Revista Brasileira de Agricultura Irrigada
Brazilian Journal of Irrigated Agriculture
ISSN: 1982-7679 (on-line)
v.18, p. 82 - 95, 2024
Fortaleza, CE - www.inovagri.org.br

DOI: 10.7127/rbai.v1801352

EGGPLANT CULTIVATION IN SALINIZED SOIL UNDER DRIP AND PULSE IRRIGATION USING BRACKISH WATER

CULTIVO DE BERINJELA EM SOLO SALINIZADO SOB IRRIGAÇÃO POR GOTEJAMENTO E PULSOS UTILIZANDO ÁGUA SALOBRA

Lucas Farias Damasceno[1], Alide Mitsue Watanabe Cova[2], Antônio Irineu Trindade Bisneto[3], Cristhian Novaes Moura[4], Louise Rosa Monte Belo[5], Renata Velasques Menezes[6], Hans Raj Gheyi[7]

[1]Agrônomo, Mestre em Engenharia Agrícola pela Universidade Federal do Recôncavo da Bahia, Rua Rui Barbosa, 710, Cruz das Almas, Bahia, Brasil
[2]Professor Visitante, Universidade Estadual de Feira de Santana, Feira de Santana, Bahia
[3]Graduando em Agronomia, Universidade Federal do Recôncavo da Bahia, Rua Rui Barbosa, 710, Cruz das Almas, Bahia, Brasil
[4]Graduando em Agronomia, Universidade Federal do Recôncavo da Bahia, Rua Rui Barbosa, 710, Cruz das Almas, Bahia, Brasil
[5]Agrônoma, Universidade Federal do Recôncavo da Bahia, Rua Rui Barbosa, 710, Cruz das Almas, Bahia, Brasil
[6]Professora, Universidade Estadual de Feira de Santana, Bahia
[7]Professor do Programa de Pós-Graduação em Engenharia Agrícola, Universidade Federal do Recôncavo da Bahia, Rua Rui Barbosa, 710, Cruz das Almas, Bahia, Brasil

ABSTRACT: Soil salinization after cultivation of crops irrigated with saline water is commonly observed and may limit the development of subsequent crops. The objective of this study was to monitor the salinity in the soil and to evaluate the growth, production, water consumption and water use efficiency of the subsequent eggplant crop using drip irrigation and pulse irrigation with brackish water. The experiment was conducted in a protected environment, following an experimental design with randomized blocks and different treatments using drip and pulse irrigation with brackish water. Soil salinity increased with cultivation time, especially in pulse irrigation treatments and in the combination of drip and pulse when the crop was irrigated with the highest salinity level. In addition, these treatments were the ones that most impaired the growth and production variables with the increase in water salinity. Irrigation with brackish water, regardless of irrigation management in saline soils, is not recommended for the subsequent cultivation of Florida Market eggplant, as it reduces growth and production and intensifies soil salinization.

Keywords: *Solanummelongena, saline soils, subsequentcrop.*

RESUMO: A salinização do solo após o cultivo de culturas irrigadas com água salina é comumente observada e pode limitar o desenvolvimento das culturas subsequentes. Objetivou-se monitorar a salinidade no solo e avaliar o crescimento, produção, consumo hídrico e eficiência do uso da água do cultivo subsequente da berinjela utilizando a irrigação via gotejamento e por pulsos com água salobra. O experimento foi realizado em ambiente protegido, seguindo um delineamento experimental com blocos casualizados e diferentes tratamentos utilizando irrigação por gotejamento e por pulsos com água salobra. A salinidade do solo aumentou com o tempo de cultivo, principalmente nos tratamento scom irrigação por pulsos e na combinação de gotejamento e pulsos,quando irrigados com maior nível salino.Além disso, esses tratamentos foram os que mais prejudicaram as variáveis de crescimento e produção com o aumento da salinidade da água. A irrigação com água salobra, independente do manejo da irrigação em solos salinos, não é recomendado para o cultivo subsequente da berinjela Flórida Market, por reduzir o crescimento e produção e intensificar a salinização do solo.

Palavras-chave: *Solanummelongena, solos salinos, cultivo subsequente.*

Protocolo 1352.27-04-2023- Aprovado em 08-10-2024
* Autor correspondente: alidewatanabe@yahoo.com.br
Editor de área: Ana Nascimento

INTRODUCTION

Soil salinization can affect plant development and growth, reducing production, and even cause total loss, due to low osmotic potential, which affects the absorption of water and nutrients by plants and prevents selective nutrient uptake (SAIBO; IBRAIMO, 2022).

Soil salinization is a significant problem in areas under irrigated agriculture, especially where groundwater is used for irrigation (CASTRO; SANTOS, 2020). This process is due to the accumulation of salts in the soil, which has generated one of the main concerns for the agricultural sector, especially in arid and semi-arid regions where these problems have been increased by the prevailing geological conditions, irregular distribution of rainfall, poor drainage and inadequate agricultural exploitation (SILVA et al., 2013; PEDROTTI et al., 2015).

Under high conditions of exchangeable sodium, the soil can become dense, compacted when dry, dispersed and sticky when wet, and changes in soil pH can affect the availability of most of the nutrients essential to plant development, which in general leads to nutritional, toxic, physical, chemical and biological problems and can trigger the desertification process, leaving the soil unsuitable for cultivation (VASCONCELOS, 2014; AZEVEDO et al., 2018).

Eggplant (Solanum melongena L.) consumption has been growing due to its medicinal properties, especially antioxidant, anti-inflammatory, cardioprotective, anti-obesity and anticancer. It helps reduce cholesterol, minimizes the risk of coronary heart disease and is a source of several vitamins and minerals (PLAZAS et al., 2013; GÜRBÜZ et al., 2018). The plant is typically tropical, and one of the most demanding oilseed crops in terms of temperature, being favored by heat (FILGUEIRA, 2007).

However, some factors can limit the production of eggplant, affecting its yield, and one of the main ones is the quality of the water used in irrigation, since, according to Dias et al. (2016), eggplant is classified as a moderately salinity-sensitive crop, with salinity threshold of 1.1 dS m-1 in the soil saturation extract and 1.5 dS m-1 in irrigation water (ÜNLÜNKARA et al., 2010). Pulse irrigation emerges as an alternative for eggplant cultivation, as it favors its growth and production, and when using brackish water, the evolution of soil salinity is delayed compared to drip irrigation (ARRIERO, 2019). This technique is characterized by fractionation of the necessary irrigation depth, applying water for a short period followed by a rest and then another period of irrigation, a cycle that is repeated until the entire depth is applied (ALMEIDA et al., 2018).

Thus, the present study aimed to evaluate the biometric variables, water consumption, water use efficiency and electrical conductivity of the saturation extract of a soil previously cultivated with eggplant using brackish water, aiming to provide relevant information regarding the subsequent crop and sustainability of production.

MATERIAL AND METHODS

The experiment was carried out in a protected environment, belonging to the experimental area of the Water and Soil Engineering Center of the Federal University of Recôncavoof Bahia, located in the municipality of Cruz das Almas (12°40'39"S, 39°40'23"W, altitude of 224 m), in the RecôncavoBaiano region of Bahia, Brazil. During the experiment, the mean temperatures ranged from 20.9 to 26.8 °C, with minimum between 20.6 and 26.8 °C and maximum between 21.4 and 27.9 °C (Figure 1A), and the average relative humidity ranged from 74.3 to 98.6% (Figure 1B).

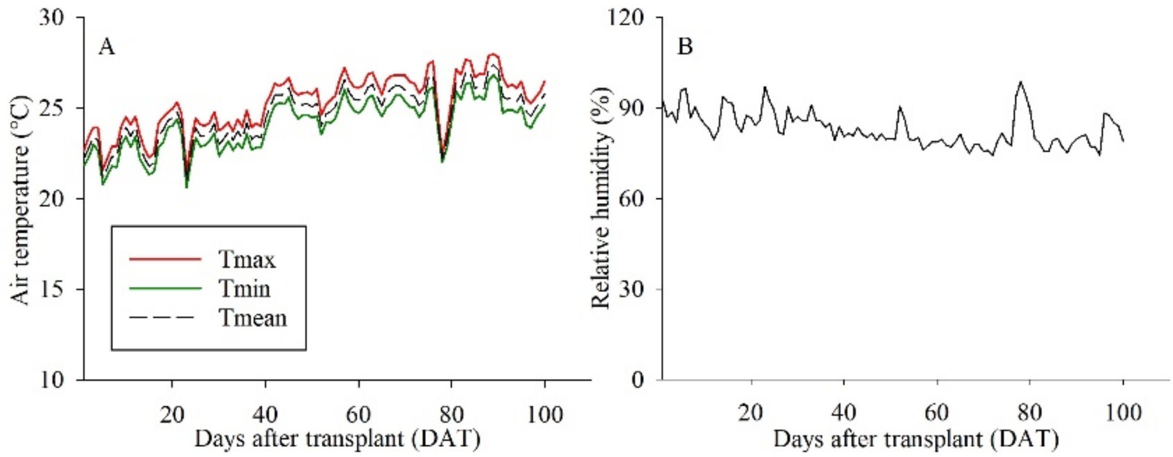

Figure 1. Air temperature (A) and relative humidity (B) data during the experiment from September 2to December 10, 2019.

A second cycle of eggplant cultivation was carried out, using the same treatments as Damasceno et al. (2022), in an experimental design with randomized blocks (RBD), with the treatments distributed in a 4 x 4 factorial scheme, with 5 replicates, totaling 80 experimental units, with a spacing of 1.5 m between plants and 1 m between rows (blocks). Two forms of water application were used in two periods of the eggplant cycle, the first period was up to 55 days after transplanting (DAT), consisting of the phase from initial growth to flowering, and the final period was from 55 to 100 DAT, consisting of the phase from the beginning of fruiting to the last harvest. Therefore, the treatments were: drip (D) and pulse (P) irrigation throughout the cycle; drip irrigation in the initial period followed by pulse irrigation in the final period (D/P) and pulse irrigation in the initial period followed by drip irrigation in the final period (P/D). Four levels of electrical conductivity of irrigation water (ECw) were used: 0.3 (control - supply water), 1.5, 3.0 and 4.5 dS m-1, similar to the first crop cycle (DAMASCENO et al., 2022). 100 L plastic boxes were filled with a 0.05-m-thick layer of crushed stone and approximately 150 kg of soil classified as LatossoloAmareloDistrocoesotípico (DensicFerralsol; Oxisol).

A 16-mm-diameter hose was installed at the bottom of each box for drainage. The salinization of this soil occurred due to the previous cultivation of eggplant using brackish water, lasting 100 days after transplanting. At the end of the first cycle, a composite soil sample was collected at 0-15 cm depth to determine the electrical conductivity of the soil saturation extract (ECse) and the pH for each treatment, as shown in Table 1.

Table 2. Electrical conductivity of the saturation extract (ECes) and initial soil pH for each treatment.

Irrigation	ECw (dS m^{-1})	ECesinitial (dS m^{-1})	pH initial	Irrigation	ECw (dS m^{-1})	ECesinitial (dS m^{-1})	pH initial
D	0.3	1.08	7.3	D/P	0.3	1.73	7.4
	1.5	4.99	7.0		1.5	1.78	7.3
	3.0	7.22	7.1		3.0	5.79	7.1
	4.5	7.25	7.0		4.5	8.04	7.1
P	0.3	1.80	7.3	P/D	0.3	1.77	7.1
	1.5	3.50	7.2		1.5	2.82	7.3
	3.0	8.06	7.0		3.0	9.80	7.1
	4.5	10.15	7.3		4.5	6.55	7.4

Basal fertilization was carried out by applying 46 g of monoammonium phosphate (MAP) and 13 g of potassium chloride (KCl) per box, in addition to 2 L of aged manure. Top-dressing fertilization was applied at 30, 60 and 90 DAT, consisting of 3.3 g of urea and 2.5 g of KCl per box, following the recommendations of Trani (2014) for the crop. Fertilization was calculated considering the area of the box equal to 0.5 m2.

The eggplant seedlings of the Florida Market cultivar were produced in polyethylene trays, containing coconut fiber and earthworm humus in a ratio of 2:1 on a volume basis. Transplanting was carried out 30 days after sowing, when the plants had four true leaves.

Irrigation management and soil moisture monitoring were performed as described by Damasceno et al. (2022).

Biometric variables were evaluated at 40 and 80 DAT, namely: plant height (PH); stem diameter (SD, mm); number of leaves (NL); and leaf area (LA, cm2), estimated according to the equation LA = 0.4395 x L x W1.0055, recommended by Hinnahet al. (2014), where L is leaf length and W is leaf width. At the end of the experiment, after 100 DAT, shoot fresh mass and shoot dry mass (SFM and SDM, g) were determined. In addition, the number of fruits (NFR), fruit length (FL, cm), fruit diameter (FD, cm) and total production (TOTP, g plant-1) were evaluated. The difference in the volume of applied and drained water was accounted for in the cycle to determine water consumption (WC, L) and water use efficiency (WUE, kg m-3), calculated by Equation 1.

"WUE = " "TOTP" /"wc" Eq.1

Where P is the total crop production (kg plant-1) and V is the volume of water applied by irrigation (m3 plant-1).

The electrical conductivity of the soil saturation extract (ECse) was also monitored, with soil samples collected at 40, 80 and 100 DAT. The samples were collected at two points of the wet bulb, 0.10 m away from its center, at 0-0.15 m depth in each box, forming a composite sample for each treatment, to analyze the ECse according to the methodology of Richards (1954).

Data from biometric variables were subjected to analysis of variance. When significant by the F test, the mean data relative to the forms of water application were compared by Tukey test at 0.05 probability level. For the factor related to salinity levels, the data were statistically analyzed by means of linear or quadratic regression. When there was a significant interaction between the factors, the interaction was decomposed. All statistical analyses were performed using the statistical program SISVAR version 5.6 (FERREIRA, 2019).

RESULTS AND DISCUSSION

Figure 2 illustrates the evolution of the electrical conductivity of the soil saturation extract (ECse) at the 0-0.15 m depth as a function of the irrigation methods and salinity of the water applied. The use of pulse irrigation throughout the cycle (P) and in the final phase of the experiment (D/P) promoted higher ECse, especially when using, water with the highest salinity level (4.5 dS m^{-1}), reaching values of 51.27 and 35.27 dSm^{-1}, respectively.

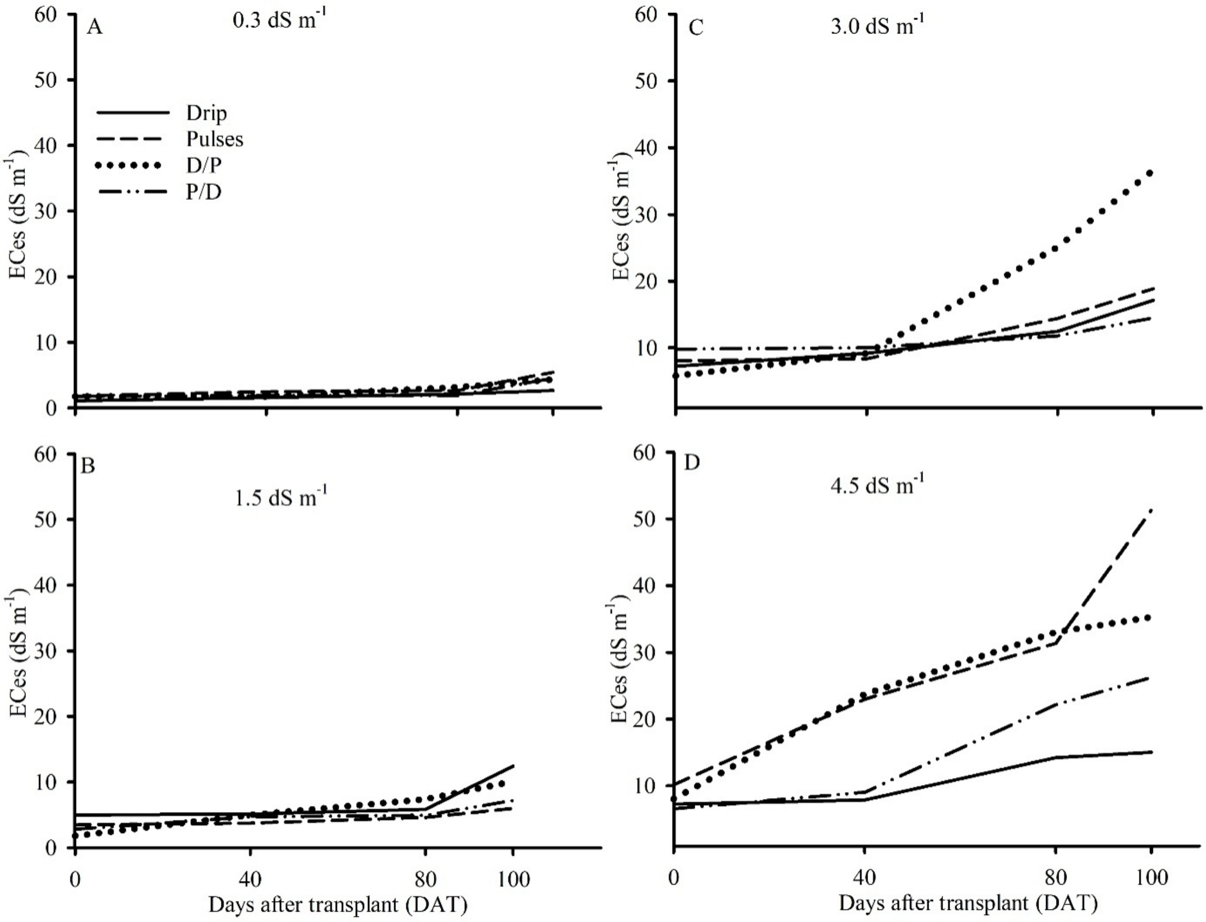

Figure 2. Electrical conductivity values of the soil saturation extract - ECes, as a function of the irrigation methods and the electrical conductivity of the water of 0.3 (A), 1.5 (B), 3.0 (C) and 4.5 dS m^{-1} (D). Drip- D; Pulses - P; D/P - Drip followed by pulses; P/D - Pulses followed by drip.

The constant frequency of irrigation with the presence of dissolved salts in the water can cause soil salinization due to water evaporation and/or water absorption by plants, resulting in the accumulation of salts in the soil area moistened by water, as observed in the different strategies and quality of irrigation water (Figure 2). Thus, among the different strategies, pulse irrigation, for concentrating more moisture on soil surface when compared to drip irrigation, consequently caused greater accumulation of salts in the evaluated layer, while drip irrigation concentrated moisture in the underlying soil layer.

In addition, it is worth mentioning that a greater amount of water is required by the plant in the flowering and fruiting stage, when compared to the growth stage. Thus, it can be inferred that the highest salinity in the 0-0.15 cm layer in the P and D/P treatments was due to the salinity of the water and the small volume applied in each pulse. Similar result was reported by Damasceno et al. (2022), who observed that ECse increased in the 0-0.30 m layer when using pulse irrigation. Therefore, for crops grown in saline soils under brackish water irrigation, it is important to monitor, and control manage irrigation management to avoid and mitigate the effects of soil salinization.

Regarding the growth variables, significant effect of salinity was observed at 40 DAT on stem diameter (SD), plant height (PH), number of leaves (NL) and leaf area (LA). For the factor forms of water application, also at 40 DAT, significant effect was observed only on SD and PH.

However, there was an interaction between water salinity and forms of application for all variables at 80 DAT and for shoot fresh mass (SFM) and shoot dry mass (SDM) at 100 days after transplanting (Table 2).

Table 2. Results of Fisher's test for stem diameter (SD, mm), plant height (PH, cm), number of leaves (NL) and leaf area (LA, cm^2), evaluated at 40 and 80 days after transplanting (DAT) and shoot fresh mass (SFM, g) and shoot dry mass (SDM, g) at 100 days after transplanting eggplant grown in a protected environment with different forms of water application using brackish water, evaluated at the end of the experiment.

Source of variation	F Test									
	SD		PH		NL		LA		SFM	SDM
	40DAT	80 DAT	40 DAT	80 DAT	40 DAT	80 DAT	40 DAT	80 DAT		
Irrigation (I)	*	**	*	ns	ns	ns	ns	**	*	**
Salinity(S)	**	**	**	**	**	**	**	**	**	**
I*S	ns	**	ns	**	ns	**	ns	**	**	**
CV (%)	12.57	8.99	14.34	10.42	14.30	14.91	18.91	18.72	10.79	9.44
Mean	8.32	12.30	44.33	97.30	11.62	64.10	2155.16	792.19	454.89	106.33

* and ** significant at the 0.05 and 0.01 level of probability, respectively; ns – not significant by the F test, CV = Coefficient of variation.

For SD at 40 DAT, as a function of water salinity, a linear reduction of 8.26% was observed per unit increase in ECw, totaling a loss of 35.56% when compared to the supply water (ECw = 0.3 dS m^{-1}) with the highest salinity level (ECw = 4.5 dS m^{-1}) (Figure 3A). On the other hand, with pulse irrigation, there was an increase of 6.44% in comparison to drip irrigation (Figure 3B).

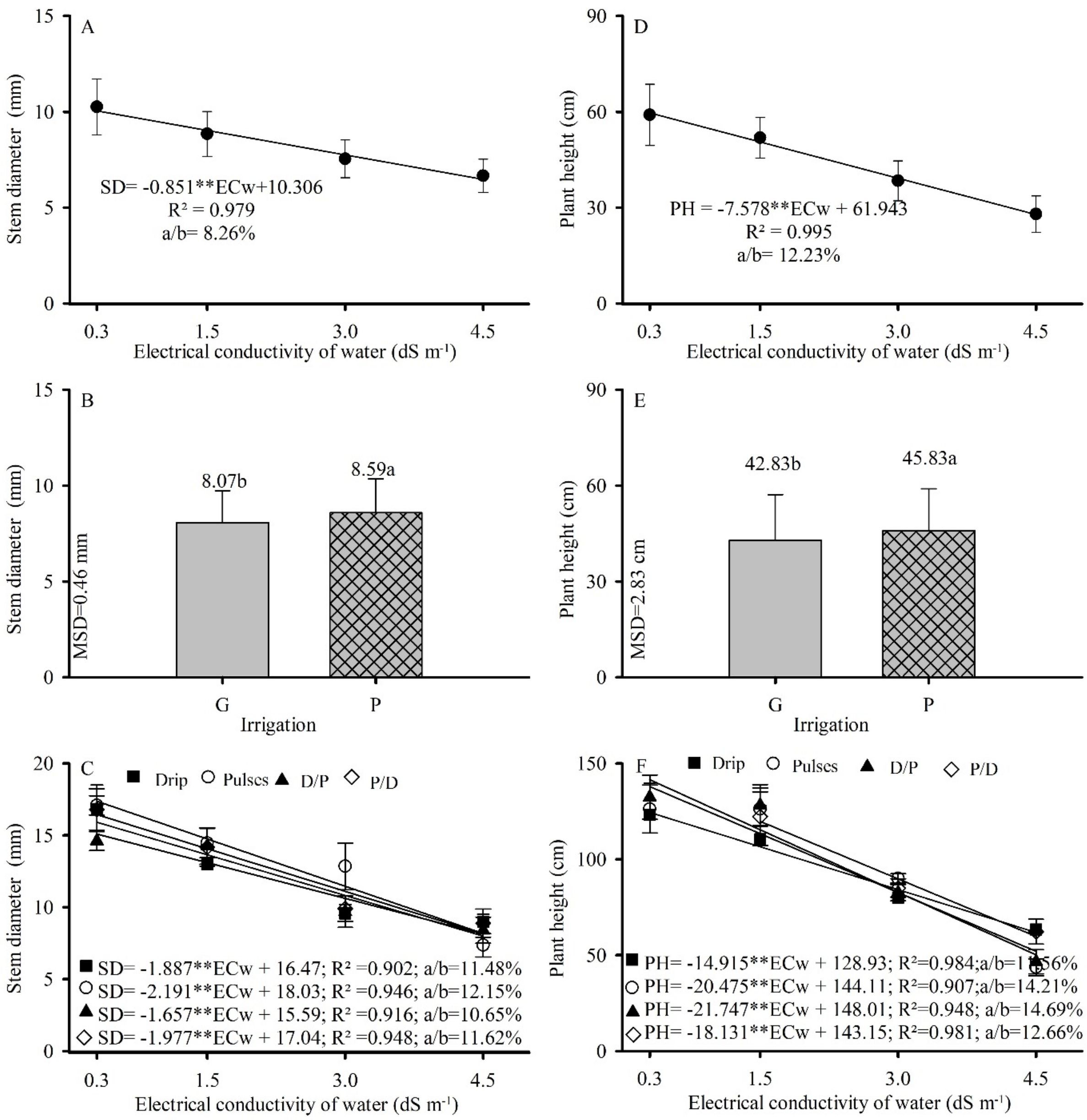

Figure 3. Stem diameter - SD (A) and plant height - PH (D) of eggplant, as a function of water electrical conductivity and application methods (B and E) at 40 days after transplanting (DAT), and breakdown of the interaction between irrigation methods and water electrical conductivity for average stem diameter (C) and height (F) off eggplant at 80 DAT.

According to the decomposition of the interaction between water salinity and forms of application at 80 DAT, it can be observed in Figure 3C that there was a decrease in SD with the increase in salinity for all forms of water application, with reductions of 47.15% (D), 54.68% (P), 46.10% (D/P) and 48.89% (P/D) when compared to the supply water (ECw = 0.3 dS m^{-1}) with salinity of 4.5 dS m^{-1}. Potassium is an essential element for plants, and its deficiency manifests with thin stems in the plants, in addition to other symptoms.

As under salt stress conditions the external concentration of sodium was substantially higher than that of potassium, it probably influenced the reduction of eggplant stem diameter (JENKS; HASEGAWA, 2005; COSTA, 2014), especially in the treatment of highest water salinity.

At 40 DAT, PH showed a negative linear response as a function of ECw, with a decrease of 12.23% per unit increase in salinity, from 59.67 cm (ECw = 0.3 dS m^{-1}) to 27.84 cm (ECw = 4.5 dS m^{-1}), representing a reduction of 53.34% (Figure 3D). For the forms of application, in the same period, the treatment P led to PH of 45.83 cm, differing statistically from the treatment D, which had a reduction of 6.55% (Figure 3E).

The interaction between salinity and forms of water application, at 80 DAT, caused linear reductions of 11.56, 14.21, 14.69 and 12.66% in PH for the treatments D, P, D/P and P/D per unit increase in salinity, respectively (Figure 3F). Thus, treatment G showed a lower reduction in eggplant PH with the increase in irrigation water salinity. Hannachi and van Labeke (2018) also observed reduction in the growth of different eggplant cultivars under salt stress, and plant height and internode length were more affected by salinity. According to the authors, this reduction in shoot growth usually occurs as a rapid response to osmotic stress, followed by a slower response due to sodium accumulation in the leaves.

The NL at 40 DAT showed a reduction of 1.004 leaves (7.19%) per unit increase in salinity, decreasing from 13.66 leaves at ECw of 0.3dS m^{-1} to 9.44 leaves at the salinity level of 4.5 dS m^{-1} (Figure 4A). At 80 DAT, considering the decomposition of the interaction between salinity and forms of irrigation, the best results were found when using supply water, with values of 83.70 (D), 99.23 (P), 106.62 (D/P) and 114.13 (P/D), with reductions of 52.9, 73.65, 82.03 and 73.20%, respectively, when compared with the highest salinity (4.5dS m^{-1}) (Figure 4B).

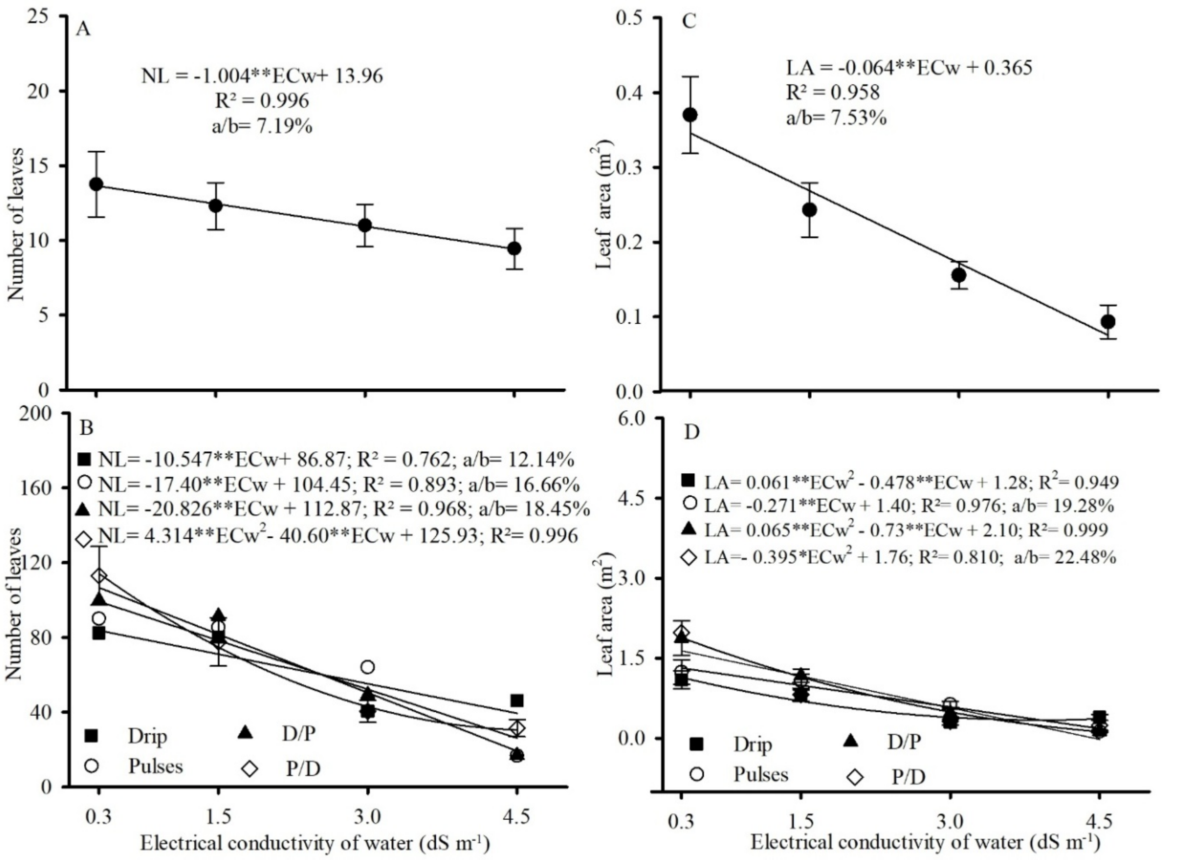

Figure 4. Number of leaves - NF and leaf area - LA of eggplant, as a function of the electrical conductivity of the water (A and C) at 40 days after transplanting (DAT), and unfolding of the interaction between the forms of irrigation and electrical conductivity of the water for the number of leaves (B) and leaf area of eggplant (D), at 80 DAT.

A linear response was observed in LA at 40 DAT, with a reduction of 0.064 m^2 (17.53%) per unit increase in salinity, reaching 0.077 m^2 when using the highest salinity level (4.5 dS m^{-1}) (Figure 4C). At 80 DAT, there was a decrease with the increase in salinity for all treatments (Figure 4D). At the salinity level of 0.3 dS m^{-1}, treatment D had the lowest leaf area, and when compared with the other forms of irrigation there were increments of 15.46% (P), 43.72% (D/P) and 65.21% (P/D) in leaf area. On the other hand, at the highest salinity (4.5 dS m^{-1}), when using drip irrigation (D), a larger leaf area was observed compared to the other treatments, with an increase of 101.80% in comparison to pulse irrigation (P). These results demonstrated that leaves are sensitive organs, showing reductions in size and number in the presence of high concentrations of salts in irrigation water and soil. Leaf area reduction has been used to evaluate the plant's response to salt stress in several crops; under such conditions, plants reduce the production of new leaves and leaf blade expansion as a mechanism to reduce transpiration and saline water absorption (GUEDES et al., 2015). In addition, it can accelerate leaf senescence, leading to this initial reduction in growth (GUEDES et al., 2015; HANNACHI; van LABEKE, 2018).

For the analysis of eggplant biomass, when considering the decomposition of the interaction for shoot fresh mass (SFM), all treatments (D, P, D/P and P/D) showed a linear response with decreases of 113.30, 130.69, 130.13 and 153.09 g, respectively, per unit increase in salinity (Figure 5A). For shoot dry mass (SDM), there was a quadratic response in the interaction between salinity and the forms of irrigation for the treatment D, and a linear response for the others (P, D/P and P/D) (Figure 5B). When comparing the dry mass of eggplant irrigated with supply water and under the highest salinity level, reductions of 75.13% (D/P), 74.67% (P), 65.90% (P/D) and 64.42% (D) were observed.

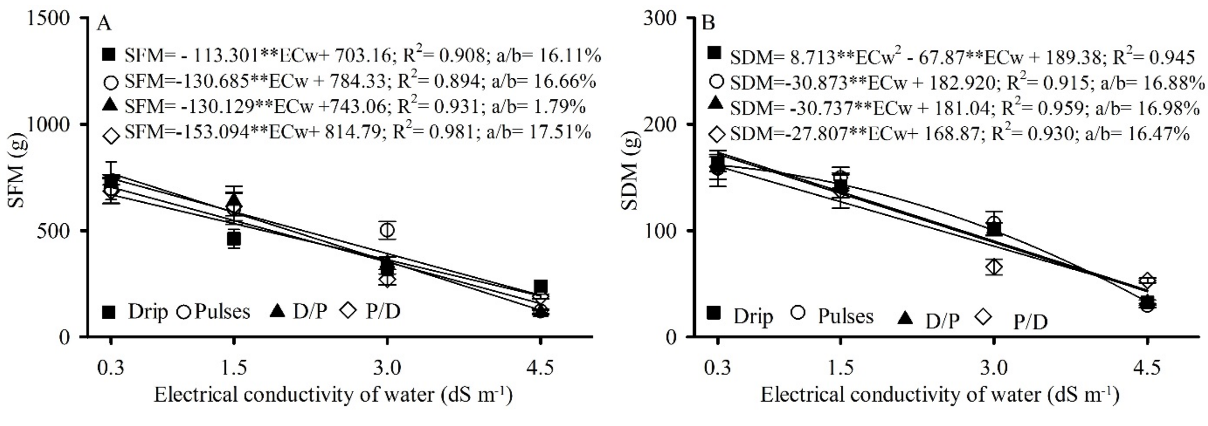

Figure 5. Breakdown of the interaction between irrigation methods and electrical conductivity of water for shoot fresh mass - SFM (A) and shoot dry mass - SDM (B) of eggplant.

Thus, the use of pulse irrigation in the final phase of the cycle was not favorable to SFM and SDM with the increase in salinity, due to the higher concentration of salts in the saturation extract caused by this type of irrigation, as seen previously (Figure 2). The high concentration of salts in the soil solution causes an increase in the retention forces due to an osmotic effect and, as a result, the plant reduces the absorption of water and nutrients, which affects its growth and development (DIAS et al., 2016), and consequently the production of SFM and

SDM. In total production (TOTP) and water use efficiency (WUE), there was significant effect only of salinity, with interaction between water salinity and the forms of application only for water consumption (WC) (Table 3).

Table 3. Results of the F test for the number of fruits (NF), fruit length (FL, cm) fruit diameter (FD, cm), total production (TOTP, g plant^{-1}), water consumption (WC, L plant^{-1}) and water use efficiency (WUE, kg m^{-3}) evaluated at the end of the eggplant experiment grown in a protected environment with continuous and pulse drip irrigation under saline stress.

	F Test				
Sourceofvariation	NFR	FL	TOTP	CW	WUE
Irrigation (I)	*	*	*	**	ns
Salinity(S)	**	**	**	**	**
I*S	ns	ns	**	**	**
CV (%)	91.13	88.86	34.87	0.00	34.82
Mean	1.78	3.64	261.28	70.42	3.14

* and ** significant at the 0.05 and 0.01 level of probability, respectively; ns – not significant by the F test, CV = Coefficient of variation.

Regarding the physical characteristics of the fruits, there were no fruits with standards for commercialization in none of the plots, so only the total fruit production was considered. In addition, there was a considerable amount of flower abscission. Even under irrigation with supply water, the fruits showed inferior characteristics compared to those reported by Santos et al. (2018), who used saline water of 5.0 dS m^{-1} in the first cycle and obtained eggplant fruits with average length of 9.7 cm and diameter of 7.06 cm, and by Damasceno et al. (2022), who found an average length of 8.5 cm with brackish water of 4.5 dS m^{-1}.

The total production of eggplant fruits decreased by 102.10, 88.95 and 137.76 g plant^{-1} per unit increase in salinity in the treatments D, P and D/P (Figure 6A). For the P/D treatment, the data were not satisfactorily described by any mathematical model, with a mean of 253.83 g plant^{-1}.

Among the salinity levels, it was observed that, under irrigation with 4.5 dS m^{-1} water, there was virtually no fruit production for none of the treatments. Salt stress induces osmotic stress, causing less water availability for plants and, in the long term, induces ion toxicity due to nutrient imbalances, in addition to reducing chlorophyll and increasing damage to cell membranes, interrupting physiological and biochemical processes considered essential, which consequently implies limiting plant yield (ACOSTA-MOTOS et al., 2017; RAJESHWARI; BHUVANESHWARI, 2017). Thus, it is understood that the initial salinity of the soil, irrigation with brackish water and climatic conditions (Figure 1) did not favor the physical characteristics of the fruits and the total fruit production.

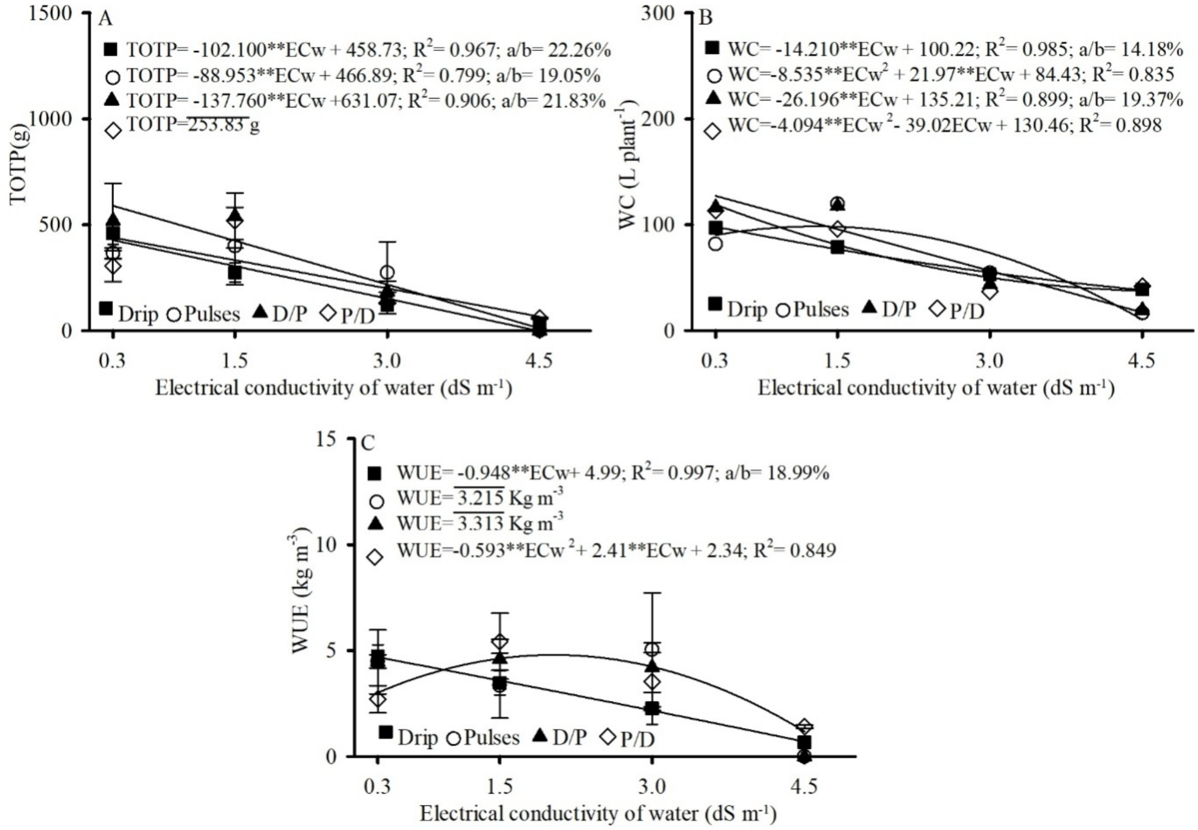

Figure 6. Breakdown of the interaction between irrigation methods and electrical conductivity of water for total production – TOTP(A), water consumption - WC (B) and water use efficiency - WUE (C) of eggplant.

When analyzing the decomposition of the interaction for water consumption (Figure 6B), it can be observed that, in relation to salinity, there was a reduction in water consumption with the increase in the concentration of salts in the irrigation water, with a linear response in the D and D/P treatments, with reductions of 14.18 and 19.37%, respectively, per unit increase in electrical conductivity, whereas the other forms of irrigation caused a quadratic response. Regarding the forms of irrigation, it can be seen that pulse irrigation reduced water consumption by 5.94% compared to drip irrigation when using supply water, while when the two forms of irrigation (D/P and P/D) were alternated, there was higher consumption, with increments of 41.11 and 31.99%, respectively. Thus, it was observed that pulse irrigation led to lower water consumption under the conditions of the experiment.

WUE decreased by 0.948 kg m^{-3} at each increment of ECw in the treatment D (Figure 6C), with a reduction of 84.61% when comparing plants irrigated with supply water and under ECw of 4.5 dS m^{-1}. In the P/D treatment, WUE of 4.80 kg m^{-3} was achieved at electrical conductivity of 2.03 dS m^{-1}, decreasing to 1.19 kg m^{-3} under the highest salinity level (ECw = 4.5 dS m^{-1}). For the other treatments (P and D/P) WUE was null at the highest level of salinity, because there was no eggplant production, but the mean values were 3.21 and 3.31 kg m^{-3}, respectively.

Although the values found are lower than those reported in other studies with eggplant, such as Damasceno et al. (2022), who observed WUE of 5.28 kg m^{-3} at a salinity of 4.5 dS m^{-1}, and Arriero et al. (2020), who found WUE of 5.00 kg m^{-3} with a salinity of 2.5 dS m^{-1} in drip irrigation in the first cycle, the results of the present study were close to those presented by Almasraf and Salim (2018), who obtained WUE of 3.709 kg m^{-3} in eggplant under drip irrigation. Thus, it is understood that for the cultivation of Florida Market eggplant it is necessary to associate other strategies to mitigate the negative effects of salinity, in addition to those applied in the present study. This can be accomplished through soil management practices to improve soil quality over time, such as applying leaching depth during the rainy season.

CONCLUSIONS

Using water with salinity of 3.0 and 4.5 dSm^{-1} in pulse irrigation and the combination of drip irrigation in the initial growth stage and pulse irrigation in the reproductive stage causes higher soil salinity in the 0-0.15 m layer when compared to drip irrigation and the combination of pulse followed by drip irrigation, in the second growing cycle of Florida Market eggplant.

Using pulse irrigation in the initial growth (40 days after transplanting) promoted greater stem diameter and plant height compared to drip irrigation, and the number of leaves and leaf area were not influenced by irrigation management, even in saline soil.

Pulse irrigation using brackish water, despite leading to lower water consumption by plants, is not recommended in the reproductive stage because it increases the concentration of salts in the soil and reduces the production of plant biomass.

Drip irrigation and the combination of pulse irrigation followed by drip irrigation favors eggplant growth and production variables.

Irrigation with brackish water, regardless of irrigation management in saline soils, is not recommended for the cultivation of Florida Market eggplant, as it reduces growth and production and intensifies soil salinization.

ACKNOWLEDGEMENTS

This study was partially funded by the Coordination for the Improvement of Higher Education Personnel – Brazil - Financial Code 001. The authors would also like to thank the National Council for Scientific and Technological Development, the Bahia State Research Foundation and the Federal University of Recôncavo of Bahia for their financial support.

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