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4. Weed communities related to no-tillage systems in agricultural center area of Uruguay.

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In Uruguay, crops production has traditionally developed in a system that rotates beef cattle and crops. However, in the last few years these systems have experienced a development process of agriculture with a tendency to separate, in a farm level, the areas dedicated to beef cattle and crops production. The strong dependence to use herbicides, the introduction of glyphosate-tolerant crops and its quick spread, have increased the treatments frequency causing a high selection pressure, favoring the more tolerant weed species populations. In this situation, and considering the experience in other countries, the weeds dynamics shifts can be a short term problem. The risk of the appearance of resistant weed biotypes to herbicides, mainly glyphosate, is probably a long-term problem, which could compromise not only the productivity and the economic equation of the crops but also the viability of the technology. In order to recognize and characterize eventual shifts in the weed communities associated to the no-tillage systems in the country, a photographic fallow report was carried out in the traditional agricultural center area, whose results are presented in this work. 77 fallows were analyzed, coming up to a total of 4617 hectares, having selected all those inside the region with no-tillage history and those that counted with crop rotation information, years without tillage, frequency of the treatment applications and quantity of glyphosate used. Species were identified from the pictures and the number of individuals was quantified by species, having determined presence, frequency and plants per square meter. Results were analyzed in an effort to find associations between different managements and presence of species. The average time for no-tillage fallows was 6.12 years; the total glyphosate used by hectare in the no-tillage period for

each fallow was 40.8 liters on average and for the total hectare-year of 6.6 liters. A total of 94 species were found, with a minimum of 6 species and a maximum of 24 by fallow. The species with more presence, frequency and plants per square meter was *Digitaria sanguinalis*. 32 families were determined, being *Gramineae* and *Asteraceae* the most numerous with 11 species each, standing out *Echinochloa spp.*(69%), *Setaria geniculata* (46%), *Gamochaeta sp.*(24%) and *Carduus sp.*(23%) with more presence, followed by the families *Leguminosae* and *Apiceae* with 7 and 4 species each. The results of the associations between presence of species and different managements showed *Digitaria sanguinalis* as the species with more presence, whatever the situation was. In systems with more than 6 years of no-tillage and 38 liters of glyphosate, *Portulaca oleracea* has the same presence as *Digitaria sanguinalis*. In the same way, *Amaranthus quitensis* and *Tragia volubilis* also increase their presence. Regardless of the years without tillage, the crops rotation and the management carried out, the richness of weed communities was preserved. The results of this work point out the necessity to continue with this kind of studies in order to predict eventual weed shifts and the appearance of resistant weed biotypes. Due to the advantages of no-tillage and glyphosate resistant crops, it is expected that the adoption of these technologies will continue, but their sustainability should be preserved by considering the concepts of integrated weed management.

Keywords: resistance, tolerance, glyphosate, weed flora, DIGSA.

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