A PRELIMINARY STUDY ON THE RELATIONSHIP BETWEEN SOIL pH AND HERBICIDAL ACTIVITY OF SODIUM AZIDE

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The effect of soil pH on the efficacy of NaN_3 applications for control of yellow nutsedge [*Cyperus sculentum*], pigweed [*Amaranthus* spp.], grasses, and other weeds, was studied in a greenhouse pot experiment. The soil was a sandy loam [pH 5.6; C.E.C < 10 meq/100 gms; organic matter content: < 1.0%] from a cotton field. The soil was sifted [$\leq$ 1 mm mesh] and apportioned in one-Kg amounts contained in 3-L polyethylene bags. Soil pH was changed by addition of $CaCO_3$ or 20% [v:v] H_2SO_4 to have values of : 5.1, 6.4, 7.7, 8.0, and 8.4; there were 40 bags for each value. The soil was left in the closed bags for three weeks at 25-27^oC when soil pH was determined. Following pH determination, NaN_3 [Au 109] was applied at rates of: 0, 10, 20, 40 and 80 mgs/Kg soil so as to have for each pH value every NaN_3 rate represented with eight bags [replications]. NaN_3 formulation was an aqueous solution stabilized with ethanolamine. The treated soil was transferred to one-L cylindrical [10-cm diam] PVC pots and was planted with yellow nutsedge [5 tubers/pot]. The number of weeds/pot was determined at weekly intervals for two months. Changes in soil pH had no effect on nutsedge populations except for pH 8.4 which depressed emergence and numbers of plants by one-third; other weed species followed the same trend. For all pH values weed populations were suppressed by NaN_3 in an exponential manner with rates > 40 mgs resulting in near-perfect control at the end of the experiment. Herbicidal properties of NaN_3 were unaffected by soil pH in the range $5.1 \geq pH \leq 7.7$ but increased sharply with pH >7.7. Results suggest NaN_3 can be used over a broad range of soil pH values without major effect on its herbicidal activity but that in soils with high pH and $CaCO_3$ content there is increased efficacy which probably related to increased residence time of the chemical in those soils.