Abstract #W175

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Yield and nutritive value for ruminants of organic winter cereals –bard vetch intercrops.

Alexey Díaz[1,4], Marîa Dolores Carro[2], Carlos Palacios[3], Cristina Saro[1], Iván Mateos[1], Marîa Luisa Tejido[4], Marîa José Ranilla[*1,4], *[1]Animal Production Department, University of León, León Spain, [2]Agriculture Production Department, Technical University of Madrid, Madrid, Spain, [3]Construction and Agronomy Department, University of Salamanca, Salamanca, Spain, [4]IGM (CSIC-ULE), Finca Marzanas s/n, Grulleros, León, Spain.*

Organic livestock in the European Union must be fed with organic feed, and forage should be at least 60% of the diet of herbivorous animals. However, the productivity of crops in organic farming is frequently lower than that in conventional farming, and organic cultivation of winter cereals often reduces forage CP content. Intercropping of winter cereals with legumes can provide both higher forage yield and quality compared with winter cereal monocultures, but the results may differ with cultivation conditions. The objective of this study was to investigate the potential of winter oats and barley intercropping with bard vetch (*Vicia articulata*) to enhance forage yield and quality as compared with cereals as a monoculture. The

experiment was carried out in the province of Zamora (Spain) in 2014, as a randomized complete block design with 4 replications. Whole-plant DM yield was determined in June and chemical composition and in vitro DM digestibility (IVDMD) of harvested forages were analyzed. In addition, samples (500 mg) of each forage were incubated with 50 mL of buffered sheep rumen fluid at 39°C for 24 h and VFA production was measured. Intercropping with bard vetch increased ($P < 0.05$) forage yield by 25 and 18% for oats and barley, respectively, compared with monoculture. Intercropping also increased CP contents ($P < 0.05$; mean values 629 vs. 949 g/kg DM), and decreased ($P < 0.05$) NDF and ADF contents. The IVDMD was also higher ($P < 0.01$) for intercrops than for cereal monocultures. The presence of bard vetch in the cultures increased total VFA production ($P < 0.001$) by 27 and 15% for oats and barley, respectively. This was due to an increase in the production of acetate, propionate and butyrate ($P < 0.05$), but no effects ($P > 0.05$) of intercropping were detected for the acetate:propionate ratio or the molar proportions of individual VFA. The results indicate that forage yield and quality of oats and barley can be enhanced by intercropping with bard vetch under the cultivation conditions of this study. These results should be confirmed in multi-year studies before drawing up guidelines for organic farmers.

Key Words: organic cultivation, cereal, legume intercropping