

## **Preliminary Evaluation of Suspected Paraquat-resistant Italian Ryegrass in a California Orchard.** Caio Brunharo<sup>1</sup>, Bradley Hanson<sup>1</sup> <sup>1</sup>University of California at Davis

Paraquat is widely used as a nonselective herbicide for the control of weeds in row, vegetable and orchard crops. This quaternary ammonium acts by siphoning electrons from the plant's photosystem I and donating them to O<sub>2</sub>, generating toxic molecules that lead to rapid plant cell membrane disruption. The present experiment was carried out following reported failures in controlling Italian ryegrass with paraquat in a prune orchard near Hamilton City, California. The 15 treatments in the experiment were commonly used herbicides for pre- and post-emergence grass-weed control in California, and included: (1) Untreated control; (2) Roundup PowerMax; (3) Gramoxone SL (2.5 pt/A); (4) Gramoxone SL (4 pt/A); (5) Rely 280; (6) Roundup PowerMax + Poast; (7) Roundup PowerMax + Fusilade; (8) Roundup PowerMax + Envoy; (9) Roundup PowerMax + Matrix; (10) Rely 280 + Poast; (11) Rely 280 + Fusilade; (12) Rely 280 + Envoy; (13) Rely 280 + Matrix; (14) Rely 280 + Alion; and (15) Gramoxone 2 + Surflan AS. Treatments were applied on May 23<sup>rd</sup>, 2015, when the ryegrass was 10 inches tall. Visual evaluations were carried out at 7, 14, 21 and 28 days after treatment, based on a 0-100 scale, where 0 represents no visible injury and 100 represent complete plant death. Overall, Roundup PowerMax exhibited poor visual control of Italian ryegrass in all treatment combinations. The treatments that performed statistically best were Rely 280 + Envoy (56 fl oz/A + 16 fl oz/A), Rely 280 + Fusilade (56 fl oz/A + 12 fl oz/A), Rely 280 + Matrix (56 fl oz/A + 2 oz/A) and Rely 280 (56 fl oz/A). In this field study, paraquat only provided 68-73% control of ryegrass which strongly supports the previously reported concerns about glyphosate-paraquat resistance in Italian ryegrass in California orchards