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Seasonal variability of hydro-physical conditions in Faxinal system subtropical climate in southern Brazil.

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The Faxinal System is a form of peasant organization, existing in the Center-South region of Paraná State which is subject to extensive livestock breeding in a common breeding site; forest harvesting within the common breeding site and subsistence feeding polyculture out of faxinal limits. The organization of Faxinal occurs through the fencing of the entire area of faxinal, without boundaries between the properties where the common breeding works. All owners have the right to raise their animals (bovine, equine, etc.) roaming free. The breeding site consists of outdoor areas (natural pastures) and secondary forest areas. The form of creation without properties restriction (roaming free) is identified as the main factor of soil erosion and land degradation due to constant grazing. The trampling ends up compacting and influencing the physical conditions of the soil which lead to the reduction of leakage and increasing the erosive processes. Based on the above considerations, the objective of this study was to evaluate the compression and water infiltration to the soil in a Faxinal in the South Central Region of Paraná - Brazil. The presented data was collected in a pasture site and secondary forest, both with constant grazing (breeding area) and an area with uncounted animals (control area) out of Faxinal limits. Two collection campaigns were carried out as follows: August (winter) and January (summer). In each collection campaign ten (10) infiltration repetitions were made in each area. In each infiltration test 15 compression collections were performed in each infiltration area, totaling 150 repetitions in each campaign. For the evaluation of water infiltration into the soil, a manual concentric cylindrics infiltrometer was used with readings each 5 minutes during one hour. The Compression was collected with the aid of a pocket penetrometer with a value of 4.5 kgf / cm2. The Infiltration in August was of 26.7 cm / h in secondary forest, 19.1 cm / h in grassland, and 46.1 cm / h in Native Forest. The infiltration in the secondary forest in January was of 32.3 cm / h (29.9% higher than in August). The pasture indicated infiltration of 12.8 cm / h (32.9% lower) and 49.2 cm / h native forest (6.3% higher). Soil compaction in August was of 2.9 kgf / cm2 in the secondary forest, 3.7 kgf / cm2 in the pasture, and 1.4 kgf / cm2 in the Native Forest. In January, compression was of 2.1 in Secondary Forest (27.6% less than in August), 4.0 kgf / cm2 in the pasture (7.5% higher) and 1.3 kgf / cm2 in the native Forest (7.1% lower). These variations may be associated to the climatic conditions which cause some frost in winter promoting greater mobilization of animals looking for food in secondary forest areas due to reduced pasture. The springs from the pasture in summer enhances the time animals stay in the pasture areas. The influence of animals on hydrogeomorphic conditions in faxinal areas was evident, especially when comparing the data from the two areas with the ones indicated by the Native Forest.