Changes of Growth and Yield Components by Salinized at Panicle Formation Stage on a Reclaimed Saline Soil

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Objectives

This experiment was conducted to find out changes of rice growth and yield components by salinized at panicle formation stage on a reclaimed saline soil.

Materials and Methods

Varieties : Saekyehwa

Treatment : Soil - medium salinity(0.3～0.4%)

Salt solution - 0, 0.1, 0.3, 0.5, 0.7%, one time at panicle formation stage(24DBH) for 5 days.

Results and Discussion

In yield components, Spikelets number per unit area decreased with increasing salinity level, particularly in the 0.7% of saline solution water. This factor affected the most yield reduction among the components. In percentage of ripened grain continuous decreased at same intervals with increasing salinity level but it decreased significantly at the 0.5% salinity level. 1,000 grain weight decreased with increasing salinity level but it was not most affected by salinity among yield components.

The reduction of milled rice yield decreased significantly with increased saline water level, in detail 6% of yield reduction at the 0.1% saline solution, 15% at the 0.3%, 24% at the 0.5%, and 29% at the 0.7% saline solution level compared with control respectively.

Results indicate that the gaining of rice yield could be reliable performance in terms of economical benefit for rice production even though high reduction of yield occurred at high salinity levels on a reclaimed saline soil in Korea.

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Table 1. Heading date, leaf color, and top dry weight based on the saline water treatment at panicle formation stage on a reclaimed saline soil.

Salt solution (%)	Heading date	Leaf color (SPAD)	Top dry weight(g/m²)			
			Leaf	Stem	Panicle	Total
Control	Aug. 16	41.0	235.8a	468.4a	140.4a	844.6a
0.1	Aug. 16	42.8	235.8a	464.7a	140.6a	841.2a
0.3	Aug. 16	42.6	218.2a	450.3ab	121.1ab	789.6ab
0.5	Aug. 17	41.9	216.1a	434.2ab	117.0ab	767.4b
0.7	Aug. 18	42.4	171.7b	379.1b	92.9b	643.8c

[a] Means followed by a common letter are not significantly different at the 5% level by Duncan's multiple range test.

Table 2. Culm and panicle length, panicle number based on the saline water treatment at panicle formation stage on a reclaimed saline soil

Salt solution (%)	Culm length (cm)	Panicle length (cm)	No. of panicle	
			No./hill	No./m²
Control	53	20.1a	14.7	408.7
0.1	54	18.9b	14.4	400.3
0.3	51	19.3b	15.4	428.1
0.5	50	18.5bc	15.1	419.8
0.7	51	18.9b	14.4	400.3

Table 3. Yield components and yield of rice based on the saline water treatment at panicle formation stage on a reclaimed saline soil

Salt solution (%)	No. of spikelets/ panicle	Spikelet per m²(×1000)	Ripened grain(%)	1000 grain weight(g)	Milled rice (kg/10a)	Yield index
Control	62a	25.3a	75.0a	19.5a	330a	100
0.1	63a	25.2a	69.7b	18.8b	309b	94
0.3	55b	23.5b	70.0b	18.5b	281c	85
0.5	55b	23.1b	66.0c	17.8c	251d	76
0.7	44c	17.6c	60.2d	17.7c	234e	71