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Poster #7

Production of Table Cucumber (*Cucumis sativa*) on Two Trellis Systems in North Florida

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ABSTRACT.
The use of trellises to support vine crops such as tomato, squash and cucumber may result in increased fruit quality compared to the conventional practice of allowing the vines to run freely on the ground. Other stated advantages of the trellis system include better canopy light interception, better control of pest and ease of harvesting. However, there is still much debate over whether the use of trellises results in increased yield. The objective of this study was to determine the performance of trellis grown cucumber vs. conventional practice. A two year study was done at the FAMU research and extension center, Quincy Florida. The experimental design was a randomized complete block with three treatments: A-frame trellis, wire trellis and conventional practice as a control. Parameters measured included fruit size (length and circumference), fruit quality and total yield. Treatment effects were evaluated by Analysis of Variance and Fisher's exact test. Despite numerically higher numbers of spoiled fruits from the conventional practice, the results showed no significant treatment effect. The study concluded that the use of trellises provided no advantage over the conventional system with respect to the parameters measured.

KEYWORDS: *Cucumis sativa*, trellis, light interception, conventional practice, quality measures.

INTRODUCTION

It is widely believed that growing cucumbers on trellises will lead to superior performance as opposed to growing these crops using conventional methods where the plants are allowed to run freely over the ground. Proponents of the trellis system have claimed certain advantages over conventional methods, including less fruit spoilage and better canopy interception resulting in higher total fruit production. However, opponents of the trellis system have argued that trellises expose more fruit to predators such as birds and insects and the amount of light intercepted by the crop is not sufficient to offset any losses realized from conventional methods.

MATERIAL AND METHODS

The experiment was laid out as a Randomized Complete block Design (RCBD) with three treatments. Treatment one involved an A-frame wooden trellis using wooden strips spaced approximately 12 inches apart for vine support. Treatment two was a wire trellis with parallel lines spread approximately 12 inches apart for vine support. In treatment three (the control) the plants were allowed to run at will over bare ground covered with plastic mulch; a practice traditionally used by cucumber growers. All plots were drip irrigated periodically on an 'as needed basis'. Data were collected weekly on fruit yield, fruit circumference, fruit length and the number of spoiled fruits. A total of six harvests were conducted, three in each year of the study. All mature fruits were harvested from within a 400 square feet (4306 sq meter) area. After taking the total weight of the harvested fruits from each treatment, thirty fruits were selected at random, examined for blemishes and deformities then their circumference were taken. Quantitative data were analyzed by analysis of variance to determine significant treatment (trellis) effects. Quality measures which included counts of deformed, discolored and rotted fruits were subjected to Fisher's exact test. The 0.05 level of significance was used for all of the statistical analyses.

RESULT AND DISCUSSION

The highest numerical yield, 5332 lb/acre (5972 kg/ha) was obtained from the control treatment. This was followed by the A-Frame, 5059 lb/acre (5666 kg/ha) and the wire trellis, 4351 lb/acre (4873 (kg/ha). Fruits from all three treatments were similar in size (circumference and length). The overall results indicated no treatment effects on yield parameters (Figures 1, 2 and 3). With respect to fruit quality, the control resulted in a slightly higher percentage of spoiled fruits. This was anticipated since the fruits in this treatment experienced some ground contact as well as exposure to moist damp conditions and other related factors could potentially cause fruit spoilage. However, since harvesting was done on a weekly basis, this period of exposure was not sufficient to result in any significant fruit spoilage (Fig.4).

CONCLUSION

With the exception of a slightly lower percentage of spoiled fruits, the use of trellises did not provide any significant benefits over the conventional method of growing cucumbers. In fact, despite being statistically insignificant, the yield parameters (fruit weight and size) were numerically higher under the conventional system. Although production costs were not assessed during this study, it is evident that the conventional method may be more suited for commercial production due to its low requirements for equipment and labor. However, trellises may be better suited for small scale production and elderly home gardeners since they facilitate easy harvesting of mature fruits.

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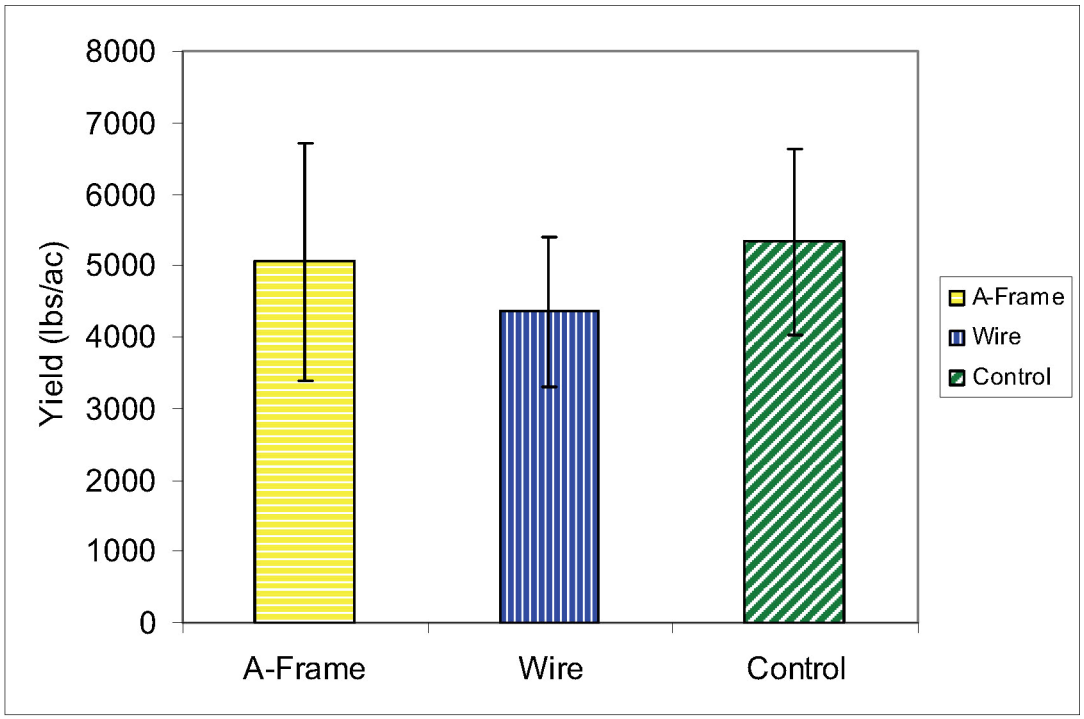

Figure. 1. Fresh fruit yield. (Data represent an average of two years)

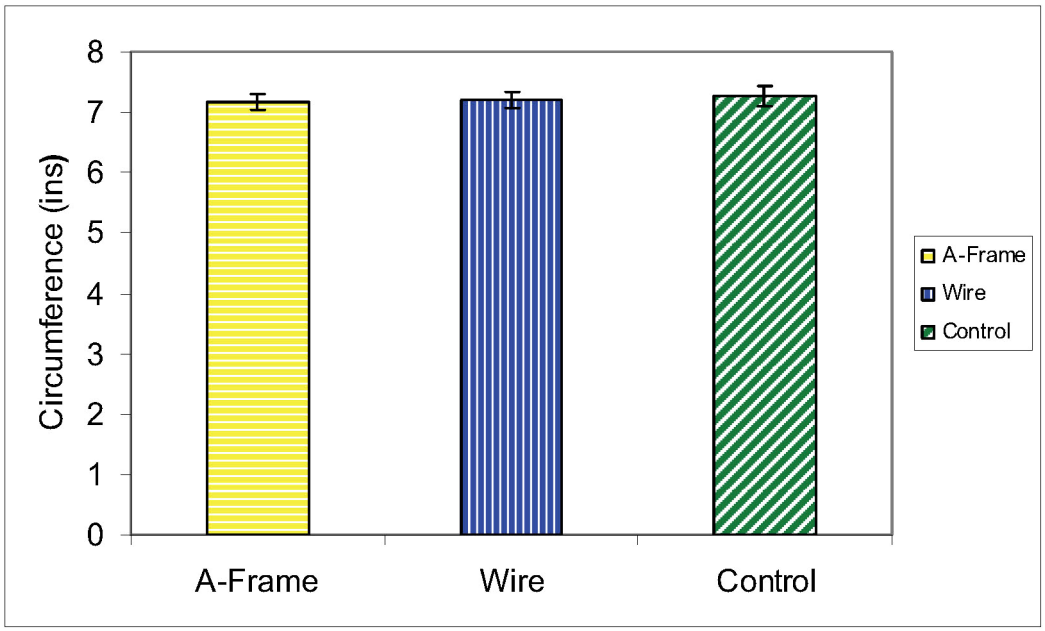

Figure. 2. Mean circumference of cucumber fruits (Data are an average of two years)

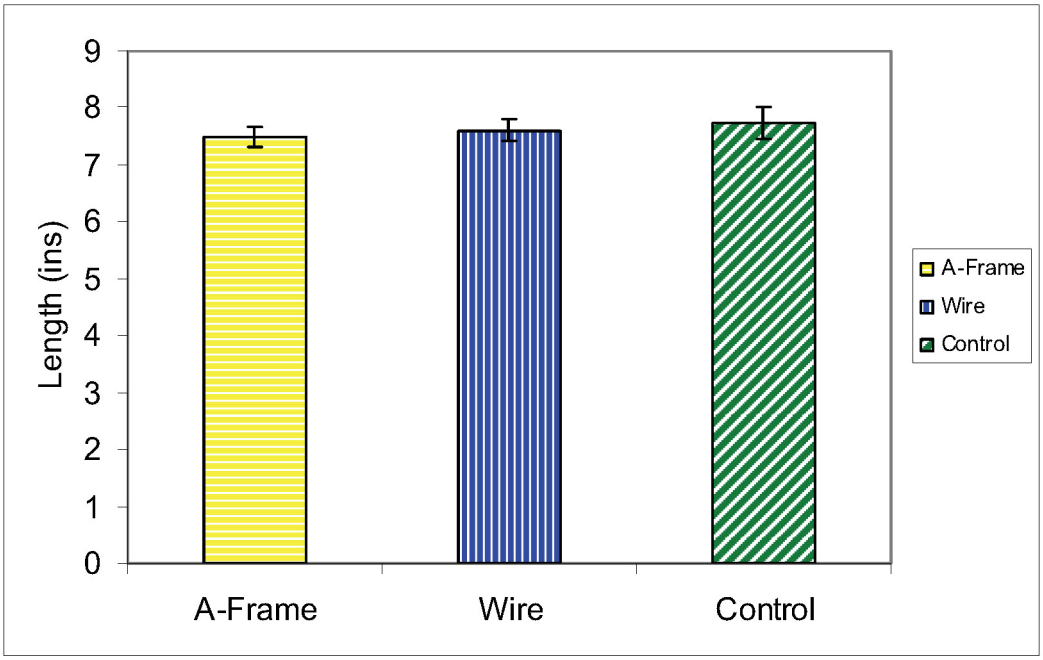

Figure. 3. Mean fruit length of table cucumbers. (Data are an average of two years)

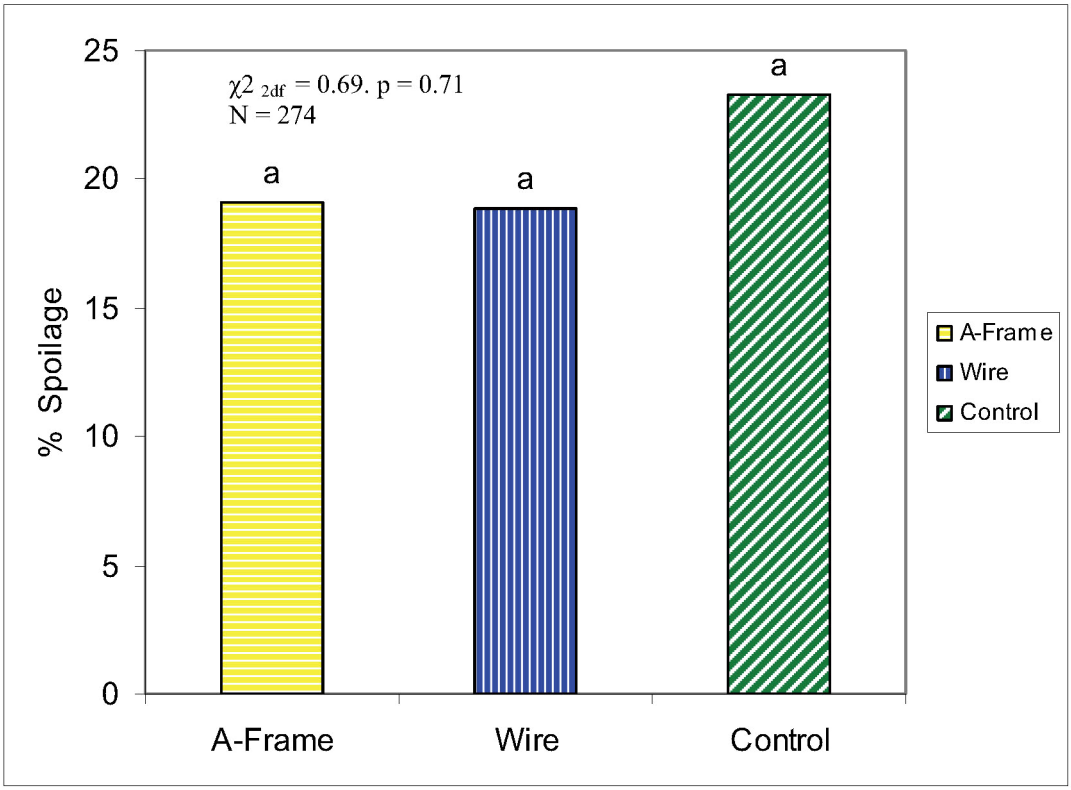

Figure. 4. Percentage of spoiled cucumber fruits (Data are an average of two harvests)