DETERMINING THE OPTIMUM RATE OF POTASSIUM BORATE NEEDED TO REDUCE DICAMBA VOLATILITY

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Abstract

Labeled applications of the *N,N*-bis(3-aminopropyl)methylamine (BAPMA) salt of dicamba (Engenia) and diglycolamine salt of dicamba with VaporGrip (XtendiMax) have resulted in a record number of off-target complaints following introduction in 2017 for use as preemergence and postemergence control of broadleaf weeds in Xtend cotton and soybean systems. In efforts to reduce dicamba volatility, the University of Arkansas Division of Agriculture has pursued potassium tetraborate tetrahydrate (potassium borate) as a volatility reducing agent. Preliminary results from 2019 suggests that potassium borate has tremendous utility in mitigating dicamba volatility through buffering and ion scavenging potential. To determine the optimal rate of potassium borate to function as a volatility reducing agent and nutritional additive, two low-tunnel trials were conducted in Fayetteville, AR, in 2020. The diglycolamine (DGA) salt of dicamba plus the potassium salt of glyphosate was applied in mixture with 0, 0.03, 0.07, 0.13, 0.27, and 0.5 lbs/A boron in the form of potassium borate. Each treatment was made to two moist flats that were placed under each tunnel and removed 48 hours after application. Regarding the three evaluated qualitative parameters (maximum soybean injury, average injury, and distance traveled), dicamba volatility was reduced as potassium borate rate increased. As boron rates approached 0.13- to 0.5- lbs/A, dicamba movement was reduced by 9- to 11-ft, respectively, compared to DGA dicamba plus glyphosate. High-volume air sampler data followed similar trends to qualitative assessments, with the least amount of total dicamba detected at 0.27 and 0.5 lbs/A boron. As potassium borate rate increased, the variability in detectable dicamba was likewise reduced. Overall, the addition of potassium borate to dicamba can effectively reduce dicamba volatility at rates sufficient to alleviate boron deficiencies.