Geophysical Research Abstracts
Vol. 19, EGU2017-2244, 2017
EGU General Assembly 2017

Depth distribution of glyphosate and organic matter after 5 years of agroecology transition compared with industrial agriculture

Virginia Aparicio (1), Martin Zamora (2), Agustin Barbera (2), Mauricio Castro Franco (2), Marisa Domenech (2), Eduardo De Geronimo (1), and Jose Luis Costa (1)

(1) INTA, Agronomy, Balcarce, Argentina, (2) INTA, Chacra Integrada Barrow, Tres Arroyos, Argentina

The industrial model of agriculture, defined here by its capital intensity and dependence on massive inputs like seeds, fertilizer, and pesticides, is reducing soil organic matter and increasing the inefficiency in agrochemical used. Ecological impacts of industrial agriculture include pollution by pesticides, soil organic matter loss and soil degradation, among many others, with the consequent human health risks. Many of the negative effects of industrial agriculture are remote from fields and farms. The impacts of industrial agriculture on the environment, public health, and rural communities make it an unsustainable way to grow our food over the long term. An alternative approach to the industrial agriculture is the agroecology which has shown promising success on the ground and is actually the only way to ensure that all people have access to sufficient, healthful food. Farming systems designed and managed according to ecological principles can meet the food needs of society while addressing these pressing environmental and social issues. Our concept of agroecological transition is based on increasing resource use efficiency (e.g. fertilizer, pesticides and water), recycling waste or byproducts of one subsystem in another and applying sound? agricultural practices or precision-agriculture technologies. The objective of this work was to compare two production systems: a) industrial agriculture, b) agroecological transition with respect to the impact on the glyphosate load and the organic matter content in the soil and its distribution in depth. The study sites were two field of 15 ha each located at Barrow Experimental Station (38º19′S, 60º15′W). Soil ECa mapping was carried out and the complete experimental area was divided in three ECa classes with similar soil characteristics. Therefore, soil sampling was carried out by zones, based on three ECa classes at each production systems. Soil samples were taken at 0-2, 2-5, 5-10, 10-20, 20-30 and 30-40 cm depth. Bulk density was taken at two depth 3-5 and 8-15 cm depth. Glyphosate and AMPA were analyzed by UPLC-MS/MS ESI(+/_) and organic matter was determined by dry combustion. Glyphosate plus AMPA concentration was reduced significantly at the first 10 cm depth. The weighted average for the first 10 cm depth was 370 to 21 mg kg-1 for industrial agriculture and agroecological transition respectively. This reduction was after 5 years of agroecological transition. In the same period of time the organic matter content increased from 4.98 to 5,6 % from industrial agriculture to agroecological transition.