

An Overall Integration on the Available Data from Soil Monitoring of Currently Used Pesticides (CUPs) Carried Out Around the World

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Introduction

In present era, the use of pesticides in agricultural activities is inevitable due to the huge need for nutritional requirements along with the demographic growth. In such circumstance, it seems crucial to inspect the fate and occurrence of such chemicals in different compartments. Monitoring programs are designed to acceptably fulfill this goal. Among agrochemicals, residue of currently used pesticides (CUPs) in the agricultural soils were less in the spotlight all around the world. As a results, in some regions there is a huge need for further investigations on CUPs occurrence in the soil. To clarify the situation and obtain an overview about the current shortcomings we collected all available data from published monitoring studies on CUPs in agricultural soils done around the world. Then all the data were put into a united data set and were integrated. The output of this integration was inferred as the overall situation for each active ingredient (AI).



Results

The overall calculation on the data from 72 monitoring studies was carried out. Totally, 387 individual AIs including 106 transformation products and 281 parental compounds were counted in the integration. The **studied AIs** mostly belonged to following categories, respectively:

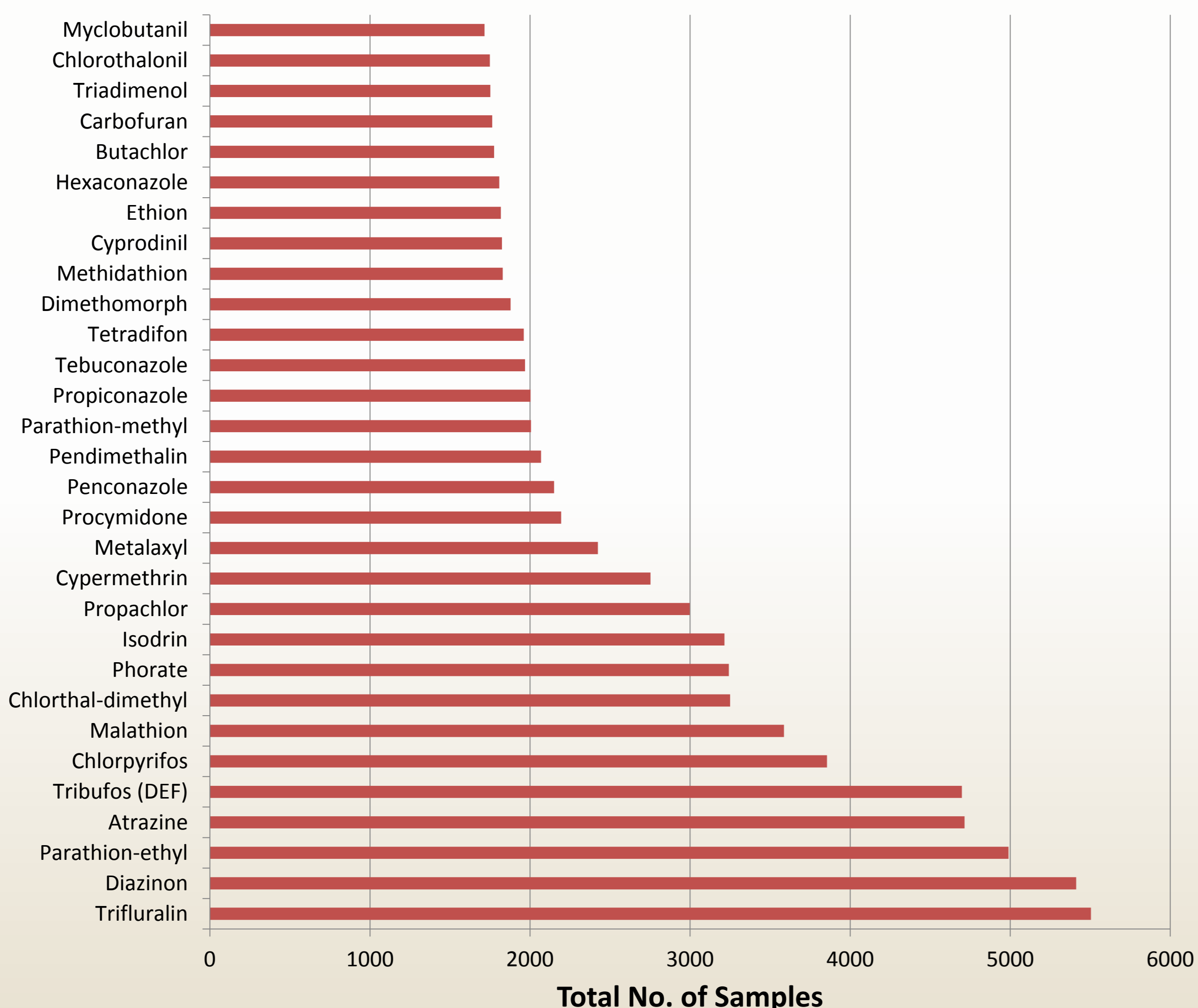
Considering type of the pesticides:

Herbicides > Insecticides > Fungicide > Acaricides

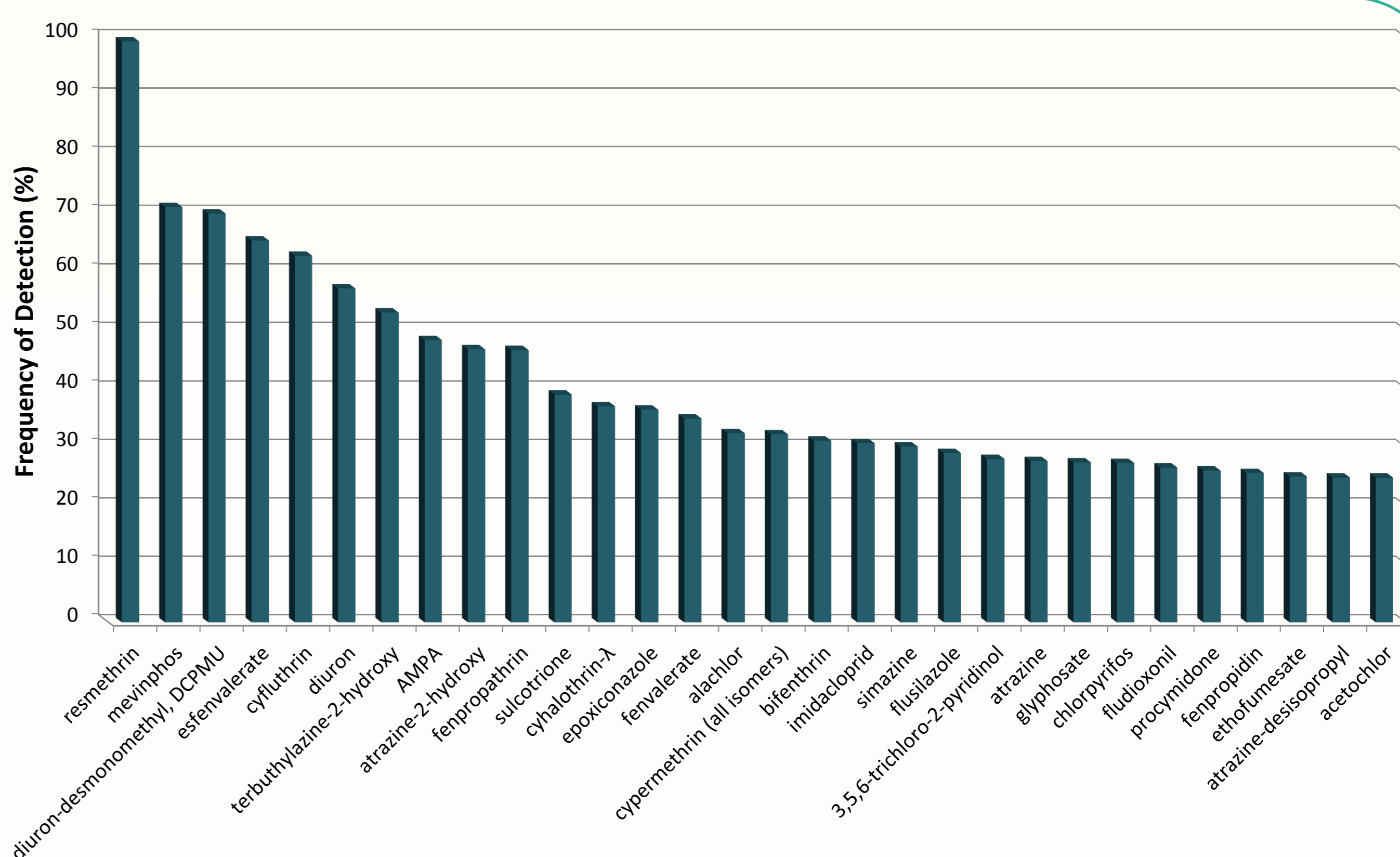
Considering their chemical group:

Organophosphates > Triazoles > Triazines > Pyrethroids

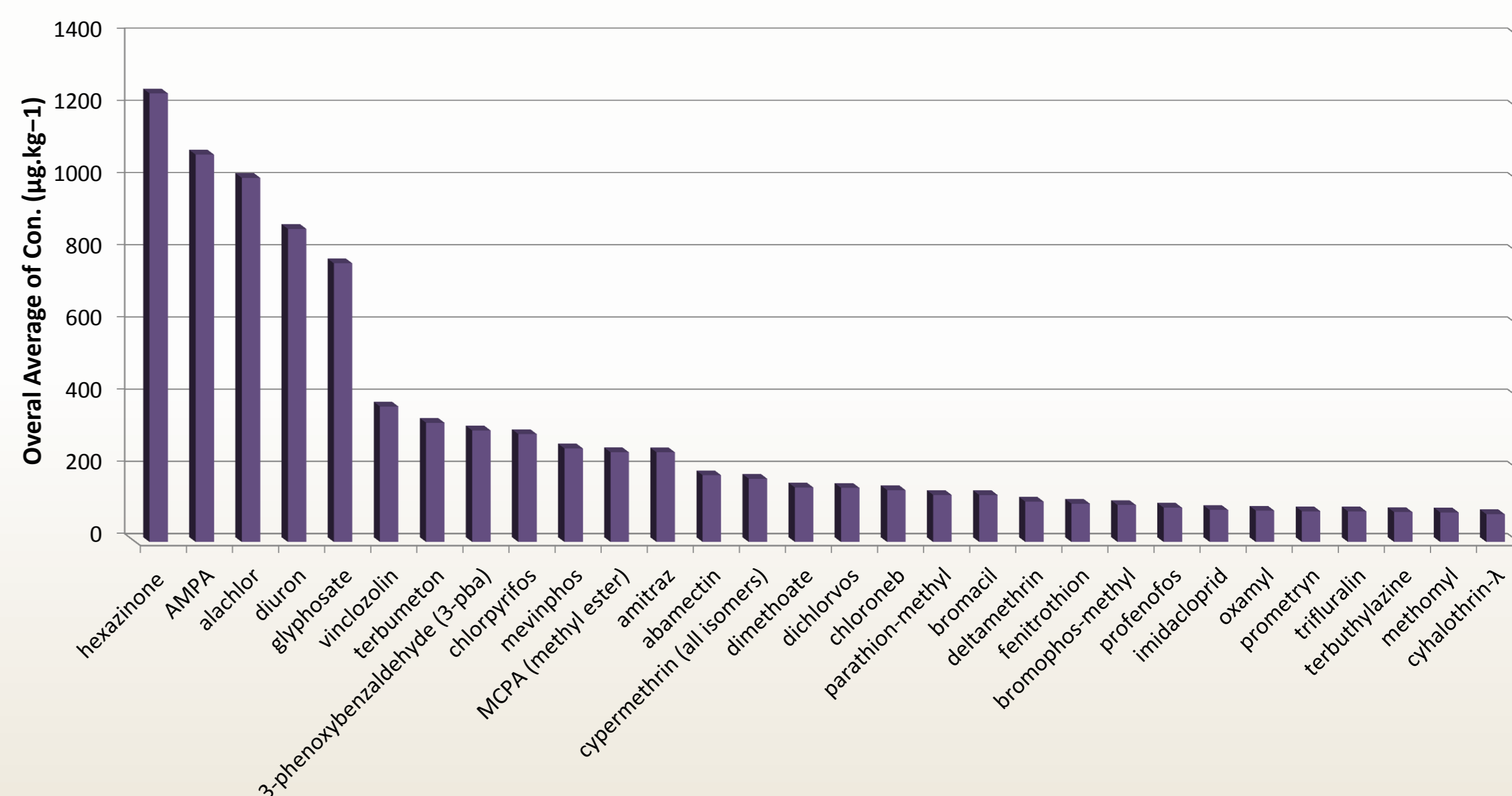
In terms of total number of samples, organophosphates and then triazines were studied in the highest number of samples over all the studies.



Graph 1: Top 30 of AIs studied in the highest number of soil samples in all the articles. The more samples AIs are analyzed in, the more reliable the results are.



Graph 2: Top 30 of AIs showing the highest overall frequency of detection over all the articles. The overall detection frequency exhibits which compound was detected more frequently on average in the soils in the whole studies all around the world and was calculated as average on all reported frequency of detections for each AI.



Graph 3: Top 30 of AIs showing the highest overall average of concentration over all the articles. The overall average concentration was obtain by calculating average on the average of concentrations reported in the studies for each AI. This parameter is of a great value because it represents reality more than average of maximum concentration.