Sainfoin production and contents of condensed tannins for veterinary medicine

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Introduction

Sainfoin (*Onobrychis viciifolia* Scop.) is a forage legume of drier regions. Recent parasitological experiments in sheep and goats suggest that sainfoin can beneficially affect their health and performance (e.g. milk yield, LWG). As far as gastro-intestinal parasites are concerned, the effectiveness seems to be related to the contents of condensed tannins (CT). Sainfoin with more than 50 g CT per kg dry weight are needed for parasitological effects (Heckendorn *et al.*, 2012. Interreg IVa N°2009/007). As a result, sainfoin has the potential to complement commercial anthelmintic drugs.

In addition to the choice of adapted cultivars (Perly or Perdix, two cultivars from Agroscope with high contents of CT), it is also crucial to consider the optimal harvest stage to get high contents of CT.

The aim of this project was to analyse the influence of the harvest stage and the season on the content of CT, the yield and the leaf ratio of sainfoin.

Material and method

Cultivar: Perly (breeder Agroscope)
Seed density: 180 kg/ha in April 2010
Treatments: Effect of 4 harvest stages in 2011 in Châteauneuf, CH (500 m), no irrigation.
Effect of season in 2011 in Conthey, CH (500 m) with irrigation: four harvests throughout the season.
Replications: 3 (RCBD).
Analysis: Dry matter yield, % leaves,
CT (method of Terrill *et al.*, 1992 adapted by Heckendorn *et al.* 2006).

Results

A harvest at the bud stage to beginning of flowering offers the best guarantee to get high levels of CT with the cultivar Perly (Table 1). It is very important to consider this harvest stage to get higher contents than 50 g CT per kg dw, especially for the first harvest in spring. The season also influenced the content of CT (Table 2). It is increased from spring to autumn.

Table 1. Yield, leaf ratio and CT in sainfoin in relation to the harvest stages without irrigation in 2011. Average of 3 field replications (Tukey-test, p<0.05)

Harvest stages in 2011	Dry weight yield (t dw / ha)	Leaf to yield ratio (% leaves)	Content of condensed tannins (g / kg dw)
Buds (20th April)	4.6 a	80 a	68 a
Full flowering (4th May)	3.7 ab	53 b	61 ab
End of Flowering (24th May)	3.4 ab	50 b	50 ab
Beginning of seed formation (9th June)	2.8 b	46 b	45 b

Table 2. Yield, leaf ratio and CT in sainfoin in relation to the harvests over the season in 2011 with irrigation. Harvest stage: beginning of flowering. Average of 3 field replications (Tukey-test, p<0.05).

Harvest number in 2011	Dry weight yield (t dw / ha)	Leaf to yield ratio (% leaves)	Content of condensed tannins (g / kg dw)
1st harvest (5th Mai)	9.5 a	44 b	50 c
2nd harvest (20th June)	7.0 b	45 b	52 c
3rd harvest (27th July)	3.8 c	54 b	71 b
4th harvest (30th August)	1.8 d	87 a	86 a

Conclusions

- It is recommended to harvest sainfoin at the very beginning of flowering to get high contents of CT.
- The season influenced the content of CT with increasing contents from spring to autumn.
- The leaf ratio had a strong influence on the content of CT in sainfoin.

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