FORAGE POTENTIAL OF AMERICAN POTATO BEAN

M.R. Morales¹, J.G. Foster² and J. VandeVender³

1Director, Medicinal Botanicals Program, Mountain State University, 410 Neville St., Beckley, WV 25801-4511
2Research Chemist, USDA, ARS, Appalachian Farming Systems Research Center, 1224 Airport Road, Beaver, WV 25813-9423
3Manager, USDA-NRCS Appalachian Plant Materials Center, P.O. Box 390, Alderson, WV 24910

Introduction

We are looking for native plants that will help meet the nutritive requirements and support the health of meat goats.

American potato bean (Apios americana Medikus) is a nitrogen-fixing, tuber-producing, perennial, leguminous vine that is indigenous to the eastern half of the United States.

We have observed deer browsing potato bean foliage in early fall when other herbage was still abundant.

Goats can obtain nutrients and beneficial secondary metabolites from leaves of woody plants, but most tree leaves are unreachable.

Potato bean seeks support from surrounding plants, making foliage accessible to browsing animals. By browsing herbage that is elevated, ruminants avoid larvae of parasitic nematodes, such as H. contortus, that proliferate on forage near the soil surface.

Our preliminary analysis indicated that potato bean contains condensed tannins, compounds considered helpful for bloating relief and parasitic worm control in ruminants.

Botanical, cultural, and nutritional aspects of potato bean have been reported for tubers (Reed and Blackmon 1985, Blackmon and Reynolds 1986, Reynolds et al 1990, Johnson et al 1990, Wilson et al 1991, Juliami and Hoshikawa 1994a) but not for herbage.

In this study, we investigated the yield and nutritional value of potato bean herbage.

Materials and Methods

Forty accessions from potato bean tuber studies conducted in Louisiana (provided by W. Blackmon) were planted as an unreplicated trial at the USDA-NRCS Plant Materials Center, Alderson, WV, on May 9, 2006.

The planting area was fertilized with 100 lb 10-10-10/acre and divided in plots of 3’ x 6’.

Two tubers were planted 3’ apart in the middle of each plot.

Plots were mulched with a 4”-thick woodchip layer and aerial tissue was supported with a 5’-tall twine trellis.

Plots were harvested on September 22, 2006, and herbage yield per plot was recorded.

Harvested tissue was oven-dried at 131°F, ground, and sent to Midwest Laboratories, Inc., Omaha, NE, for feed nutrient analysis.

Sub-samples from three randomly selected plots were separated into leaves and stems and these fractions were also sent for feed nutrient analysis.

Results

Herbage yield of potato bean accessions grown in Alderson, WV, in 2006.

<table>
<thead>
<tr>
<th>Accession</th>
<th>lb/plant</th>
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<tbody>
<tr>
<td>LA-166³</td>
<td>1.5</td>
</tr>
<tr>
<td>LA-2190³</td>
<td>1.4</td>
</tr>
<tr>
<td>LA-2011³</td>
<td>1.3</td>
</tr>
<tr>
<td>LA-0807³</td>
<td>1.3</td>
</tr>
<tr>
<td>LA-2183³</td>
<td>1.2</td>
</tr>
<tr>
<td>LA-2161³</td>
<td>1.1</td>
</tr>
<tr>
<td>Mean</td>
<td>0.8</td>
</tr>
</tbody>
</table>

³Estimated, based on an area of 8FV/plot
²One of six best yielding accessions.
³Based on 48 accessions.

Conclusions

The nutritional values (protein, digestibility, energy) of potato bean herbage suggest that it could be a useful component in the diet of browsing ruminant livestock. However, due to slow establishment and growth on upland sites potato bean will not meet the needs of small ruminant producers.

Accession variability could allow progress in yield improvement.

References


Whitesides, R. J., J. Richards, W. Blackmon, and C. Pichardo. 1990. Protein quality in Apiose americana tubers and