

ASHS ABSTRACTS 1993

The following are abstracts for talks and posters that will be presented by the floriculture group at the annual American Society for Horticultural Science meetings in Nashville, Tennessee, July 25 - 29, 1993. We hope this will give you an idea of some of the research that is going on at the University.

GENETIC TRANSFORMATION OF AFRICAN VIOLET USING THE BIOLISTIC PROCESS

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Genetic transformation of cut roses may greatly facilitate cultivar improvement programs by shortening the time required to introduce new genes into elite germplasm. The biolistic process offers a very promising method for the genetic transformation of roses.

Several factors that have a significant affect on transformation efficiency were examined in an effort to optimize the biolistic process for gene transfer in roses. The factors examined were type of tissue (leaf segments, petioles, callus, etc.), bombardment distance, the number of bombardments, DNA construct and microcarrier velocity.

Two constructs of the reporter gene, -GUS, were examined to determine which construct provided the highest level of expression. Only the construct designated pBI 426 provided -GUS positive cells in leaf and callus tissue. This construct was used in all subsequent experiments.

Experiments to find the optimum number of bombardments and rupture disk pressure were carried out using leaf and callus tissue and 1.6 μ m gold particles. The optimum number of bombardments per sample was three for leaf tissue. The optimum rupture disk pressure was 900 p.s.i. for leaf and callus tissue.

Meristems of axillary buds are being bombarded in situ on stem-bud explants. These should yield transgenic rose plantlets in 3 to 4 weeks.

DAY/NIGHT TEMPERATURE EFFECTS ON *PELARGONIUM ZONALE* L. FLOWER DEVELOPMENT AND LEAF UNFOLDING RATE

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Rooted cuttings of *Pelargonium zonale* cv 'Fantasy' were planted in 12.7 cm pots and were placed in glasshouses maintained as 12, 18, 24 or 30 + 2C. Plants were rotated among glasshouses as 0800 and 1700hr each day (9 hr photoperiod) to yield 16 day/night temperature (DT/NT) treatments. Data were collected on primary stem node number after 60 days. Total flower number per inflorescence, flower diameter, peduncle length and inflorescence, peduncle and flower dry weight were collected when all flowers were visible on an inflorescence. Flower number per inflorescence increased exponentially from 23 to 52 flowers/inflorescence as the average daily temperature (ADT) decreased from 30 to 12C. Inflorescence and peduncle dry weight decreased exponentially from 1.05 to 0.28g and 0.34 to 0.05g, respectively as ADT increased from 12 to 30C. Flower dry weight and diameter were not affected by temperature treatments. Peduncle length increased from 9.2 to 17.1 cm as the difference between DT and NT (DT-NT) increased from -12 to +12C. Node unfolding rate increased as temperature increased from 12 to 24 then decreased as temperature increased to 30C.

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