

**CHANGES IN ENDOGENOUS CAROTENOID POOLS OF TURF AND WEED  
SPECIES AS AFFECTED BY MESOTRIONE AND ENVIRONMENTAL  
CONDITIONS**

A Thesis Presented for the Master of Science Degree.

The University of Tennessee, Knoxville.

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## THESIS ABSTRACT

Mesotrione, a carotenoid biosynthesis inhibiting herbicide, was evaluated for its use in turfgrass systems. Experiments were conducted to evaluate smooth crabgrass (*Digitaria ischaemum*) control with preemergence applications of mesotrione plus prodiamine. Experiments evaluated the influence of application timing on the efficacy of mesotrione plus prodiamine combinations and compared mesotrione plus prodiamine to current preemergence and early-postemergence herbicide treatments used for control of crabgrass. Greenhouse studies were conducted to compare the effects of foliar, soil, and soil plus foliar application of mesotrione on yellow nutsedge (*Cyperus esculentus*) and large crabgrass (*Digitaria sanguinalis*). Research was conducted in environmental growth rooms to investigate the effects of light intensity and temperature on perennial ryegrass (*Lolium perenne*) and large crabgrass carotenoid composition following mesotrione application.

To the Graduate Council:

I am submitting herewith a thesis written by James D. McCurdy entitled "Changes in Endogenous Carotenoid Pools of Turf and Weed Species as Affected by Mesotrione and Environmental Conditions." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Plant Science.

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J. Scott McElroy, Major Professor

We have read this thesis and recommend its acceptance:

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Carl E. Sams

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John C. Sorochan

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Dean A. Kopsell

Accepted for the Council:

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Carolyn R. Hodges, Vice Provost  
and Dean of the Graduate School

(Original signatures are on file with official student records)