

Precision agriculture in crop-livestock system in southern Brazil: are soybean and winter pasture yield zones identical?

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Introduction

Yield maps are increasingly accessible to farmers generating large amount of information with high precision. However, the same does not occur with the yield pasture especially under grazing. Since animals throughout the growth cycle consume pasture's production selectively, other methods must be considered. This work aims to identify if the soybean and winter pasture yield zones coincide in crop-livestock system in Southern Brazil.

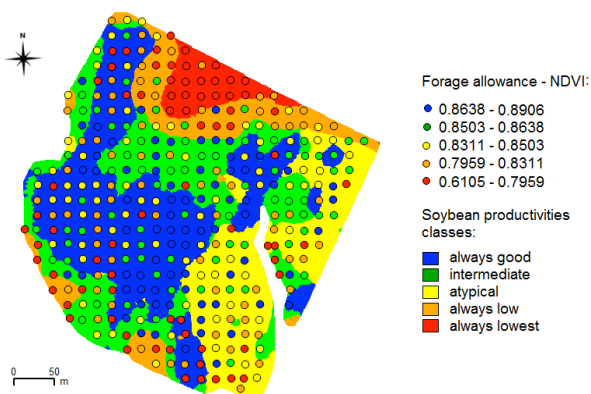
Material and Methods

To check the coincidence zones, 400 geo-referenced points were evaluated in a plot of 12.9 ha conducted since 2008 in a crop-livestock integration system, using soybean during the summer (cultivated at a fixed rate of seeds and fertilizer) and ryegrass pasture in the winter. In order to evaluation of biomass, at each point it was obtained the Normalized Difference Vegetation Index (NDVI) with Crop Circle, just before grazing by steers, in 03.07.2014. The results were overlaid on a map of the soybean yield classes obtained by the classification from three soybean yield maps, for the years 2012, 2013 and 2014. Classification and visualization procedures were performed by QGIS 2.2 software.

Results and Conclusions

Four zones of soybeans showed consistency with the ranking of class productivity over the years. Two of them with the lowest productivity, and two with the best. The most of the sampled points with low forage mass (vegetation index) lying over the low yield soybeans areas, specially in the zone classified as always lowest. This shows that this zone have productivity restrictions at the pasture and crop stages. The other two zones with higher productivity of soybean occurred a large proportion of points with high values of vegetation index. However, in the latter case, the points of high mass grassland were interspersed with other classes of grass production. Based on these results, we can infer that the lowest productivity zone is the same, for soybeans and winter pasture. Accordingly, the identification of the soil-plant relationships can be better evaluated in this zone, in order to identify specific site management practices that improve the system performance.

Fig.1. Soybean yield zones and forage vegetation index



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