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Thriving climate change in Mantiqueira, Brazil. Coffee agroforestry design for soil and crop resilience in slope zones

Ziantoni V.[1] (ziantoni.valter@gmail.com), Costa P.[2], Araujo P.[3], da Mota M.[4]

[1] *Agroforestry, PRETATERRA, Timburi, SP, Brazil*; [2] *Agroforestry, PRETATERRA, Sao Paulo, SP, Brazil*; [3] *Communication, Fazenda da Toca, Itirapina, SP, Brazil*; [4] *Research, Café dos Contos, Monte Sião, MG, Brazil*

Mantiqueira region, Brazil is under desertification process, facing droughts and soil degradation. Regenerative models, considering soil conservation are needed to thrive under harsh conditions while diminishing chemical fertilizers. An agroforestry system was designed, maximizing soil infiltration and improving coffee resilience on slope zones in Monte Sião. Final model and costs are shown in table 1. For soil conservation, aggregation and retention, an ancestor method based on *Anthropogenic Dark Earth* (TPI) was used, based on charcoal and sawdust deposition. N_2 fixer species were selected for alley green manure. Species selection and arrangement considered succession, stratification, shade, architecture, permeability, lifecycle and root depth. Components are: *M. integrifolia*, *C. arabica*, *T. ciliata*, *Musa sp*, and *I. vera*. Seed-mixture for alley enrichment is: *U. brizantha*, *C. cajan*, *H. annus*, *P. glaucum* and *C. spectabilis.* Soil management and mulching used a mix for fertilizing purposes, charcoal residues for raising soil CEC, coffee husks + poultry manure (10% N) and eucalyptus sawdust for soil covering. Design attributes were systematized. With a cost of USD 6,316, the first 1 hectare was implemented in Dec, 2018 in the Farm "Café dos Contos". Integrated systems diversify revenues. A replicable agroforestry model for Mantiqueira coffee-based agriculture will drastically improve soil conservation and crop resilience, while building a new sustainable productive paradigm.
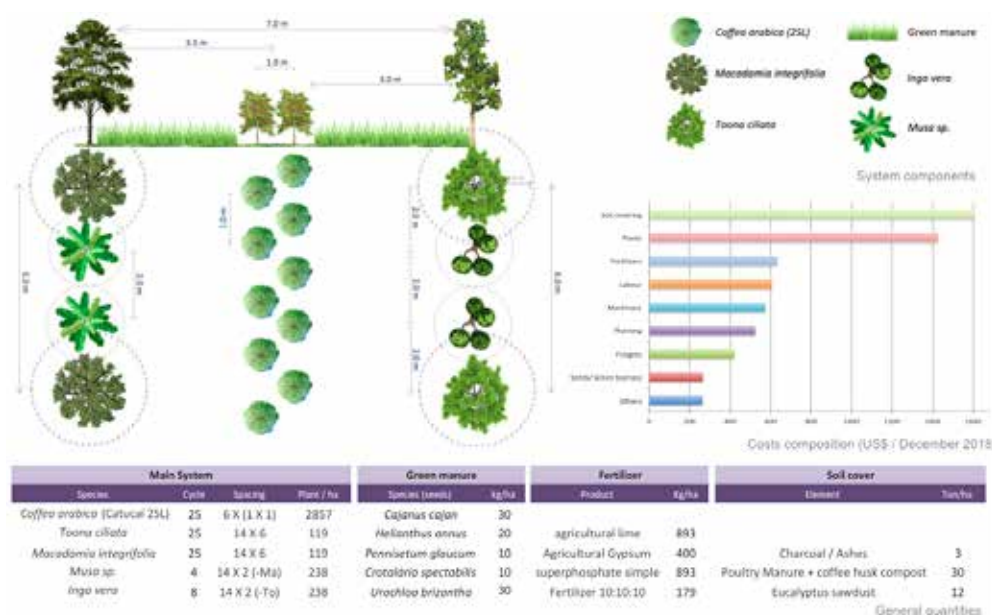

Table 1. Complete information of (a) design, (b) table of quantities and (c) general costs.

Keywords: Shade-grown coffee, Terra Preta de Indio, desertification, Anthropogenic Dark Earth, Soil conservation.

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