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Área do trabalho: Pastagens e forragicultura

Nitrogen fixation in butterfly pea (*Clitoria ternatea* L.) in different cropping systems

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The search for greater efficiency in forage plant-based systems has intensified in recent years, increasing the need to reduce the environmental impacts of livestock farming. To this end, it seeks to reduce dependence on fossil fuels for nitrogen (N) input with the use of microorganisms (for example, biological nitrogen fixation, FBN). And in this way, the intercropping of legumes and grasses became a recommended practice. In tropical regions, an example of an intercrop used is butterfly pea and elephant grass. However, biological nitrogen fixation by legumes in intercropped systems can be modified by some factors as such persistence and production of legumes, N status in the soil and competition with the associated grass. The objective of the study was to quantify biological nitrogen fixation in butterfly pea (*Clitoria ternatea* L.) in monoculture or intercropped with elephant grass (*Cenchrus purpureus* Schum.) at different seasons of the year. The experiment was carried out at the Carpina Sugarcane Experimental Station of UFRPE (tropical humid climate with a dry summer), in Pernambuco, Brazil, using a randomized block experimental design with four replications. The cropping systems were butterfly pea in monoculture, butterfly pea intercropped with elephant grass cv. 'Elefante B' and intercropped with cv. Mott. The assessments took place in the dry (September and November 2021) and rainy (January and March 2022) seasons. The cutting frequency used was 60 days, with cutting intensity at ground level and fertilization with 60 kg of K and 70 kg of P ha⁻¹ in the cuts of the rainy season. The data were submitted to anova using SAS® On Demand, with means compared using the Tukey Test (P<0.05). For the botanical composition, there was a greater proportion of butterfly pea in the consortium with 'Elefante B' (10%) compared to Mott (7%). However, a higher proportion of elephant grass was observed in the dry season (96%) compared to the rainy season (86%). The opposite was observed for the proportion of butterfly pea, with a higher proportion in the rainy season (14%). Butterfly pea, in monoculture or intercropped, did not differ in the proportion of N derived from the atmosphere (70%). During the rainy season, butterfly pea in monoculture fixes 30 kg of N ha⁻¹ 60-d⁻¹, while butterfly pea intercropped with different genotypes of elephant grass fixes an average of 5 kg of N ha⁻¹ 60-d⁻¹. However, in the dry season, fixed N does not differ between butterfly pea cropping systems. Annually, butterfly pea in monoculture adds 100 kg of N ha⁻¹ to the soil via biological N fixation, while in an intercropped system these values drop to 18 kg of N ha⁻¹. Thus, we conclude that biological nitrogen fixation in butterfly pea is favored in monoculture systems and in the rainy season, but the N addition by fixation biological to intercropping systems with can help to reduce the use of nitrogen fertilization, decreasing the production costs.

Palavras-chave: *Cenchrus purpureus*, *Clitoria ternatea*, ecosystem services, intercropped systems.

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