Different covering plastic films used for low tunnels affect the strawberry yield in southern Spain

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INTRODUCTION

Nowadays, current systems of strawberry production consist of large field extensions with low or high plastic tunnels (more common in last years) under which strawberry plants grow properly. In general, it is known that changes in irradiance levels and quality alterations of the radiation reaching different agricultural crops (e.g. tomato, lettuce, eggplant or maize) can have influence on their productivities and nutritional fruit properties. In most of cases, photosynthetic issues are behind these promoted changes.

In particular, in this study several plastics films (polyethylene, 300 galgas) with different optical properties were tested to evaluate their rather than possible effects on strawberry crops during 2007/2008 season. Some of them are characterized by attenuating the ultraviolet range, while others modify the diffusion and transmitance of light inside the tunnels.

METHODOLOGY

Experimental works were developed applying a complete randomized block design with three replications of 30 plants (*Fragaria x ananassa* Duch; cultivar Camarosa).

Seven covering plastics films for low tunnels were tested, including normal plastic film traditionally used by local growers as reference.

Different agronomic parameters were analysed:

1. total and early production (grams per plant)
2. number of fruits per plant
3. average fruit weight
4. fruit dimensions and firmness
5. content in solids soluble
6. nutritional parameters (total phenolic compounds, anthocyanins and carbohidrates).

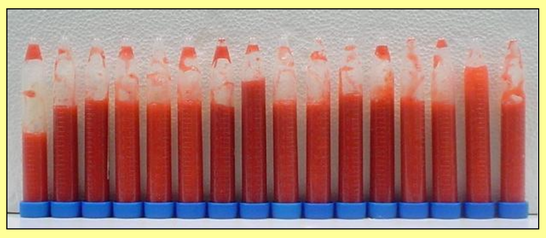

Figure 1. Samples of strawberry juice.

Figure 2. Experimental field.

RESULTS

❖ When season concluded, it was observed that the accumulated strawberry yield (grams per plant) under plastic film "B" (which diffuses light inside tunnel) was significantly higher (about 13%) than that under the normal film ("CT"). Besides, the plastic film "A" (clearer plastic) also give rise to higher values than normal film (6%).

❖ In relation to the early production, which is very important for the strawberry market, plastic films "A" and "B" yield the highest values (ca. 5% over the normal film).

❖ During most of the season the plastic film "B" reached the highest values in total fruits harvested per plant (16% over the normal plastic film).

❖With regard to nutritional parameters, total phenolic compounds analysed were higher under plastic film "A" (8% respect that for normal film).

❖Otherwise, the rest of the assayed films showed worse results than those for normal film.

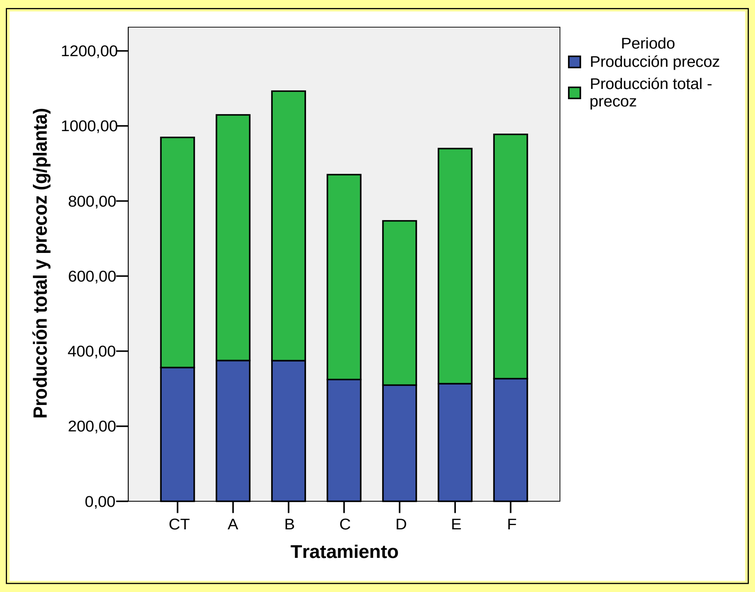

Figure 3. Total and early production (until March 31).

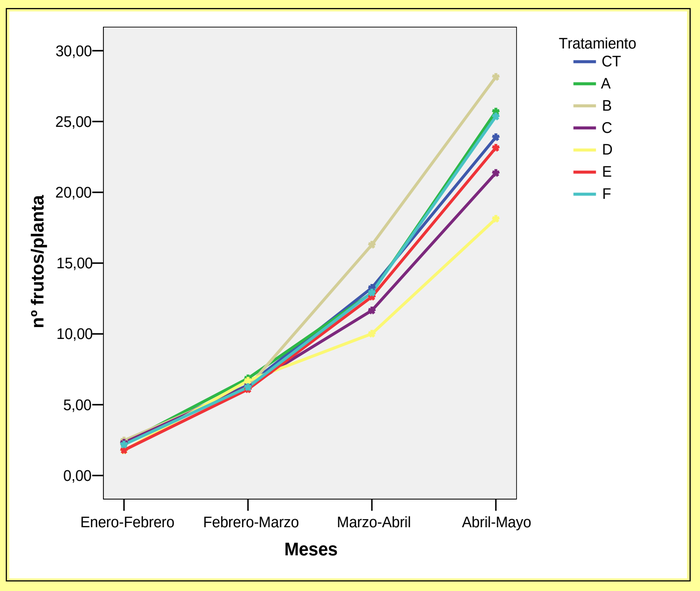

Figure 4. Time course evolution of total fruits per plant.

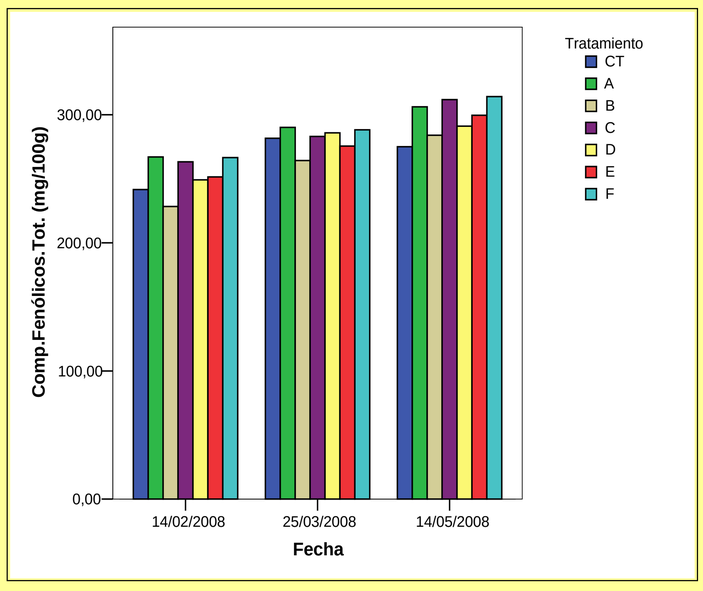

Figure 5. Time course evolution of total phenolic compounds.

CONCLUSIONS

❖Plastic films that increase light diffusion inside tunnels could contribute to increase the strawberry yield.

❖The clearest plastic films (with high visible transmitivity) also could favour this increase in the productivity and improve the fruit nutritional quality as well.

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