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Soilless saffron cultivation – first results

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INTRODUCTION

Saffron (*Crocus sativus* L.), belonging to the Iridaceae family, is the most expensive spice in the world, with the stigmas being the more economically attractive part of the plant. The inability to mechanize cultivation and harvesting operations and lower yields due to the climate crisis promoted soilless cultivation in a controlled environment. The aim of the study was to examine the effects of aeroponic system (AE) (no substrate) and hydroponic system of saffron cultivation on growth, flowering and bulb formation.

MATERIALS E METHODS

Two substrates, in a hydroponic system, coconut fiber (C) and coconut fiber/agriperlite in the ratio 50:50 by volume (C+A) (Fig.1) and polystyrene aeroponics module (two 40 x 40 by two-meter-long) powered through a 0.5 hp pump (Fig.2) were evaluated. A randomized block experimental design with 4 replications was utilized.

The following measurements were taken: flowering time, flower number, flower and stigma dry weight, leaf area, plant height, corm weight, diameter, and number of secondary bulbs.

RESULTS

Significant results were obtained regarding:

- percentage of flowering versus number of corms, higher in AE (67%) than in hydroponic substrates (14%);
- flowers and stigmas dry weights, higher in AE (Fig. 3);
- leaf area, that in C was about two times more than AE, and 1,5 times than C+A.

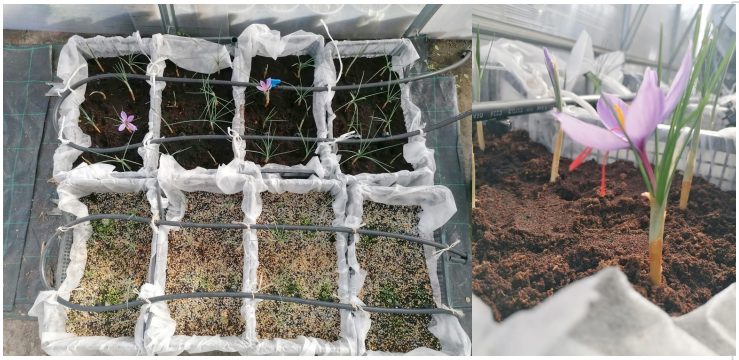

Figure 1 Hydroponic system (two substrates)

Figure 2 Aeroponic module

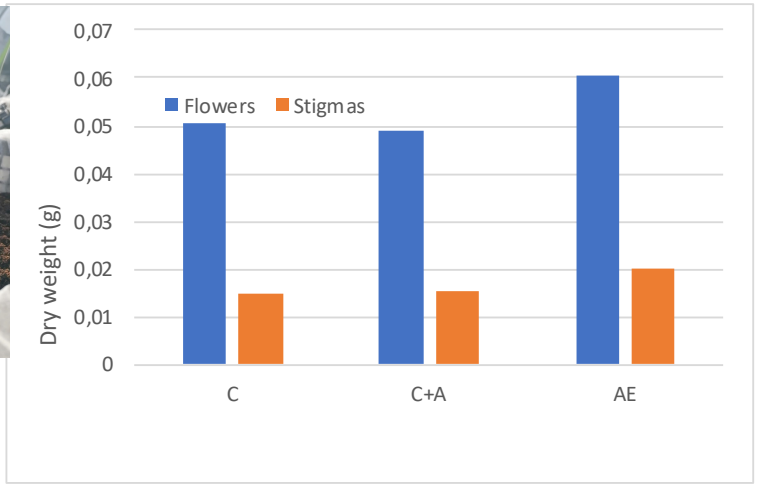

Figure 3 stigmas and flower dry yield

CONCLUSIONS

From the results, the C substrate seem to be the most suitable for bulb development, having promoted greater vegetative development of the plants, and the C+A appear less suitable for the saffron soilless cultivation. From the initial results obtained, the very late cultivation starts (late November) resulted in a significant reduction in flowering time compared to earlier sowing (September) in trials conducted in previous studies (data not showed).

References/acknowledgement

CSEI Catania and PSR Sicilia 2014/2020 - Misura 16 sottomisura 16.1 - "Nuove prospettive per lo Zafferano dell'Etna, dalla tavola alle applicazioni cosmetiche e nutraceutiche" - Fondo Europeo Agricolo per lo Sviluppo Rurale. For the Aeroponic system the VC Automation s.r.l.s. di Di Stefano Carmelo – Ispica (RG)

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