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Evaluation and Comparison Yield and Feed Value of Pasture Species and Varieties by Spring Sowing in High-Latitude Regions

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[Abstract]

In preparation for the ever-changing climate and unification of North Korea and South Korea, it is necessary to increase the grain self-sufficiency rate by selecting crops with good utilization in high-altitude regions. The principle is to sow pastures at the end of August. However, sowing occurs in spring because the sowing period is missed when the weather is bad or when the workforce is insufficient. Sometimes when the grassland is completely devastated, it is frequently sowed in spring. In addition, North Korea consists of a high-altitude regions, and has been devastated in a general mountainous region. As a result, the landscape is not good and it is vulnerable to natural disasters such as landslides. Therefore, to prevent this, pasture must be sowed in the high-altitude regions. The goal of this study was to evaluate and compare yield and feed value of pasture species and varieties by spring sowing in high-latitude regions. The study was conducted in Pyeongchang, Gangwon-do, which is 700m height above sea level. The pasture species and varieties was sown on April 24, 2022. Each treatment was carried out by sowing 30 kg/ha, the experiment field size was 1 m² (1m x 1m), and randomized block design with tri-repeat. The total of 14 varieties was used in the study, 6 varieties of Orchardgrass (OG), 6 varieties of Tall fescue (TF) and 2 varieties of Perennial ryegrass (PRG). The grassland composition fertilization using (N:P₂O₅:K₂O at 80:200:70 kg/ha) was conducted and management fertilizer was N:P₂O₅:K₂O at 210:150:180 kg/ha. The first harvest was June 26, 2022 and the second harvest was on August 16, 2022. For statistical analysis of the data, an Analysis of Variance (ANOVA) was performed using the R3.6.3 software program, and all data was subjected to analysis using Duncan's multiple range test. Significance was set at the 5% level. The dry matter yield at the first harvest was the highest in PRG, and second harvest was the highest in TF (p < 0.05). Overall, PRG showed a trend of gradually decreasing growth, OG and TF showed a trend of gradually improving growth. This showed that PRG was considerably weaker to summer depression than other pasture species. Comparing the total dry matter yield, TF was the highest (4,565.45 kg/ha), but there was no significance difference with PRG (4,487.24 kg/ha) (p < 0.05). In addition, comparing the total TDN (total digestible nutrient) yield, TF was the highest (3147.33 kg/ha), second in PRG (2975.67 kg/ha) and third in OG (2052.33 kg/ha). Since this result is the data of the second harvests, if the result is derived by the end of next year, it will be provided as basic data for selection of pasture species and varieties suitable for spring seeding in high-altitude regions.

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