

Preliminary screening of suspected glyphosate resistance in Palmer Amaranth (*Amaranthus palmerii*) in the Central Valley finds negative results

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Palmer amaranth (*Amaranthus palmeri* S Watson) is a highly competitive annual weed belonging to the Amaranthaceae family. In the last 5 years, glyphosate-resistant (GR) biotypes of Palmer amaranth have been reported from the south-eastern US. In recent years, a few cases of poor control of this species have also been reported in the Central Valley. A suspected case of GR Palmer amaranth in San Joaquin County led to this study.

A study was conducted at California State University, Fresno in the summer of 2010. Seeds were collected from suspected GR Palmer amaranth plants along Hwy 99, Stockton, CA. Seeds from known glyphosate-susceptible (GS) Palmer amaranth were also used for comparison. Sixty 4 x 4" plastic pots were filled with a potting mix and about 12 seeds were planted in each pot. The pots were placed in the sun and regularly monitored for moisture and germination. At 31 days after planting (DAP), the plants were sorted into three categories by height: short (<3"), medium (3-6"), and tall (>6") and sprayed with Glyphosate Weathermax at 27.5 fl oz/ac, 30 psi, 20 gal/ac volume by means of a CO₂ backpack sprayer equipped with a flat fan nozzle. A set of unsprayed plants for each plant size was also included. Each set had 14 pots of short, 5 pots of medium, and 4 pots of tall for a total of 46 pots. About 45 DAP, the plants were cut and placed into brown bags for drying, and then weighed for biomass.

Typical symptoms of glyphosate injury were present at 22 days after treatment on the short and medium plants and they were dead. However, the treated tall plants showed no injury symptoms and appeared similar to their untreated control counterpart. The treated tall plants outweighed the untreated control, which indicated that glyphosate had no affect on them. These results indicate that this Palmer amaranth biotype is still susceptible at the labeled rate of glyphosate. Although this study tested negative for glyphosate resistance, the size of the plant at the time of application made a difference as the taller (> 6") plants survived the glyphosate application. At this point, it is not known if GR populations of Palmer amaranth exist in other locations of the Central Valley. Growers and land managers should be cautious and plan for management strategies to prevent the onset of glyphosate-resistance in this species in California.