

Evaluation of Sunn Hemp Hay for St. Croix White Hair Sheep Production

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Background

Sunn hemp (SH; *Crotalaria juncea* L.) has historically been cultivated as a multi-purpose fiber crop that originated in India

Utilized as a cover crop and green manure to improve soil properties –

Increase soil organic matter

recycle nutrients

contribute soil nitrogen

Can produce 5,000 – 8,500 kg/ha biomass

Exhibits root-knot nematode resistance

Can serve as a nutritious livestock forage and feed source

Introduction

- **Sunn hemp has the potential to serve as a dual purpose crop in mixed crop/livestock systems**
- **Sunn hemp may act as a soil improving crop and contribute forage biomass as a suitable forage crop**
- **Sunn hemp is well suited to St. Croix, USVI, is drought tolerant, and has demonstrated its ability to serve as a cover crop in previous trials**

Objectives

- **To determine if sunn hemp can act as a soil improving crop and contribute forage biomass as a suitable livestock feed**
- **Determine if sunn hemp hay can effectively be produced in the U.S. Virgin Islands**
- **Evaluate sunn hemp hay as a livestock feed resource by measuring post-weaning lamb weight gain**
- **Evaluate sunn hemp hay nutritional quality**

Materials and Methods

- **Sunn Hemp Hay Production**
 - **Fields were plowed and then disk harrowed**
 - **Hay fields were planted on August 26, 2009 at a rate of 56 kg/ha (50 lb/acre) by broadcast seeding and then culti-packed**
 - **No irrigation, pesticide, or fertilizer was applied**
 - **The sunn hemp was cut on Nov. 20, 2009 – 86 DAP**
 - **The sunn hemp cured for 4 days, raked multiple times due to varying moisture, and baled 12 days after cutting**

Sunn hemp 21 days after planting, Sept. 16, 2009



Nov. 13, 2009 – 79 DAP





**Hay was cut with a John Deere 730
Center Pivot Mower Conditioner
(Flail)**

**Hay cured for 4 days prior to first
raking**



**Wind rows were raked multiple times
(as needed) due to precipitation**



**Baling was done with a New
Holland 570 square bailer**

Materials and Methods

- **Pen Feeding Trial**

- St. Croix White post-weaning 11-month lambs (n = 36)
- All lambs fed a mixed ration containing a concentrate diet (16% crude protein) fed at 2% body weight
- **Treatment 1 – sunn hemp hay**
- **Treatment 2 – sorghum sudan hay (Sorghum bicolor x S. sudanense cv. Mega Green)**
- **Hay was fed ad libitum daily**

- **Lambs were provided a 2 week adjustment period prior to data collection**
- **Live weight was collected at two week intervals for 84 days**
- **Random hay core samples were collected at the beginning, middle, and end of the feeding trial**
- **Samples from each collection were dried, ground, and analyzed for quality**

Analysis

- Gain and forage data were analyzed using GLM procedures of SAS using treatment (SH, SS) as the main effect

Results

- **SH hay resulted in an ADG of 80 g compared to SS hay with an ADG of 75 g**
- **Castrated male lambs had greater ADG than female lambs with 89 g compared to 70 g, respectively ($P < 0.05$)**
- **There was no difference in total weight gain between the two treatments.**

Average Daily Gain (ADG) & Total Weight Gain for Sunn Hemp and Sorghum Sudan Fed Lambs

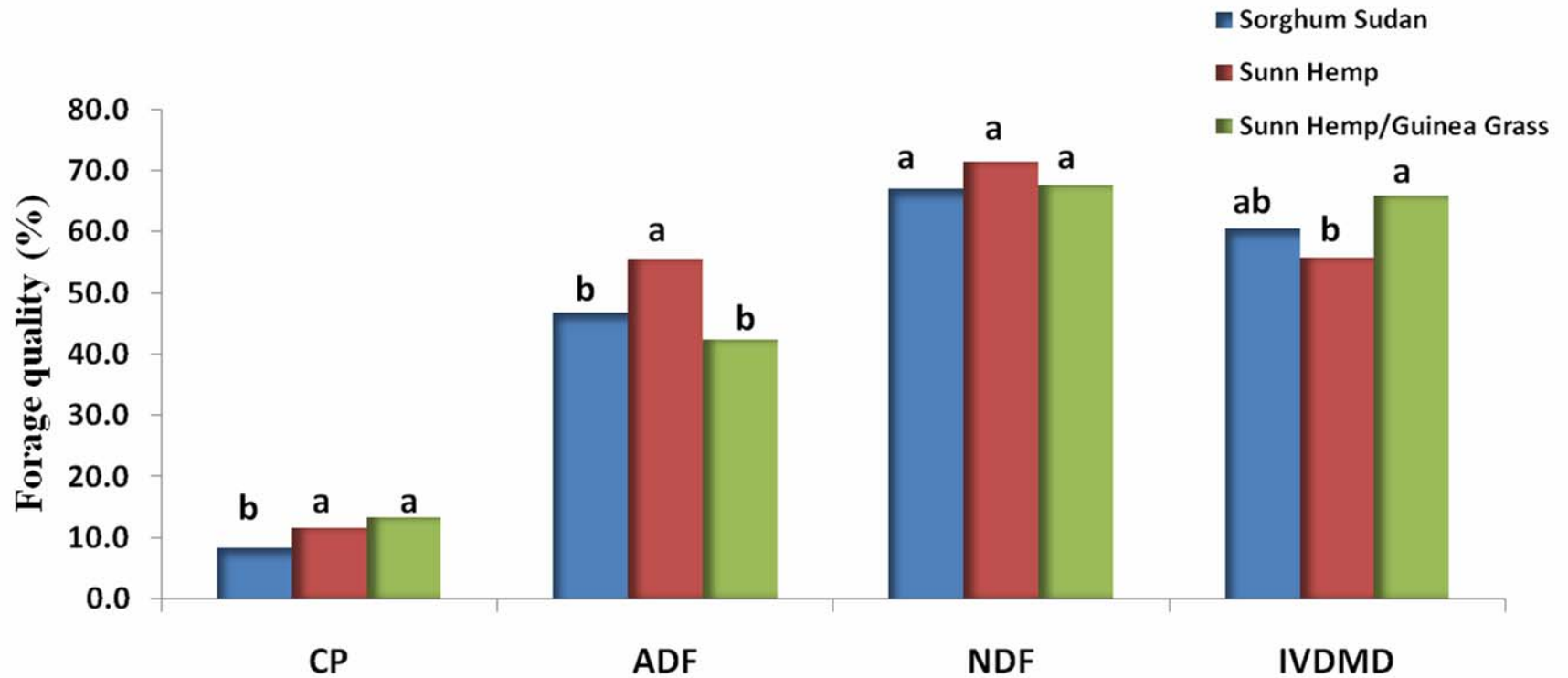
Species	ADG	Total Weight Gain
	g day ⁻¹	kg
Sunn Hemp	79.5 a	6.7 a
Sorghum Sudan	75.3 a	6.3 a

a,b P < 0.0001

Forage Quality

- SH hay had higher CP and ADF than SS hay, yet no difference in NDF or digestibility
- Fresh cut SH had between 12.9% CP which was numerically higher than the stored SH hay which had 11.5% CP

Sunn Hemp vs. Sorghum Sudan Hay Lamb Feeding Trial 2010



***Different letters indicate significant difference ($p \leq 0.05$)

	CP	ADF	NDF	IVDMI
Species	----- g kg ⁻¹ -----			
SH	116 ± 1.3 ^a	556 ± 7.1 ^a	713 ± 4.8 ^a	557 ± 5.1 ^b
SS	83 ± 3.5 ^b	468 ± 8.3 ^b	669 ± 4.2 ^a	605 ± 4.2 ^{ab}

Summary

- Sunn hemp is an effective forage for tropical hay production
- St. Croix White hair lambs will consume SH hay and attain growth performance similar to that of SS hay with a concentrate supplement at 2% body weight

Implications

- Sunn hemp is a tropical legume that can serve as an alternative dual purpose crop that can be grown under low-external-input production systems
- Sunn hemp has plant tissue quality characteristics that make it a viable option as an alternative livestock forage resource

A photograph of a dense field of green plants with yellow flowers, likely a cover crop. The plants are growing in a field, and the overall scene is a lush green with scattered yellow blooms. The word "Questions?" is overlaid in the center in a white, serif font.

Questions?