

## VEGETATIVE GROWTH AND YIELD OF FIG (*Ficus carica* L.) WITH DIFFERENT PLANT ARCHITECTURE

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### ABSTRACT

The fig (*Ficus carica* L.) is a crop of high commercial and nutritional value that has motivated research into agronomic practices to improve its production and quality. Pruning is an essential practice to reduce tree size and promote intensive production in protected systems. In this study, the effect of the number of productive branches and pruning at different numbers of nodes on the growth and yield of fig cv. Nezahualcóyotl was evaluated. The experiment was conducted in a tunnel greenhouse at the Postgraduate College (19° 27' 34" N and 98° 54' 12" W, at an altitude of 2247 m). Plants were established from the first year in 20 L pots with a substrate of tepetate, pine needles, and forest soil (1:1:1 v/v). A generalized randomized complete block design was used with three blocks (4, 6, and 8 branches per plant) and four pruning treatments (4, 6, and 8 nodes and no pruning), with five replicates per treatment. Vegetative growth and yield variables were evaluated, and means were compared using Tukey's test ( $p \leq 0.05$ ) in RStudio. Pruning every eight nodes with four branches per plant resulted in the greatest branch length (75.9 cm) and internode length (2.6 cm). Pruning every four nodes with the same number of branches promoted a greater number of lateral shoots (23 shoots), while pruning every four nodes and the treatment without pruning increased the total number of nodes per branch (34 nodes). The combination of six branches pruned every eight nodes resulted in the highest number of fruits per plant (83 fruits). No significant differences were observed in average fruit weight or total yield per plant.

**Keywords:** Moraceae, Ficeae, pruning, intensive production, plant architecture.

**Citation:** Vázquez-Moisen A, Muratalla-Lúa A, López-Jiménez A, Chávez-Franco SH, Suárez-Espinosa J. 2026. Vegetative growth and yield of fig (*Ficus carica* L.) with different plant architecture. *Agrociencia*. <https://doi.org/10.47163/agrociencia.v60i4.3411>

**Editor in Chief:**  
Dr. Fernando C. Gómez-Merino

Received: November 20, 2025.

Approved: June 20, 2026.

**Published in Agrociencia:**  
June 29, 2026.

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## INTRODUCTION

Fig (*Ficus carica* L.) is one of the first plants domesticated by humans, originating in the Mediterranean region of Turkey and propagated worldwide since the 16th century. Its fruit, consumed fresh, dried, or processed, is highly valued for its nutritional content and health benefits, including its association with longevity and food security (Kiralán *et al.*, 2023). Global fig production has increased due to its high commercial potential, ease of handling, and growing demand for the benefits it offers (Abbas *et al.*, 2019). In Mexico, its cultivation has contributed to rural economic development, although it faces challenges such as pests, diseases, and adverse climatic factors, which have driven the adoption of protected production systems such as greenhouses (Mendoza-Castillo *et al.*, 2017).

Intensive greenhouse production allows precise control of key factors such as planting density, substrate management, and pruning, resulting in higher yields compared to open-field systems. However, inadequate practices in fertilization, water management, or vegetative growth control can significantly reduce productivity (Nosir, 2023). Agronomic management, including pruning, is crucial for adapting plant architecture to modern production systems, which aim to optimize fruit production for fresh consumption. Practices such as branch pruning, the use of growth regulators, and the generation of lateral shoots are essential to maximize productivity and facilitate cultural work (Ferrara and Mazzeo, 2023).

Leaves develop at the nodes of fig tree branches, and vegetative and floral buds originate in their axils. These buds give rise to the fruit, which may correspond to the current season (figs) or the previous season (early figs). For this reason, the number of nodes on a branch is directly related to the number of fruits and yield per tree. This is especially important in intensive pruning systems, which renew the canopy of fig trees annually. These systems require adequate branch growth to ensure a sufficient number of nodes and reproductive buds (Gonçalves *et al.*, 2006). The common fig has a natural tendency toward vertical growth, making it necessary to implement specific pruning and management practices to limit upward growth and encourage the development of lateral shoots to increase fruit production (Ferrara and Mazzeo, 2023). Based on their tolerance to pruning, fig cultivars can be divided into two categories: those that do not tolerate heavy annual pruning and those that can be intensively pruned while maintaining high yields. Cultivars in the first group tend to branch freely, producing a large number of lateral shoots. However, excessive pruning generates vigorous but unproductive shoots, significantly reducing plant yield. In contrast, as early fig crops are insignificant and produce vigorous fruit, the previous season's wood is unnecessary in cultivars of the second group (Nosir, 2023). Therefore, the objective of this study was to evaluate the effect of the number of branches per plant and pruning according to the number of nodes under protected conditions in order to optimize vegetative growth and fig yield.

## MATERIALS AND METHODS

### Location

This study was conducted from September 2022 to December 2023 at the “San José” experimental orchard, in the Postgraduate College Montecillo Campus, in the municipality of Texcoco, State of Mexico, Mexico (19° 27' 34" N and 98° 54' 12" W, at an altitude of 2247 m). The experiment was carried out in a 260 m<sup>2</sup> tunnel greenhouse, covered with aphid-proof netting and 20 % shading.

### Plant material

Five-year-old fig (*Ficus carica* L.) cv. Nezahualcóyotl plants were used, obtained from a collection established in 1982 by the Fruit Growing Center of the Postgraduate College. This variety is characterized by its environmental plasticity, high yield, and ease of management under intensive greenhouse conditions. The fruits are pear-shaped, with a large ostiole, red pulp, a neck, and a long peduncle. Under controlled conditions, they can reach yields of up to 120 Mg ha<sup>-1</sup> (García-Ruiz *et al.*, 2013). The plants were grown in 20 L pots using a substrate composed of tepetate, pine needles, and forest soil in a 1:1:1 (v/v) ratio.

The physical and chemical characteristics of the substrate were: bulk density of 1.2 g cm<sup>-3</sup>, sandy loam texture (55.5 % sand, 34.9 % silt, and 9.6 % clay), pH of 5.5, electrical conductivity of 3.23 dS m<sup>-1</sup>, organic matter content of 6.69 %, total nitrogen (N) of 0.31 %, and available phosphorus (P) of 554.3 mg kg<sup>-1</sup>. Exchangeable bases, expressed in cmol(+) kg<sup>-1</sup>, include calcium (Ca) at 5.64, magnesium (Mg) at 1.99, potassium (K) at 0.35, and sodium (Na) at 0.23. No carbonates were present.

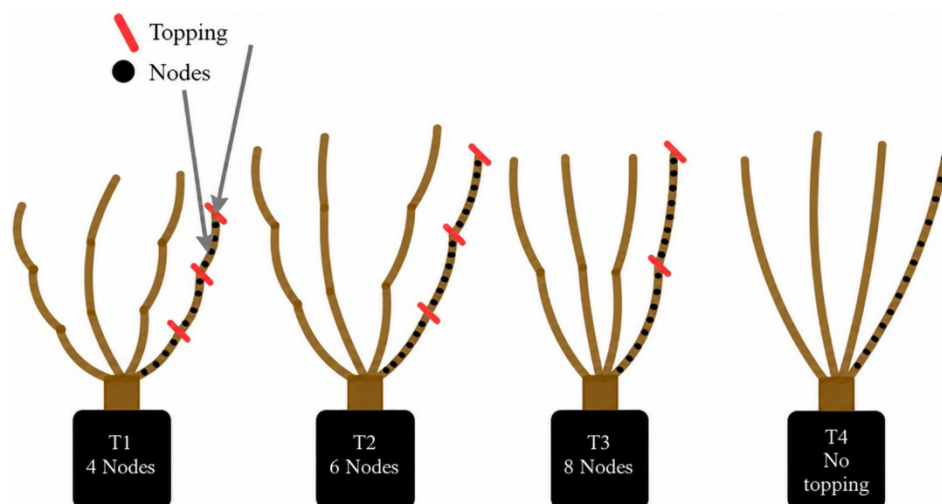
### Treatments and experimental design

Four pruning treatments were evaluated on the main branches: T1, pruning at four nodes; T2, pruning at six nodes; T3, pruning at eight nodes; and T4, no pruning. The experimental design was a generalized randomized complete block design, with three blocks defined according to the number of branches per plant: B1 (four branches), B2 (six branches), and B3 (eight branches). Each treatment had five replicates, resulting in a total of 60 experimental units, with one plant per experimental unit.

After pruning, the apical shoots were allowed to grow until they progressively reached the number of nodes corresponding to each treatment, while the lateral shoots were limited to a maximum growth of five nodes (Figure 1).

### Crop management

The experiment began on September 26, 2022, with pruning at 20 cm above ground level, leaving only the main stem, from which the required branches emerged. Fertilization was carried out manually in three stages. During vegetative growth (December 2022 to March 2023), 10 g of Ultrasol-Growth (SQM, Mexico) was applied per plant every 30 d. During the growth and fruiting stage (April to June 2023), 5 g of



**Figure 1.** Pruning of branches of fig (*Ficus carica* L.) cv. Nezahualcóyotl. The distance between prunings was defined by the number of nodes (T1, T2, T3) and the control (T4). Pruning was done on plants with 4, 6, and 8 production branches.

Ultrasol-Growth and 10 g of Ultrasol-Production were applied per plant, while during the final fruiting stage (July to December 2023), 10 g of each fertilizer was applied per plant every 30 d.

Irrigation was applied using a drip system with 8 L h<sup>-1</sup> pressure-compensating emitters connected to a Hunter X-Core XC-200i four-stake timer distributor (Hunter Industries Inc., USA). The water volume applied was 2.7 L d<sup>-1</sup> per plant from December 2022 to March 2023 and 3.2 L d<sup>-1</sup> per plant from April to December 2023. Harvesting was carried out twice per week from April to December 2023. Fruits were harvested when more than two-thirds of the surface had darkened and the fruit had softened.

#### Variables evaluated

Several variables related to vegetative growth and plant yield were evaluated. Branch length was measured using a measuring tape (Truper, Mexico), and the average was calculated according to the number of branches per plant; data were expressed in centimeters. The number of nodes was counted on each branch and averaged across all branches per plant, while internode length was obtained by dividing branch length by the number of nodes. Lateral shoots were recorded at the end of the experiment, and their number was averaged across the branches of each plant.

The number of fruits was determined by adding the fruits recorded at each harvest to obtain the total per plant. Fruit weight was measured individually in freshly harvested fruits using a digital scale, and the data were expressed in grams. Finally, yield per plant was calculated by multiplying the total number of fruits by their average weight.

The cumulative values at the end of the experiment were expressed in kilograms per plant.

### Statistical analysis

Statistical analysis was performed using RStudio software version 4.2.1. The assumptions of homogeneity of variances (Bartlett's test at 5 %) and normality (Shapiro-Wilk test at 5 %) were verified. Differences among treatments were determined using Tukey's test ( $p \leq 0.05$ ).

## RESULTS AND DISCUSSION

### Vegetative growth

#### Branch length

The yield of figs managed in intensive orchards is closely linked to branch growth, since the fruit develops at the nodes, specifically in the leaf axils (Gaaliche *et al.*, 2011). In this study, pruning at different numbers of nodes and branch numbers per plant showed significant differences ( $p \leq 0.05$ ) in final branch length. Plants with four branches and pruning at eight nodes achieved the greatest branch length, with an average value of 75.9 cm, similar to that produced by the treatment without pruning (Table 1). These data suggest a compensatory growth response to intermediate pruning severity.

**Table 1.** Vegetative growth of fig (*Ficus carica* L.) cv. Nezahualc6yotl (means  $\pm$  standard deviation) in response to the number of branches in the plant and the number of nodes at the tip of the branches.

Combination		Branch length (cm) <sup>†</sup>	Nodes at the branch	Internode length (cm) <sup>†</sup>	Lateral shoots <sup>†</sup>
Branches on the plant	Nodes at the tip				
Four branches	Four nodes	54.8 bcd $\pm$ 6.7	22 c $\pm$ 2.9	2.5 ab $\pm$ 0.3	23 a $\pm$ 6.4
	Six nodes	51.4 bcde $\pm$ 5.9	23 bc $\pm$ 2.0	2.3 abc $\pm$ 0.2	18 ab $\pm$ 3.1
	Eight nodes	75.9 a $\pm$ 16.6	29 ab $\pm$ 3.6	2.6 a $\pm$ 0.4	14 ab $\pm$ 4.7
	No pruning	66.2 ab $\pm$ 17.2	34 a $\pm$ 5.3	1.9 bcd $\pm$ 0.2	2 c $\pm$ 2.0
Six branches	Four nodes	37.1 de $\pm$ 5.1	16 d $\pm$ 1.9	2.3 abc $\pm$ 0.1	16 ab $\pm$ 6.1
	Six nodes	45.4 bcde $\pm$ 9.6	20 cd $\pm$ 1.7	2.3 ab $\pm$ 0.4	18 ab $\pm$ 5.8
	Eight nodes	60.2 abc $\pm$ 16.2	24 bc $\pm$ 3.7	2.5 a $\pm$ 0.4	12 b $\pm$ 4.2
	No pruning	43.3 cde $\pm$ 3.8	28 ab $\pm$ 2.4	1.5 d $\pm$ 0.1	2 c $\pm$ 2.4
Eight branches	Four nodes	35.0 de $\pm$ 5.0	16 d $\pm$ 0.9	2.3 abc $\pm$ 0.3	17 ab $\pm$ 4.7
	Six nodes	33.4 e $\pm$ 5.0	16 d $\pm$ 1.4	2.1 abcd $\pm$ 0.3	12 b $\pm$ 3.6
	Eight nodes	43.1 cde $\pm$ 5.9	20 cd $\pm$ 1.3	2.2 abc $\pm$ 0.3	16 ab $\pm$ 1.9
	No pruning	40.0 cde $\pm$ 5.0	23 bc $\pm$ 1.8	1.7 cd $\pm$ 0.2	2 c $\pm$ 1.5

<sup>†</sup>Average values per column with a different letter are different ( $p \leq 0.05$ ).

Pruning temporarily reduces the apical dominance that the apex exerts over lateral buds, reconfiguring the hormonal signaling network and critically altering the source-sink relationship immediately after cutting (Beveridge, 2023; Barbier *et al.*, 2019; Madhumala *et al.*, 2024). Pruning at eight nodes likely preserved enough leaf area and vascular connectivity to sustain carbon supply and facilitate the rapid replacement of the apex by a distal bud, thus avoiding any net penalty on elongation. This outcome contrasts with more intensive pruning or tree architectures that feature greater competition among apices. Gaaliche *et al.* (2011) reported an annual growth of 10 cm in fig branches grown under rainfed conditions, which was lower than the growth observed in this study.

Annual canopy renewal, achieved by removing the early fig crop, increases shoot length to more than 139 cm without affecting the main crop yield (Micheloud *et al.*, 2018). The open-field cultivar 'Roxo de Valinhos', subjected to a severe pruning system (one fruit per node), produced branch lengths of up to 189 cm per year (Gonçalves *et al.*, 2006). These differences may be attributed to environmental conditions and management practices, such as the use of intensive systems and cultivar genotype. However, in figs, this type of pruning does not affect fruit production, because the apical meristem continues to generate leaves and inflorescences along its axis (Gaaliche *et al.*, 2011), as observed in this study under greenhouse conditions. Furthermore, the sequential growth of shoots prolongs the harvest period, requiring management practices such as irrigation, fertilization, and pruning to maintain continuous growth and high productivity (Leonel and Tecchio, 2010).

#### **Nodes in the branch**

The effect of the treatment combinations was significant ( $p \leq 0.05$ ) on the number of nodes per branch. The combination of four branches on unpruned plants showed the highest average number of nodes, with 34 nodes per branch (Table 1). Under temperate climate conditions in Argentina and with intensive pruning of 'Brown Turkey' and 'Guarinta' figs, Micheloud *et al.* (2018) observed branches with average lengths of 151.6 and 139.6 cm and 34.2 and 28.8 nodes per branch, respectively, which is consistent with this study. However, these authors reported longer branches with a lower percentage of fruit-bearing nodes (49.9 and 45 %). This suggests that not all available nodes become reproductive sites, possibly due to factors such as competition for resources or genetic limitations. In contrast, Gaaliche *et al.* (2011) reported, under Mediterranean climate conditions and with light pruning, percentages of fruit-bearing nodes ranging from 50.2 to 88.5 % in five cultivars, although with lower branch growth (14.25 cm).

#### **Internode length**

The effect of blocks (number of branches per plant) and treatments (number of nodes at pruning) showed significant differences ( $p \leq 0.05$ ) in internode length. Plants with 4 and 6 branches, combined with pruning at eight nodes, exhibited greater average

internode lengths (2.6 and 2.5 cm, respectively) (Table 1). These values were lower than those reported by Micheloud *et al.* (2018) and Garza-Alonso *et al.* (2019), who recorded internode lengths ranging from 3.34 to 4.85 cm in different cultivars under protected conditions.

In contrast, Kumar *et al.* (2014) observed an increase in internode length from 2.89 to 3.07 cm in 'Deanna' fig when the pruning level was reduced. These results may be attributed to the fact that moderate pruning preserved sufficient early leaf area and source capacity, while a multi-axis architecture increased canopy complexity, thereby modulating both the distribution of photoassimilates and the quality of light perceived by the expanding internodes. The elongation of each internode depends on the coordinated activity of cell division and elongation, processes strongly regulated by gibberellins and brassinosteroids, with auxin playing a modulating role under canopy shading conditions (Li *et al.*, 2024).

### **Lateral shoots**

The number of lateral shoots per branch differed significantly ( $p \leq 0.05$ ) depending on the treatment combination. The treatment with four branches and pruning at four nodes showed the highest number of lateral shoots (Table 1). These results are consistent with those reported by Ateyyeh and Sadler (2006), who observed lateral shoot growth ranging from 1.9 to 6.3 shoots per branch in a traditional fig tree pruning and training system. Furthermore, these authors noted that most lateral shoots emerged from the distal nodes of the branches, whereas the basal nodes exhibited limited lateral development.

This finding is consistent with the results obtained in the present study, in which all topped branches generated lateral shoots predominantly at distal nodes. These results may be attributed to a stronger release of apical dominance and a rapid redistribution of the source-sink balance toward axillary buds near the cut point. Pruning eliminates a highly demanding apex and reduces the inhibitory control associated with the dominant axis, thereby allowing bud activation and transition to growth (Beveridge, 2023; Barbier *et al.*, 2019). This process does not depend solely on a gradual decline in auxin within the stem, since early increases in promotive signals within the bud may occur after pruning, accompanied by a rapid reconfiguration of metabolites and carbon signaling (Cao *et al.*, 2023).

## **Yield**

### **Fruits per plant**

During the warmer months, figs are harvested daily, but as temperatures decrease, fruit ripening slows and harvesting is reduced to once per week (Gariglio *et al.*, 2014). Since figs ripen sequentially with shoot growth, greater vegetative development prolongs the harvest period, and the number of fruits per plant depends directly on branch length and the number of nodes per branch (Gaaliche *et al.*, 2011). To maintain

stable and high productivity in fig trees, it is essential to promote shoot development through appropriate cultural practices such as irrigation, fertilization, and pruning (Micheloud *et al.*, 2023).

Annual intensive pruning, in addition to reducing plant size and allowing higher planting density, promotes increased branch length, thereby increasing the number of fruits per plant and extending the harvest period. In this study, the number of productive branches per plant and the number of nodes at pruning had a significant effect ( $p \leq 0.05$ ) on the number of fruits per plant. The combination of six branches per plant with pruning at eight nodes resulted in the highest number of fruits per plant, with an average of 83 fruits, exceeding the value obtained with six branches and pruning at four nodes (43 fruits) (Table 2). These values were lower than those reported by Nienow *et al.* (2006) for the 'Roxo de Valinhos' fig, who recorded 46 fruits on plants with four branches, 50 fruits on six branches, 95 fruits on eight branches, and 113 fruits on 12 branches.

Under open-field conditions with supplemental irrigation in Argentina, Micheloud *et al.* (2018) reported values closer to those obtained in this study, with averages of 15.4 and 14.2 fruits per shoot in the fig varieties 'Brown Turkey' and 'Guarinta,' respectively. Similarly, Kumar *et al.* (2014) observed that, in the fig variety 'Deanna' under different spacings, plants pruned to eight nodes per branch produced an average of 85 fruits per plant, whereas those pruned to six nodes yielded only 68 fruits. These results are consistent with those of the present study, in which pruning management and branch number were key factors in maximizing fruit production.

**Table 2.** Yield of fig (*Ficus carica* L.) cv. Nezahualc6yotl (means  $\pm$  standard deviation) in response to the number of branches on the plant and the number of nodes at the tip of the branches.

Combination		Fruits per plant <sup>†</sup>	Fruit weight (g)	Yield (kg per plant)
Branches on the plant	Nodes at the tip			
Four branches	Four nodes	48 ab $\pm$ 16.6	44.7 a $\pm$ 3.3	2.15 a $\pm$ 0.8
	Six nodes	55 ab $\pm$ 11.7	43.2 a $\pm$ 6.4	2.42 a $\pm$ 0.7
	Eight nodes	81 ab $\pm$ 20.3	42.2 a $\pm$ 3.5	3.40 a $\pm$ 0.9
	No pruning	71 ab $\pm$ 26.8	47.3 a $\pm$ 8.1	3.47 a $\pm$ 1.9
Six branches	Four nodes	43 b $\pm$ 12.6	43.5 a $\pm$ 5.5	1.86 a $\pm$ 0.5
	Six nodes	53 ab $\pm$ 18.0	44.2 a $\pm$ 2.8	2.36 a $\pm$ 0.9
	Eight nodes	83 a $\pm$ 25.3	48.9 a $\pm$ 5.1	4.14 a $\pm$ 1.7
	No pruning	66 ab $\pm$ 9.0	44.4 a $\pm$ 6.1	2.95 a $\pm$ 0.8
Eight branches	Four nodes	57 ab $\pm$ 19.7	44.1 a $\pm$ 3.1	2.52 a $\pm$ 0.9
	Six nodes	58 ab $\pm$ 15.2	45.3 a $\pm$ 5.0	2.67 a $\pm$ 0.9
	Eight nodes	71 ab $\pm$ 17.4	43.6 a $\pm$ 2.9	3.13 a $\pm$ 1.0
	No pruning	62 ab $\pm$ 9.7	46.7 a $\pm$ 6.6	2.93 a $\pm$ 0.8

<sup>†</sup>Mean values per column with a different letter are different ( $p \leq 0.05$ ), means  $\pm$  standard deviation.

Because axillary buds can rapidly differentiate into reproductive structures, the number of active nodes acts as an immediate structural limit to the productive potential of the shoot (Singh, 2023). Therefore, more nodes per branch increased the number of available fruiting sites and favored the continuity of vegetative-reproductive development, which depends on the supply of photoassimilates. In contrast, fewer nodes per branch, despite stimulating bud emergence through reduced apical dominance, tend to prioritize vegetative regrowth. This reallocation of carbon and nutrients toward new growth may reduce the proportion of reproductive structures.

### **Fruit weight**

Fruit weight is one of the most important characteristics in the fresh fruit market, as it directly influences market prices. In addition, it plays a key role in fruit packaging and transport (Pérez-Sánchez *et al.*, 2016). Smaller fruits are typically destined for processing and packaging, whereas larger fruits are preferred for fresh consumption. In this study, the interaction between the number of branches per plant and the number of nodes at pruning had no effect ( $p \leq 0.05$ ) on average fruit weight. All treatment combinations ranged from 42.2 to 48.9 g (Table 2). These results are consistent with those reported by Mendoza-Castillo *et al.* (2017), who worked with plants of the same cultivar having between 3 and 8 branches and likewise found no significant differences in fresh fruit weight, although they obtained slightly higher average values (52.37 to 58.45 g).

On the other hand, Kumar *et al.* (2014) evaluated 'Deanna' figs with plants containing 4, 6, and 8 branches and reported average fruit weights ranging from 42.6 to 65.7 g. Final fruit weight depends on the coordination between cell division and cell expansion, processes regulated by hormonal networks and influenced by environmental conditions and management practices (Zhao *et al.*, 2021). In perennial fruit trees, changes in canopy architecture are generally reflected more in fruit load than in consistent reductions in individual fruit weight (Rossouw *et al.*, 2024). Likewise, in intensive systems, fruit weight responds more strongly to cultivar, season, and fruit load per shoot than to the training system itself because of local source-sink restrictions (Galán *et al.*, 2025).

### **Yield per plant**

The yield of fruit trees is critically influenced by the balance between vegetative growth and fruit production. In fig cultivation, this balance is especially important, as fig and early fig fruits develop during the continuous growth of annual shoots (Gaaliche *et al.*, 2011). Annual canopy renewal through intensive pruning is an effective strategy to promote shoot development, extend the harvest period, and increase annual yield. Currently, intensive greenhouse production systems that combine high planting densities, the use of containers and substrates, management of the number of branches per plant, and severe pruning can increase yields by up to 20-fold compared with open-field plantations (Mendoza-Castillo *et al.*, 2017).

In this study, the combinations of branches per plant and nodes at pruning showed no significant differences ( $p \leq 0.05$ ) in yield. However, the combination of six branches per plant with pruning at eight nodes resulted in a higher annual yield than the other combinations, reaching 4.14 kg per plant (Table 2). This is similar to the results reported by Kumar *et al.* (2014), who observed yields of 4.04 kg per plant with pruning at eight nodes and 3.29 kg per plant with pruning at six nodes in the 'Deanna' fig. In contrast, Nienow *et al.* (2006), working in Brazil with 'Roxo de Valinhos' figs at a spacing of 1.5 × 1.9 m and plants with 8 to 12 branches, reported considerably higher average yields, ranging from 11.34 to 11.65 kg per plant. Conversely, the results of the present study were higher than those reported by Leonel and Tecchio (2010), who found yields of 1.13 kg per plant without irrigation and 2.5 kg per plant with irrigation. Shoot length is closely related to the number of nodes, reproductive buds, and yield per plant (Gonçalves *et al.*, 2006; Gaaliche *et al.*, 2011).

Arrangements with fewer nodes tend to redirect resources toward vegetative reconstruction after apical removal, which may reduce the proportion of reproductive structures that develop into harvestable fruit, particularly when light interception and canopy microenvironment become determining factors (Singh *et al.*, 2025). Therefore, the integration of appropriate pruning practices, together with modern technologies and proper agronomic management, is fundamental to optimize fig productivity in intensive systems.

## CONCLUSIONS

Managing the number of branches per plant and pruning at different numbers of nodes proved to be an effective strategy for improving vegetative growth and yield of the 'Nezahualcóyotl' fig under protected conditions. Pruning at eight nodes with four branches maximized key vegetative parameters such as branch length and internode length, while pruning at four nodes with four branches favored lateral shoot development. The combination of six branches and pruning at eight nodes was the most efficient in terms of yield, achieving the highest number of fruits and the greatest yield per plant.

## ACKNOWLEDGEMENTS

We thank the Secretariat of Science, Humanities, Technology and Innovation (SECIHTI) for the scholarship awarded to the first author during his academic training, at the Postgraduate College, Montecillo Campus, State of Mexico, Mexico.

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