

Evaluation of the Physiochemical Stability of Different Formulations of Diazinon 50 within Its Shelf-life

H.A.S.P.Kularatne¹, K.G.Premathilake, A.N.R.Weerewansa¹, Champa Magamage²

¹*Department of Export Agriculture, Uva Wellassa University, Badulla, Sri Lanka.*

²*Office of Registrar of Pesticides, Gatambe, Peradeniya.*

Pesticide formulations can undergo chemical and physical changes on storage. The physiochemical stability of the product has been of exalted concern to the efficacy and safe use of the product within its shelf life. A laboratory evaluation to determine the physiochemical stability of Diazinon emulsifiable concentrate, emulsion oil in water and granule formulations within its shelf-life was conducted. The physical and chemical parameters of the respective formulations were assessed as a function of time at ambient temperature and after storage at 54 °C for 14 days. Analysis was performed as per the Collaborative International Pesticides Analytical Council protocols and in accordance with Food and Agriculture Organization and World Health Organization specifications. The results revealed physiochemical instability in EC formulations was affected by time units and temperature. A marked variation in pH and active ingredient were apparent in EC formulations of 12-18 months old and >24 month old obtained from local manufacturers. A mean active ingredient of 429.34 at mean pH 3.3 was registered with 12-18 month old sample and a mean active ingredient of 249.8 at mean pH 2.2 was registered with >24 month old sample. EW formulations comply with specifications in pH, density, specific gravity and emulsion stability in spite of the slight differences shown. Wettability and persistent foaming of granule samples were in conformity with the WHO specifications. Granule sample of 12-18 months old recorded a decrease in pH recording a mean value of 6.1. Despite the EC samples of time 12-18 months old and >24 month old, stability of the active ingredient content evaluated for all 3 Diazinon formulations used in study were in agreement with the specifications with time units within its shelf-life. However significant difference in active ingredient content was recorded in all formulations used in the study after storage at 54 °C which shows light for the formation of toxic impurities.

Keywords: Diazinon, Physiochemical stability, EC formulation, EW formulation, GR formulation