	1.3 ±2.5	2.6 ±1.5	5.3 ±1.5	1.6 ±0.5	0.3 ±0.5	1 ±1.7	1.3 ±1.5	0 ±0	0 ±0	0 ±0	0 ±0
FYM-B	0.66 ±1.15	0 ±0	0 ±0	1.6 ±1.5	0.6 ±1.15	5.6 ±5.5	3.6 ±2.8	1.6 ±1.15	3.3 ±1.15	4 ±0	2.6 ±1.5	0.6 ±0.5	0 ±0	1.3 ±1.15	2.3 ±1.5	0.3 ±0.5	0 ±0	0.3 ±0.5	0 ±0
PM-B	0 ±0	0 ±0	0 ±0	0 ±1.7	1 ±1	4.3 ±1	3.3 ±0.5	1.3 ±1.5	2.6 ±2.08	1 ±1	3 ±2.6	0.3 ±0.5	0.3 ±0.5	1 ±1.15	1 ±1	1 ±1	0 ±0	0 ±0	0 ±0

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Crop grown in non-saline soil, second-year sampling																		
Date	20.10	21.10	22.10	25.10	26.10	27.10	28.10	29.10	1.11	2.11	3.11	4.11	5.11	8.11	9.11	10.11	11.11	12.11
Treatments	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean
	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD
Control	0 ±0	0 ±0	0 ±0	1.3 ±	0.3 ±	1.6 ±	4.3 ±	6 ±2	14.3	8 ±	1.6 ±	3.3 ±	1 ±	1 ±1	0.6 ±	0.3 ±	0.3 ±	0 ±0
				1.5	0.5	0.5	3.5		±	3.6	0.5	0.5	1.7		0.5	0.5	0.5	
									6.02									
SG	0 ±0	0 ±0	0 ±0	0 ±0	0 ±0	2.3 ±	0.3 ±	4.6 ±	7 ±	5.6 ±	3.3 ±	3.6 ±	0 ±0	0 ±0	1 ±0	0.30.5	0 ±0	0 ±0
						0.5	0.5	2.8	4.5	1.5	2.5	1.5						
FYM	0 ±0	0 ±0	0 ±0	0 ±0	0 ±0	0.6 ±	2 ±2	9 ±	8.6 ±	5.3 ±	3 ±	3.6 ±	1 ±1	2 ±1	1 ±1	0 ±0	0 ±0	0.2 ±
						0.5		2.6	5.03	2.5	2.6	2.08						0.5
PM	0 ±0	0 ±0	0 ±0	0.3 ±	0 ±0	1.6 ±	3.3 ±	5.6 ±	10.3	7.3 ±	1.6 ±	3.3 ±	0.3 ±	1.3 ±	0.3 ±	0.6 ±	0 ±0	0 ±0
				0.5		0.5	4.1	5.03	±	1.5	0.5	0.5	0.5	1.15	0.5	0.5		
									2.88									
SG-B	0 ±0	0 ±0	0 ±0	1.3 ±	0 ±0	1.6 ±	2.6 ±	5.3 ±	11.6	6.3 ±	3 ±	3 ±1	0 ±0	2.3 ±	1 ±1	0.3 ±	0 ±0	0 ±0
				22.3		1.15	2.5	3.5	±4.5	3.2	1.7			2.3		0.5		
FYM-B	0.6 ±	0.3 ±	2 ±	9.6 ±	0.6 ±	1.6 ±	7.3 ±	4 ±	4 ±	4 ±1	1 ±	2 ±1	0 ±0	0.3 ±	0.6 ±	0 ±0	0.3 ±	0 ±0
	1.15	0.5	3.4	8.5	1.15	0.5	7.5	1.7	1.7		1.7			0.5	0.5		0.5	
PM-B	0 ±0	0 ±0	0 ±0	1 ±	0 ±0	1.6 ±	3.6 ±	1.3 ±	3.6 ±	4.3 ±	1.6 ±	4.3 ±	0.6 ±	0.6 ±	0.6 ±	0 ±0	0.3 ±	0.3 ±
				1.7		1.15	3.2	0.5	0.5	1.15	0.5	1.52	1.15	1.15	0.5		0.5	0.6

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Crop grown in saline soil, first-year sampling																			
Sampling dates	28.10	29.10	30.10	31.10	1.11	2.11	3.11	4.11	5.11	6.11	9.11	10.11	11.11	12.11	13.11	16.11	17.11	18.11	23.11
	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean
	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD
Control	0 ±0	0 ±0	0 ±0	0 ±0	1 ±1	1.6 ±	3.6 ±	4.3 ±	3.3 ±	1.3 ±	9.3 ±	1.3 ±	1.3 ±	2 ±1	1.3 ±	1 ±	0 ±0	0.6 ±	0 ±0
						1.5	2.08	2.5	1.5	0.5	6.8	1.5	1.5		1.5	1.7		1.1	
SG	0 ±0	0 ±0	0 ±0	0 ±0	1.3 ±	3 ±1	1.3 ±	3.6 ±	3 ±1	2.3 ±	5 ±	1 ±1	0.6 ±	1 ±1	1 ±1	1 ±0	0 ±0	0 ±0	0 ±0
					1.15		0.5	1.1		2.08	2.64		0.5						
FYM	0 ±0	0 ±0	0 ±0	0 ±0	3 ±	0 ±0	3.6 ±	1.6 ±	3 ±1	2.3 ±	4.3 ±	0.6 ±	1.3 ±	1.6 ±	1.6 ±	0.6 ±	0 ±0	0 ±0	0.3 ±
					2.6		2.08	2.8		1.5	2.5	0.5	1.5	1.5	0.5	1.1			0.5
PM	0 ±0	0 ±0	0 ±0	0 ±0	1.6 ±	4 ±	3 ±	3.6 ±	2.6 ±	2.6 ±	5.6 ±	0.6 ±	0.6 ±	1.6 ±	1 ±1	0.3 ±	0 ±0	0.6 ±	1.3 ±
					1.5	1.7	1.7	2.08	1.5	2.3	2.08	0.5	0.5	1.15		0.5		0.5	1.5
SG-B	0 ±0	0 ±0	0 ±0	0 ±0	0 ±0	2 ±2	0.6 ±	2.6 ±	1.6 ±	1.6 ±	3.6 ±	0.6 ±	1 ±1	1.6 ±	1.6 ±	2 ±	0 ±0	2 ±	0.3 ±
							0.5	0.5	2.08	1.5	1.5	1.15		1.5	1.15	0.5		0.5	0.5
FYM-B	0 ±0	0 ±0	0 ±0	0 ±0	1.6 ±	1.6 ±	3.3 ±	4.3 ±	2.6 ±	2.6 ±	7.6 ±	0.6 ±	1 ±1	2 ±1	0.3 ±	0.6 ±	0 ±0	0 ±0	0.3 ±
					2.08	1.5	3.05	1.5	1.5	1.5	2.08	0.5			0.5	1.1			0.5
PM-B	0 ±0	0 ±0	0 ±0	0 ±0	2 ±2	3.3 ±	2 ±1	4.6 ±	2.6 ±	3.3 ±	5 ±2	2.3 ±	0.3 ±	2.3 ±	0.6 ±	1 ±	0 ±0	0 ±0	0 ±0
						3.05		2.3	0.5	2.3		0.5	0.5	0.5	1.15	1.7			

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Crop grown in saline soil, second- year sampling																		
Sampling dates	20.10	21.10	22.10	25.10	26.10	27.10	28.10	29.10	1.11	2.11	3.11	4.11	5.11	8.11	9.11	10.11	11.11	12.11
	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean
	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD	±SD
Control	0 ±0	0 ±0	0 ±0	1 ± 1.7	0 ±0	1.3 ± 0.5	1.6 ± 1.5	1.6 ± 0.5	3.3 ± 1.5	6.3 ± 1.5	2 ±1	3.3 ± 0.5	0.6 ± 0.5	0.3 ± 0.5	0.6 ± 0.5	0 ±0	0 ±0	0 ±0
SG	0 ±0	0 ±0	0.3 ± 0.5	2.3 ± 2.3	0.3 ± 0.5	2.3 ± 1.1	2.3 ± 3.2	3 ±2	2.3 ± 1.5	7.6 ± 1.5	3.6 ± 2.8	3.3 ± 1.1	0 ±0	1 ±1	1 ±1	0.3 ± 0.5	0 ±0	0 ±0
FYM	0 ±0	0 ±0	0 ±0	4.3 ± 4.5	0.3 ± 0.5	1.6 ± 0.5	6.3 ± 3.2	1 ±1	4 ±2	7.3 ± 2.5	4 ± 2.5	4.6 ± 0.5	0 ±0	0 ±0	1.3 ± 0.5	0.6 ± 1.15	0 ±0	0 ±0
PM	0 ±0	0 ±0	0 ±0	0 ±0	0 ±0	2.3 ± 0.5	0 ±0	3 ± 2.6	5.3 ± 1.5	10.3 ± ±2.5	2 ±1	3.3 ± 1.5	0.3 ± 0.5	0 ±0	0.6 ± 0.5	0.3 ± 0.5	0.3 ± 0.5	0.3 ± 0.5
SG-B	0 ±0	0 ±0	0 ±0	0.6 ± 1.15	0.6 ± 1.15	1.3 ± 0.5	1 ±1	1.6 ± 1.5	1.6 ± 1.15	5.3 ± 1.15	2.6 ± 2.08	3 ±1	0 ±0	0 ±0	2 ±1	0 ±0	0.3 ± 0.5	0.3 ± 0.5
FYM-B	0 ±0	0 ±0	0 ±0	0.3 ± 0.5	0 ±0	2.3 ± 0.5	3 ±2	4 ±2	11.6 ± ±5.1	7.6 ± 2.5	1.6 ± 0.5	2 ±1	1.3 ± 1.15	0 ±0	0.3 ± 0.5	0.3 ± 0.5	0 ±0	0 ±0
PM-B	0 ±0	0 ±0	0 ±0	0.3 ± 0.5	0 ±0	2.3 ± 0.5	1.3 ± 2.3	2.3 ± 3.2	6.6 ± 1.5	10.6 ± ±2.3	2.6 ± 0.5	2.6 ± 0.5	0.3 ± 0	0 ±0	1.3 ± 0.5	0 ±0	0.6 ± 1.15	0 ±0

**Table S8.** Raw data of fresh saffron stigma yield ( $\text{g m}^{-2}$ ).

Treatment	Non-saline 1st yr	Saline 1st yr	Non-saline 2nd yr	Saline 2nd yr
Control	0.946	1.06	1.5182	0.939
Control	0.9	0.759	1.491	0.55
Control	1.29	0.46	1.948	0.689
SG	0.81	0.58	1.637	1.2716
SG	0.7	0.57	1.108	0.675
SG	0.86	0.46	0.794	1.034
FYM	0.57	0.7	1.072	1.29
FYM	0.78	0.87	1.553	1.686
FYM	0.75	0.34	1.192	0.934
SG-B	1.28	0.39	2.077	0.5551
SG-B	0.83	0.57	1.4542	0.9982
SG-B	0.57	0.38	0.946	0.633
FYM-B	0.78	0.77	2.6732	1.583
FYM-B	0.79	0.72	1.658	1.1455
FYM-B	0.66	0.42	0.4609	0.673
PM-B	0.296	0.79	1.8236	1.3603
PM-B	0.42	0.527	1.27	0.745
PM-B	0.54	0.65	0.548	0.789
PM	0.616	0.55	0.955	0.947
PM	0.85	0.87	1.1397	1.596
PM	0.85	0.69	1.853	1.193

**Table S9.** Raw data of stigma size of saffron.

Treatment	Non saline first year	Saline first year	Non saline second year	Saline second year
Control	2.6	2.4	3.2	2.5
Control	2	2.1	2.5	2.9
Control	1.8	2.2	3.2	2.7
Control	1.3	1.6	1.6	1.5
Control	1.3	1.6	1.5	1.5
Control	1.7	1.5	1.5	1.4
Control	2.3	2.3	2.7	1.9
Control	2.3	1.9	3.4	2.6
Control	2	2.1	3.7	2.2
Control	1.3	1.6	1.5	1.5
Control	1.3	1.5	1.6	1.5
Control	1.4	1.6	1.5	1.6
Control	2.2	2.4	3.8	2.2
Control	2	2	3.4	2.3
Control	1.8	2.1	3.3	1.9
Control	1.6	1.4	1.8	1.3
Control	1.7	1.6	1.6	1.4
Control	1.5	1.6	1.6	1.4
SG	2	2	2.7	3
SG	2	1.8	3.1	2.9
SG	1.8	1.6	2.2	2.7
SG	1.3	1.3	1.6	1.4
SG	1.4	1.2	1.6	1.3
SG	1.4	1.1	1.3	1.3
SG	2.1	2.5	3.4	1.8
SG	1.8	1.8	3	1.6
SG	2	2	2.9	2
SG	1.5	1.4	1.7	1.5
SG	1.5	1.6	1.5	1.4
SG	1.1	1.6	1.5	1.4
SG	2.3	2	2.7	2.1
SG	2	1.6	1.9	1.9
SG	1.8	1.5	2.6	1.5
SG	1.6	1.4	1.5	1.6
SG	1.5	1.3	1.6	1.3
SG	1.5	1.3	1.6	1.3
FYM	2.7	2.4	3.7	2.4
FYM	2.4	2.1	3	2.3
FYM	2.6	1.8	2.9	1.9
FYM	1.5	1.6	1.5	1.6
FYM	1.5	1.7	1.3	1.5
FYM	1.5	1.6	1.4	1.6

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Treatment	Non saline first year	Saline first year	Non saline second year	Saline second year
FYM	2.3	2.7	2.6	3
FYM	2.5	2	2.9	2.5
FYM	2.3	2	3.2	2
FYM	1.3	1.6	1.7	1.7
FYM	1.3	1.5	1.8	1.3
FYM	1.2	1.3	1.4	1.4
FYM	2.5	2.7	3	2.6
FYM	1.9	1.6	2.9	1.9
FYM	2.1	2	2.8	2.2
FYM	1.4	1.5	1.5	1.5
FYM	1.4	1.5	1.6	1.5
FYM	1.6	1.4	1.3	1.5
SG-B	2.3	2.6	3	2.6
SG-B	2.1	1.8	3.5	2
SG-B	2.1	2	3.2	2
SG-B	1.4	1.5	1.5	1.7
SG-B	1.3	1.5	1.5	1.7
SG-B	1.5	1.5	1.3	1.7
SG-B	2.2	2	3.1	2.2
SG-B	2.2	1.2	2.9	1.6
SG-B	1.8	2	2.7	2
SG-B	1.4	1.4	1.5	1.5
SG-B	1.5	1.5	1.5	1.4
SG-B	1.5	1.4	1.5	1.5
SG-B	2.3	2.7	2.9	3
SG-B	2.2	2	2.7	2.2
SG-B	2.2	2.1	3	2.3
SG-B	1.5	1.3	1.4	1.4
SG-B	1.5	1.3	1.5	1.4
SG-B	1.3	1.3	1.5	1.4
FYM-B	2.3	2.5	3.4	2.4
FYM-B	2.1	1.6	2.9	2.2
FYM-B	1.9	1.6	2.7	1.8
FYM-B	1.5	1.5	1.5	1.5
FYM-B	1.5	1.5	1.5	1.5
FYM-B	1.5	1.5	1.4	1.5
FYM-B	2.5	2.6	3	2.7
FYM-B	1.8	2	3.2	2
FYM-B	2.2	2.2	3	2
FYM-B	1.5	1.7	1.5	1.5
FYM-B	1.5	1.7	1.4	1.5
FYM-B	1.5	1.7	1.6	1.5
FYM-B	2.7	2.3	2.9	2.5
FYM-B	1.9	1.7	2.8	1.9

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Treatment	Non saline first year	Saline first year	Non saline second year	Saline second year
FYM-B	1.6	2.1	3.5	2.3
FYM-B	1.2	1.3	1.5	1.4
FYM-B	1.5	1.3	1.5	1.5
FYM-B	1.2	1.4	1.5	1.3
PM-B	3	2.5	2.5	2.3
PM-B	2	2.3	2.1	2.5
PM-B	2	2	2.9	2.1
PM-B	1.5	1.5	1.3	1.4
PM-B	1.5	1.6	1.2	1.6
PM-B	1.5	1.7	1.3	1.5
PM-B	2.6	2.4	2.9	2.5
PM-B	2.2	2.1	3.2	2.2
PM-B	2.1	2.1	3	2.1
PM-B	1.4	1.4	1.6	1.8
PM-B	1.3	1.8	1.3	1.6
PM-B	1.4	1.4	1.4	1.4
PM-B	2	2.4	3	2.6
PM-B	1.7	2	2.9	2
PM-B	2.1	2.3	2.6	2.4
PM-B	1.4	1.3	1.3	1.4
PM-B	1.5	1.3	1.3	1.5
PM-B	1.5	1.3	1.3	1.4
PM	2.2	2.5	2.6	2.7
PM	1.9	2.2	2.4	3
PM	2	2.1	2.3	2.3
PM	1.3	1.2	1.4	1.8
PM	1.3	1	1.3	1
PM	1.3	1.4	1.3	1.4
PM	2.9	2.5	2.9	3.3
PM	2.4	2	2.7	2.1
PM	2.4	2.3	2.6	2.4
PM	1.6	1.6	1.5	1.5
PM	1.5	1.6	1.3	1.4
PM	1.5	1.5	1.6	1.6
PM	2.2	2.5	2.3	2.5
PM	2	2	2.2	2.1
PM	1.9	2.1	2	2.5
PM	1.5	1.4	1.5	1.4
PM	1.6	1.4	1.5	1.4
PM	1.6	1.4	1.6	1.4



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