Artigos Técnicos

PHOSPHORUS CYCLING IN PASTURES

The recycling of phosphorus (P) is related to its stability (low solubility) and its low mobility in soils. OP is relatively immobile in soil and has no gaseous forms. Removal of P by cutting and / or grazing is the main source of removing the system, however in pastures and managed through its return organic waste and animal excretions cycle results in a relatively closed. Due to the high degree of weathering, the tropical Oxisols and Ultisols have low amounts of available P, with about 60-80% is in organic form. Furthermore, these soils have a high binding capacity of P. HPO4 ions that are released by mineralization of organic P or phosphate fertilizers are fixed in forms not readily available or unavailable to plants. Due to the low calcium content and low pH, P mineral form of iron and aluminum phosphates relatively insoluble or soluble under anaerobic conditions (reduced soil). The two main procedures for setting soil P are: 1. Precipitation with exchangeable Al. By applying the phosphate fertilizer basic cations contained therein disperses aluminum exchangeable clays, which is hydrolyzed and reacted with HPO4 ions forming insoluble aluminum phosphate, 2. Adsorption of P in particulate sesquioxides. The higher content of oxides of iron and aluminum, the greater the binding capacity of P.

P inputs to the system - the main source of P to pasture is the mineralization of soil organic matter. The initial content of organic P, total P, moisture content of organic waste, temperature and time are factors that determine the degree of net mineralization of P contained in organic waste and animal. Approximately 3-30% of organic phosphorus contained in the feces of sheep and 2-5% P contained in the organic waste can be vegetable mineralized. On average, about 77% of P from the litter and 79% of P contained in the dead roots, become available for plant growth in the year following its deposition. Of total P contained in the shoot of the plant is 60-80% soluble in water and most are inorganic. In general, only the long-term return through animal manure P will significantly its recycling as a result of irregular distribution of feces and low mobility. The occurrence of beetle dung worms and increase the rate of mineralization of the faeces through its burial in the soil. Phosphorus through the atmosphere (dust) or the rain is small, being reported values from 0.04 to 0.6 kg P / ha / year. A similar situation occurs with the processes of weathering of primary minerals from the soil.
Another important mechanism for recycling or incorporation of P in plant-animal system is the symbiotic association between roots and mycorrhiza. In general, the effects of mycorrhiza on plant growth is manifested by increased surface area for absorption of nutrients, and longevity of the root suckers and better use of some forms of nutrients not available for the roots colonized. Resaeches in Rondônia demonstrated that inoculation of Scutellospora heterogama in Desmodium gyroides, Glomus etunicatum in Stylosanthes capitata and Gigaspora margarita in Pueraria phaseoloides, provided forage yields similar or higher than those obtained with the application of 50 kg P2O5/ha in the absence of inoculation. Moreover, the absorption of nitrogen and phosphorus were significantly enhanced with mycorrhizal inoculation.

volatilization is minimal, estimated at 0.3 kg P / ha. No evidence of gas losses P, even under anaerobic conditions. Approximately 69-80% of total P plant vegetation can be recycled when it presents itself in a latent or decaying. The intensity and duration of rainfall and the interval between the senescence of tissues and the first rain affect the amount of P returned to the soil or can be lost through runoff.
The higher output of the system due to removal of fodder for the production of hay, silage or green biomass for direct supply to the animals. The removal means is small animal products, and reported values of 6.71, 6.76, 4.53 and 1.03 kg of animal product

p/1000 kg respectively for calves, steers, sheep and cow's milk. In general, the losses range 1-10 kg P / ha / year depending on the yield load of pasture and animal used. Work undertaken in the Amazon found that the amount of P exported by cattle grazing, supplied with mineral salt in the trough, represented only 31.53% of the sum of nutrients in the grass (Brachiaria humidicola) and mineral salt. For an animal productivity of 256 kg liveweight / ha / year, a total of 5.93 kg / ha / year of intake, was 60.88% of the mineral and was only 39.12% of the grass, a , 87 kg / ha / year were stocked in the animal and 4.06 kg / ha / year returned to the soil.

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