Report Field Work TCD Grant 2016
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Soil carbon sequestration and biochar use in silvopastoral systems for climate-change mitigation.

The present TCD student went to Brazil in the end of June of 2016 intending to collect soil samples in the research station of the Empresa de Pesquisa Agropecuaria de Minas Gerais (EPAMIG) in Prudente de Moraes, Minas Gerais. The field work was done in a silvopasture experiment conduced there since 2008. In the beginning of July, the student arrived in the research station and stayed there until the beginning of August, hosted in a EMBRAPA's dorm near by. A total of nine treatments were selected for the research, to understand the influence of land use system in carbon sequestration in soils (each treatment had three replications).

The nine treatments were: 1) Near trees in the silvopasture with spacing of 20m double rows x 3m, 2) Away trees in the silvopasture with spacing of 20m double rows x 3m, 3) Near trees in the silvopasture with spacing of 9m double rows x 3m 4) Away trees in the silvopasture with spacing of 9m double rows x 3m 5) Near trees in the silvopasture with spacing of 9m x 3m, 5) Away trees in the silvopasture with spacing of 9m x 3m, 6) Open pasture, 7) Eucalyptus plantation (3m x 3m) and 8) Native forest. In each replication of these treatments were three holes and one pit, the pits were to collect soils for bulk density (BD) analyses and the holes plus the pits to collect soil samples, being a composed soil sample from four subsamples.

In the first days three workers were hired to help to dig pits (27) and holes (81) in the selected treatments. In the 27 pits were collect soils for bulk density (BD) analyses, in five selected depths (0-5 cm, 5-10, 10-30, 30-60 and 60- 1 meter), being three replications in the nine treatments. The soil samples for the BD analyses were then conduced to the EPAMIG laboratory where they were heated in 105 °C for two days, weighted and divided by the cylinder size to calculate the BD. So the BD values about these depths, necessary to measure the total of carbon in the soil, is already available. In the 27 pits and in the 81 holes were collected soil samples from four depths (0-10 cm, 10-30, 30-60 and 60-1 meter) for future analyses in the UF laboratories. In each of the four subsample were collect about 500g of soils to form a total of a sample of 2kg.

As a challenge to collect the soil samples I can highlight the fact that in the holes, which were small, we had to create tools to collect soils in the lower depths (30cm-60 and 60-1m), and the success for that can be awarded to one of the local workers who had a great idea about it. Additionally to this specific help, I considered that my field work was successful to the great support that I receive from the local workers in the field, like an internship who stayed one day with me in the field until the evening.

After the part to collect the soil, being a total of 108 samples (4 depths x 3 replications x 9 treatments), the 2kg soil samples were sieved, mixed, divided in two samples of 750g and packaged, one to be send to UF and a duplicate to keep in the EPAMIG for any problem with the original or for future studies there. Both samples, the original and the duplicate still in the EPAMIG station, the original is already in boxes to the send by FEDEX to the UF, for that we are only waiting for a tax invoice from the EPAMIG, required by the Brazilian custom house.

The experience in the field not only was important for the specific scientific purpose to collect soils but also as a personal experience, where the challenge to deal with difference points of view and the necessity to adjust my expectations with the institution, showed me how important are the the skills to deal with people in the best way possible, which with no doubt my ability to do that I can associate with what I learnt in the TCD's class, Facilitation Skills, that I had last in the Spring with Jonathan Dain.