

How does irrigation with wastewater affect the physical soil properties and the root growth of sugarcane under subsurface drip?

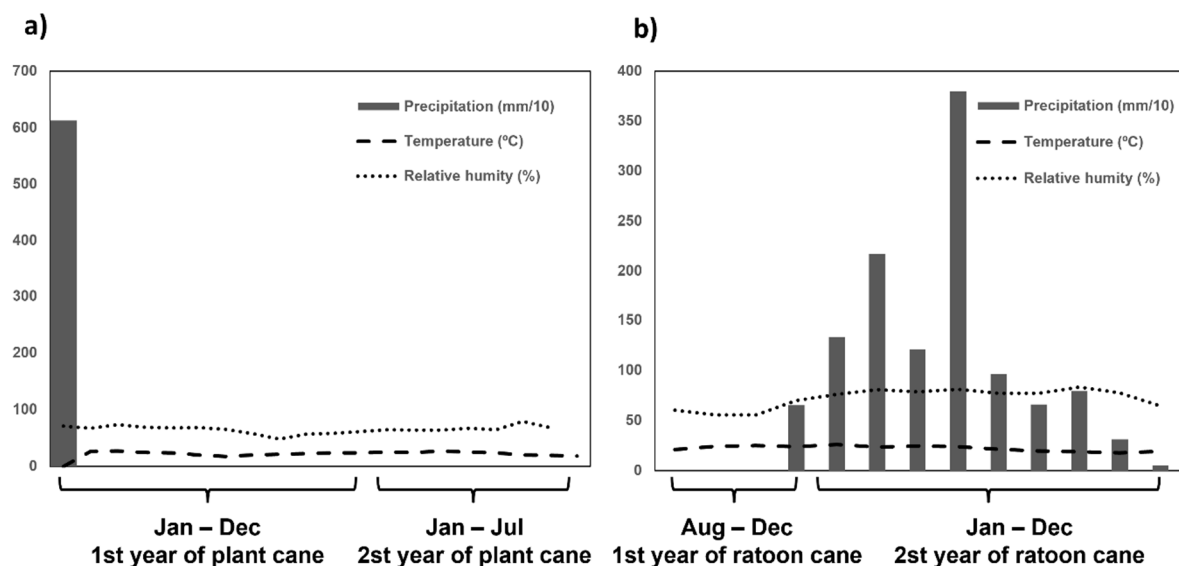


Figure S1. Distribution of climate data in the experimental area during the cultivation period of sugarcane under irrigation treatment with TSE or SRW. The data include plant cane (a) and ratoon cane periods (b) and precipitation, humidity, and temperature.

Table S1. Pre-cultivation chemical characterization of a dystrophic red latosol used for sugarcane under irrigation treatments TSE or SRW. Samples collected at 0–0.2 m soil depth.

Properties	Units	Means	CV ⁽¹⁾	Level (Raij et al., 1996 [33])
pH (H ₂ O) ⁽²⁾	-	5.62	4.77	Medium
P ⁽³⁾	mg dm ⁻³	19.33	24.12	High
S ⁽⁴⁾	mg dm ⁻³	15.56	18.81	High
Na ⁽⁵⁾	mg dm ⁻³	1.9	30.23	Low
K ⁽⁶⁾	cmol _c dm ⁻³	0.57	24.66	High
Ca ⁽⁷⁾	cmol _c dm ⁻³	5.1	23.69	High
Mg ⁽⁸⁾	cmol _c dm ⁻³	0.94	16.83	Medium
Al ⁽⁹⁾	cmol _c dm ⁻³	0	-	Low
H+Al ⁽¹⁰⁾	cmol _c dm ⁻³	3.25	20.5	Medium
CEC ⁽¹¹⁾	cmol _c dm ⁻³	9.87	9.79	Medium
V ⁽¹²⁾	%	66.4	13.22	Medium
OM ⁽¹³⁾	dag kg ⁻¹	3.75	10.41	High
EC ⁽¹⁴⁾	dS m ⁻¹	0.1	17.78	Low
ESP ⁽¹⁵⁾	%	0.08	21.62	Low

⁽¹⁾Coefficient of variation in percentage; ⁽²⁾Potential of hydrogen; ⁽³⁾Phosphorus; ⁽⁴⁾Sulphur; ⁽⁵⁾Sodium; ⁽⁶⁾Potassium; ⁽⁷⁾Calcium; ⁽⁸⁾Magnesium; ⁽⁹⁾Aluminum; ⁽¹⁰⁾Potential acidity; ⁽¹¹⁾Cation exchange capacity; ⁽¹²⁾Base saturation; ⁽¹³⁾Organic matter; ⁽¹⁴⁾Electrical conductivity; ⁽¹⁵⁾Exchangeable sodium percentage.

Table S2. Pre-cultivation characterization regarding sodic-saline properties and the classification by Richards (1954) [37] of a dystrophic red latosol used for sugarcane under irrigation treatments TSE or SRW. Samples collected at 0–0.2, 0.2–0.4, 0.4–0.6, and 0.6–0.8 m soil depths.

Properties	Units	Soil depth layers (m)				CV ⁽⁶⁾	General average
		0-0.2	0.2-0.4	0.4-0.6	0.6-0.8		
pH ⁽¹⁾	-	5.5	5.6	5.7	5.8	3.9	5.7
EC ⁽²⁾	dS m ⁻¹	0.19	0.1	0.09	0.10	53.57	0.12
ESP ⁽³⁾	%	0.07	0.1	0.09	0.01	25.09	0.1
SAR ⁽⁴⁾	mmolc dm ⁻³	0.01	0.02	0.01	0.02	19.77	0.02
CLASSIF. ⁽⁵⁾	-	Normal	Normal	Normal	Normal	-	-

⁽¹⁾Potential of hydrogen; ⁽²⁾Electrical conductivity; ⁽³⁾Exchangeable sodium percentage; ⁽⁴⁾Sodium absorption ratio; ⁽⁵⁾Soil classification according to Richards criteria (1954); ⁽⁶⁾Coefficient of variation in percentage.

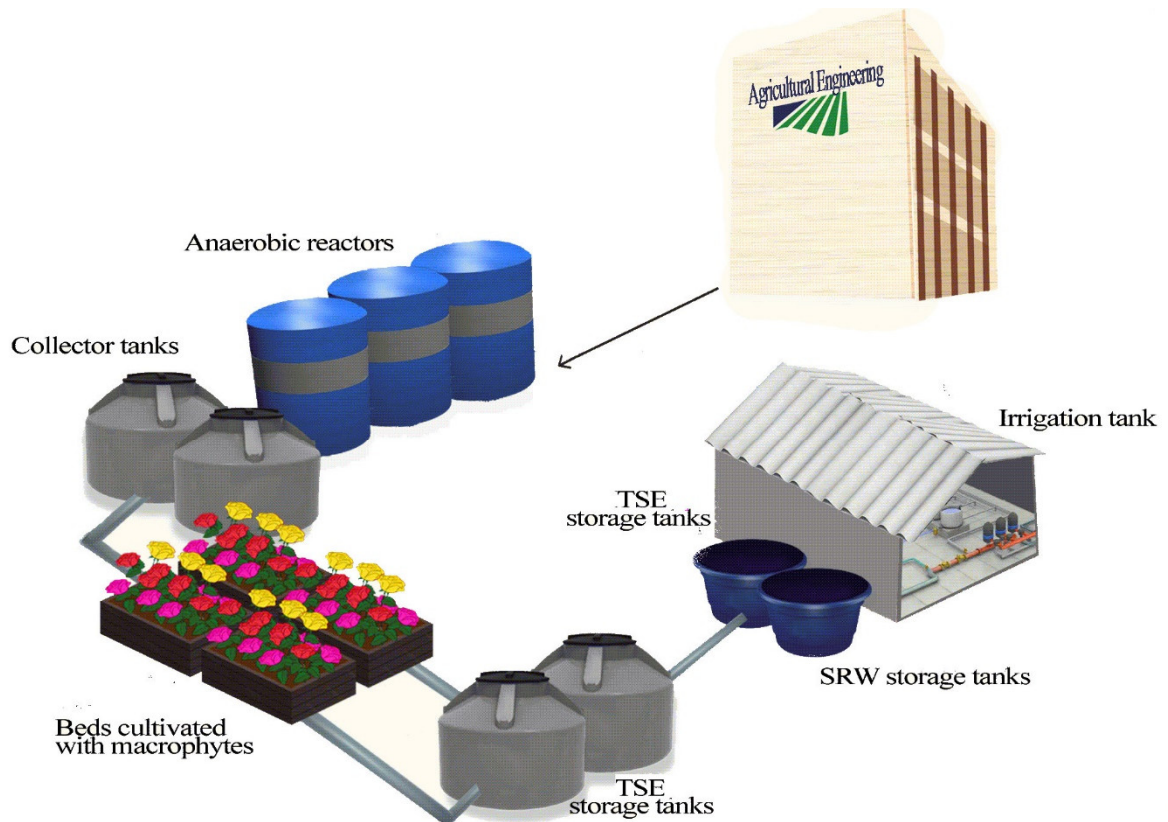


Figure S2. FEAGRI-UNICAMP integrated sewage treatment system used to generate the TSE used to irrigate sugarcane crops.

Table S3. Monthly averages of the properties of TSE and SRW used to irrigate sugarcane crops.

First ratoon cane				
Properties	Rainy season		Dry season	
	TSE ⁽¹⁹⁾	SRW ⁽²⁰⁾	TSE	SRW
N-total (mg.L ⁻¹) ⁽¹⁾	59.23	1.06	98.05	0.68
P-total (mg.L ⁻¹) ⁽²⁾	8.57	0.04	20.5	0.04
K (mg.L ⁻¹) ⁽³⁾	25	1.35	26.7	0.81
Ca (mg.L ⁻¹) ⁽⁴⁾	18.56	3.7	21.6	4.4
Mg (mg.L ⁻¹) ⁽⁵⁾	3.3	2.48	3.8	3.18
S (mg.L ⁻¹) ⁽⁶⁾	14.6	<5	6.15	<5
Na (mg.L ⁻¹) ⁽⁷⁾	56.36	2.2	76.7	2.2
B (mg.L ⁻¹) ⁽⁸⁾	0.31	<0.001	0.2	<0.001
Fe (mg.L ⁻¹) ⁽⁹⁾	0.84	0.2	0.93	0.25
Mn (mg.L ⁻¹) ⁽¹⁰⁾	0.08	0.03	0.06	0.02
Zn (mg.L ⁻¹) ⁽¹¹⁾	0.08	0.08	0.05	0.05
Cl (mg.L ⁻¹) ⁽¹²⁾	0.02	0.03	<0.01	<0.01
BOD (mg.L ⁻¹) ⁽¹³⁾	5	<5	14.7	<5
EC (dS. m ⁻¹) ⁽¹⁴⁾	0.99	0.07	1.24	0.06
SAR (mmol.L ⁻¹) ⁽¹⁵⁾	4.46	0.3	5.66	0.27
pH (a 20 ^o C) ⁽¹⁶⁾	7.7	7.33	7.21	7.23
FC (MPN.100 mL ⁻¹) ⁽¹⁷⁾	72167	-	23215380	59
<i>E. coli</i> (MPN.100 mL ⁻¹) ⁽¹⁸⁾	66827	-	203910	66

⁽¹⁾Total nitrogen; ⁽²⁾Total phosphorus; ⁽³⁾Potassium; ⁽⁴⁾Calcium; ⁽⁵⁾Magnesium; ⁽⁶⁾Sulphur; ⁽⁷⁾Sodium; ⁽⁸⁾Boron; ⁽⁹⁾Iron; ⁽¹⁰⁾Manganese; ⁽¹¹⁾Zinc; ⁽¹²⁾Chlorine; ⁽¹³⁾Biochemical oxygen demand; ⁽¹⁴⁾Electrical conductivity; ⁽¹⁵⁾Sodium absorption ratio; ⁽¹⁶⁾Potential of hydrogen; ⁽¹⁷⁾Fecal coliforms; ⁽¹⁸⁾*Escherichia coli*; ⁽¹⁹⁾Coefficient of variation in percentage; ⁽¹⁹⁾Treated sewage effluent; ⁽²⁰⁾Surface reservoir water.