POTENTIAL OF COMBINATION TREATMENTS OF METHYL DISULFIDE AND METAM SODIUM FOR WEED CONTROL

R. Rodriguez-Kabana and Lee Simmons
Department of Entomology and Plant Pathology
Auburn University & Alabama Agricultural Experiment Station
Auburn, Alabama 36849, U.S.A.
rrodrigu@acesag.auburn.edu

The herbicidal properties of combinations of methyl disulfide [$(CH_3)_2S_2$; MDS] and metam-sodium [MS] were studied in greenhouse experiments with a sandy loam soil [pH 6.5; org. matter <1%; C.E.C.< 10 meq./100 gms soil] from a cotton field. The soil was infested with a variety of weed species principal among which were: crabgrass [*Digitaria sanguinalis*] and other gramineae, pigweed [*Amaranthus* spp.], morning glories [*Ipomea* spp.], sicklepod [*Cassia tora*], and yellow nutsedge [*Cyperus esculentus*]. MDS and MS were delivered as a drench in water equivalent to 1" acre. MS was applied using the Vapam HL^R formulation at rates of: 6.4, 13.1, 26.2, and 39.2 mgs a.i./Kg soil. These rates were applied with MS alone and in combination with MDS [Aldrich, Milwaukee, WI, U.S.A.] at 750 mgs a.i./Kg soil. MDS was also applied alone at rates of 250, 500, 750, and 1000 mgs a.i./Kg soil. The experiment included no treatment controls. Each treatment was represented by 7 replications [pots] in a randomized complete block design. Each pot contained 1 kg soil. The pots with soil were covered with transparent polyethylene bags [1 mil] immediately after treatment. The bags were removed after10 days and the number of weeds were counted at 10, 18, 25, and 39 days after application of the chemicals. . Combination treatments resulted in superior control of all weed species compared with or MS alone as shown in Fig. 1 for yellow nutsedge. Applications of MDS were ineffective against yellow nutsedge and crabgrass [Fig. 2] but resulted in satisfactory control of pigweed and other broad leaf weeds when applied at rates $\geq$ 500 mgs [Fig. 3]. Results suggest strong synergy for herbicidal activities between the two compounds. The data support the possibility of combining MDS and MS for development of alternatives to methyl bromide for soil fumigation

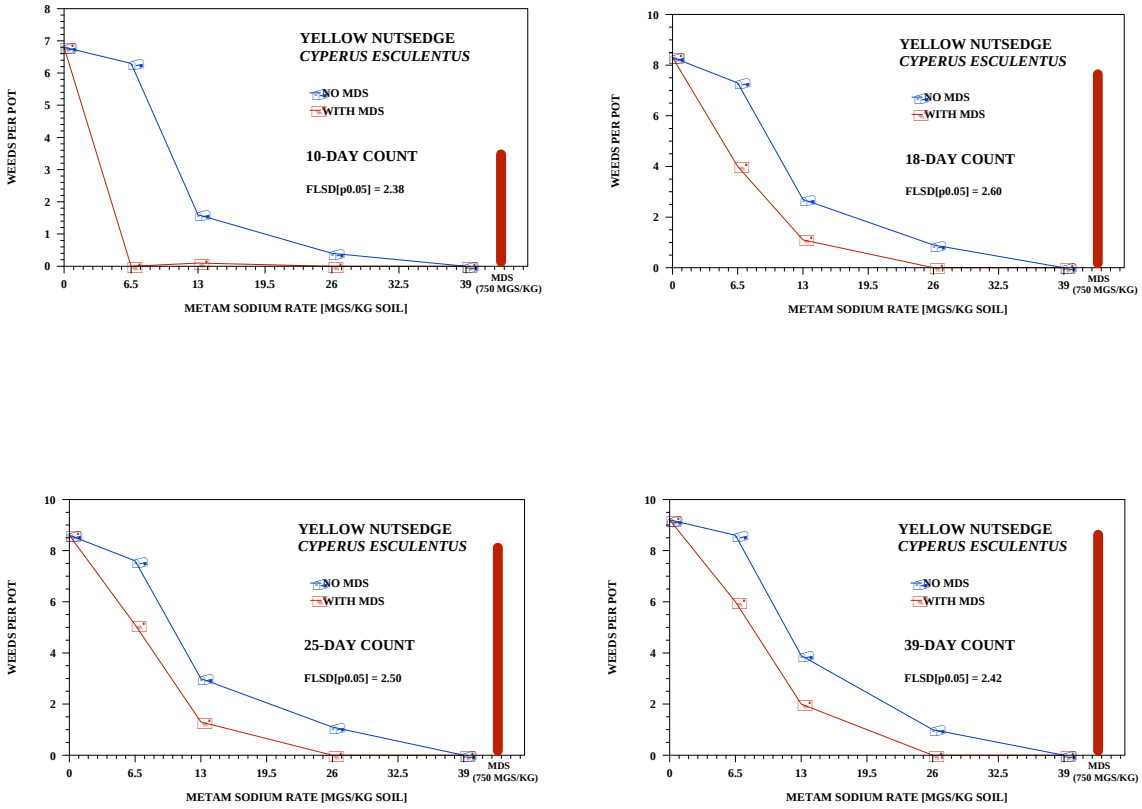
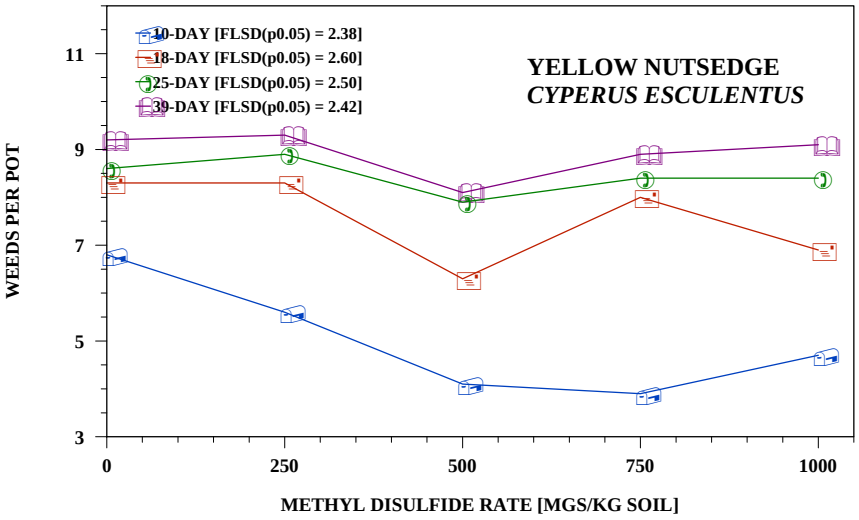


Figure 1. Effect of metam Na [Vapam HL^{R}] applied by drenching alone and in combination with methyl disulfide [MDS]on the incidence of yellow nutsedge [*Cyperus esculentus*] in a greenhouse experiment 10, 18, 25, and 39 days after delivery into soil in 1" acre of water.



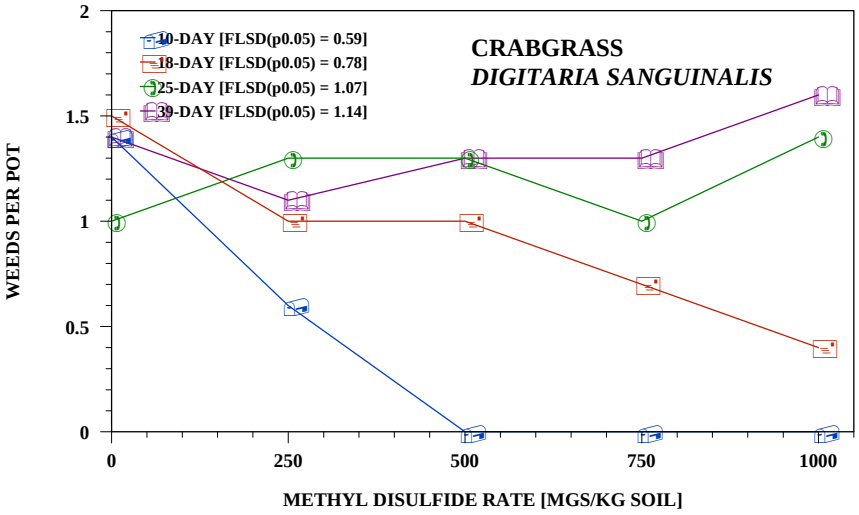


Figure 2. Relation between numbers of yellow nutsedge and crabgrass and dosage of methyl disulfide applied by drenching in 1" acre of water in a greenhouse experiment.

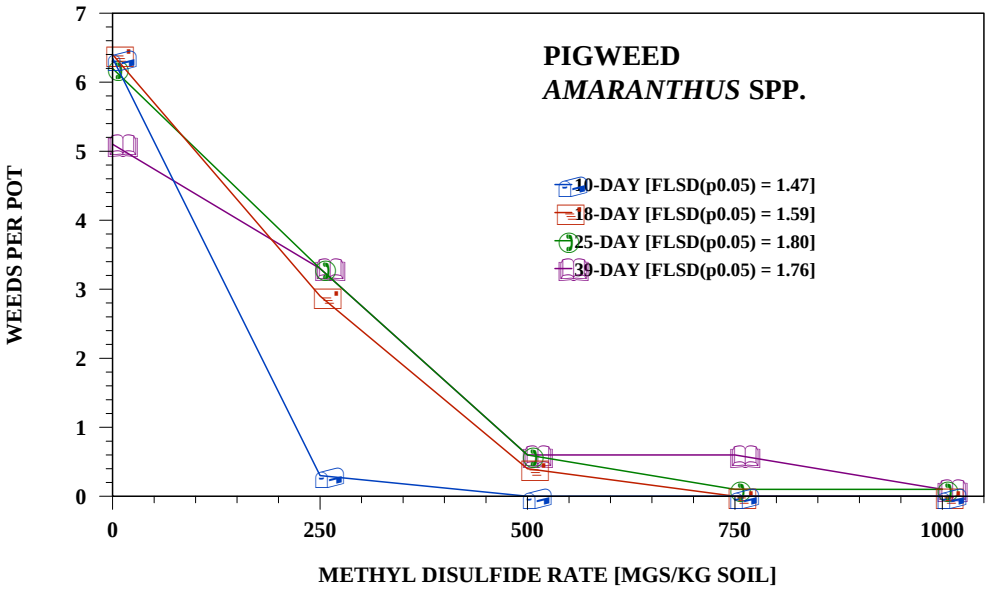


Figure3. Relation between numbers of pigweed and dosage of methyl disulfide applied by drenching in 1" acre of water in a greenhouse experiment.