EFFICACY OF AQUEOUS FORMULATIONS OF SODIUM AZIDE WITH AMINE-PROTEIN STABILIZERS FOR CONTROL OF NEMATODES AND WEEDS IN TOMATO PRODUCTION

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The efficacy of pre-plant applications of a proprietary formulation of NaN_3 for control of plant parasitic nematodes and weeds was studied in a microplot experiment with tomato [*Lycopersicon esculentum*]. NaN_3 was stabilized in the formulation by means of a mixture of amines and commercially available protein. Soil in the microplots was a sandy loam [pH= 6.2; organic matter content < 1.0%; C.E.C < 10 meq/100 g soil] infested with the nematodes: *Meloidogyne incognita, Paratrichodorus minor, Tylenchorhynchus claytoni* , and *Helicotylenchus dihystera* l]. Weeds in the plots were principally crabgrass [*Digitaria sanguinalis*], yellow nutsedge [*Cyperus esculentum*], pigweed [*Amaranthus* spp.], and morning glories [*Ipomea* spp., *Jacquemontia tamnifolia*]. NaN_3 was applied to the 1-ft^2 microplots by drenching [2L/plot] at rates of : 0, 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0 g/plot. The plots were covered with standard polyethylene [1 mil] tarp immediately after application of the chemical. After 10 days the cover was removed, the number of weeds was determined, soil samples for nematological analyses were taken and each plot was planted with two 4-week old 'Huskie' tomato seedlings. The plants were grown for 3 months and data were collected on yield, number of fruits, weed infestation and nematode populations. There were no nematodes in the planting time samples from plots treated with NaN_3 but soil from control plots had significant numbers of all nematode species. At planting time, there were no weeds in plots treated with all but the three lowest rates of NaN_3. Yield and number of fruits increased directly in response to NaN_3 rates from 0- 4 g/plot with no additional increase [yield] or a slight decline [no. fruits] in response to the highest rate. At the end of the experiment there were no plant parasitic nematodes in NaN_3-treated plots for all rates of the chemical. Final weed counts were inversely related to NaN_3 rate in a pattern described [R^2=0.95**] by

W= -0.32X + 5.82, where W represents total weed population density/microplot and X, azide rates in gms NaN_3/plot. Results indicate that the amine-protein formulation is superior for nematode control and equal in herbicidal activity to formulations stabilized with inorganic buffers. The data also suggest that it is possible to deliver NaN_3 into soil together with organic compounds that can serve as plant nutrients and stimulate beneficial soil microbial activities.