**Objective:** To determine the effect of cover crops (wheat and Austrian pea) and wicking applications of GreenMatch herbicide on Palmer amaranth control and yield and quality of ‘Covington’ sweetpotato.

**Materials and Methods:** A study was conducted in 2013 at the Horticultural Crops Research Station (35°1′12″N, 78°16′48″W) near Clinton, NC. A one acre block was divided in half and winter wheat was planted on one half and Austrian pea was planted on the other half. Before planting sweetpotato the cover crops were sprayed with paraquat and then turned under with a disc. ‘Covington’ sweetpotato transplants were harvested from field propagation beds by hand cutting plants approximately 2.5 cm above the soil line. Non-rooted ‘Covington’ slips 18 to 28 cm long were transplanted mechanically using a tractor-mounted sweetpotato planter on July 10, 2013 into a field with historically high Palmer amaranth densities. Planting was delayed due to the abnormal weather conditions in the spring consisting of lower than normal temperatures and high rainfall amounts which delayed slip (transplant) production. Generally sweetpotato is planted in NC from mid-May to late June. In-row spacing was 25 to 30 cm and planting depth was 10 to 12.5 cm. Soil type was an Orangeburg loamy sand (fine-loamy, kaolinitic, thermic Typic Kandiudults) with 0.6% humic matter and pH 6. Plots were three rows each 1.1 m wide by 12.2 m long. The first row of each plot was a nontreated buffer row. The second and third rows of each plot were treated. Paraquat (Gramoxone Inteon) and d-limonene (Avenger AG) were wick-applied to control Palmer amaranth. Treatments consisted of wick-applied d-limonene solution (50% Avenger AG v/v with water) applied at 2, 3, or 4 weeks after transplanting (WAP) alone or in sequential; paraquat solution (50% Gramoxone Inteon v/v with water) was applied at 2 or 3 WAP for comparison. Weed-free and weedy checks were included for comparison. Paraquat and d-limonene treatments were applied using a 2-row LMC Cross-Wick Bar applicator (LMC Cross-Wick Bar) 2.5 m wide. A polyvinyl chloride pipe (PVC) 7.6 cm wide and 2 m long was mounted on a sealed metal frame which functioned as a reservoir for herbicide solution. Eight pieces of rope 40 cm long were positioned on the front of the system in a V-shape and were connected to the PVC reservoir via a pressurized plastic tube. The sealed frame that held the wick was filled with compressed air which provided pressure to maintain wick saturation. Flow rate was adjusted by the use of a pressure knob connected to one end of the PVC reservoir. The entire unit was tractor-mounted 30.5 cm above the sweetpotato canopy. Treatments were applied in two passes across both directions (front to back, back to front) for each plot at 3.5 km h-1, with the tractor in 3rd gear, 1st range, and with an output of 323 L ha-1. Flow rate for paraquat and d-limonene treatments was maintained at approximately 15 and 22, respectively, according to manufacturer recommendations. A higher flow rate was required for d-limonene treatments because d-limonene is an essential oil with a viscous consistency, higher than that of water. Target wick height for each application was to achieve coverage of at least 50% of Palmer amaranth foliage above the sweetpotato canopy. Treatment heights varied due to rapid Palmer amaranth growth. Additional height adjustments were made manually as needed to increase application accuracy and accommodate for various sizes of Palmer amaranth.

Experimental design was a randomized complete block with 4 replications. Data collected included visual crop injury and Palmer amaranth control (0% = no injury or no control, 100% = crop death or complete control). Although sweetpotatoes may be harvested 90 to 120 DAP, generally we harvest at approximately 110 DAP. However with the delayed planting it was necessary to dig the sweetpotates prior to this time to avoid rotting of the sweetpotatoes in the field which is caused by low temperatures and increased rainfall over the season. Therefore sweetpotato storage roots were harvested 105 days after planting using a tractor-mounted single row chain digger and hand graded into jumbos (> than 8.9 cm in diameter), No. 1 (> than 4.4 cm but < 8.9 cm), and canners (> 2.5 cm but < 4.4 cm) (USDA 2005). Marketable yield was calculated as the sum of jumbo, No. 1, and canner grades.

**Results:** Unfortunately results from this study are not quite as expected. Several factors influenced the results. Water stood in the first replication for several days at a time during several periods in the season. It appeared that the cover crops did not have an effect on Palmer amaranth emergence and growth. Visually, weed population appeared to be similar. Palmer amaranth control from Avenger Ag was less than expected (<10%) which was inconsistent with results from 2012. Sweetpotato plots were harvested and the greatest yields were observed in the weed-free checks. Generally yield in the paraquat treatments was greater than yield from Avenger Ag.