Yield of soybean in integrated crop-livestock-forest system

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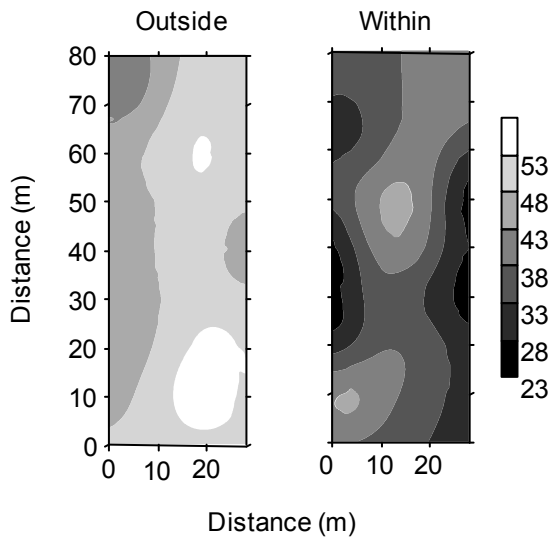
Introduction The integrated crop-livestock-forest system (CLFS) can enhance the production of soybean, meat and wood in regions characterized by sandy soils and warm climate as the Northwestern region of Paraná State, Brazil. The tree component in CLFS can provide water conservation, carbon sequestration, wood production, and improved animal welfare. On the other hand, it is necessary to evaluate the tree component effects on annual crops performance. This study aimed to evaluate the yield of soybean within and outside eucalyptus rows.

Material and Methods
The experiment was established in the municipality of Santo Inacio, (latitude 22°45'56" S, longitude 51°50'30" W and altitude 386 m). The soil was classified as Typic Haplustox according to USDA Soil Classification System. The eucalyptus specie used was *Corymbia maculata*, planted in single rows spaced 28 m, with a spacing of 4.2 m between trees in a row. In 2014/15 growing season – when eucalyptus had five years old - the soybean was sown in November using a row spacing of 0.5 m and 250,000 plants ha^{-1}. Soybean yield was assessed in 64 samples of 3 m^2 collected within and outside tree rows. The soybean yields were subjected to geostatistical analysis.

Results and Conclusion
Fig. 1. Maps of soybean yield (bags of 60 kg ha^{-1}) from areas within and outside the tree rows in an integrated crop-livestock-forest farming system. Santo Inácio, PR, Brazil



In the 5th growing season after eucalyptus establishment, the soybean yield losses caused by the trees were 27.0% on average, being more intense near the trees rows (Fig. 1). None of the positions between eucalyptus rows presented higher soybean yield when compared with the non-forested area. This result demonstrates that the eucalyptus plants induce high soybean yield loss, mainly due to high competition for water, light and nutrients.