

Evaluation of critical weed-free period for three sweetpotato (*Ipomoea batatas*) cultivars

Sweetpotato (*Ipomoea batatas* L.) is a staple crop that provides nutritional benefits to humans globally, but it is subjected to yield loss when competing with weeds, especially during the early stage of establishment. Yield loss can vary widely based on the cultivar, production environment, weed species, and management techniques. To address this challenge, we conducted field research at the Samuel G. Meigs Horticulture Research Farm, Lafayette, IN, and at the Southwest Purdue Agricultural Center, Vincennes, IN, in 2022 to determine the effect of sweetpotato cultivar on the critical weed-free period. The experiment was a split-plot design, with weed-free interval treatments as the main plot factor and cultivar as the subplot factor. The three cultivars used were Covington, Monaco, and Murasaki. Weeds were removed by hand and allowed to establish and compete with the crop beginning at 0, 14, 21, 28, 35, or 42 days after transplanting (DAP). As weed-free interval increased from 0 to 42 DAP, predicted total yield increased from 19 kg ha⁻¹ to 20,540 kg ha⁻¹ for Covington, 3 kg ha⁻¹ to 11,407 kg ha⁻¹ for Monaco, and 125 kg ha⁻¹ to 13,460 kg ha⁻¹ for Murasaki at the Lafayette location. At Vincennes, as weed-free interval increased from 0 to 42 DAP, predicted total yield increased from 14,664 kg ha⁻¹ to 33,905 kg ha⁻¹ for Covington, 4,817 kg ha⁻¹ to 18,059 kg ha⁻¹ for Monaco, and 12,735 kg ha⁻¹ to 21,105 kg ha⁻¹ for Murasaki. A threshold of ≤10% total yield reduction was achieved by maintaining sweetpotatoes weed-free 24 DAP for Covington, 20 DAP for Murasaki, and 33 DAP for Monaco.

**Effects of in-row spacing on weed suppression and yield of ‘Covington and ‘Monaco’
sweetpotato (*Ipomoea batatas* L.)**

Organic sweetpotato growers have limited effective weed management options and the majority rely heavily on in-season between-row cultivation and hand-weeding, which are time-consuming and costly. To address this challenge, studies were conducted at the Samuel G. Meigs Horticulture Research Farm, Lafayette, IN and at the Southwest Purdue Agricultural Center, Vincennes, IN, in 2022 and 2023 to determine the effects of in-row plant spacing and cultivar selection on weed suppression and organic sweetpotato yield. The experiment was a split plot design, with in-row spacings of 20, 30, and 40 cm as the main plot factor and sweetpotato cultivar (‘Covington’ and ‘Monaco’) as the subplot factor. In 2023, sweetpotato canopy at 5 WAP decreased as in-row spacing increased from 20 to 40 cm. Canopy of the Monaco cultivar was significantly (62%) greater than Covington (44%). In-row spacing had no statistically significant effect on weed densities at 4, 5, and 6 WAP. However, numerically weed density increased from 28 to 46 plants m⁻² for Monaco and 33 to 46 plants m⁻² for Covington as in-row spacing increased from 20 to 40 cm. As in-row spacing increased from 20 to 40 cm, total sweetpotato yield pooled across both locations in 2023 decreased from 30,223 to 21,209 kg ha⁻¹ for Covington and 24,370 to 20,848 kg ha⁻¹ for Monaco. Results showed that as in-row spacing increased from 20 to 40 cm, jumbo yield increased for both cultivars. Findings from this study suggest that an in-row spacing of 20 cm will provide better yield than the standard spacing, 30 cm, for both Monaco and Covington cultivars and could reduce weed interference through more rapid sweetpotato canopy closer.