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Evaluation of Seven Cultivars of Italian Ryegrass for Salinity Tolerance and Growth in Reclaimed Paddy Field

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[Introduction]

The purpose of this study was to select IRG varieties suitable for productivity enhancement in reclaimed land located in South-West area of Korea, where salt concentration of soil was about 0.3%. For this purpose, 7 Korean bred varieties were compared for salinity tolerance by hydroponics and greenhouse test with salt concentration of 0% and 0.3%, and their productivity was evaluated in the reclaimed paddy field located in Muan, Korea.

[Materials and Methods]

The 7 varieties used in this study were Kowinearly, Greencall, Greenfarm, Greenfarm3, IR603, IR605 and IR901, which were obtained from the National Institute of Animal Science, RDA. The germination test was carried with 0% and 0.3% saline water in incubator at 15°C, 20°C and 25°C. The early growth characteristics were investigated by hydroponics with salt concentration of 0% and 0.3%, respectively. For the greenhouse test, the salt concentration of the soil was adjusted to 0% and 0.3% with sun-dred salt, and 3kg/seeds were sown in rows. The field test was conducted in the reclaimed paddy field located in Muan area, where the initial salt concentration was 0.3%, and the seeds were sowed by drill seeding with 4 kg/10a of seeding rate. The amount of fertilization in both greenhouse experiment and field test was 18 kg/10 of nitrogen, 15 kg/10a of phosphoric acid, and 15 kg/10a of potassium.

[Results and Discussion]

The germination percentage decreased at saline water compared at 0% salinity, but the reduction in germination at 0.3% salinity was not a practical cultivation problem. Among the 7 varieties of Italian ryegrass, IR603 showed relatively high growth in the early growth in hydroponics and greenhouse test. In the test of Muan reclaimed paddy, the dry yield (kg/10a) of IR603 (648kg) was the highest compared to the other varieties; IR605 (643kg), Greenfarm (599kg), Kowinearly (586kg), IR901 (571kg), Greenfarm3 (413kg) and Greencall (364kg). The feed values of 7 varieties were similar with no significant difference. In conclusion, IR603 was superior to those of other cultivars in early growth characteristics in hydroponics and the growth and yield in both greenhouse and reclaimed paddy fields test.

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