

Biochar as drought management to enhance tolerance and recovery of sugarcane

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Supplement Table 1. Chemical properties of the experimental soil

Parameters	Values
Total N (%)	0.09
Total P (%)	0.18
Total K (%)	1.32
Exchangeable N (mg/100 g)	4.23
Exchangeable P (mg/100 g)	50.07
Exchangeable K (mg/100 g)	11.72
Organic matter (%)	1.64
pH	6.37

Supplement Table 2. Chemical properties of biochar used in the experiment

Parameters	Values	Parameters	Values
pH	10.17	Ash content	5.03%
EC	2.15 dSm ⁻¹	Organic carbon	14.6 mg L ⁻¹
Specific surface area	270.76 m ² g ⁻¹	C content	88.71%,

Pore volume	0.12 cm ³ g ⁻¹	H content	1.21%
Pore diameter	1.10 mm	N content	0.36%
		O content	9.72%
		Molar O/C ratio	0.08

Supplement Table 3. Plant height, number of leaves and stem diameter of sugarcane in response to biochar application of 0, 5, and 10 tons ha⁻¹ under control and drought conditions at 1, 2, 3 and 4-week drought.

Drought treatment	Biochar rates (tons ha ⁻¹)	Plant height (cm) ± SD				Number of leaves ± SD				Stalk diameter (mm) ± SD			
		1-week	2-week	3-week	4-week	1-week	2-week	3-week	4-week	1-week	2-week	3-week	4-week
Control	0	126.69 ^{cd} ± 2.65	131.47 ^{bc} ± 2.3	132.88 ^{bc} ± 2.85	133.59 ^{bc} ± 3.70	7.78 ^b ± 0.44	8.56 ^c ± 0.53	9.11 ^{cd} ± 0.33	9.78 ^{bc} ± 0.67	16.7 ^a ± 0.62	17.5 ^{a-c} ± 0.54	18.78 ^a ± 0.50	19.5 ^b ± 0.46
	5	129.29 ^{a-c} ± 1.79	132.97 ^b ± 1.61	134.58 ^b ± 1.80	136.06 ^b ± 1.08	8.0 ^b ± 0.01	8.78 ^{bc} ± 0.44	9.78 ^{bc} ± 0.44	10.33 ^b ± 0.50	16.73 ^a ± 0.35	17.78 ^{ab} ± 0.22	19.06 ^a ± 0.49	19.85 ^{ab} ± 0.39
	10	131.93 ^a ± 3.45	136.87 ^a ± 3.0	139.58 ^a ± 2.15	141.03 ^a ± 2.13	8.67 ^a ± 0.50	9.78 ^a ± 0.44	10.78 ^a ± 0.44	11.67 ^a ± 0.50	16.88 ^a ± 0.57	18.11 ^a ± 0.66	19.23 ^a ± 0.72	20.35 ^a ± 0.76
Drought	0	125.44 ^d ± 2.56	127.24 ^d ± 2.02	127.83 ^d ± 3.4	127.86 ^d ± 3.37	7.78 ^b ± 0.44	8.22 ^c ± 0.44	8.56 ^d ± 0.53	8.78 ^d ± 0.44	16.5 ^a ± 0.67	15.92 ^d ± 0.68	15.56 ^c ± 0.52	15.21 ^d ± 0.49
	5	127.09 ^{b-d} ± 0.96	129.72 ^{cd} ± 2.09	129.29 ^{cd} ± 3.26	128.57 ^d ± 1.68	7.89 ^b ± 0.33	8.33 ^c ± 0.50	8.89 ^d ± 0.33	9.11 ^{cd} ± 0.33	16.74 ^a ± 0.74	16.8 ^c ± 0.84	16.65 ^b ± 0.72	16.47 ^c ± 0.56
	10	130.29 ^{ab} ± 1.33	131.13 ^{bc} ± 2.03	131.37 ^{b-d} ± 4.21	130.08 ^{cd} ± 3.55	8.67 ^a ± 0.50	9.44 ^{ab} ± 0.53	10.0 ^b ± 0.87	10.33 ^b ± 0.87	16.85 ^a ± 0.61	17.17 ^{bc} ± 0.60	17.15 ^b ± 0.62	16.83 ^c ± 0.60
Means for drought treatment	Control	129.3 ± 3.4	133.77 ± 3.25	135.68 ± 3.65	136.89 ± 3.99	8.15 ± 0.53	9.04 ± 0.71	9.89 ± 0.80	10.59 ± 0.97	16.77 ± 0.52	17.8 ± 0.55	19.02 ± 0.59	19.9 ± 0.65
	Drought	127.61 ± 2.66	129.36 ± 2.56	129.50 ± 3.80	128.83 ± 3.02	8.11 ± 0.58	8.67 ± 0.73	9.15 ± 0.86	9.41 ± 0.89	16.69 ± 0.67	16.63 ± 0.87	16.46 ± 0.91	16.17 ± 0.89
		*	*	*	*	<i>ns</i>	*	*	*	<i>ns</i>	*	*	*
Means for biochar rates	0	126.07 ^C ± 2.61	129.35 ^C ± 3.03	130.36 ^B ± 4.0	130.72 ^B ± 4.53	7.78 ^B ± 0.43	8.39 ^B ± 0.50	8.83 ^C ± 0.51	9.28 ^B ± 0.75	16.6 ^A ± 0.64	16.71 ^B ± 1.01	17.17 ^B ± 1.73	17.35 ^B ± 2.26
	5	128.19 ^B ± 1.79	131.34 ^B ± 2.46	131.93 ^B ± 3.73	132.31 ^B ± 4.09	7.94 ^B ± 0.24	8.56 ^B ± 0.51	9.33 ^B ± 0.59	9.72 ^B ± 0.75	16.73 ^A ± 0.56	17.29 ^A ± 0.78	17.86 ^A ± 1.37	18.16 ^A ± 1.8
	10	131.11 ^A ± 2.67	134.0 ^A ± 3.86	135.47 ^A ± 5.32	135.56 ^A ± 6.31	8.67 ^A ± 0.49	9.61 ^A ± 0.50	10.39 ^A ± 0.78	11.0 ^A ± 0.97	16.87 ^A ± 0.58	17.64 ^A ± 0.78	18.19 ^A ± 1.25	18.59 ^A ± 1.93

Different lowercase letters show interaction significance among biochar rates and drought treatment conditions at 1-, 2-, 3, and 4-week at $p \leq 0.05$. Different capital letters show significance among biochar rates by Tukey's test at $p \leq 0.05$. Hyphen (-) is used for significant differences of more than two letters (e.g., a-c = abc; b-d = bcd). * and *ns* respectively show significance and non-significance between drought conditions.