

## **Glyphosate and AMPA content in the PM10 emitted by a soil of the central semiarid region of Argentina (CSRA)**

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Particle matter with aerodynamic diameter lesser than 10  $\mu\text{m}$  (PM10) has shown adverse effects on health even at low concentrations. Entic Haplustoll dominates central semiarid region of Argentina (CSRA) and PM10 are emitted from the soil by tillage and wind erosion. The aim of study was measure glyphosate concentration in the PM10 emitted by a soil fine-sandy loam Entic Haplustoll. The study was carried in Santa Rosa La Pampa ( $S36^{\circ}46'$ ;  $W64^{\circ}16'$ ; 210 m a.s.l.) in a plot where 3.7 kg ha<sup>-1</sup> active ingredient of glyphosate was used in the last two year and glyphosate was not used in the last 12 months.

Soil samples were air dried and sieved with a rotary sieve to separate the following aggregate fractions: <0.42 mm, 0.42 to 0.84 mm, 0.84 to 2 mm, 2 to 6.4 mm, 6.4 to 19.2 mm, and > 19.2 mm. The Easy Dust Generator (EDG) was used to generate dust from the soil and its aggregate fractions. The PM10 emitted by EDG was collected using an electrostatic precipitator (C&L model number GH-939). The following determinations were carried out in the soil, aggregates and PM10 emitted by them: organic matter contents (OM) (Walkley & Black, 1934), particle size composition (Malvern martersizer2000) and the Glyphosate and AMPA content. Results showed that mean geometric diameter (MGD) of the material collected in the electrostatic precipitator and emitted by the aggregate fraction and the soil was between 4.6 and 5.3  $\mu\text{m}$ . OM content in the aggregates fraction and soil ranged between 1.4% and 2.9% while than in the PM10 emitted by them ranged between 3.5% and 3.7%. Clay content in aggregates and soil ranged between 6.5% and 8.5% while than in PM10 emitted by them ranged between 17.5% and 19.0%. Glyphosate content in aggregates fraction and soil ranged between 1 and 3 ppb. Glyphosate in PM10 emitted by aggregates and soil did not show differences in despite of it ranged between 11.0 ppb and 19.5 ppb. OM and clay in aggregate fractions and PM10 do not explained glyphosate content in PM10. AMPA concentration in aggregates and soil ranged between 80 ppb and 150 ppb, while than in PM10 emitted by them ranged between 520 ppb and 750 ppb. The enrichment ratio (ER, quotient between concentration or content in PM10 and aggregates) of glyphosate and AMPA (between 4 and 17) were higher than ER of clay and OM (between 1 and 3). ERglyphosate and ERAMPA were different among aggregate fractions ( $p < 0.05$ ) and the highest ER was found in the fraction >19.2 (ERglyphosate = 17 and ERAMPA = 10). Our results showed contents variable of glyphosate and AMPA in the soil and its aggregate fractions after 12 month from the last glyphosate application in a haplustoll soil of the CSRA. High glyphosate content were also found in PM10 emitted by the soil and its aggregate fractions. More studies are necessary to evaluate the glyphosate content in PM10 and its potential impact in the heath.