

## S U M M A R Y

The present work was comparative ecological study of soil fauna in several pasture systems and a nearby area of primary forest. A total of 1304 soil samples, each of 12,56 cm<sup>2</sup> area to a depth of 5 cm, were taken on 21 dates between January and December of 1977. Fauna were extracted with a modified Berlese — Tullgren method, using 1% formol as the liquid collector. Identifications were made to the level of major group (subclass or order, or family).

Study sites were in the municipalities of Silves and Itacoatiara, Amazonas, Brazil, with the primary locality at Fazenda Aruanã (3°08'S, 58°45'W). The soil was a heavy yellow latosol (oxisol) of pH 3,4 to 5,9.

Environmental parameters measured included soil temperature, moisture, fertility organic matter content, vegetative cover of grasses and invading plants, and solar radiation. Climatic factors recorded were mean air temperature, relative humidity, and precipitation.

Comparisons were made between intensive and extensive *Setaria* pasture systems extensive systems with other grasses and of several ages, and primary forest.

Mites and Collembolans were the dominant soil fauna in all environments. Up to 22 groups (subclasses or orders) of Arthropods were found in the pasture and 26 in the forest. In the pasture mite densities varied between 32.000 and 73.000 per square meter and Collembolan densities between 4.000 and 35.000 per square meter. In the forest densities were 49.000 and 12.000 per square meter for mites and Collembolans respectively.

There was no statistically significant difference between the soil faunas of the two

*Setaria* pasture systems, there were differences between different grass species and different ages of extensive systems. The primary forest differed from the *Setaria* pastures principally in the number of groups of Arthropods found.

There was an apparent difference in vegetative cover of intensive and extensive *Setaria* systems, but it is suspected that this was an incorrect result attributable to problems of methodology.

The forest soil had more stable temperatures, higher and more constant moisture content throughout the year, lower fertility, and higher organic matter content than the pasture soil. In the forest solar energy at 1,5 m above the soil was only 0.06 cal/cm<sup>2</sup>/min while in the pasture it was 1,59 cal/cm<sup>2</sup>/min.

The arthropod populations were found aggregated and those of the mites and Collembolans were satisfactorily described by the negative binomial distribution.

In general there was no correlation between physical and edaphic factors and the soil fauna. Collembolans showed a negative correlation with air temperature and precipitation, and a positive correlation with relative humidity in pasture. Acari showed a positive correlation with organic matter content of the forest soil. There was a positive correlation between numbers of mites and Collembolans at least in the intensive *Setaria* pasture systems (calculated by the Spearman coefficient of rank correlation).

Soil respiration under *Setaria* sp. was 455,7 (day) and 448,1 mg CO<sub>2</sub>/m<sup>2</sup>/h (night) and under *Solanaceae* was 507,0 (day) and 483,6 mg CO<sub>2</sub>/m<sup>2</sup>/h (night).