

Assessment of Potential Application of Binary Mixtures of 2,4-D with Novel Aminophosphonates

Janusz Sarapuk^{a,*}, Halina Kleszczyńska^a, Dorota Bonarska^a, Krzysztof Bielecki^b, Zenon Trela^a, and Leszek Kordas^c

^a Department of Physics and Biophysics, Agricultural University, Norwida 25, 50-375 Wrocław, Poland. Fax: (+ 48)-071-32 05-1 72. E-mail: js@ozi.ar.wroc.pl

^b Department of Botany and Plant Physiology, Agricultural University, Cybulskiego 32, 50-205, Wrocław, Poland

^c Department of Soil Management and Plant Cultivation, Agricultural University, Norwida 25, 50-375 Wrocław, Poland

* Author for correspondence and reprint requests

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A series of new aminoalkane- and aminofluorenephosphonates was synthesized for agrochemical application. The particular compounds had different alkyl substituents at the carbon, nitrogen and phosphorus atoms. Their pesticidal activity was checked by applying various experimental methods. These included the measurements of compounds' potency: to inhibit growth of cucumber and germination of white mustard seeds, to influence on the membrane potential of algae and to damage human erythrocyte membranes resulting in hemolysis. All the aminophosphonates were also used in equimolar binary mixtures with the well-known herbicide 2,4-dichlorophenoxyacetic acid (2,4-D), to check, if using such mixtures, the biological efficiencies found for particular compounds could be enhanced due to interactions between aminophosphonates and 2,4-D.

The results demonstrated, that depending on the structural features of the compounds, the final effects differed from antagonistic, through additive to the most promising synergistic ones. However, the type of interaction between 2,4-D and the compounds studied found in different experiments was somewhat different. In order to estimate those effects various statistical methods were used (toxic unit method, isobole method).

Key words: Aminophosphonates, Binary Mixtures, Plant Growth Inhibition