

Influence of maturity on grain processing of whole plant silage

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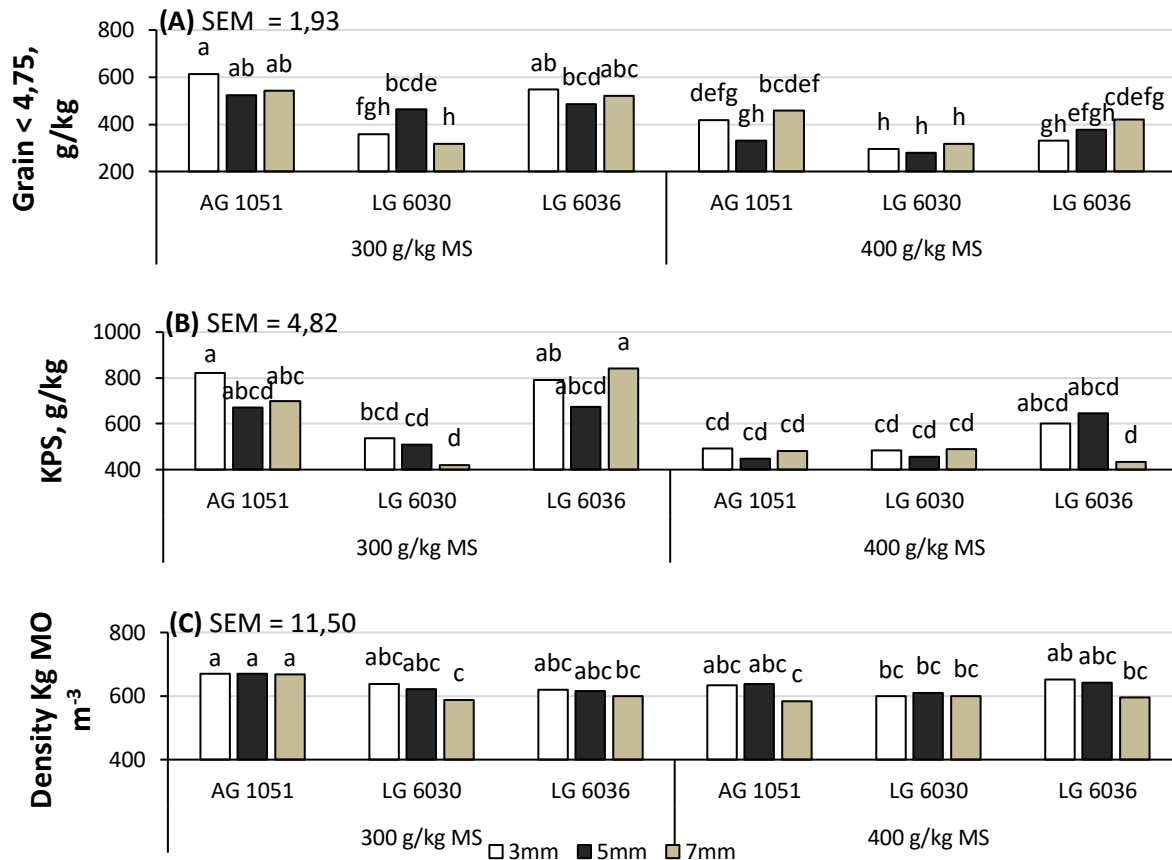
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Introduction Maturity and length of cut are factors that influence silage quality. The objective of this study was to evaluate this factors in the process of whole-plant-corn silage. The effect of different hybrids harvested at different stages of maturation and mechanically processed under gradient of theoretical length of cut (TLOC) was evaluated. The best strategy of setting cut size for harvest at different stages of maturation was reflected by the results.

Material and Methods The trial was conducted at the Animal Science Department of the Luiz de Queiroz College of Agriculture, University of São Paulo (USP/ESALQ). Whole-corn plants were harvested at 300 and 370 g/kg DM. Hybrids were harvested with the JF AT 1600 harvester (without kernel processor), chopped in three different TLOC (3, 5 and 7mm) and packed in lab scale silos (20L buckets), using four replicates per treatment and stored for 90 days. The following parameters were evaluated: kernel processing score (KPS) as described by Ferreira and Mertens (2005), particle and grain physical characteristics as described by Savoie et al. (2004), and density as described by Jobim et al. (2007).

Results and Discussion There was interaction between hybrid, maturity and TLOC, and these factors had effect on the physical characteristics. The sample KPS ranged from 434 to 871 g/kg DM. The KPS of the AG 1051 and LG 6036 hybrids decreased with increase maturity (Figure 1B). The treatments with 300 g/kg DM presented higher amounts of grains <4.75 mm than others. The average treatment density ranged from 584 to 670 kg/m³. For the calculated density, the AG 1051 hybrid with 300 g/kg DM and the LG 6030 with 370 g/kg DM presented the highest density (Figure 1C). The treatments with 300 g/kg DM had higher grains <4.75 mm (P <0.01) and lower size grain average (P <0.01) than procedures with 370 g/kg DM. The treatments with higher maturity presented lower proportion of grains less than 4.75 mm in relation to the treatments with lower DM content, because the proportion of vitreous endosperm increases with increasing DM content (Johnson et al., 1999) and higher grain hardness make drier grains less likely to break during harvest processing (Ferraretto et al., 2018).

Conclusion The strategy of reducing TLOC (without grain processor) to maximize grain processing is effective when the plant is harvested with 300 g/kg DM but not effective with 370 g/kg DM.



1. Interaction between hybrid, maturity and TLOC for Grain < 4.75 mm ($P = 0.01$), KPS ($P = 0.02$) and Density ($P = 0.03$) of silages. AG 1051, LG 6030, LG 6036 (Hybrids); 300 and 370 g/kg (MS content); 3 mm, 5 mm and 7 mm (TLOC); SEM: standard error of the mean. Means followed by the same letter do not differ by the 5% Tukey test.

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