

Carbon stock on a beef cattle ranch in a savanna woodland area in the Pantanal, Brazil

Suzana SALIS¹, Ana MAROZZI-FERNANDES^{1}, Fernando FERNANDES¹, Patrícia MATTOS², Ivan BERGIER¹, Sandra Mara CRISPIM¹, Carlos Rodrigo LEHN³*

¹ Embrapa Pantanal, ² Embrapa Florestas, ³ Instituto Federal de Educação, Ciência e Tecnologia Farroupilha

E-mail address of presenting author*: ana.marozzi-fernandes@embrapa.br

The amount and distribution of biomass in agroecosystems expresses the carbon sequestration or mitigation potential of emissions released into the atmosphere. Estimates of total biomass and carbon in vegetation and soil are therefore essential to determine whether an agricultural activity is neutral, a source or a sink for greenhouse gases. The objectives of this study were to estimate the total stock of biomass and carbon contained in the native vegetation and the soil on a beef cattle farm in a savanna woodland area in the Nhecolândia region of Pantanal in Corumbá, state of Mato Grosso do Sul, Brazil. Woody biomass (stems and roots) was estimated from a statistical regression analysis of field data (destructive sampling). The best regression adjustment was obtained with exponential or potential equations, depending on the species. Herbaceous biomass (shoots and roots) was also estimated from field data (destructive sampling). Herbaceous roots and fine roots (of woody species) were collected at depths of 0 to 40 cm, using a zinc box for the former and a soil auger for the latter, both with known volumes. Soil carbon sampling was carried out at seven points according to the plant species under study, at depths of 0-10 cm, 10-20 cm and 20-40 cm. Soil bulk density was estimated based on pedogenetic relationships. The total biomass (above and below ground level) was estimated at 161.34 Mg ha⁻¹ and total carbon at 75.42 Mg ha⁻¹. The soil carbon stock was estimated at 17.85 Mg C ha⁻¹, which, added to the total biomass carbon, resulted in 93.27 Mg C ha⁻¹. Unlike what

has been observed in other savanna woodland environments, the data revealed a relatively higher aerial biomass than root biomass, as well as a higher carbon stock in biomass than in soil. Proportionally, the soil was found to store only 19.14% of the total carbon stock of this agroecosystem. (These findings are part of the EMBRAPA PECUS Network - Greenhouse gases dynamics in livestock production systems from Brazil - and partially funded by Conservation International, CI- Brazil).