

**BEHAVIOR AND CONTROL OF PURPLE (*Cyperus rotundus*)
AND YELLOW NUTSEDGE (*C. esculentus*) WITH CGA-362622**
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Abstract

A field study conducted by North Carolina State University observed that CGA-362622 (proposed trifloxysulfuron sodium) postemergence (POST) controlled purple (*Cyperus rotundus*) and yellow nutsedge (*Cyperus esculentus*) as well as one application of Roundup Ultramax (glyphosate) early postemergence (EPOST). The addition of a late season MSMA (Buena Vista) post-directed treatment (LAYBY) increased purple and yellow nutsedge control to greater than 95%, which was equivalent to Roundup Ultramax applied EPOST and post-directed (PDS). Greenhouse studies observed that CGA-362622 EPOST fb MSMA LAYBY reduced purple and yellow nutsedge shoot and root dry weights equivalent to Roundup EPOST fb MSMA LAYBY. Thus, lab studies were conducted to evaluate the absorption, translocation, and metabolism of ¹⁴C-CGA-362622 in purple and yellow nutsedge. The study was a random complete block design with three replications of treatments and the experiment was repeated in time. Treatment structure consisted of a split-split plot design with five harvest timings (4, 24, 48, 72, and 96 h after treatment (HAT)) as the main plots, two nutsedge species (purple and yellow) served as subplots, and seven portions of quantified radioactivity (leaf wash, treated leaf, above treated leaf, below treated leaf, other leaves, tubers, and roots) were sub-subplots. CGA-362622 was applied POST at 0.10 oz/acre (0.0048 lb ai/acre) to purple and yellow nutsedge at the six-leaf stage, (4-5 inches in height) immediately before spotting with radioactive material. Five µL droplets consisting of CGA-362622 dissolved in HPLC-grade water with 0.25% v/v nonionic surfactant and containing 2.0 and 5.1 kBq radioactivity were spotted on a 1-cm² area on the middle-adaxial surface of the third fully expanded leaf on both species for absorption/translocation and metabolism experiments.

Less than 48 and 52% of ¹⁴C-CGA-362622 was absorbed after 96 HAT by purple and yellow nutsedge. Absorption of ¹⁴C-CGA-362622 peaked between 4 and 24 HAT. Both nutsedge species translocated appreciable herbicide (30%) out of the treated leaves. Translocation was both acropetal and basipetal, with at least 25% transported basipetally. Neither nutsedge species translocated over 4% of applied radioactivity to the tubers and roots. Most of the metabolites found in the nutsedge species were more polar than CGA-362622 and averaged 69 and 61% of the absorbed radioactivity in purple and yellow nutsedge. The half-life of CGA-362622 was estimated at 4 h in both purple and yellow nutsedge. The basis of susceptibility of purple and yellow nutsedge to CGA-362622 is not clear, and does not appear to be solely related to metabolism. Further research is needed to determine if the metabolites are hebicidally active.