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## Weed cover, frequency and diversity in field plots and edges in the soybean central region of Argentina

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### ABSTRACT

A comparative survey of the weed species present in field plots and edges was performed in fields at Zavalla (Santa Fe) Argentina in the soybean central region of the country in order to determine changes in cover, frequency and diversity of the weed communities. Five to twelve soybean fields were surveyed in 2006, 2007, and 2009. Weed surveys were carried out in the soybean fallow in winter and after soybean planting in spring. In edges, species richness was higher than in field plots in spring-summer but diversity showed an erratic response. The weed community cover showed a shift in weed vegetation composition relative to the field plot. Our results indicate that the community in crop edges relative to field plots differs in structure and abundance and that many weed species are only present either in crop edges or in field plots.

### KEYWORDS

Weed Community; Richness; Glyphosate

### Cite this paper

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### References

- [1] Sutcliffe, O.L. and Kay, Q.O.N. (2000) Changes in the arable flora of central southern England since the 1960s. *Biological Conservation*, 93, 1-8.
- [2] Romero, A., Chamorro, L. and Sans, F.X. (2008) Weed diversity in crop edges and inner fields of organic and conventional dryland winter cereal crops in NE Spain. *Agriculture, Ecosystems & Environment*, 128, 68-76.
- [3] Marshall, E.J.P., Brown, V.K., Boatman, N.D., Lutman, P.J.W., Squire, G.R. and Ward, L.K. (2003) The role of weeds in supporting biological diversity within crop fields. *Weed Research*, 43, 77– 89.
- [4] Jackson, L.E., Pascual, U. and Hodgkin, T. (2007) Utilizing and conserving agrobiodiversity in agricultural landscapes. *Agriculture Ecosystems & Environment*, 121, 196– 210.
- [5] Marshall, E.J.P. (1989) Distribution patterns of plant associated with arable field edges. *Journal of Applied Ecology*, 26, 247-257.
- [6] Buhler, D. D. and Owen, M.D.K. (1997) Emergence and survival of horseweed (*Conyza canadensis*). *Weed Science*, 45, 98– 101.
- [7] Leiss, K.A., Müller-Sharer, H. (2001) Adaptation of *Senecio vulgaris* (Asteraceae) to ruderal and agricultural habitats. *American Journal of Botany*, 88, 1593– 1599.
- [8] Smith, H., Firbank, L. G. and Macdonald, D. W. (1999) Uncropped edges of arable fields managed for biodiversity do not increase weed occurrences in adjacent crops. *Biological Conservation*, 89, 107– 111.

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- [9] Stoate, C., Boatman, N.D., Borralho, R.J., Carvalho, C.R., de Eden, P. (2001) Ecological impacts of arable intensification in Europe. *Journal of Environmental Management*, 63, 337– 365.
- [10] Baessler, C. and Klotz, S. (2006) Effects of changes in agricultural land-use on land-scape structure and arable weed vegetation over the last 50 years. *Agriculture Ecosystems & Environment*, 115, 43– 50.
- [11] Rasmussen, I.A., Askegaard, M., Olesen, J.E. and Kristensen, K. (2006) Effect of weeds of management in newly converted organic crop rotation in Denmark. *Agriculture, Eco-systems & Environments*, 113,184-195.
- [12] Haas, H. and Streibig, J.C. (1982) Changing patterns of weed distribution as a result of herbicide use and other agronomic factors. In: LeBaron H.M.and Gressel, J. Eds., *Herbicide Resistance in Plants*, John Wiley & Sons, New York, USA, 57– 79.
- [13] Norsworthy, J.K., Smith, K.L., Scott, R.C. and Gbur, E.E. (2007) Consultant perspectives on weed management needs in Arkansas cotton. *Weed Technology*, 21, 825-831.
- [14] Norsworthy, J.K. (2008). Effect of tillage intensity and herbicide programs on changes in weed species density and composition in the southeastern coastal plains of the United States. *Crop Protection*, 27,151-160.
- [15] Owen, M.D.K. and Zelaya, I.A. (2005) Herbicide-resistant crops and weed resistance to herbicides, *Pest Management Science*, 61, 301– 311.
- [16] Powles, S.B. and Preston, C. (2006) Evolved glyphosate resistance in plants: biochemical and genetic basis of resistance, *Weed Technology*, 20, 282– 289.
- [17] Heap, I. (2012) International survey of herbicide resistant weeds. *Weed Science Society of America*. [http:// www.weedscience.org](http://www.weedscience.org).
- [18] Faccini, D. and Puricelli, E. (2007) Efficacy of herbicide dose and plant growth stage on weeds present in fallow ground. *Agriscientia*, 24, 23-29.
- [19] Wilson, P.J. and Aebischer, N. J. (1995) The distribution of dicotyledonous arable weeds in relation to distance from the field edge. *Journal of Applied Ecology*, 32, 295– 310.
- [20] Kaar, B. and Freyer, B. (2008) Weed species diversity and cover-abundance in organic and conventional winter cereal fields and 15 years ago. In: IFOAM, ISO FAR (eds.), 16th IFOAM Organic World Congress; *Cultivating the Future Based on Science, Livestock, Socio-economy and Cross disciplinary Research in Organic Agriculture*, 2, 16-20, Modena.
- [21] Tuesca, D. and Puricelli, E. (2007). Effect of tillage systems and herbicide treatments on weed abundance and di-versity in a glyphosate resistant crop rotation. *Crop Protection*, 26, 1765-1770.
- [22] McCune, B. and Mefford, M.J. (1999) *PC-ORD Multivariate Analysis of Ecological Data*. Version 4. MJM Software Design, Gleneden Beach, Oregon, USA.
- [23] McCune, B. and Grace, J.B. 2002 *Analysis of Ecological Communities*. MJM Software Design, Gleneden Beach, Oregon, USA.
- [24] Orłowski, L.A., Schumm, S.A. and Mielke, P.W. (1995) Reach classifications of the lower Mississippi River. *Geomorphology*, 14, 221-234.
- [25] Orłóci, L. (1967) An agglomerative method for classification of plant communities. *Journal of Ecology*, 55, 193-206.
- [26] Pielou, E.C. (1984) *The Interpretation of Ecological Data: A Primer on Classification and Ordination*. J. Wiley and Sons, New York.
- [27] Hotelling, H. (1933) Analysis of a complex of statistical variables into principal components. *Journal of Educational Psychology*, 24, 417-441.
- [28] Fried, G., Norton, L.R. and Reboud, X. (2008) Environmental and management factors determining weed species composition and diversity in France. *Agriculture, Eco-systems & Environment*, 128, 68-76.
- [29] Boutin, C., Jobin, B., Bélanger, L. and Choinère, L. (2001) Comparing weed composition in natural and planted hedgerows and in herbaceous field margins adjacent to crop fields. *Canadian Journal of Plant Sciences*, 81, 313– 324.

- [30] Le Coeur, D., Baudry, J., Burel, F. and Thenail, C. (2002) Why and how we should study field boundary biodiversity in an agrarian landscape context. *Agriculture, Ecosystems & Environments*, 89, 23-40.
- [31] Odum, E.P., Park, T.Y. and Hutchenson, K. (1994) Comparison of the weedy vegetation in old-fields and crop fields on the same site reveals that fallowing crop fields does not result in seedbank buildup of agricultural weeds. *Agriculture, Ecosystems and Environment*, 49, 247-252.
- [32] Mahn, E.G. (1984) Structural changes of weed communities and populations. *Vegetatio*, 58, 79-85.
- [33] Derksen, D.A., Thomas, A.G., Lafond, G.P., Loeppky, H.A. and Swanton, C.J. (1995) Impact of post-emergence herbicides on weed community diversity within conservation-tillage systems, *Weed Research*, 35, 311-320.
- [34] Sosnokie, L.M, Luschei, E.C. and Fanning, M.A. (2007) Field margin weed-species diversity in relation to land-landscape attributes and adjacent land use. *Weed Science*, 55, 129-136.
- [35] Grichar, W.J., Bessler, B.A. and Brewer, K.D. (2004) Effect of row spacing and herbicide dose on weed control and grain sorghum yield. *Crop Protection*, 23, 263– 267.
- [36] Johnson, W.G., Davis, V.M., Kruger, G.R. and Weller, S.C. (2009) Influence of glyphosate-resistant cropping systems on weed species shifts and glyphosate-resistant weed populations. *European Journal of Agronomy*, 31, 162-172.
- [37] Puricelli, E, and Tuesca, D. (2005) Riqueza y diversidad de malezas en trigo y barbechos de secuencias de cultivos resistentes a glifosato. *Agriscientia*, 22, 69-78.
- [38] Harker, K.N., Clayton, G.W., Blackshaw, R.E., O' Donovan, J.T., Johnson, E.N., Gan, I., Holm, F.A., Sapsford, K.L., Irvine, R.B. and Van Acker, R.C. (2005) Glyphosate-resistant wheat persistence in western Canadian cropping systems. *Weed Science*, 53, 846-859.