Effect of inclusion of perennial soybean (*Neonotonia wightii*) on the chemical composition and in vitro dry matter digestibility of elephant grass silage[4].

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Introduction The elephant grass is a forage specie of great importance in ruminant feeding, ease of deployment, adaptation and management, as well as high productivity, a disadvantage of the elephant grass is their seasonality of production (Lopes, 2011). Thus, the use of forage in the process of silage is increasing, however despite the high elephant grass production has a high dry matter content and low content of soluble carbohydrates. Pre wilting is a technique that aims to increase the dry matter since the inclusion of legumes is to improve the nutritional value. The objective of this study was to evaluate the effect of adding soy bean perennial on the *in vitro* dry matter and chemical composition of elephant grass silages

Materials and Methods The experiment was conducted in an area formed with elephant grass cv. Taiwan A-146 belonging to the Institute of Animal Science, UFRRJ in Seropédica – RJ. There was a uniformity cut followed by a top dressing with 100 kg / ha of N and K_2O. The elephant grass and perennial soybean (*Neonotonia wightii)* were collected manually with 70 days of growth, plants were cut and subjected to a period of wilting in the sun for 6 hours and then chopped. The treatments were: Treatment 1 - grass wilted and without addition of perennial soybean; Treatment 2 - grass wilted whit 10% perennial soybean; Treatment 3 - grass wilted whit 20% perennial soybean; Treatment 4 - grass wilted whit 30% perennial soybean. We used PVC experimental silos with 10 cm in diameter and 30 cm high. The ensiled material was compacted manually in order to provide density of about 600 kg / m³ of silage. After 60 days, the silos were opened and sampled for chemical analysis. Chemical analysis of silages were performed at the Laboratory of Embrapa Dairy Cattle. We evaluated the levels of dry matter, crude protein, neutral detergent fiber, acid detergent fiber, cellulose, lignin using techniques described by Silva and Queiroz (2002). The in vitro dry matter digestibility by the method of Tilley and Terry (1963).

The experimental design was a completely randomized design with five replications, and the results interpreted through analysis of variance and regression. Choosing the best model was based on the coefficient of determination and significance of regression coefficients, and SNK test at 5% probability.

Results and Discussion: There was a positive linear effect for crude protein, in vitro dry matter digestibility, lignin, and pH values ($P < 0.05$) (Table 1), demonstrating that the inclusion the perennial soybean in elephant grass silage was beneficial to increase the levels of protein and in vitro dry matter digestibility. The pH values behaved the same way but this rise may indicate the occurrence of secondary fermentation in silage, and the inclusion until 25% of perennial soybean can provide appropriate values of pH (McDonald, 1991), as rising levels of lignin can reduce consumption, but no detectable decline on *in vitro* dry matter despite the increase in lignin. In variables NDF, ADF, cellulose and hemicellulose effect was observed ($P < 0.05$) negative (Table 1), showing that there was a decrease of the values of these variables as the levels of inclusion of perennial soybean increased, probably due to the dilution effect provided by the inclusion of perennial soybean.

Conclusions Including up to 25% perennial soy bean (*Neonotonia wightii*) in the elephant grass silages had a positive effect on their chemical composition and in vitro dry matter digestibility.

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Table 1. Regression equations for the variables pH, in vitro dry matter digestibility (IVDMD), neutral detergent fiber (NDF), hemicellulose, lignin and crude protein in silage of elephant with inclusion of perennial soybean.

Variable	Inclusion Levels of Perenial Soybean (%)				Regression equations
	0	10	20	30	
pH	3.87	4.19	4.16	4.25	$Y = 3.95 + 0.01X$ (R^2 = 71.36%)
IVDMD	48.41	50.89	54.72	57.97	$Y = 48.12 + 0.32X$ (R^2 = 99.37%)
NDF	68.95	65.37	63.01	60.16	$Y = 68.68 - 0.29X$ (R^2 = 99.33%)
ADF	42.12	41.51	39.35	38.82	$Y = 42.26 - 0.12X$ (R^2 = 93.47%)
Cellulose	35.98	34.50	32.23	30.07	$Y = 36.20 - 0.20X$ (R^2 = 99.23%)
Hemicellulose	26.83	23.86	23.66	21.34	$Y = 26.42 - 0.17X$ (R^2 = 91.46%)
Lignin	5.15	6.31	6.26	7.62	$Y = 5.23 + 0.07X$ (R^2 = 88.41%)
Crude Protein	9.11	11.04	12.89	14.53	$Y = 9.17 + 0.18X$ (R^2 = 99.87%)