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Weed infestation and similarity in sustainable cropping systems

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Introduction

Integrated production systems such as crop-livestock make possible to produce with sustainability, being also an important approach for weed management. Costs with herbicides are increasing and farmers urge for most economical planting systems whose cultural effect helps herbicides in controlling weed species. It is widely known that herbicides work better in less infested areas, compared to those with dense weed canopy, due to a better leaf coverage by the time of herbicide application, among other factors. We aimed to assess weed infestation in distinct cropping systems.

Material and Methods

The experiment was installed in 2009 at the area of Embrapa Western Agriculture, Ponta Porã, MS, Brazil (22° 32' 56" S 55° 38' 56" W), 680 m asl, in Oxisol soil. Treatments are listed at Figure 1. Assessments of weed occurrence were performed in the early post-emergence of the 2011/12 cropping season, in completely randomized design. A quadrat with 0.5 m side was released randomly 10 times in each area, and weeds inside each quadrat were counted and collected for determination of dry mass.

Results and Conclusions

The level of weed infestation depends on the planting system; crops which accumulates smaller dry mass, or whose dry mass has low C:N ratio, promoted high infestation levels. After soybean harvest, cultivation of maize intercropped with *B. brizantha* in the second cropping season, between rows of *Eucalyptus* (ICLF), proved to be the option with the greatest potential to reduce weed incidence in integrated production systems.

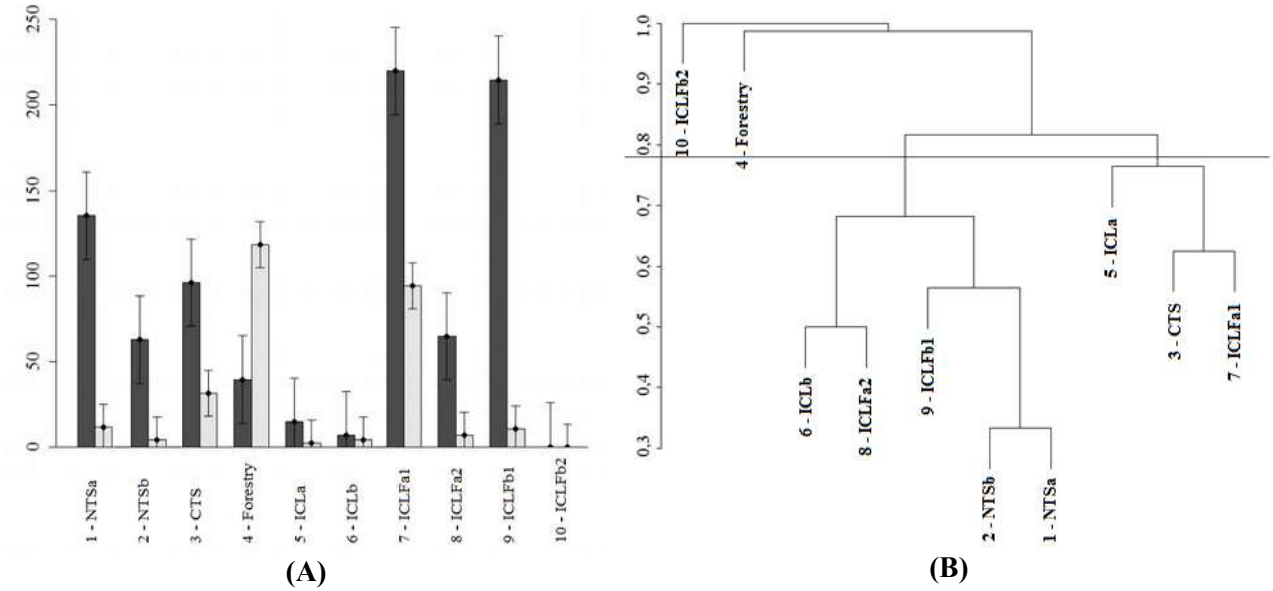

Figure 1. (A) - number of individuals (■ - m^{-2}) and dry mass (■ - g m^{-2}) of weeds as a function of planting system; (B) - Cluster analysis by dissimilarity of infestation based on the UPGMA method. Treatments (crop sequence from 2009-2011): **1-NTSa** =S/W/S/M/S; **2-NTSb** =S/W/S/(M+Br)/S; **3-CTS** =S/A/S/M/S; **4-Forestry** =E; **5-ICLa** =S/X/X/X/S; **6-ICLb** =S/W/S/(M+X)/X; **7-ICLFa1** =(E+S)/(E+A)/(E+S)/(E+M+Br)/(E+S); **8-ICLFa2** =(E+S)/(E+A)/(E+S)/(E+M+Br)/(E+S). **S** = soybean, **M** = maize, **Br** = *B. ruziziensis*, **X** = *B. brizantha* cv. Xaraés, **E** = *Eucalyptus*, **A** = oat, **W** = wheat. **NTSa/b** = no-till planting system (agriculture-only) with distinct crop successions; **CTS** = conventional soil tillage system (agriculture-only) with distinct crop successions; **ICLa/b** = integration crop-livestock; **ICLFa/b** = integration crop-livestock-forest. For ICLF, numbers "**1**" and "**2**" represent, respectively, evaluations in the rows of *Eucalyptus* and in the crops planted between these rows.