

Legume Grain as Alternative to Soya Bean Meal in Small Ruminant Diets

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Abstract : In Tunisia, there is an urgent need to maintain food security by reversing soil degradation and improving crop and livestock productivity. Conservation Agriculture (CA) can be helpful in enhancing crop productivity and soil health. However, the demand for crop residues as animal feed are among the major constraints for the adoption of CA. Thus, the objective of this trial is to test the nutritional value of new forage mixture hays as alternative to cereal residues. Two tri-specific cereal-legume mixture were studied and compared to the classic Vetch-Oat one. They were implemented at farm level in four regions characterized by sub-humi climatic: V70-A15-T15 (Vetch70% - Oat15% -Triticale15%) installed in two sites (Zhir and safasaf), V60-A7-T33 (Vetch60% - Oat7% -Triticale33%) and V70-A30 (Vetch70%-Oat30%). Results revealed a significant variation between mixtures V70-A15-T15 installed at Safsafa, recorded the highest forage yield with 12t DM ha⁻¹ than V60A7T33 and V70A30 installed, respectively in ksar cheikh and Fernana with 11.6 and 11.2.tMSha⁻¹. The same mixture installed in Safsafa gave 22% less yields than the one installed in Safsafa. In fact, the month of March was dry in Z'hir. Moreover, these yields in DM can be comparable to those observed by Yucel and Avci (2009). The CP contents of the samples studied vary significantly between the mixtures (P<0.0003). V70-A15-T15 installed in Safsaf and V70A30 present higher contents of CP (respectively 14.4 and 13.7% DM) compared to the other mixtures. These contents are explained by the high proportion of vetch in the fourth mixture and by the low proportion of weeds in the second. In all cases, the hay produced from these mixtures is significantly richer in protein than that of oats in pure culture (Abdelraheem et al., 2019). The positive correlation between the CP content and the proportion of vetch explains this superior quality. The NDF and ADF contents were similar for all mixtures. These values were similar to those reported in the literature (Abidi and Benyoussef, 2019; Haj-Ayed and al., 2000). In general, the Land Equivalent Ratio (LER) was significantly greater than 1 for the vetch-oat-triticale mixture at Zhiir and Safsafa and also for the vetch-oat a at Fernana, proving that they are more productive in intercropping than in pure culture. For the Ksar Cheikh site, the LER value of the vetch-oat-triticale mixture is maintained at around 1. Proving the absence of the advantage of mixture culture compared to pure culture. This proves the massive presence of weeds interferes with the two partners of the mixture increases. The LER for the vetch-oat mixture reached its maximum in March 13 and decreases in April but remained above 1. This proves that the tutoring power of oats showed itself in a constant way until an advanced stage since the variety used is characterized by very thick stems, protecting it from the risk of lodging. These forages mixture present a promising option, a high nutritional quality that could reduce the use of concentrate and, therefore, the cost of feed. With such feed value, these mixtures allow good animal performance.

Keywords : soybean, lupine, vetch, lamb-ADG, meat

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