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ORAL PRESENTATION AND POSTER SESSION ABSTRACTS ON VEGETABLE GRAFTING
(ALPHABETICAL BY LAST NAME OF FIRST AUTHOR)**

EFFECT OF PALMER AMARANTH (*AMARANTHUS PALMERI*) DENSITY ON YIELD OF GRAFTED AND NONGRAFTED WATERMELON ON WEED SEED PRODUCTION

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ABSTRACT

Watermelon grafting was initially adopted for management of diseases caused by soilborne pathogens, and there is evidence that grafted plants confer additional benefits such as tolerance to drought, salinity, and suboptimal temperatures. However, there is little research available to compare weed-competitive ability of grafted and nongrafted watermelon. Field studies were conducted at the Horticultural Crops Research Station in Clinton, North Carolina in 2015 and 2017. "Exclamation"™ triploid (seedless) watermelon was used as the scion for all grafted plants. Grafting treatments included two interspecific hybrid squash rootstocks (ISH) rootstocks "Carnvor"™ and "Kazako"™, as well as nongrafted Exclamation as the control. Weed treatments included Palmer amaranth at densities of 1, 2, 3, and 4 Palmer amaranth per triploid watermelon vine (0.76 m⁻¹ row) as well as a weed-free control. Both grafting treatment and Palmer amaranth density had a significant effect ($P < 0.05$) on marketable yield and fruit number. Watermelon yield reduction was described as a rectangular hyperbola model, and 4 Palmer amaranth 0.76 m⁻¹ row reduced marketable yield 41, 38 and 65% for Exclamation, Carnivor and Kazako, respectively. Neither grafting treatment nor Palmer amaranth density had a significant effect on SSC or on the incidence of hollow heart in watermelon fruit. Total Palmer amaranth seed number was similar across weed population densities, but seed number per female Palmer amaranth decreased according to an exponential decay curve. Thus, increasing weed population densities resulted in increased intraspecific competition among Palmer amaranth. While grafting may offer benefits regarding disease resistance and tolerance to abiotic stresses, there is no immediate benefit regarding weed-competitive ability and a consistent yield penalty was associated with grafting, even in weed-free treatments.