Strategies to Enhance Pre-Emergence Herbicide Performance in Citrus

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Figure: Weed managed tree row (left) and weed emergence in citrus tree rows (right)

Weeds emerging in citrus tree rows must be managed as they compete for resources with the trees, support pests, and interfere with grove operations like irrigation. Pre-emergence (or residual) herbicides are an excellent 'tool' in the citrus weed control toolbox for suppressing weeds in the tree rows. These herbicides persist in the soil and suppress the germination of susceptible weeds. For optimal suppression of weed seeds or tubers, the pre-emergence herbicides must be retained within the top ~5 inches of the soil. However, high sand content in Florida's citrus soils facilitates relatively faster leaching of herbicide active ingredients from the topsoils, reducing the herbicide's performance. Therefore, this project was undertaken to evaluate the utility of adjuvants such as 'soil binding agents' or 'soil deposition agents' to enhance the retention and performance of pre-emergence herbicides in sandy soils of Florida. Pre-emergence herbicide flumioxazin (e.g., trade name: Chateau) was tank-mixed with a soil deposition agent such as polyvinyl polymer (e.g., trade name: Hydrovant *f*A) and applied to the citrus tree rows. The weed control efficacy observed in the tree rows due to the herbicide/deposition agent combination was compared with the herbicide treatment alone. Pre-emergence herbicide/deposition agent combination resulted in a ~30% increase in total weed control efficacy compared to the herbicide alone when measured at ~4 months after the treatment application. The results from this experiment suggest that utilizing these adjuvants could potentially improve the effectiveness of pre-emergent herbicides in citrus weed control.

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