Nutritional value of corn silage harvested at 121 days after emergence in R4 stage, under the effect of different planting densities

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Introduction Corn silage has great importance in the production chain of cattle being fundamental in intensified systems. The quest for technologies that increase the yield of corn for silage should be constant, but great attention must be given to the silage quality result, and this will reflect in the performance of the animals fed. The increase in plantation density is one of the most efficient methods of raising the interception of solar radiation by the community of corn plants, and consequently increase their production (Demetrius et al., 2008). But at very high densities changes may occur in the plant as reduced grain fraction, leading to a decrease in the quality of the silage. Therefore, this work aimed to evaluate the impact of different planting densities on level of neutral detergent fiber (NDF), detergent fiber (ADF), hemicellulose, ash and total digestible nutrients (TDN) in silage resulting.

Materials and Methods The experiment was conducted at the Department of Animal Production (NUPRAN), Department of Agricultural and Environmental Sciences of the State University Midwest (UNICENTRO) in Guarapuava, PR. Temperate climate of altitude - Cfb. no dry season, with cool summers and mild winter according to the Köppen classification, The soil of the experimental area is classified as Oxisol the experimental area has been used in recent years with pastures annual cycle in the winter season, and corn and soybeans in the summer season. The contents of neutral detergent fiber (NDF), using heat-stable α amylase, acid detergent fiber (ADF) and ash, according to Van Soest et al. (1991). The hemicellulose was obtained by difference between NDF and ADF. The levels of TDN were obtained via equation [TDN% = 87.84 - (0.70 x ADF)] suggested by Bolsen (1996), and crude protein (CP) by the micro Kjeldahl method, hybrid used was SG-6030 YG grown in different planting densities (45, 55, 65, 75 and 85 000 plant/ha), and seeded in October in plots with a total area of 28.8 m^2 (4, 8 mx 6.0 m) was used to assess the quantitative and qualitative floor area of 16 m^2 (3.2 mx 5.0 m), the between line spacing used was 0.8 m. The plants were harvested, chopped and packed in PVC silos, with dimensions of 0.5 m long and 0.1 m diameter, equipped with valve "Bunsen". The silos were open 35 days after silage production, and these samples were dried in a forced air oven at 55 ° C for 72 hours ground in a mill type "Wiley," sieve of 1 mm mesh and used for laboratory testing. Data were subjected to analysis of variance comparison of means at 5% significance level, through the SAS (1993).

Results and Discussion Table 1 presents bromatolological parameters silage hybrid LG 6030-YG harvested at 121 days after emergence, the developmental stage dough, with a mean value of plant dry matter of 36.4. Only the NDF values differed significantly from the other parameters, and was lowest for the intermediate densities of 55 and 65 thousand plants per hectare, according to Alvarez et. al. (2006) low plant populations favor the formation of a more fibrous stem which can raise the NDF. Likewise, Barbosa et al. al. (1995) concluded that high plant densities are associated with a reduction ear fraction of the plant, which consequently increases the NDF silage resulting in agreement with the data presented in the

study. The data show the versatility of hybrids tested, cultivated in different planting densities, for keeping up with NDF content below 50%, the FDA below 30%.

Table 1 Nutritional value of corn silage hybrid SG-6030YG harvested at 121 days after emergence(DAE) plants, under the effect of different planting densities

	Planting density of SG-6030YG (plants/ha)					
Constituents, % DM	45000	55000	65000	75000	85000	Mean
Crude protein	6.86 [a]	6.63 [a]	6.15 [a]	6.91 [a]	6.48 [a]	6.61
Neutral detergent fiber	47.11 [a]	47.32 [a]	45.39 [b]	46.31 [b]	48.38 [a]	46.70
Hemicellulose	18.59 [a]	17.98 [a]	15.08 [a]	17.45 [a]	18.66 [a]	17.55
Acid detergent fiber	27.52 [a]	29.34 [a]	30.30[a]	28.86 [a]	29.71 [a]	29.15
Ash	2.19 [a]	2.21 [a]	2.30 [a]	2.36 [a]	2.23 [a]	2.26
TDN	68.58 [a]	67.30 [a]	66.63 [a]	67.64 [a]	67.04 [a]	67.44

[a,b]Means within a row with different superscripts differ by Tukey test at 5%.

Conclusion The densities of 65 and 75 thousand plants per hectare provided a decrease in NDF content of the resulting silage, indicating that for the hybrid GS-6030YG this population of plants provide a silage with higher potential for intake.

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