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Fruit quality and productivity of yellow passion fruit grown under different irrigation depths

Qualidade dos frutos e produtividade do maracujazeiro amarelo cultivado sob diferentes lâminas de irrigação

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ABSTRACT

The yellow passion (*Passiflora edulis*) is a fruit tree belonging to the Passifloraceae family. Brazil is one of the world's largest producers and consumers of the fruit. Irrigation is directly important for productivity and drip irrigation is the most appropriate method used by passion fruit farmers. Correct irrigation management directly influences the success of the crop. This work aimed to evaluate the effect of different irrigation depths on: fruit quality; physical-chemical parameters; and crop productivity. The experiment was carried out in the field, on private property. The design was in randomized blocks, with six treatments (irrigation depths) and four replications. The treatments were: T1 – Depth corresponding to the crop's evapotranspiration; T2, T3, T4 and T5 – Depths corresponding to 33%, 80%, 133% and 200% of the depth applied by the farmer, respectively; and T6 – Depth applied by the farmer. The following variables were evaluated: plant height and stem diameter; physical-chemical characteristics of fruits and productivity. The different depths applied did not affect the quality of the passion fruit, but affected productivity, with the highest depth corresponding to the highest productivity and the smallest corresponding to the lowest.

Keywords: *Passiflora edulis* Sims; irrigation management; orcharding.

RESUMO

O maracujazeiro-amarelo (*Passiflora edulis*) é uma frutífera pertencente à família Passifloraceae. O Brasil é um dos maiores produtores e consumidores mundiais do fruto. A irrigação é essencial e o gotejamento é o método mais apropriado e utilizado pelos passicultores. O manejo de irrigação influencia o sucesso da cultura. Objetivou-se, com esse trabalho, avaliar o efeito de diferentes lâminas de irrigação sobre: qualidade do fruto; parâmetros físico-químicos: e produtividade. O experimento foi realizado em propriedade privada. O delineamento foi em blocos casualizados, com seis tratamentos (lâminas de irrigação) e quatro repetições. Os tratamentos foram: T1 – Lâmina correspondente à evapotranspiração da cultura; T2, T3, T4 e T5 – lâminas correspondentes a 33%, 80%, 133% e 200% da lâmina aplicada pelo produtor, respectivamente; e T6 – lâmina aplicada pelo Produtor. Foram avaliadas: altura da planta e diâmetro do caule; características físico-químicas dos frutos e produtividade. As diferentes lâminas aplicadas não influenciaram na qualidade do fruto do maracujazeiro, mas influenciaram na produtividade da cultura, com a maior lâmina correspondendo à maior produtividade e a menor lâmina correspondendo à menor produtividade.

Palavras-chave: *Passiflora edulis* Sims; manejo de irrigação; fruticultura.

INTRODUCTION

Irrigation has fundamental importance for passion fruit cultivation, especially in the Northeast of Brazil, as it is directly linked to positive results in the production and vegetative and physiological development of the crop.

In passion fruit cultivation, the most used irrigation methods are drip or microsprinkler irrigation, the latter of which provides a larger wetted area of the soil when compared to the former. Aiming to make better use of water by the crop, the best irrigation system is drip irrigation (FREITAS, 2019), making this system more suitable, as, despite its high initial cost, it is still the most efficient in terms of water use.

According to Costa et al. (2000), an advantage of drip irrigation is the fact that it does not form a temporary microclimate inside the canopy, as it does not wet the shoots of the plants, thus reducing the risk of disease incidence, consequently favoring phytosanitary management.

According to SILVA et al. (2014), irrigation is essential for passion fruit plants, since it promotes greater plant development, greater productivity and obtain continuous and uniform production, with good quality fruits.

Irrigation management aims to meet the water needs of crops in the right amount, without deficit or excess; management is necessary to achieve successful production and preserve the environment (TESTEZLAF, 2017). Among various existing research to determine the efficiency of water use by crops, studies of irrigation depths in different crops and regions are promising.

In view of the above, the objective of this work was to evaluate the effect of different irrigation depths on the quality of the fruit, the physical-chemical parameters and the productivity of yellow passion fruit.

MATERIAL AND METHODS

Characterization of the experimental area

The trial was conducted in an experimental area installed in a commercial crop planted on private property (Figure 1), located in the municipality of Ibicoara, BA, called Fazenda Paraguassu, with coordinates of the center of the experimental area equal to 13°20’0.29’’ S Latitude and 41°20’59.71’’ W Longitude, Altitude of 1,068 m.

Figure 1 – Aerial view of the property where the experiment was installed, in the municipality of Ibicoara, BA

Source: Own authorship (2021)

The region's characteristic climate is Aw (Kottek et al., 2003), with an average annual temperature of 21.3 °C; maximum of 25.8 °C; and a minimum of 16.8 °C. The rainy season goes from November to April. The average annual rainfall is1,098 mm and there is medium drought risk. Meteorological data for irrigation management were provided by Irriger, a technology-based company dedicated to providing services in irrigation management.

Experimental design and treatments

The experimental design adopted was randomized blocks (DBC), with six irrigation depths (treatments) and four replications, as described below:

T1 – Depth corresponding to the crop's evapotranspiration (ETc) - (dripper: 1.5 L h^{-1});

T2 – Depth corresponding to 33% of that applied by the farmer - (0.278 mm day^{-1} - dripper: 0.5 L h^{-1});

T3 – Depth corresponding to 80% of that applied by the farmer - (0.667 mm day^{-1} - dripper: 1.2 L h^{-1});

T4 – Depth corresponding to 133% of that applied by the farmer - (1.111 mm day^{-1} - dripper: 2 L h^{-1});

T5 – Depth corresponding to 200% of that applied by the farmer - (1.667 mm day^{-1} - dripper: 3 Lh^{-1}).

T6 – Depth applied by farmer - (0.833 mm day^{-1} - dripper: 1.5 L h^{-1}).

The yellow passion fruit was cultivated with a spacing of 4 m between rows and 0.90 m between plants. Each experimental plot consisted of a line with 16 plants, with six lines in each block, totaling 96 plants per block (total of 384 plants). The plots were randomly drawn in each block and the blocks were equally drawn in the experimental area. Each plot measured 14.4 m long by 4 m wide. The useful area of each plot was made up of ten central plants, totaling 9 m in length.

Irrigation

Irrigations were carried out daily, with the automated irrigation system. The dripper tubes of treatments T1 and T6 had a flow rate equal to 1.5 L h^{-1}, and, in the other treatments, drippers with different flow rates were used, to adopt the same irrigation time as the farmer, in order to meet the water depths specified in the different treatments.

The data of reference evapotranspiration by Penman-Montheith – FAO – ETo (ALLEN et al., 1998) for carrying out irrigation management were provided daily by Irriger, obtained from a meteorological station installed on the Igarashi farm, located close to the experimental area. ETc was calculated using Equation 1.

$$ETc = EToKcKl \quad (1)$$

Where:

ETc = crop evapotranspiration, mm day^{-1};

ETo = reference evapotranspiration, mm day^{-1};

Kc = crop coefficient; and

Kl = localization coefficient.

In treatment T1, irrigation time was calculated to apply ETc from the dripper installed in T1. At the beginning of each irrigation line, a manual valve was installed, which was closed when the calculated time was reached. In other treatments, irrigation time was equal 2 h, same time used by the farmer.

Setup and conduct of the experiment

Field planting was carried out on November 13, 2020. Visual assessments of crop development (growth, internode spacing) began 43 days after transplantation (DAT). All management (chemical, foliar, phytosanitary) was carried out in accordance with the method already used by the farmer.

The cultivation of yellow passion fruit was carried out in vertical espaliers, with a smooth wire no. 12, at 2 m height, on treated eucalyptus logs. The plants were conducted with two lateral shoots or lateral branches. The plants were supported with string and guided in a single stem until they reached the espalier wire. When they reached 2 m in height, the branches were guided over the smooth wire.

Pest and disease control was carried out in accordance with technical recommendations, with preventive applications of insecticides and fungicides to the crop. Manual pollination was used, between 1:00 pm and 5:00 pm, totaling two flowering peaks. The first flowering started in April 2021.

Variables evaluated in the field

The variables evaluated during passion fruit growth were: physical characterization of the plant (stem diameter and plant height), productivity (kg ha^{-1}), physical and chemical quality of the fruits (pH, soluble solids content, titratable acidity, ratio of soluble solids/titratable acidity).

Plant height (m) and stem diameter (mm)

The height of the plants, in m, (Figure 2) was determined measuring the plant from the soil surface to the point where the plants appeared on the espalier curtain. This measurement was carried out at 300 DAT. The stem diameter (Figure 3) of the plants, in mm, was measured using a manual digital pachymeter, 25 cm from the ground.

Figure 2 – Measurement of plant height and **Figure 3 -** Stem diameter of the yellow passion fruit tree

Source: Own authorship (2021)

Harvest and productivity

Counting of fruits began at approximately 100 DAT. Fruit harvesting in the experimental area began on April 18, 2021. Only fruits with a yellow color, or with more than two yellow lines, were harvested and weighed weekly.

Commercial harvesting began on May 18, 2021 and lasted until December 22, 2021. Fruits were harvested daily, with all fruits being collected, including those that fell on the ground. All fruits harvested in the useful area were separated and weighed, according to their respective treatment.

Variables evaluated in the laboratory

During the plants' production cycle, several collections of fruits formed by natural pollination were carried out. These fruits were counted and registered in each treatment. Using a refractometer, the soluble solids content of the fruits was determined. Then, five fruits were selected per plot, which were taken to the Biofábrica laboratory - UESB, Vitória da Conquista, BA for evaluation of physical and chemical characteristics.

The masses of fruit and pulp were determined. In the laboratory, the following were also determined: soluble solids content (º Brix), titratable acidity, ratio of soluble solids and titratable acidity, ascorbic acid content and pH.

Fruit and pulp mass

The fresh mass of the fruits (g) was determined by individually weighing each fruit (with peel) on a digital scale. After cutting and separating, the pulp (including seeds, aril and juice) was weighed. The pulp yield (%) was obtained by the ratio between the pulp mass and the total fruit mass.

Soluble solids

The determination of the soluble solids (SS) content was carried out using a digital refractometer with automatic temperature compensation, Model PAL-1 from the ATAGO brand, with decimal division, placing a drop of the juice on the prism and taking a direct reading in °Brix. At each reading, the device was reset with distilled water, according to the INSTITUTO ADOLFO LUTZ manual (2008).

For titratable acidity analysis, 2 mL of passion fruit pulp were measured and transferred to an erlenmeyer flask. Distilled water was added to a final volume of 50 mL and three drops of 1% phenolphthalein were added. Under stirring, the sample was titrated with 0.2 mol L^{-1} sodium hydroxide (NaOH) solution until the color changed to slightly pink, according to the methodology described in the standards of INSTITUTO ADOLFO LUTZ (1985). The results were expressed as % citric acid 100 g^{-1} of pulp.

Soluble solids and titratable acidity ratio

The soluble solids and titratable acidity ratio (SS/TA) was obtained by dividing the soluble solids by the titratable acidity contents. This relationship is called ratio and is one of the best ways to evaluate the flavor of a fruit.

Ascorbic acid

The ascorbic acid (AA) content present in the fruit pulp was determined by titrating the passion fruit pulp extract. After the titratable acidity, the preparation of the samples to be titrated followed the same procedure, except for sample dilution, when 50 mL of 0.5% oxalic acid solution at 5 ºC were used, and the titration was carried out with a solution of 2.6 sodium dichlorophenolindophenol 0.1%. The results were expressed as mg of ascorbic acid 100 g^{-1} of pulp (Ranganna, 1977).

pH Values

The pH of the passion fruit pulp was determined using a Hanna pHmeter, model pH 21, with readings taken directly from a sample containing 100 g of passion fruit pulp.

Statistical analysis

The productivity data and post-harvest parameters were subjected to analysis of variance and the means were compared by the Tukey test, adopting a significance level of 5%.

RESULTS AND DISCUSSION

The infiltrated water depths in each treatment, considering the irrigation depth plus effective precipitation, and the ETc are presented in Table 1.

Table 1 – Total infiltrated water depth (Effective precipitation + Net irrigation depth), in mm, in each treatment (T1 to T6) and crop evapotranspiration (ETc) accumulated during the experimental period

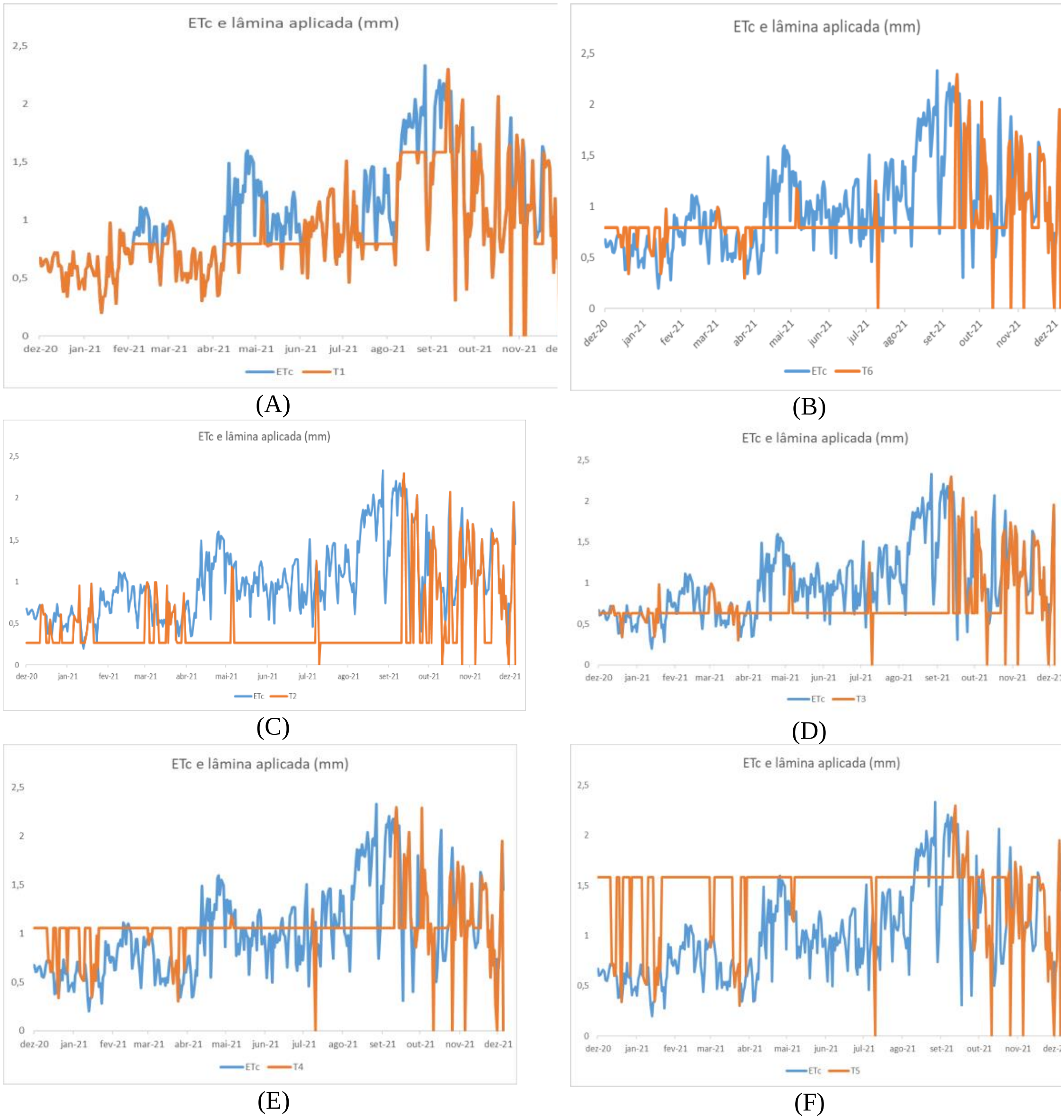
ETc (mm)	Infiltrated water depth (Effective precipitation + Net irrigation depth) (mm)					
	T1	T2	T3	T4	T5	T6
375,5	329,5	169,7	268,2	386,4	534,0	311,9

Source: Own authorship (2023)

Considering the total water depth in each treatment, when compared with ETc, it is clear that there was a water deficit in treatments T1, T2, T3 and T6. However, when considering the daily distribution of this applied water depth, it is clear that, even in treatments T4 and T5, which received a total water depth higher than ETc, water deficits occurred in some periods, in which the evapotranspirometric demand was higher than the applied depth, even in the treatment with the highest emitter flow (T5), as can be seen in

Figure 4. It presents comparisons between ETc and water depths effectively applied in each treatment (Figures 4A to 4F)

Figure 4 – Comparison between crop evapotranspiration (ETc) and infiltrated depth (effective precipitation plus irrigation) in treatments T1(A), T6(B), T2(C), T3(D), T4(E) e T5(F).



Source: Own authorship (2023)

Analyzing Figure 4A, it is clear that the limitation presented by the farmer's irrigation system, whose maximum possible irrigation time was equal to 2 h, together with the flow rate of the emitters in this treatment (1.5 L h^{-1}) prevented the system from automatically meeting the ETc for most of the year. Therefore, when the application of ETc required an irrigation time of more than 2 h, it was necessary for a farm employee to act, activating a valve that connected the irrigation lines of the T1 treatment to the irrigation of the subsequent sector of the property, closing the valve when the calculated irrigation time was reached. However, the employee was unable to work for a large part of the experimental period (May, June and August 2021).

Additionally, in the period of greatest water demand (September 2021), the calculated irrigation time was greater than 4 h, which was a limiting irrigation time, considering the sum of the maximum irrigation times in each of the two sectors. Therefore, in September, the depth applied at T1 was also lower than the ETc. In the remainder of the experimental period, and with the help of the rainfall that occurred during the period, it was possible to meet the ETc. However, for much of the year, the crop was under water deficit in the T1 treatment plots.

In Figure 4B, a more intense deficit is observed in the T6 treatment (same T1 emitter flow and irrigation time of 2 h throughout the entire period), with a deficit over a longer period and with excess water in the months in which ETc required an irrigation time less than 2 h. In other words, due to lack of management, in addition to the water deficit due to system limitations, there was excessive water in December 2020 and January and March/April 2021. The plants in treatments T1 and T6 received similar amounts of water during the experimental period, but there was a greater water deficit in T6 than in T1, due to the lack of management in T6, which allowed water and energy to be wasted with excessive irrigation in periods of lower demand.

In Figures 4C and 4D, treatments T2 and T3, respectively, which applied 33% and 80% of the depth applied in T6, respectively, the deficit was more intense. In T2, it was only possible to meet ETc when there was effective precipitation for this. For most of the year, the crop was under intense water deficit, above 50% most of the time. In T3, the deficit was less intense, since it was possible to meet the water demand more times than in T2, and in the periods in which this was not possible, the water deficit was much smaller than in T2.

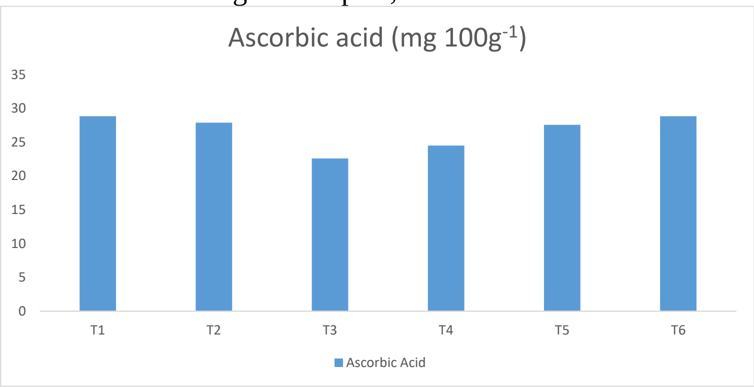
In Figure 4E (T4) it is observed that there was excess irrigation until April 2021, with a deficit from May to September 2021. With an emitter that allowed the application of 133% of the depth applied in T6, but without irrigation management, it decreased the period and intensity of water deficit, but the period and intensity of excess were increased when compared to T6.

In Figure 4F (T5), it is observed that there was excess irrigation in almost the entire experimental period, with a deficit only in September 2021. With an emitter that allowed the application of 200% of the water applied in T6, it was possible to meet the water demand of the crop throughout almost the entire experimental period, with a small deficit in a short period, which probably did not compromise crop productivity. However, once again, due to lack of management, there was a large waste of water and energy throughout almost the entire crop cycle.

With these results, it is clear that the farmer's irrigation system is not adequately sized, as it is not capable of meeting the crop's water demand for most of the year. It is necessary to adapt the system, so that it is possible to apply a larger depth. Furthermore, it is also necessary to adopt adequate irrigation management to avoid wasting water and energy during periods of lower water demand.

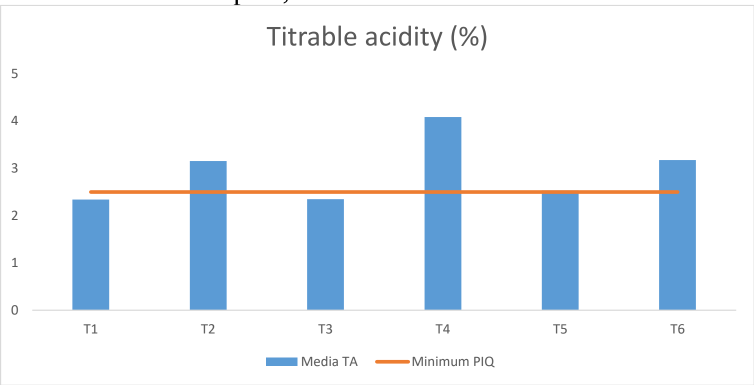
Post-harvest parameters were subjected to analysis of variance and showed no significant difference. The ascorbic acid and titratable acidity levels are presented in Figures 5 and 6, respectively, in an illustrative and descriptive way.

Figure 5 – Average ascorbic acid content (mg 100 g^{-1}) in yellow passion fruits, cultivated under different irrigation depths, in treatments T1 to T6



Source: Own authorship (2023)

Figure 6 – Titratable acidity (%) in yellow passion fruits, grown under different irrigation depths, in treatments T1 a T6



Source: Own authorship (2023)

Observing the levels of ascorbic acid in yellow passion fruit (Figure 5), on average, all treatments presented higher levels than those seen in other studies, where the lowest value observed in T3, with 22.5 mg 100 g^{-1} and the highest in T1 and T6, with 28.8 mg 100 g^{-1}. The ascorbic acid contents of passion fruit reported to be ideal are 15.6 mg 100 g^{-1} in the fruit and 4.2 mg 100 g^{-1} in the juice (Franco, 2007).

It can be seen, in Figure 6, that only the fruits from treatments T2, T4 and T6 presented titratable acidity within the standards established by the Ministry of Agriculture, which is above 2.5%. High acid content in juice is an important characteristic for the processing industry, since high acidity reduces the addition of acidulants to the juice (NASCIMENTO et al., 1996). For the fresh fruit market, sweeter and less acidic fruits are preferred (CAVICHIOLI et al., 2008).

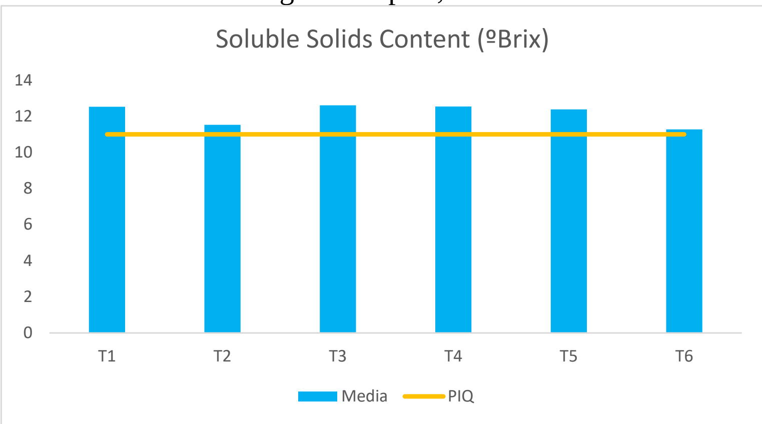
The total acidity of the evaluated fruits (Figure 6) ranged from 1.88 to 5.86%. Yellow passion fruits demanded by the "in natura" market and for industrial purposes must have titratable acidity between 3.2% and 4.5%, as reported by Costa et al. (2001). In this case, only in treatments T2, T4 and T6 would the fruits be suitable for use in natura and for industrial purposes. The high acidity guarantees greater flexibility when adding sugars.

For the processing industry, the high TA content reduces the need to add acidifiers and provides nutritional improvements, food safety and organoleptic quality (ROCHA et al., 2001). The literature describes that the acidity of passion fruit tends to decrease as the fruit ripens, according to results presented by Pocasangre (1995).

According to Marchi et al. (2000), titratable acidity values for yellow passion fruit range from 3.91- 4.68%. The minimum value required by the Identity and Quality Standards (PIQ) for passion fruit pulp from the Ministry of Agriculture is 2.5 g 100 g^{-1} (2.50%) (MAPA, 2018). Marchi et al. (2000) observed this reduction in TA content at the end of ripening, with a result similar to that presented by the yellow passion fruit in the present study.

Soluble solids contents were expressed in °Brix and are represented in Figure 7.

Figure 7 – Average soluble solids content (º Brix) of the pulp of yellow passion fruits, grown under different irrigation depths, in treatments T1 a T6



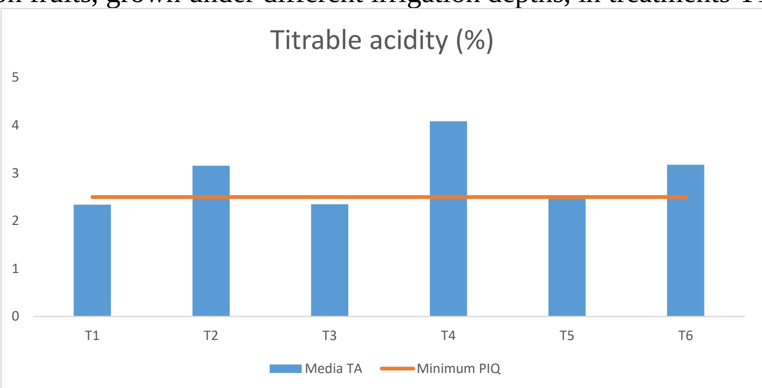
Source: Own authorship (2023)

In the literature, the soluble solids levels found for passion fruit were 13.8 °Brix (MACHADO et al., 2003), 11.7 °Brix (ROSA et al., 2010), 13.08-14.67 °Brix (MARCHI et al., 2000), which are values close to those found in this work, in which the levels varied from 11.3 to 12.6 ºBrix. The PIQ establishes a minimum value of 11 °Brix for passion fruit pulp. Therefore, regardless of the layer applied, the yellow passion fruits in the present study presented soluble solids levels above the minimum required in the PIQ.

Costa et al. (2001) reported soluble solids values that varied between 12.7 and 15.0 °Brix in wild passion fruits from crops irrigated with non-saline water. Soluble solids contents vary with climatic conditions (dry times or high humidity during harvest period).

The average values of the soluble solids and titratable acidity ratio (SS/TA) of the passion fruit pulp are shown in Figure 8.

Figure 8 – Average soluble solids and titratable acidity ratio (SS/TA) of the pulp of yellow passion fruits, grown under different irrigation depths, in treatments T1 a T6



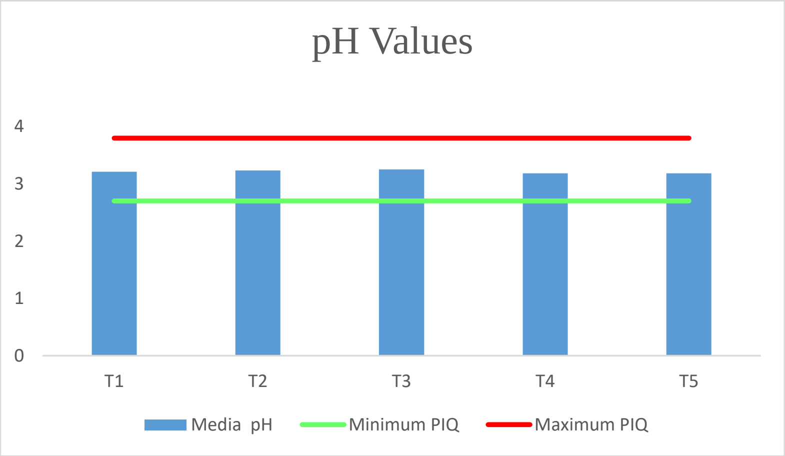
Source: Own authorship (2023)

It can be seen, in Figure 8, that the SS/TA ratio varied from 2.58 to 4.38. According to Raimundo et al. (2009), calculated values for the ratio in frozen passion fruit pulp were between 3.07 and 4.40. In the fresh pulp, extracted directly from the fruit, they were 3.13 and 3.18. According to Cavichioli et al. (2008), the ratio can vary from 2.8 to 3.5, similar to the data found by Borges et al. (2003), where there was a variation from 3.4 to 3.7.

The soluble solids/titratable acidity ratio is related to the degree of palatability of the fruit. In this work, it can be observed that this ratio varied from 2.58 to 4.38. As the relationship between soluble solids content (represented mainly by sugars) and the acidity of the fruit increases, they provide the characteristic sweet flavor of the fruits (GONÇALVES, 2009).

The average pH values of the yellow passion fruit pulp are shown in Figure 9.

Figure 9 – Average pH values of the yellow passion fruit pulp, grown under different irrigation depths, in treatments T1 a T6

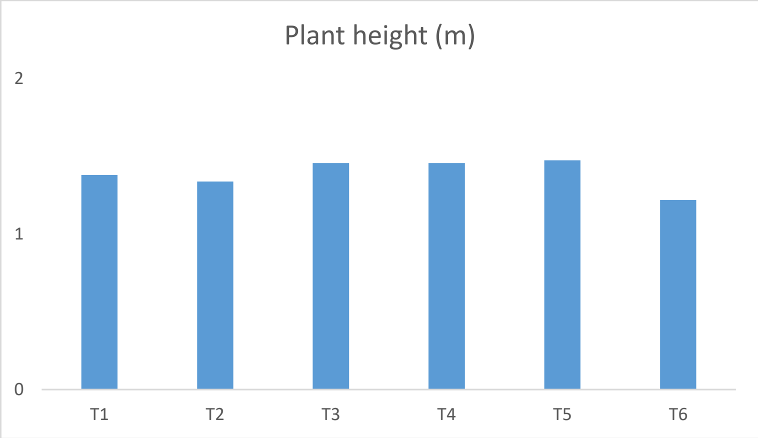


Source: Own authorship (2023)

As seen in Figure 9, the pH values were around 3.2, which fits the standard required by the Technical Regulation for Setting Identity and Quality Standards (PIQ) for Passion Fruit pulp from the Ministry of Agriculture (MAPA, 2018), which establishes a minimum value of 2.7 and a maximum value of 3.8.

The average heights of the curtains of the yellow passion fruit plants, due to the different depths applied, are shown in Figure 10. The values varied from 1.22 to 1.47 m, and showed no significant difference.

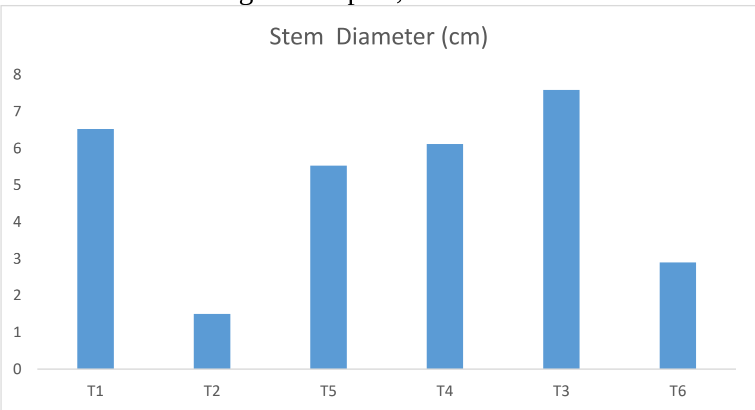
Figure 10 – Average plant height (APH) of yellow passion fruit, grown under different irrigation depths, in treatments T1 a T6



Source: Own authorship (2023)

The average stem diameter (SD) of the yellow passion fruit plants is shown in Figure 11.

Figure 11 – Average stem diameter (SD) values of yellow passion fruit plants, grown under different irrigation depths, in treatments T1 a T6



Source: Own authorship (2023)

In relation to stem diameter (Figure 11), the averages varied from 1.5 to 7.5 cm. It was observed that the plants in treatment T2 had a much lower average diameter than those in the other treatments, which is a direct consequence of the high hydrical stress to which these plants were subjected. This certainly impacted the productivity of the plants in this treatment. According to Souza et al. (2018), plants with a small diameter and very tall are considered to have inferior quality when compared to those with a larger stem diameter.

According to Nunes (2020), the stem diameter, despite not having direct economic importance, is related to the plant's photoassimilate transport capacity, which makes its evaluation important. Therefore, a larger stem diameter is related to the larger size of the shoots of the plants and associated with a greater increase in the development of the root system, thus favoring its growth, due to the greater quantity of nutrients absorbed, directly influencing the production of fruits.

The yellow passion fruit productivity data, due to the different irrigation depths, were subjected to analysis of variance and the results are presented in Table 2.

Table 2 – Analysis of variance of the average productivity of yellow passion fruit, cultivated under different irrigation depths, in treatments T1, T2, T3, T4, T5 e T6.

Treatments	Means	Results*
T2	6,96	A
T6	16,03	AB
T3	18,89	AB
T1	24,87	BC
T4	26,79	BC
T5	39,74	C

* Means followed by the same letter do not differ from each other using the Tukey test at 5% significance.
Source: Own authorship (2023)

It can be seen, in Table 2, that the highest productivity observed occurred in treatments T5, T1 and T4, which were statistically similar, with T5 being the only one that was superior to all other treatments. T1 and T4 were superior only to T2. In treatment T5 there was almost no water deficit throughout the experimental period, which explains its superiority in productivity. Plants in treatments T1 and T4 were subjected to a small water deficit when compared to treatments T6, T2 and T3, which also explains the good performance of plants in these treatments. The lowest productivity was on the T2 treatment, in which the plants were subjected to intense water deficit throughout almost the entire experimental period.

Results of research carried out by Martins (1998) and Sousa (2000) show that maximum crop yields (between 35 to 45 t ha^{-1}) were obtained with water consumption, via supplementary irrigation, of around 1300 to 1400 mm $year^{-1}$. In fact, the important thing is to fully meet the crop's water demand (ETc), which varies depending on the region's climate. In the present study, the only treatment that satisfactorily met ETc was T5, which presented the highest productivity.

Carvalho et al. (2000), researching nitrogen fertilization and irrigation levels on passion fruit productivity, observed that, when 75% of ETo was applied, fruit productivity obtained was 41.3 t ha^{-1}. In the current work, in treatment T5, in which almost all of the crop's water demand was met, productivity was 40 t ha^{-1}, which is consistent with those obtained by the aforementioned researchers.

CONCLUSIONS

Irrigation of yellow passion fruit, under different water depths applied, does not influence the quality of the passion fruits.

The larger irrigation depth, which allows the crop's evapotranspiration to be met, enhances the productivity of yellow passion fruit.

The greater the water deficit suffered by the crop, the lower the productivity of the yellow passion fruit.

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