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A Comparison of Growth and Yield of Wheat, Barley and Oat Sprouts in Saemangeum Reclaimed Land

Yu Rim Choi[1]*, Chan Ho Kang[1], In-Sok Lee[1], Ju Kim[1]

[1]Jeonllabukdo Agricultural Research & Extension Services, Iksan 54968, Korea

[Introduction]

Reclaimed land has a poor environment to grow crops due to many adverse factors such as low organic matter and high salt content. However, when crops are placed in a poor environment, certain substances are produced for self-defense, and these substances act as functional ingredients for people. If the functionality of crops grown in reclaimed land is increased, it will be a good alternative to compensate for the decrease in yield and improve added value. Recently, attempts have been made to use it as a functional material through sprout cultivation of crops. A consumer demands for sprout crops with high content of unique health functional substances such as sprouted barley. An attention of sprouted wheat has been on the rise since several years ago. Therefore, sprouts were taken using wheat, barley, and oats with high salt resistance, and a yield comparison was presented before selecting wheat varieties with improved functional components.

[Materials and Methods]

The test was carried out in the Saemangeum reclaimed area 5 in Gimje and upland in Iksan using wheat, barley, and oats. The fertilization amount followed the standard application amount of 9.1-7.4-3.8kg/10a (N-P_2O_5-K_2O). Sowing was carried out in reclaimed land on March 10th and upland on March 11th. The seeding amount was 120kg/10a for wheat and barley, and 140kg/10a for oats because the germination rate was low through the seed germination test. Harvesting was carried out when the average plant height reached around 15cm.

[Results and Discussion]

The plant heights of sprouts grown in reclaimed land and upland were compared on the 20th after sowing. “Saegeumgang” of wheat was 7.08±0.99cm, 10.45% higher than that of upland, and had the fastest initial growth rate. “Arijinheuk” of wheat with 7.12±0.90cm was 1.57% higher in reclaimed land. In reclaimed land, “Daeyang” and “Joyang” of oat were 5.71±0.81cm and 5.33±0.79cm, respectively, being similar to that of upland. “Keunalbori-1ho” of barley was 6.56±0.80cm, “Nurichal” of barley was 6.87±0.65cm, and “Highspeed” of oat was 6.94±0.63cm, which was 5.48%, 13.37%, 9.16% lower than that of upland. As for the fresh weight per 10a, “Saegeumgang” and “Arijinheuk” in reclaimed land were 678.0 and 729.3kg, which was decreased up to 45.1% and 36.7% compared to upland. “Keunalbori-1ho” and “Nurichal” were 938.3 and 1469.3, which was decreased by 43.7% and 26.3% compared to upland. Oat “Highspeed”, “Daeyang”, and “Joyang” were 1124.7, 564.0, and 546.3, which was decreased up to 18.1%, 35.2%, and 21.0%. Overall, the yield decreased compared to upland, and “Highspeed” and “Nurichal” were the best when considering the yield and the extent of decrease. On the other hand, “Saegeumgang” showed the largest difference in yield, which seems to be the effect of wet injury. From this result, it is necessary to drain well when it is cultivated for sprouts in the field. The drying of the harvest was carried out in hot air at 50°C. Based on the dry matter yield of sprouts grown in reclaimed land, “Nurichal” with 145.3, “Keunalbori-1ho” with 110.7 and “Highspeed” with 127.7kg/10a were significantly high than “Joyang” with 72.7 being the lowed.

*Corresponding author: E-mail. cyrim1020@korea.kr Tel. +82-63-290-6040