

June 6, 2017

MEMORANDUM

TO: Horticultural Science Faculty, Staff and Graduate Students

FROM: John M. Dole, Chair of Advisory Committee

SUBJECT: **MS Seminar and Thesis Defense for Nathan J. Jahnke**

Nathan Jahnke will present his MS seminar on Tuesday, June 20, 2017 at 9:00 am in 121 Kilgore Hall. The seminar will be followed by his defense. Everyone is encouraged to attend the seminar.

ABSTRACT

JAHNKE, NATHAN J. Preventing Postharvest Stress and Disease of Unrooted Cuttings and Liners. (Under the direction of Dr. John M. Dole)

Vegetative cuttings are one of the most cost and time effective sources of plant material used for propagation around the world. However, postharvest environments while shipping these cuttings, remains one of the least controllable factors in floriculture production. This research looked at how unrooted cuttings and liners were affected by three postharvest factors: ethylene (ET), *Botrytis cinerea*, and storage temperature to preserve plant health and propagation success. Ivy geranium cultivars 'Great Balls of Fire Light Lavender' and 'Great Balls of Fire Lavender' were more sensitive to ethylene treatments and susceptible to botrytis than zonal cultivars. Zonal geraniums had measureable differences in leaf yellowing and susceptibility with "Patriot Bright Red' and 'Americana Coral' being less susceptible to yellowing and botrytis damage than 'Patriot Rose Pink', 'Tango Tango', Tango Dark Red, and 'Americana Red'. Pre-treating shoot tip cuttings of geranium with $1.0 \mu\text{L}\cdot\text{L}^{-1}$ ET before inoculating with botrytis increased the amount of botrytis damage after 4 days of incubation. 1-methylcyclopropane increased ethylene production, but reduced leaf yellowing and kept botrytis damage to levels comparable to control treatments. Geranium rooted cuttings (liners) developed botrytis after 4 days of storage at 15°C , which was comparable to inoculated treatments of 10^4 and 10^6 spores/mL of botrytis after 6 days of storage. Storing cuttings of *Euphorbia pulcherrima* cultivars 'Prestige Red' and 'White Star' for 8 days at 10°C significantly reduced fresh weight, rooting, and carbohydrate content. Multivariate correlation showed glucose and reducible sugars (fructose + glucose) to be the best predictors of rooting. This research demonstrated that cultivars of *Pelargonium* and *Euphorbia* have differences in shipping durability. Extended shipping durations and variable temperatures induce dehydration, carbohydrate loss and disease of unrooted cuttings and liners.