Evaluation of four groups of sorghum hybrids for silage.

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Introduction In Argentina, due to advancement of agriculture in the area called *pampa húmeda*, has caused livestock to move toward the north, such as the province of Formosa. This raises the need to adopt new production strategies and feeding, in order to enhance the activity and make it sustainable over time. Sorghum is the most important cereal in many parts of the world for its resistance to drought and high temperatures. It is a culture of excellent behavior in good environments and versatile adaptation to soil and climatic characteristics committed to other crops, developing a wide range of soil conditions. In our country the importance of sorghum as part of a production system is the use as grain and forage for animal feed, as well as an essential part of a rotation system to maintain productivity and soil structural stability. The whole plant silage sorghum is one of the possibilities for increasing forage availability in northeastern Argentina, mainly as a reserve (silo whole plant), being used in the months in which the forage production curve decreases (usually during June, July, August and part September). The aim of this study was to evaluate the agronomic performance of four genetic groups of sorghum: dry matter production (MS) and its components (leaf, stem, panicle).

Materials and Methods The trial was carried out in the Agricultural Experimental Station El Colorado, located in the SE of the province of Formosa, 78 meters above sea level, 26 º 18 S and 59 º 23' W. The average annual rainfall is 1170.2 mm and average annual temperature is 22 º C. The soil is from the series El Colorado (Haplustol oxic, alluvial silt loam). Were evaluated 42 sorghum hybrids with fitness siler, classified into 4 genetic groups (GG): 18 grain sorghum hybrids (G) 2 forage (F), 12 dual-purpose (DP) and 10 siler (S). The crop management was as follows: chemical fallow 3 months prior to planting and applying Sulfosate Touchdown® and Tordon® 24K, in pre-sowing Sulfosate Touchdown® and Dual Gold, atrazine 50% in pre-emergence, Concep III® in the hybrids that came with this antidote cured, 50 kg/ha of diammonium phosphate at planting and 100 kg/ha of urea when plant had 6 leaves. Planting was done with a pilot drill four grooves on October 29, 2010 with a seed density of 16.5 seeds per linear meter of furrow, and 0.52 m between rows, the production target was 200 000 plants per hectare at harvest. The phenological stage of the crop was cut for forage materials (F) by looking at 4 to 6 dead basal leaves for the rest (G, DP and S) when the grain was in a pasty state drive, for all materials between 30 - 35% of DM, the height of cut was 20 cm. The variables were evaluated by groups: kg DM/ha, % DM, and total percentage of the plant is partitioned to leaf (% L), stem (% S) and panicle (% P). The design was randomized complete block with three replications, randomized groups within each block, plots were 10 m long and 1.56 m wide (15.6 m^2). The data were analyzed with statistical software version INFOSTAT 2011 and subsequent multiple range test of Duncan.

Results and Discussion Significant differences were observed across groups for all variables studied (Table 1). The group of grain sorghum was smaller for DM production/ha and % S, as well as higher % P, no differences between other groups for these variables. The reduced

production of DM could be due to lower participation of stem fraction, which is characteristic of this genetic group. The group of foragers was the one who showed the lowest percentage of DM and the highest percentage of L, not significant differences for these variables in other groups, this could be due to the high production of green matter, added to that, the parameter used to harvest 4 to 6 dead basal leaves, could have been harvested before reaching the minimum value of DM to be harvested.

Conclusion The variety of genetic materials of sorghum available in our area shows great potential for obtaining high performance silos, making this a key resource within the production systems. The distribution of dry matter is dependent on the genetic group that we use and gives us an idea of the nutritional quality than we get. Grain sorghum cultivars have a higher percentage of grain (more digestible fraction and quality) and feed a greater percentage of leaves (fraction of lower digestibility).

Table 1. Maximum, minimum, mean and coefficient of variation for study variables of four genetic groups of sorghum

Variable	Genetic groups			
	Siler	Grain	Forage	Dual Purpose
Kg DM/ha				
maximum	75550	40087	43197	49726
minimum	3073	14802	28484	29420
mean	44555_{b}	24009_{a}	35840_{b}	40854_{b}
CV	43.42	29.73	29.03	15.50
% DM				
maximum	49	37	36	45
minimum	27	31	20	30
mean	38_{b}	34_{b}	28_{a}	37_{b}
CV	18.73	6.52	40.41	12.51
% leaf				
maximum	25	30	37	30
minimum	9.47	13	15	12
mean	17.09_{a}	17.71_{a}	26_{b}	17.91_{a}
CV	27.82	21.01	59.83	27.80
% stem				
maximum	78.08	65	63	75
minimum	33.00	31	63	44
mean	59.10_{b}	43.20_{a}	63_{b}	54.81_{b}
CV	25.12	21.25	0	16.13
% panicle				
maximum	43,00	50	22	40
minimum	8.19	22	22	10
mean	23.81_{a}	39.02_{b}	22_{a}	26.61_{a}
CV	48.35	20.01	0	38.27

a–b Means within a row with different subscripts differ according to Duncan`s test ($P < 0.05$).
CV = coefficient of variation