

## THE EFFECT OF MALATHION ON STAPLE METABOLISM

Ronald H. Blackley, Jr., Shani L. File and Daniel B. Reynolds

Mississippi State University

Mississippi State, MS

### Abstract

Previous research has indicated that malathion inhibits the metabolism of sulfonylurea herbicides in several crops. Pyriithiobac, which has the same mode of action as the sulfonylurea herbicides, has been shown to interact with malathion in cotton. Significant visual injury, such as bronzing and chlorosis, has been reported in previous studies. In 1999 field grown plants were utilized at the Plant Science Research Center near Starkville, MS to evaluate the effects of malathion applications on pyriithiobac metabolism in cotton. Malathion applications at 0.85 kg ai/ha were made with a CO<sub>2</sub> backpack sprayer delivering 140 L/ha. These applications were made 6, 3, 1, and 0 hours before application of pyriithiobac. <sup>14</sup>C-pyriithiobac was applied at the 0 hour timing interval to the 3rd leaf of each plant.

Total recovery was 92 to 94%, and <sup>14</sup>C-pyriithiobac absorption ranged from 16 to 20%. Translocation was minimal, and at least 92% of the <sup>14</sup>C remained in the treated leaf. The majority of <sup>14</sup>C was recovered in the wash solution, which ranged from 73 to 75%. Thin-layer chromatography was used to determine pyriithiobac metabolism. The amount of <sup>14</sup>C remaining as parent material, or the herbicidally active form, was minimal (4 to 9%) and did not differ among treatments. These data suggest that close application timing of 0.85 kg/ha malathion in relation to timing of pyriithiobac applications does not increase injury of cotton based on the metabolism of the parent molecule to inactive metabolites.