

Changes in Nutritional Composition in whole plants and stover of forage corn after silage period ⁽¹⁾

Chia-Sheng Chen ⁽²⁾⁽⁴⁾ Jian-Fu Liu ⁽³⁾ and Shu-Min Wang ⁽²⁾

Received: Apr. 22, 2024; Accepted: Jun. 19, 2024

Abstract

The purpose of the study aimed to analyze the changes in nutritional composition in forage corn from the silage period to the full maturity period, in order to understand the forage value of the whole plant and the stover. The study conducted a harvest survey every 7 days from 14 to 70 days after silking of four forage corn lines to investigate the changes in nutritional composition from the early silage and harvest period to maturity. The results showed a slight linear decline in the crude protein (CP) content of the whole plant during the survey period, with the difference of only 1% in pre/post period. The content of acid-detergent fiber (ADF) and neutral-detergent fiber (NDF) remained stable or slightly decreased after 49 days post-silking, while starch content increased from less than 5% in the early stages to 40% at 70 days.

In terms of stover, CP exhibited a similar trend to the whole plant, decreasing slightly over the survey period. NDF reached its lowest point around 35 days and then increased, showing a difference of about 3% from the lowest point. ADF linearly increased from 39% to 42%, and starch content remained low throughout the period. The harvest of average silage period at 35 days after silking and the delayed harvest at 70 days were compared and showed no significant difference in whole-plant CP, but NDF and ADF were significantly lower at 70 days, compared with at 35 days, reaching a level of significance. Dry matter yield increased from 15.0 mt/ha at 35 days to 18.1 mt/ha at 70 days, with a substantial increase in dry matter percentage. This suggests that delaying harvest by 35 days can yield maize material with higher dry matter and nutritional value comparable to that harvested at the silage period. Furthermore, this study aimed to evaluate the forage value of stover by surveying the changes in stover composition. The results showed that stover harvested 70 days after silking had CP, NDF, and ADF percentages of 8.5%, 64.8%, and 42.6%, respectively, with a dry matter yield of 7.5 mt/ha, equivalent to the yield of a single pangolagrass harvest, which suggests its potential as a byproduct with forage material.

Key words: Maturity, Forage corn, Nutritional composition.

(1) Contribution No. 2796 from Taiwan Livestock Research Institute (TLRI), Ministry of Agriculture (MOA).

(2) Southern Region Branch, MOA-TLRI, Pingtung 94644, Taiwan, R. O. C.

(3) Experimental Farm, College of Bioresources and Agriculture, National Taiwan University.

(4) Corresponding author, E-mail: chencsg@mail.tlri.gov.tw.