

Productive and Agronomic Response of three eggplant (*Solanum melongena* L.) cultivars to CO₂ Enrichment under greenhouse conditions

C. Baixauli¹, J. M. Aguilar¹, A. Giner¹, I. Nájera¹, J. V. Maroto², A. San Bautista², S. López² and B. Pascual²

1. Fundación Ruralcaja. Apdo. 194. 46200 Paiporta (Valencia) Spain.
2. Departamento de Producción Vegetal, ETSIA. Universidad Politécnica de Valencia.



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INTRODUCTION

In the greenhouses of central and northern Europe is common to enrich the greenhouse with CO₂ for growing vegetables. The aim is to improve the quality, earliness and yields.

MATERIALS AND METHODS

The study was carried out throughout two years (2004-05 and 2005-06) at the Experimental Station of Fundación Ruralcaja in Paiporta, Valencia (Spain)

| Year | July | August | September | October | November | December | January | February | March | April | May | June | July |
|---------|------|--------|-----------|---------|----------|----------|---------|----------|-------|-------|-----|------|------|
| 2004/05 | 6 | 6 | 7 | | | | | | | | | | 15 |
| 2005/06 | 29 | 29 | 3 | | | | | | | | | 26 | |

■ sowing ■ planting ■ harvest

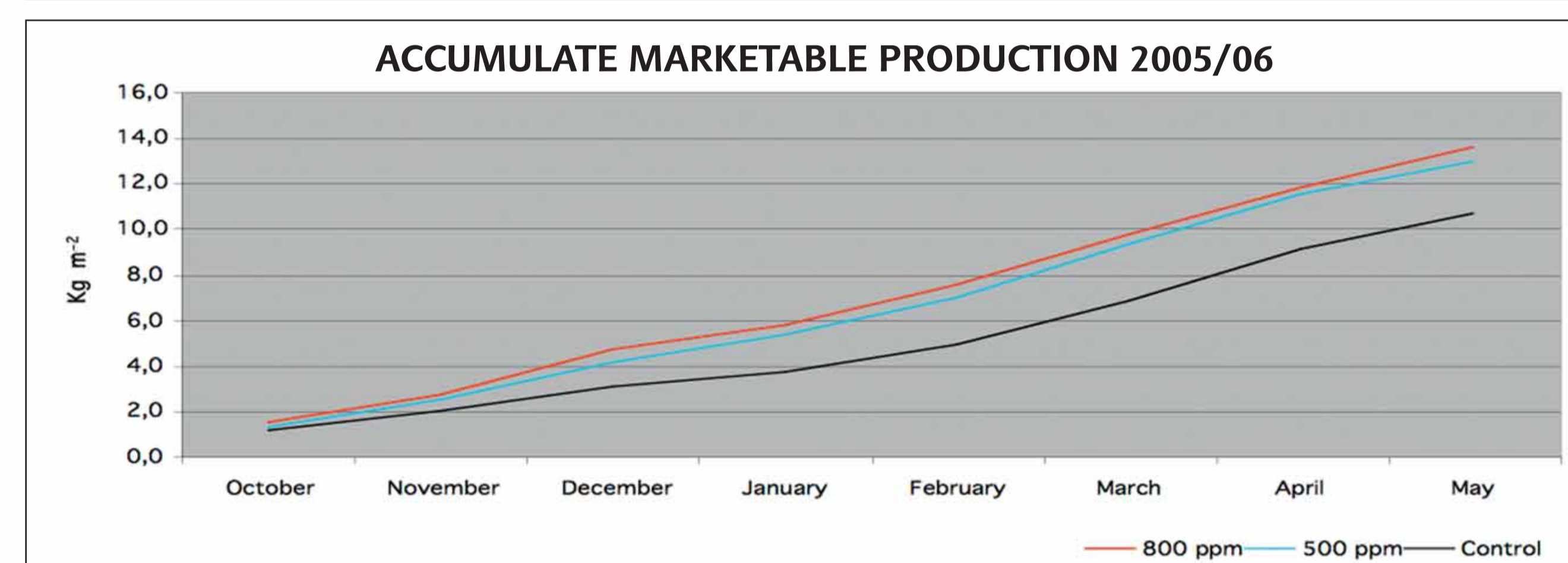
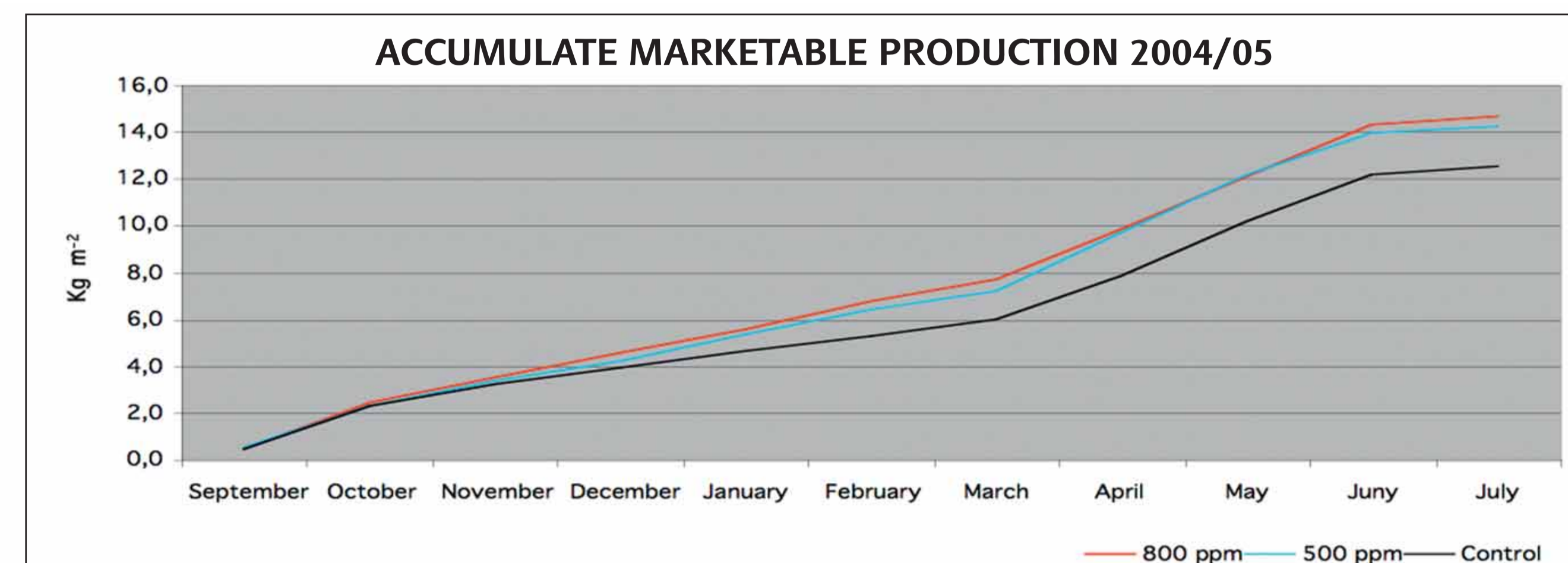
The eggplant cultivars 'Cintia', 'Cava' and 'Cristal' were used. Plants were grown in soilless system, using rock wool like substrate under three glasshouses Venlo type, with the same climate management. The density of plantation was 2,5 plants m⁻² and prune to two branches was realized.



CO₂ enrichment from compressed CO₂ was applied through perforated plastic pipes. Two CO₂ concentrations, 500 and 800 ppm, were compared, maintaining a control with the natural CO₂ concentration. These concentrations were monitored by an infrared analyzer and controlled by a computer. When the windows were opened more than 20% the injection stopped.

The experiment was performed in a split-plot design with CO₂ concentration in the main plots and cultivars treatments in the subplots, with 12 plants per experimental unit. The minimum nocturne temperature was 15 °C.

RESULTS



In the early marketable yield (February) there were statistically differences at P<0.01 between CO₂ concentrations (500ppm and 800 ppm) and the control during both years. In 2004/05 they were found statistically differences at P< 0.05 for the final marketable yield between the control and the diverse CO₂ concentrations. Meanwhile in 2005/06 the statistically differences founded were at P<0.01 between the control and CO₂ concentrations again. There were no statistically differences in unmarketable yield in both years.

In the monthly average weight there were no statistically differences except in February for 2004-05 and December for 2005-06. The statistically differences in this months was between 800 ppm and the control (P<0.01)

In both seasons the most productive cultivars were 'Cava' and 'Cristal'. In 2005/06 'Cava' and 'Cristal' achieved the highest final yield and there were statistically differences at P<0.05 between those two and 'Cintia'.

The greatest efficiency of irrigation expressed in kg of commercial product m⁻³ of nutritional solution was higher in the carbonic fertilized greenhouses than in the control greenhouse.

CONCLUSIONS

In both seasons the best result for early and final yield was obtained under the CO₂ fertilized greenhouses, without statistically differences between 800 and 500 ppm.

