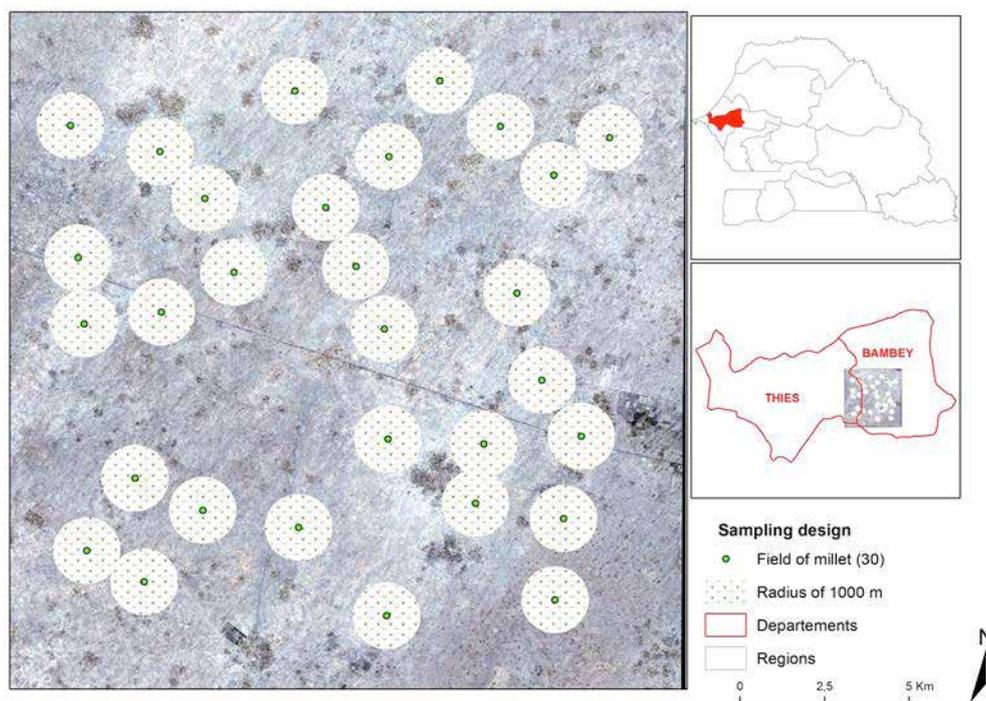


### Tree species effect on natural control of *H. albipunctella* de Joannis in a millet agroforestry system in Senegal

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Association of several tree species in and around a plot can have a positive impact on ecosystem services. Thus, traditional agroforestry systems, characterized by a high plant diversity, constitute an ideal model of study to test if the natural tree vegetation provides both shelter and food resources for insects that could potentially improve biocontrol services. The main objective of this study was to test if tree species presence and diversity could enhance the natural regulation of the millet head miner *Heliocheilus albipunctella* (MHM) in agroforestry systems of the Senegalese Peanut Basin. To address our objective, we realized an inventory of tree species in a total of 30 millet fields surveyed in Bambeý area, during 2013 and 2014 (Fig.1). These data were used to calculate indices related to the abundance and diversity of tree species. The natural regulation was estimated using the biocontrol service index (BSI) for each millet field. In addition, data on MHM egg and larval predation and parasitism rates were also collected to estimate biocontrol services. Statistical analysis of the effect of tree presence and diversity on natural regulation variables were tested using a linear regression. Surprisingly, we found that BSI decreased with tree diversity and that it increased with the presence of the tree species *Faidherbia albida*. Moreover, the presence of *Anogeissus leiocarpus* enhanced MHM egg parasitism and the presence of *Azadirachta indica* favored MHM egg predation.



Bambeý study area and the set of 30 millet field sites surveyed

**Keywords:** *H. albipunctella*, Tree species, natural regulation, Biodiversity conservation, Senegal.