

at 30/20 °C germinated significantly better than seeds matured at 20/10 °C, 100% for EVE 30/20 °C compared to 9% for those produced at 20/10 °C and 80% for DGB 30/20 °C compared to 24%. When seeds from all lots were imbibed in 20 mM silver thiosulfate (STS), an inhibitor of the ethylene action, germination was lower than that of seeds incubated in water. Ethylene production in DGB and EVE seeds matured at 30/20 °C was higher than that in seeds, matured at 20/10 °C. Ethylene production in DGB and EVE seeds matured at 20/10 °C was higher at 20 °C than at 35 °C. Conversely, seeds, matured at 30/20 °C produced more ethylene at supraoptimal temperature than at optimal temperature. For the two cultivars, there was no difference in response to increasing ACC concentrations between seeds matured at 30/20 °C and 20/10 °C. These results suggest that the ability of lettuce seeds matured at 30/20 °C to germinate at high temperature is related to their ability to produce more ethylene and to maintain ethylene production at supraoptimal temperature.

10:30 Lettuce (*Lactuca sativa* L.) Seed Quality Evaluation Using the Saturated Salt Accelerated Aging Test and the Seed Vigor Imaging System

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Seed quality assessment is crucial for outstanding performance of lettuce (*Lactuca sativa* L.) plants. The standard germination test has been used extensively to evaluate seed quality in lettuce. However, this test is conducted under ideal conditions, which are rarely found in the field. Consequently, it is necessary to evaluate other tests that better indicate how seeds might perform under a wider range of environmental conditions. Experiments were conducted in the Seed Biology Laboratory at The Ohio State University (OSU, Columbus, OH). Six varieties of lettuce differing in seed coat color were evaluated in this study. Each variety included four different seed lots making a total of 24 treatments. Standard germination, saturated salt accelerated aging (SSAA, 48 and 72 h), greenhouse emergence and automated seed vigor tests were used to assess seed quality. Results indicated that lettuce varieties with white coated seeds had lower germination percentage, greater seed deterioration as indicated by the SSAA test, and lower seed vigor as determined by the OSU Seed Vigor Imaging System (SVIS) compared to black coated seeds. Similarly, white coated seeds consistently showed a higher fungus incidence during SSAA compared to black coated seeds. Seed lots having an initial germination percentage greater than 98% were slightly affected by SSAA (48 h) with 11.5% reduction. However, seed lots having germination percentages lower than 80% resulted in a 40% reduction in germination after 48 h SSAA. A similar trend was observed when seeds were subjected to SSAA for 72 h. These findings demonstrate that, in general, white-coated lettuce seeds display poorer quality than dark coated lettuce seeds. Both the SSAA and SVIS vigor assessment systems were superior to the standard germination test in evaluating lettuce seed quality of both seed coat colors.

10:45 Pollinator Effects on Seed Production in Greenhouse-Grown Herbaceous Ornamental Plants

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Seeds of herbaceous ornamental accessions conserved by the United States Department of Agriculture's National Plant Germplasm System are traditionally produced in summer field cages with honey bees (*Apis mellifera*) when pollinators are required. Efficient methods to produce high-quality seed in sufficient quantity in greenhouses may allow for year-round seed production. The effects of pollinating insects on number and weight of seed produced were studied in greenhouses at the Orna-

mental Plant Germplasm Center in 2002 in a randomized complete block experiment with two replications. Honey bees or bumblebees (*Bombus impatiens*) were used as pollinators; one colony was placed in each greenhouse compartment. Controls included greenhouse compartments with no pollinator and field cages with honey bees. Cultivars evaluated included *Cosmos sulfureus* 'Bright Lights', *Melampodium paludosum* 'Showstar', *Rudbeckia hirta* 'Indian Summer', *Zinnia elegans* 'Rose Starlet', *Antirrhinum majus* 'Rust Resistant Yellow', *Dianthus chinensis* 'China Doll', and *Phlox drummondii* 'Paloma Violet with Eye'. Seeds were harvested, cleaned, counted, weighed; 1000-seed weights were calculated. *Cosmos*, *Melampodium* and *Rudbeckia* yielded more seeds per plant on average in field cages than in greenhouse compartments, and *Antirrhinum*, *Dianthus* and *Phlox* produced more seed on average with greenhouse pollination. *Zinnia* produced similar seed quantities in all treatments. In the greenhouse, *Antirrhinum*, *Cosmos*, *Dianthus*, *Melampodium*, *Rudbeckia* and *Phlox* yielded more seed on average with bumblebee pollination than with honey bees or no pollinators. Each genus had similar 1000-seed weights on average in all treatments. Results suggest that bumblebee pollination in greenhouses may be an alternative method for seed production from herbaceous ornamentals.

10:00 am–11:45 am ORAL SESSION 34

556A

Commercial Horticulture

Moderator: *To Be Announced*

10:00 Evaluation of Commercial Phytophthora Resistant Peppers

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Phytophthora blight of peppers caused by the soil-borne fungus, *Phytophthora capsici*, is the most destructive and widespread disease of peppers in New Jersey. Two new hybrids, Paladin and Aristotle, have been developed with resistance to *Phytophthora* blight. These disease resistant hybrids are the only option for some growers in northern New Jersey with limited land available for production. Trials were conducted (1999-2002) to compare the performance of Paladin and Aristotle to standard commercial cultivars. Paladin and Aristotle produced fruit of excellent quality and high yields in the trials.

10:15 Fumigant and Herbicide Combinations for Pest Management in Plasticulture Production of Fresh Market Tomato and Cucumber

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Methyl bromide (MB) is commonly used to manage weeds, pathogens, nematodes and soilborne insects which limit crop productivity. MB phase-out, coupled with the essential need for weed control, presented an opportunity to evaluate new chemical methods of weed control. Combinations of pre-plant alternative fumigants, metam-sodium (MS) and Telone-C35 (TC), and herbicides should give the desired control of pests in cucumber and tomato. We aimed to identify a fumigant or fumigant/herbicide combination effective at controlling weeds, but not injurious to the crop. A split-plot design used three soil treatments, TC (35 gal/A), MS (75 gal/A) and non-fumigated (NF), as main plots and 12 weed management treatments as subplots. Weed management treatments for each crop will be discussed in detail. Cucumber yields differed among fumigants in both years. In 2000, both TC and MS improved control of purslane and carpetweed compared to NF control plots. In 2000 and 2001, hand weeded