Dehydration curve of *Crotalaria ochroleuca* under two drying managements for hay production

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Introduction The hay materials are derived from grasses that present high productivity and high dehydration capacity in the environment (Machado et al., 2019). However, the use of leguminous for haying is still a little widespread practice in Brazil livestock, an example of this is *Crotalaria ochroleuca*, which has good nutritional characteristics and has been widely used in succession to the soybean crop. The process of plant dehydration for haying can be favored from the use of techniques or equipment that accelerate the loss of water (Pasqualotto et al., 2015). In this context, the objective was to evaluate two drying managements on the dehydration curve of *Crotalaria ochroleuca* for hay production.

Materials and Methods The experiment was conducted at the experimental farm of Universidade Estadual do Oeste do Paraná – Marechal Cândido Rondon *Campus*. The experimental design was in randomized blocks with split-plots in time, with two drying systems (with or without turning) and four sampling times (0; 24; 48 and 72 hours) of *Crotalaria ochroleuca*, with four replicates. Sowing was performed in no-tillage system using 12 kg ha^{-1} of seeds and spacing between lines of 0.5 m. Plant emergence was verified at 20 days after sowing. The cutting of plants was performed in pre-flowering stage at 82 days after emergence, with a conditioning mower with free finger beaters and production of 7.77 t ha^{-1}. The dehydration curve was determined with sampling of plants every 24 hours after cutting extending until the moment the dry matter contents were ideal for baling (850 g kg^{-1}). The samples were packaged in identified paper bags and submitted to drying in forced air oven at 55 °C for 72 hours for determination of dry matter contents. The data referring to the dry matter contents during the dehydration times were subjected to statistical analysis and the equation was chosen based on the determination coefficient and the significance of the regression coefficients, using the T test at 5% probability level.

Results and Discussion A cubic behavior of the dry matter contents was observed throughout the dehydration period for both drying methods (Figure 1). There was no difference ($P > 0.05$) between the drying methods, with and without turning, in the different times evaluated. During the drying process, when the forage is rowed, the progressive loss of water promotes the closure of the stomata, generating a plant resistance to the loss of water. In this initial phase of drying the resistence of the row in losing moisture is a critical point, because the surface of the plants loses more water and dries faster than the base of the plants (Pasqualotto, 2015).

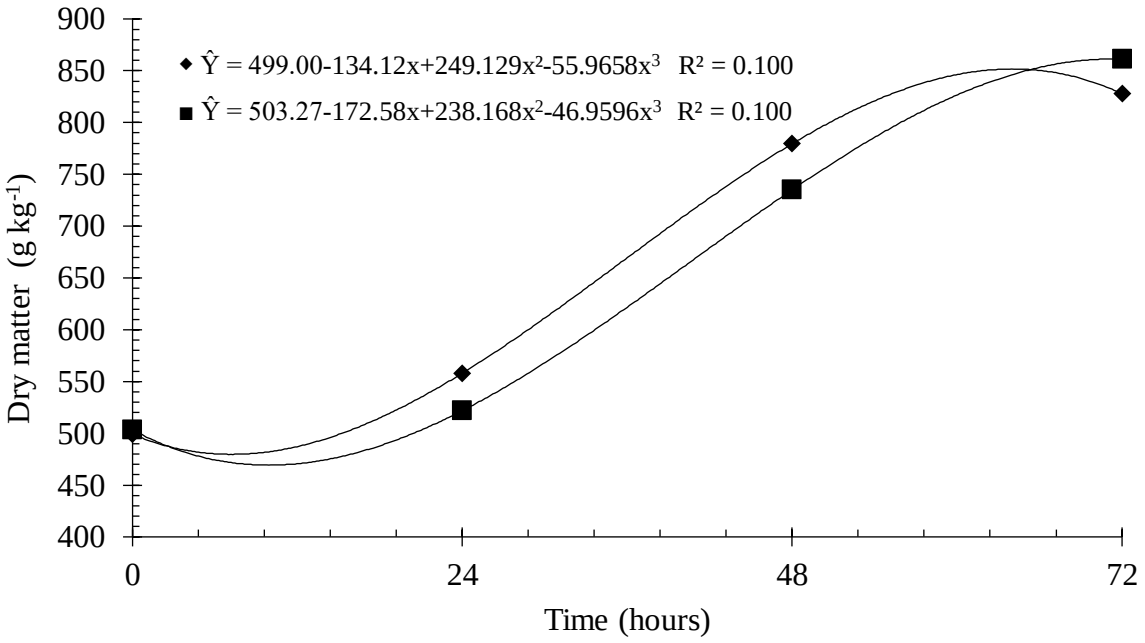

Figure 1 Dehydration curve of *Crotalaria ochroleuca* under two drying managements, with (◆) and without (■) turning.

Therefore, the dehydration rate can be increased with the technique of row turning, stimulating the loss of moisture by turning and revolving. The turning is indicated and more efficient when the water content of the forage varies between 66 and 50%. In the final phase of dehydration, plant metabolism reduces, however the plant is more susceptible to damage caused by the environment, such as rehydration, leaching and leaf fall. In this phase the revolving should be avoided, because the loss of leaves can be accentuated (Bayão et al., 2016). Forage leguminous in general present a higher rate of leaf detachment at the time of dehydration in the environment, with no recommendation of turning (Silva et al., 2015). In the present study, the revolving of *Crotalaria ochroleuca* did not accelerate the dehydration process, therefore the drying of the same can be carried out in the field without its revolving and with low rates of leaf detachment.

Conclusions *Crotalaria ochroleuca* hay with average production of 7.77 t ha^{-1} can be dehydrated without turning.