

Comparison of silage characteristics among monocropping and intercropping of soybean and forage corn ⁽¹⁾

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Abstract

Due to the insufficient crude protein content of forage corn that could not meet the demand for ruminants, soybean intercropped with forage corn thus becomes an ideal mean to improve the nutrient quality of corn silage. To determine the difference of silage fermentation between monocropping and intercropping, and the effect of soybean cultivars on silage fermentation of corn-soybean intercropping, this study was conducted with forage corn (cv. Kenting No.1, KT1), intermediate-late maturing soybean (cv. Tainan No. 3, TN3) and late maturing soybean (cv. Leichhardt, Au) sown as monocropping and intercropping in fall crop season, respectively. The results showed that soybean silage was the lowest content of lactic acid and the highest content of acetic-, propionic- and butyric acid, which caused the highest pH and dry matter loss rate of soybean silage and the lowest quality among other silages. Except for the pH and acetic acid content higher than those of corn silage, the silage quality and content of fermentation products such as lactic-, propionic-, and butyric acid of intercropping (Au-KT1 and TN3-KT1) silage were not significantly different from those of corn silage. The fluctuating trend of pH, fermentation products and quality during fermentation of intercropping silage were similar to corn silage; however, subject to the high buffering capacity of soybean in intercropping silage, its pH, fermentation products and quality took about 14 days to become steady state, which was longer than that of corn silage (7 days), and the dry matter loss rate was also significantly higher than corn silage. Since Au-KT1 and TN3-KT1 had similar proportion of soybean in dry matter yield (25.3% and 24.6%), and those dry matter content and forage chemical components showed no significant difference between each other before ensiling, there was no effect on tested intercropping silage pH, content of fermentation products and quality by soybean cultivars. According to the results, late maturing soybean intercropped with forage corn could significantly increase crude protein content of corn silage and obtain silage of higher yield and quality.

Key words: Soybean, Forage corn, Intercropping, Monocropping, Silage.

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