

# ALTERNATIVE SYSTEM TO SLASH-AND-BURN FOR AGRICULTURE IN THE EASTERN AMAZON REGION: IMPACTS ON ANT SPECIES RICHNESS

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## INTRODUCTION

Slash-and-burn is the most widespread approach to preparing land for agriculture and livestock in Brazil's Amazon region. Leaf-litter biomass may be totally burned in affected areas, destroying a vital habitat for thousands of invertebrate, such as ant communities. An alternative to slash-and-burn has been developed, using tractor-driven equipment to mulch vegetation, leaving organic material on the soil surface. This study focuses on evaluating ant species richness in plantations of cassava under slash-and-burn and mulch systems.

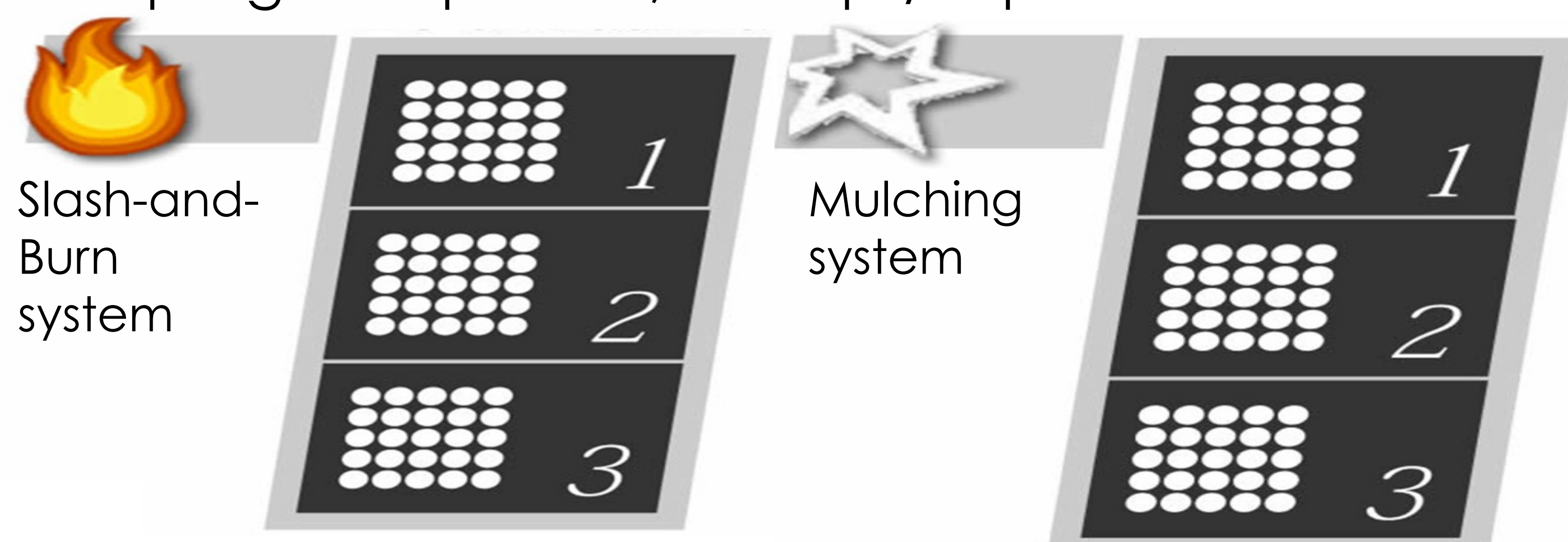
## MATERIALS AND METHODS

Locality: Northeastern of Pará State, Brazil

Sampling period: 01 – 04/2008

Agricultural System: Plantations of Cassava

Sampling: 3 Repetitions, 20 traps/ rep.



Statistical Analysis: Multiple regressions with quaise-Poisson error distribution, in statistical program R.



Figure 1: Capoeira (vegetation)



Figure 2: Cassava (*Manihot esculenta*)

## RESULTS

We found greater ant species diversity in mulching as compared to slash-and-burn systems ( $p < 0.005$ ). Higher magnitudes in the variables plant height ( $p < 0.005$ ), leaf litter biomass ( $p = 0.016$ ) and litter phosphorus content ( $p = 0.020$ ) were significantly related to increased ant species richness in both systems. Higher litter nitrogen content was significantly related to increased ant species richness in mulching systems ( $p = 0.030$ ). In a model analyzing slash-and-burn sites, soil hardness ( $p < 0.005$ ), phosphorous ( $p < 0.0005$ ) and aluminum content ( $p = 0.015$ ) were found to be significantly related to increased ant species richness. In a model analyzing mulch systems, leaf litter biomass ( $p < 0.0005$ ) and distance from the nearest forest fragment ( $p = 0.012$ ) were the environmental variables correlating to greater richness.

## CONCLUSION

Our results showed that land-use systems using different crop preparation approaches have different impacts on biodiversity, specifically that systems using fire reduced ant species richness as compared to the fire-free mulch systems. The fire-free systems appeared to maintain the environmental variables within the agricultural matrix that are vital for resource and habitat conditions for ant species.

## ACKNOWLEDGMENTS