

**SHE 2012**

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UNDER THE AEGIS OF ISHS  
AND THE NATIONAL EUROPEAN HORTICULTURAL SOCIETIES



# BOOK OF ABSTRACTS

HORTICULTURE  
IN A CHANGING  
WORLD

A SYMPOSIUM  
TO COVER ALL  
RESEARCH AREAS  
RELEVANT TO  
HORTICULTURE  
IN EUROPE

2<sup>ND</sup> SYMPOSIUM ON  
**HORTICULTURE IN EUROPE**  
ANGERS, FRANCE **1<sup>ST</sup> ▶ 5 JULY 2012**



g<sup>-1</sup> 100 g<sup>-1</sup> FW), but the highest content of Ca and K were in plants growing on coconut fiber (respectively 41,32 and 434,8 mg.100 g<sup>-1</sup> FW). However, the accumulation of nitrate in leaves of endive was lowest in plants grown on wood fiber medium. In the remaining other substrates and investigated cultivars, nitrate concentrations were below the maximum acceptable level for human consumption too. The content of phenolic acids and antioxidant activity was not depend on the substrate differences, and depended only on cultivar. Bleached plants contained far fewer of the examined components and had lower antioxidant activity, while were characterized by similar nitrate acumulation of nitrate as the not bleached one. The highest antioxidant activity was observed in plants of 'Kethel' cultivar.

Keywords: coconut fiber, wood fiber, rockwool, bleaching, FRAP, DPPH\*, nitrates.

### 3D Climate Optimization humidity, temperature, ventilation, light, CO2

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Conventional climate control systems, wrongfully assume that the climate in a greenhouse is uniform, while in practice large climate gradients occur.

With 3D Climate Optimization the entire three-dimensional climate profile (e.g. humidity, temperature, air flow, light, CO2) is estimated using a wireless sensor network in combination with an advanced 3D climate model. The climate profile is then optimized by a combination of global and local actuators, using distributed model predictive control. This way, it is possible to efficiently create different climate zones in one greenhouse, enabling multi-layer cultivation, while saving energy.

### Technology update on greenhouse horticulture in Portugal

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Portugal has excellent natural conditions for year round production of fruits, vegetables and flowers under protected cultivation. Favourable climate conditions (radiation, insolation, mild winter temperatures) combined

with relatively low labour costs and soil prices as compared to northern European countries are driving the attention of both national and foreign investors to this subsector of the Portuguese agriculture. Tomato, lettuce, berries, melon, and green beans account for 75% of the area under protected cultivation, while carnation, rose, and gerbera are among the most important ornamental crops. Protected cultivation in Portugal started in the 1960's, in the Algarve (South of Portugal) and it was based on "chapel" type greenhouses, with wooden structures covered with short duration plastics. In the last three decades, production expanded to the North, along the Atlantic coast, and these simple greenhouses have been replaced by plastic tunnels and by greenhouses with metal structures. Nowadays, the total protected cultivation area is estimated in 2200 ha, of which about 75% correspond to single and multiple plastic tunnels area. Farm organizational structure and technological trajectory of the last decade are characterized by increased greenhouse area per grower, higher volume/covered area ratio greenhouses, and progressive transition to soilless cultivation. Some recent high-tech investments were done in glasshouses with closed hydroponic systems and co-generation technology. Nevertheless, the use of glasshouses, or modern plastic greenhouses with computerized active climate control, heating, artificial lighting, and carbonic fertilization remains minor, due to high costs of equipments and energy, and limited experimentation for local conditions. Portuguese horticulture must account for the increased competition from Spain and The Netherlands, but also from other emerging competitors such as Morocco. Modern production structures and climate control, combined with environmentally friendly practices that permit to increase yield and quality and minimize environmental impacts are needed. The modernization of this sector requires investments in education as well as more professionalized associations, industry and services. A SWOT analysis is presented for the most important greenhouse production areas. General guidelines for more competitive and environmental sustainable production are provided.

Key words: protected cultivation, fruits, vegetables, ornamentals, SWOT analysis.

## The application of some fungicides as alternative growth retardant in pot plant production

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In consequence of the connection of European Union, traditional plant growth retardants will be withdrawn in Hungary. Therefore, we tested the dwarfing effect of several fungicides, Bumper 25 EC and Mirage 45 EC, Caramba SL and Regalis WG comparing to Alar 85 and Cycocel 720, traditional growth retardants. Testplant was *Ismelia carinata*, a decorative ornamental annual plant. The 6 weeks old, once pinched back plugs were treated 3 times 3 weeks intervals with the given chemicals with the concentration advanced by the producer. The height of plants, the diameter of plant bush, number of branches, number and diameter of flowers were measured. Caramba had the best retardant effect on the plant height. The other chemicals didn't resulted statistically proved shorter plants comparing to the control. The effect of Caramba was better comparing to Alar and Cycocel too. With the use of Caramba the average plant height didn't reach 20 cm, while control plants overgrew the 50 cm. None of the treatments had positive effect on the bush diameter. In the aspect of number of branches none of the treatments had difference comparing to the control. The treatments hadn't effect on the leaf length at all. The treatments hadn't significantly proved effect on the number of flowers comparing to the control. Alar and Regalis treatments had significantly positive effect on flower bud number comparing to the control and the other treatments. The treatments hadn't statistically proved effect on the flower diameter. Mirage had an unequal effect on the measured parameters the use of this fungicide as retardant is contraindicated. Rising the concentration of Alar and Regalis we found that all examined concentrations retardant effect on plant height but the leaf size and bush diameter stood equal. Higher (4 g/l) concentration of Alar had positive effect on flower bud number.

Keywords: growth control, *Ismelia carinata*, annual plants, floriculture, greenhouse, daminozide, metconazole, chlomequat, prohexadion-Ca.