

## **Growth and flowering response of cut chrysanthemums grown in restricted root conditions**

### **Abstract**

Rooted cuttings of chrysanthemum (*Chrysanthemum morifolium* cv. Reagan White) were grown in seedling trays of three differing volumes (34, 73, and 140 ml) and containing three different substrates (coconut peat, burnt rice husk, and coconut peat:burnt rice husk). Growth and flowering of nine treatments were observed and compared with soil culture as the control. Burnt rice husk had the highest bulk density and it was strongly alkaline (pH 8.75), while coconut peat showed the highest water content and cation exchange capacity, with slightly acidic property (pH 5.26). Plant height and total leaf area of chrysanthemums reduced significantly when substrate volume decreased, regardless of substrate type. Chrysanthemums grown in a substrate volume of 140 ml, with any substrate, had a larger root surface area than those grown in soil. Relative water content and macro elements in leaves did not differ significantly between control and other treatments. Chrysanthemums grown in restricted root volume had higher proline levels than control, throughout growth period, indication of plant stress. Restricted root volume reduced the total dry weight of chrysanthemums by more than 38%. Root:shoot ratio of all treatments was significantly higher than control but it did not differ between treatments. The number of flowers reduced more than 29%, depending on the substrate volume. Number of petals, days to harvest and vase life were not affected by restrictions. Chrysanthemums grown in 140 ml of coconut peat mix with burnt rice husk had better performance than other treatments. Cut chrysanthemums can be grown under restricted root volume constraints but stressful conditions result and both growth and flowering are affected.

**Keyword:** Hydroponics; Soilless culture; Cut flower