# HERBICIDAL ACTIVITIES OF COMBINATIONS OF SODIUM AZIDE (SEP 100$^{R}$) WITH METAM Na AND OTHER SULFUR CONTAINING COMPOUNDS

R. Rodriguez-Kabana, L. J. Simmons, R. H. Walker, and J. L. Belcher
Auburn University & Alabama Agricultural Experiment Station
Auburn, AL 36849
rrodrigu@acesag.auburn.edu

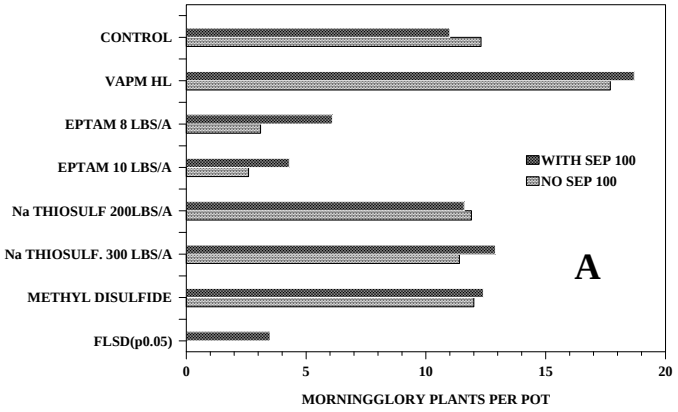
The effects on herbicidal activity of combinations of SEP 100$^{R}$ (Na azide) with metam Na, Na thiosulfate, methyl disulfide and the herbicide EPTC (Eptam 7E) were studied in greenhouse experiments. In a first experiment SEP 100 was applied by drenching (1" acre water) at 150 lbs a.i./A to pots ( 4 inch diam; PVC) containing each 2.2 pounds of silt loam (pH 6.2; org. matter <1.0%) from a cotton field. Immediately after treatment each pot was covered with a clear polyethylene bag (1.5 mil). The bags were removed 4 days after, and additional applications were drenched in with: Vapam HL at 120 gal/A; EPTC at 8 and 10 lbs ai/A; Na thiosulfate at 200 and 300 lbs ai/A; and methyl disulfide at 300 lbs ai/A. Pots were again covered with the bags for 3 days after which they were removed and pots planted with annual morningglory (*Ipomoea* spp.; 25 seed/pot). Some pots received only SEP 100 and others received water only. Each treatment was represented by 7 pots (experimental units) arranged in a randomized complete block design on a bench. The number of plants in each pot was determined at 10, 13, and 26 days after application of SEP 100. Morningglory plant tops were collected from each pot 33 days after initiation of the experiment and their fresh weight was determined.

Applications of Vapam HL to SEP 100-treated soil significantly reduced herbicidal activity of Na azide (Fig. 1A). There was evidence that the combination of SEP 100 and metam Na resulted in improved morningglory growth over that obtained with SEP 100 alone (Fig. 1B). EPTC was strongly herbicidal against morningglory and initially its combination with SEP 100 more so than EPTC alone. Na thiosulfate and methyl disulfide applications had little effect on herbicidal activity of SEP 100.

A second experiment explored the interaction between a fixed rate of Vapam HL (60 gal/A) and applications of SEP 100 in the 40 - 120 lbs a.i./A range. The methods and procedure followed were as for the first experiment except that weed counts were taken at 13 and 17 days after application and plant top weights were determined 32 days after initiation of the experiment.

Applications of Vapam HL to soil treated with SEP 100 again diminished the herbicidal activity of Na azide (Fig. 2A). Data on top weights suggest a clear antagonistic effect derived from the application of Vapam HL to soil previously treated with Na azide (Fig. 2B).

Conclusions. Results suggest that metam Na can be used after application of SEP 100 to neutralize residual Na azide in the soil. Combinations of EPTC were more herbicidal than either of the two compounds applied alone. Inclusion of EPTC in the treatment of soil with Na azide could permit significant reductions in the rates of Na azide needed for satisfactory herbicidal activity.



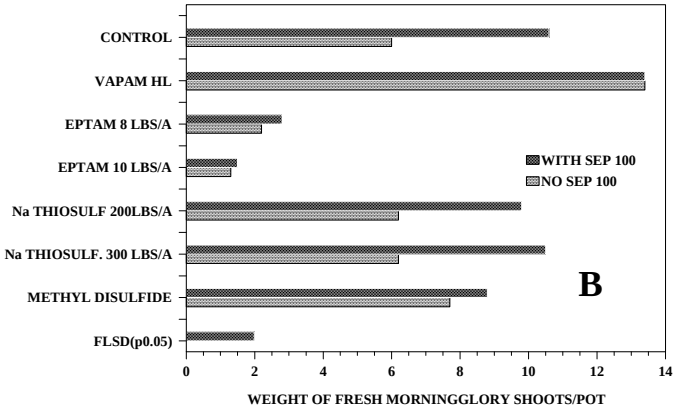
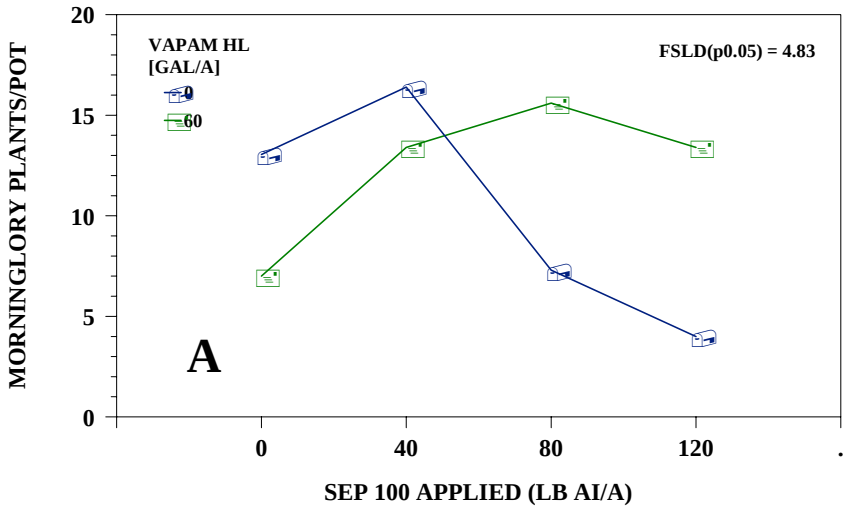




Figure 1. Effects of pre-plant applications of SEP 100 (Na azide) alone and in combination with Vapam HL (metam Na) and other S-containing compounds on the number (A) and fresh weights (B) of annual morningglory (*Ipomoea* spp.) plants. SEP 100 was applied at 150 lbs ai/A, Vapam HL at 120 gal/A, and methyl disulfide at 300 lbs ai/A.



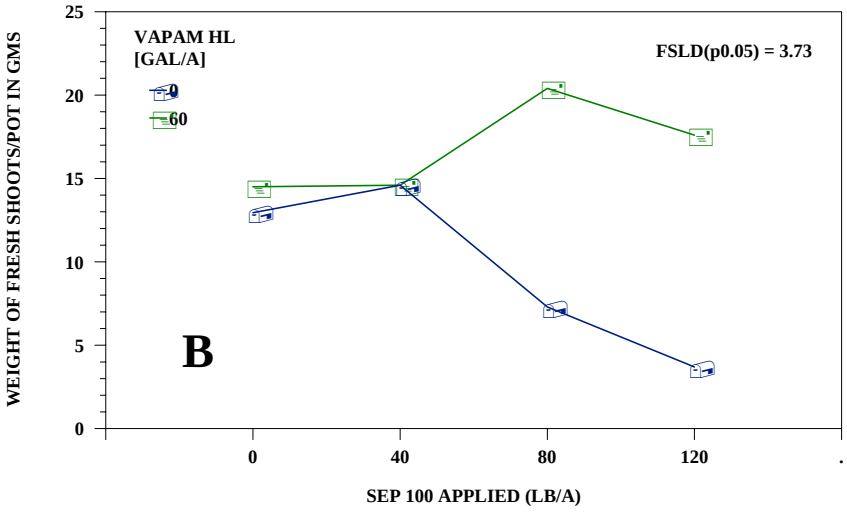




Figure 2. Effect of pre-plant applications of SEP 100 (Na azide) alone and in combination with Vapam HL (metam Na) on the number (A) and fresh weights (B) of annual morning glory (*Ipomoea* spp.) plants.