

# Tannin concentration and nutritive value of a Swiss collection of sainfoin (*Onobrychis viciifolia*) accessions as influenced by harvest time and growth location.

B.N. Azuhwi<sup>1,2</sup>, B. Boller<sup>3</sup>, S. Ampuero<sup>1</sup>, F. Dohme<sup>1</sup>, M. Kreuzer<sup>2</sup>, H.D. Hess<sup>1</sup>

<sup>1</sup> Agroscope Liebefeld-Posieux Research Station ALP, Posieux, Switzerland

<sup>2</sup> ETH Zurich, Institute of Animal Sciences, Switzerland

<sup>3</sup> Agroscope Reckenholz - Tanikon Research Station ART, Zurich, Switzerland

## Introduction

Condensed tannin (CT) are a highly diverse group of plant secondary metabolites with promising nutritional, animal health and environmental effects. Sainfoin is a perennial temperate legume with moderate CT concentration, attracting renewed interest in forage and nutritional research. Trials with this legume have produced equivocal results and intra-specific differences in tannin concentration and structure being advanced to explain this. We hypothesise here that different accessions of sainfoin differ in concentration of CT and that harvest time and growth location also influence this variation and consequently the nutritive value of sainfoin forage.

## Materials and Methods

- Sainfoin genotypes and accessions:

**Bifera cultivata:** Visnovsky, Perly, OV0505

**Bifera landrace:** Echandens, La Rippe, Middel, Perly 66

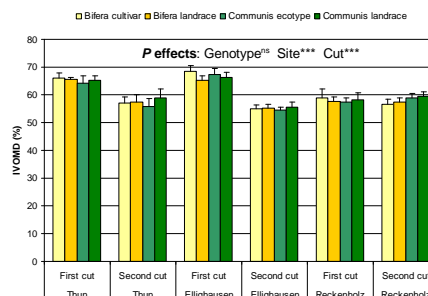
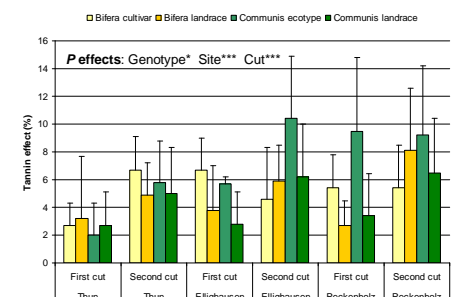
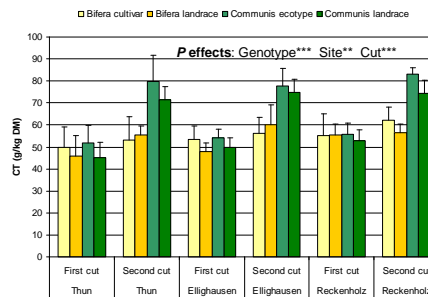
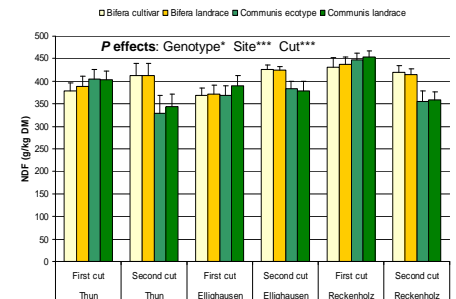
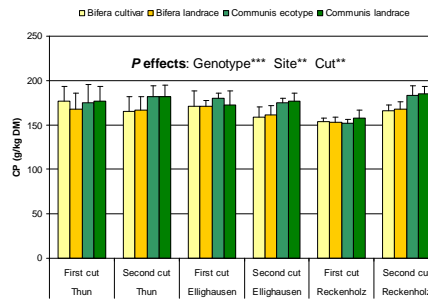
**Communis ecotype:** Wiedlisbach, Thun Allmend

**Communis landrace:** Moiry, Cuarnens, Pompaples, Premier, Sarzens, Vinzel

- Sites and altitude: Thun (559 m), Ellighausen (520 m), Reckenholz (440 m).
- Plant material established in spring 2007 on subplots using a complete randomised block design. 1<sup>st</sup> cut carried out in late May 2008 while 2<sup>nd</sup> cut 6 weeks after.
- Samples were lyophilised and grind to pass a 1 mm screen
- Crude protein (CP), neutral detergent fibre (NDF) of samples were measured using standard protocols.
- HCl/butanol method was employed to measure CT concentration with Visnovsky variety as standard.
- Samples were incubated with and without polyethyleneglycol (PEG), in the Hohenheim gas test to determine tannin effect.
- In vitro* organic matter digestibility (IVOMD) was determined by Tilley & Terry (1963).
- Data were evaluated by analysis of variance based on three factorial design. Pearson correlation was used to examine relationship between various parameters.

## Results

\*  $P < 0.05$ ; \*\*  $P < 0.01$ ; \*\*\*  $P < 0.001$ ; ns not significant



*Onobrychis viciifolia* (sainfoin)

Pearson's correlation between chemical composition and *in vitro* parameters

	CT	CP	NDF	Tannin effect	IVOMD
CT	1.00				
CP	0.45***	1.00			
NDF	-0.50***	-0.79***	1.00		
Tannin effect	0.34***	0.08 <sup>ns</sup>	-0.01 <sup>ns</sup>	1.00	
IVOMD	-0.55***	0.21*	0.27**	-0.30**	1.00

## Conclusion

Significant effect of genotype, site and cut on CT, chemical composition & *in vitro* parameters highlight the importance of these effects on nutritive value of sainfoin. Significant correlations between CT and factors indicating nutritive value suggest that CT also play an important role in predicting the nutritive value of this legume.