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Performance of soybean crop in a crop-livestock-forest system in the southwestern of Brazilian Amazon

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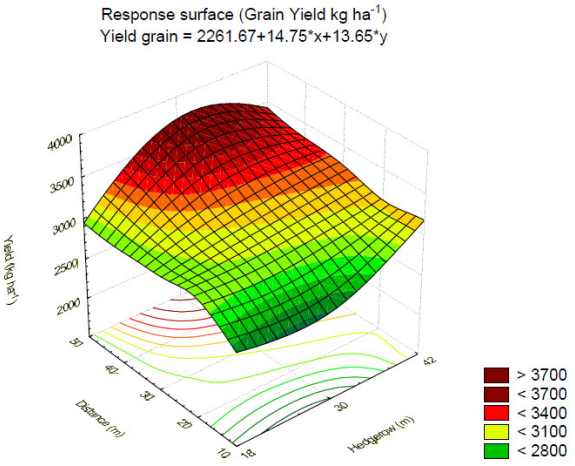
Introduction Nine billion people is expected to inhabit our planet by 2050. That is the most important and unprecedented challenge of the humanities, all the time. One solution of this equation is to improve the agricultural land use efficiency, especially in the tropics. So, the exploitation of the forest, cash crops and livestock in the same area at the same time can be a sustainable practice to boost the efficiency of the agricultural land.

Material and Methods
In order to evaluate the influence of the eucalyptus trees (hedgerow), planted in 2013, in the grain yield of soybean plants, a long term experiment has carrying been out in the southwest of the Amazon, in Porto Velho, Rondonia (Passos et al., 2013). The spatial arrangement of the trees comprehends hedgerow of four rows of eucalyptus plants spacing in 18, 32 and 42 meters among them. Between the hedgerows the soybean in the summer was grown. The treatments were three distances of the hedgerow versus four proportions of distances from trees (10, 20, 30 and 45%). The treatments were laid out in a randomized complete block design (RCBD) with eight replicates.

Results and Conclusions
Fig. 1. Response Surface of grain yield of soybean plants intercropped with eucalyptus plants.



The higher grain yield was observed in the middle of the largest hedgerow (42m). The average of this hedgerow (3,321.6 kg ha^{-1}) boosted the grain yield in 15,6% in relation to the smallest one (2,874.1 kg ha^{-1}). That difference (7.5 bags ha^{-1}) could represent a significant effect on the profitability of the farmer. The medium hedgerow presented the average of 3,083.4 kg ha^{-1}. Into the smallest and largest hedgerows, the evaluated distances, from the trees to the soybean plants, did not effected the grain yields. This factor only significantly influenced the productivity of soybean plants in the medium hedgerow (30 meters). In this case, the grain yield is explained by the linear equation Y (kg ha^{-1}) = 98.6*meters + 2,307.3 (R^2=97.7%); up to the middle of the hedgerow (15 meters). In that distance from the trees, the yield (3,785 kg ha^{-1}) was about 47.4% higher than the closest row of soybean (2,568 kg ha^{-1}). The two years old eucalyptus hedgerow affected the average grain yield from 30 meters wide.

References cited
PASSOS, et al. (2013). In: XII CONGRESSO INTERNACIONAL DO LEITE.

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