



Tropentag, September 20-22, 2023, hybrid conference
“Competing pathways for equitable food systems transformation:
Trade-offs and synergies”

Chemical composition of willow trees for silage making based on harvest frequency

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Abstract

A study was conducted to evaluate the chemical composition and biomass production of willow tree for silage making for small ruminant based on harvest frequent. A total of 9 plots (42 trees per plot) were randomly assigned into 3 harvest frequency (3 plots per treatment) per production year. A total of 378 willow trees were all harvested on November and allowed to regrowth for the following year. The regrowth was observed throughout the production year. Plots were harvested on June, September and November for the first treatment (H3); plots in the second treatment (H2) were harvested on July and November, while the third treatment (H1) were harvested once on November. Samples were collected on a monthly basis from both leaves and stem to evaluated the chemical composition of willow trees throughout the production year. Plots were harvested and weighted for each treatment, total mass productions were calculated from the accumulative weight for treatment H3 and H2, while the total mass production for H1 were weighted at the end of the experiment. Average production per tree were also calculated for each treatment. willow leaves and stems were analysed for moisture contents, CP, NDF, ADF, Fiber, either extract and ash. Only moisture and CP contents were significantly different among the treatments. The study shows that moisture content in H3 (62.8 %) and H2 (62.6 %) group were significantly higher than H1 (50.7 %). In addition, H3 and H2 group were significantly higher protein contents (DM basis) compared to H1 (13.2 and 12.7 vs. 9.5 % CP, respectively). The total biomass productions were 173.1, 153.4 and 192.1 kg, with an average forage production of 1.47, 1.58 and 1.60 kg per tree for H3, H2 and H1, respectively. In conclusion, for silage making, harvest willow trees twice or more in a production year produce higher biomass, with higher protein and moisture contents, which is ideal for silage making compare to harvest willow trees once in a production year.

Keywords: Biomass production, chemical composition, harvest frequent, silage making