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Study on the variation of nutrient compositions of forage oats (1)

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Abstract

Forage oats are suitable for cultivation in winters and springs, which can also be incorporated with annual cropping farmland in Taiwan. Its development merits attention. Two oat varieties were used to determine 3 subjects, as shown in the follows: 1. The continuous changes of plant composition with the growth period in 60 days after sowing (DAS); 2. The diurnal changes of water-soluble carbohydrate; 3. The influence of cutting in the morning or afternoon as well as the drying method (sun-curing *vs.* artificial drying). The purpose aimed to understand the changes of nutrient composition of oats in the local environment (Hengchun area). The crude protein (CP) contents of the two varieties decreased during the growth days in the early period, but both showed increase in the later growth stage. In terms of neutral detergent fibers (NDF), both varieties increased steadily from 60 DAS, where Saia decreased 85 DAS, and Swan declined 110 DAS. The trend of acid detergent fibers (ADF) was similar to those of NDF. The accumulation speed and range of starch contents of the two varieties were quite different, as both decreased after reaching a high point, while the contents of water soluble carbohydrate (WSC) continued to rise. The above-mentioned components showed discontinuous increase or decrease in the later period of investigation, which could have been caused by the production of new tillers. Although the main tillers grew with advancement, the emergence of new tillers changed the ingredient ratio of the whole plant. In terms of the diurnal variation of WSC, basically the contents of WSC were accumulated with photosynthesis after sunrise, and then gradually decreased after sunset. The daily variation was about 2-4%, and there were difference in different varieties and growth dates. The third experiment explored the effects of cutting in the morning or afternoon, as well as the drying speed (method). From the analytical results of variance, the cutting time mainly affected WSC. Sais and Swan both increased in WSC contents by 1.9% and 3.7% cut in the afternoon respectively, compared to those cut in the morning. The cutting time also affected both CP and starch of Swan. Drying speed had a significant impact on all the investigated ingredients (except CP of Saia). The NDF of Saia and Swan decreased by 5.4% and 6.0%, respectively, with artificial drying. ADF decreased by 4.1% and 4.7%, respectively. WSC increased by 3.3% and 2.9%, respectively and the starch increased by 0.6% and 1.4%, respectively. From the results of this experiment, we might recognize the relative impact of harvesting and processing. Artificial drying not only reduced the risk of rain, but also significantly improved the quality of hay. The results could provide information for production management and further researches of forage oats.

Key words: Forage oat, Harvest date, Diurnal change, Drying method, Nutrient Compositions.

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