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Zhongsheng Zhi

Inner Mongolia Agricultural University, China

Guiping Yao

Inner Mongolia Agricultural University, China

Jianguang Wang

Inner Mongolia Agricultural University, China

Meihua Gao

Inner Mongolia Agricultural University, China

Meihua Li

Inner Mongolia Agricultural University, China

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Effects of fertilizer and plant density on the fresh biomass of Sudan grass

Zhongsheng Zhi,* Guiping Yao, Jianguang Wang, Meihua Gao, Meihua Li
College of Agronomy, Inner Mongolia Agricultural University, Huhhot, China, 010018, Phone: 0471-4301317,
E-mail: mrzszs@126.com

Key words: Sudan grass, Neinong No.1, mathematic model, yield, planting density, fertilization

Introduction *Sorghum sudanense* Stapf, cv. Neinong No.1 was a hybrid of Sorghum and Sudan grass bred by our group. The objective of this study was to evaluate the effects of planting density and fertilizing level on fresh matter (FM) yield of Neinong No.1. The optimum cultivation condition was obtained.

Material and methods Sudan grass No.1 was seeded with four randomized replications for 11 treatment plots and one control plot in a greenhouse in 2006. The area of each plot was 14m². The experimental field located in Huhhot. Data were analyzed with SAS 9.0 software.

Results and analysis

Regression analysis of FM yield of Sudan grass The relation between FM yield and other factors were analyzed with the regression simulation method at different harvest time. One regression equation was obtained with stepwise regression:

$$y^2 \text{ (FM weight (kg) / 2 m}^2\text{)} = -3.35695 + 0.03885x_1 + 3.87533x_2 + 0.06993x_3 - 0.36936x_4$$

It is clear that the grass height (x_2) plays a major role in Sudan grass production. However, germination rate (x_1) had a minor influence on the FM yield.

Single-factor analysis For two harvest times: July 19 and September 2, the differences of FM yield between 11 treatment plots and one control plot were not significant ($p > 0.05$). If analyzed with single-factor analysis of variance, however, the FM yield of Sudan grass in No.9 treatment plot was highest ($p < 0.15$), which was 14613.97kg/667m².

Conclusion In current study, the results showed that cultivating measurement combination of No.9 plot, in which planting density was 45022 plants/ha and 20kg additional urea was applied to the plot during the growth, was optimum for the maximum yield of FM of tested Sudan grass, which was harvested for four times.