

Optimum N Fertilization rate According to Ecotype by Rice Machine Transplanting at the Reclaimed Saline Land in Southwestern

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Objectives

This study was conducted to establish the optimum N fertilization rate of each ecotype for producing good quality rice at the reclaimed saline land in southwestern.

Materials and Methods

- Testing varieties : Samcheonbyeo(Early Maturity), Hwaseonbyeo(Mid Maturity), Nampyeongbyeo(Mid-Late Maturity)
- Testing soil and soil salinity : Fine sand loam(Munpo series), 0.1 ~ 0.2%
- Transplanting date . May 30
- Transplanting space : 30×12cm
- Fertilization rate : N-0, 7, 11, 15, 18, 20(standard), 24 kg/10a, P₂O₅-K₂O . 5.1-5.7kg/10a
 - N split application(Basal fertilizer-Top dressing at tillering stage-Maximum tillering stage-fertilization at panicle initiation stage-Top dressing at ripening stage)
 - = 30:20:20:20:10%

Results

- 1 The more N fertilization application increases, The more No. of panicle and spikelet per the unit area gain. but, ripened grain rate and 1000-grain weight decrease.
2. In case of increasing N fertilization application, the head rice rate is low and the protein content is apt to rise. the amylose content don't differ among N fertilization application.
- 3 In case that N fertilization application increases up to 12kg/10a, 11kg/10a, Samcheonbyeo, Hwaseongbyeo and Nampyeongbyeo, respectively. Head rice yield increases, but there isn't a difference on the N fertilization application of more than of those
4. Consequently, as considering the yield of head rice, ripened grain rate and rice quality. It is proper that the optimum N fertilization rate apply 11 ~ 12kg/10a at gyehwadosubstation.

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Table 1 Changes of nitrogen contents of leaf blade, leaf color, leaf area index and top dry weight by nitrogen level in different varieties at reclaimed saline land

Nitrogen level (kg/10a)	Leaf color (SPAD)			Nitrogen content of leaf blade(%)			Leaf area index			Top dry weight (g/m ²)		
	Sam-cheon	Hwa-seong	Nam-pyeong	Sam-cheon	Hwa-seong	Nam-pyeong	Sam-cheon	Hwa-seong	Nam-pyeong	Sam-cheon	Hwa-seong	Nam-pyeong
0	34	33	30	1.69	1.49	1.41	2.3	2.8	2.9	438	624	640
7	36	35	33	1.86	1.58	1.55	3.0	3.7	3.4	495	670	698
11	38	36	34	1.98	1.67	1.60	3.4	3.9	3.7	525	690	761
15	40	35	34	2.06	1.73	1.64	3.6	4.2	4.4	550	710	828
18	40	37	35	2.12	1.76	1.67	3.5	4.6	4.7	609	751	866
20	41	38	36	2.16	1.80	1.73	3.7	4.8	5.3	634	768	916
24	42	38	35	2.15	1.78	1.71	4.1	5.1	5.5	659	789	922
Mean	39	36	34	2.00	1.69	1.62	3.4	4.2	4.3	559	715	804

Table 2. Changes of yield components as nitrogen level in different varieties at reclaimed saline land

Nitrogen level (kg/10a)	No. of panicle/m ²			No. of spikelet/m ² (×1,000)			Ripened grain rate			1,000 grain weight(g)		
	Sam-cheon	Hwa-seong	Nam-pyeong	Sam-cheon	Hwa-seong	Nam-pyeong	Sam-cheon	Hwa-seong	Nam-pyeong	Sam-cheon	Hwa-seong	Nam-pyeong
0	326	343	297	23.2	23.4	23.1	88	94	91	20.9	23.1	21.9
7	356	373	341	26.8	25.4	27.1	86	93	90	20.6	22.8	21.8
11	375	403	371	29.5	25.9	28.6	84	91	90	20.5	22.5	21.8
15	390	407	407	30.1	27.7	31.4	84	85	85	20.4	22.4	21.8
18	418	413	434	32.0	27.5	34.9	82	86	84	20.3	22.4	21.8
20	427	418	445	33.0	28.2	34.6	82	84	83	20.3	22.4	21.7
24	442	434	451	34.3	30.2	34.7	80	82	83	20.3	22.4	21.7
Mean	391	399	392	29.8	26.9	30.6	84	88	87	20.5	22.6	21.8

Table 3 Changes of the yield of milled rice, head rice, milling characters and rice quality as nitrogen level in different varieties at reclaimed saline land

Nitrogen level (kg/10a)	Milled rice yield(kg/10a)			Head rice yield(kg/10a)			Protein content (%)			Palatability value		
	Sam-cheon	Hwa-seong	Nam-pyeong	Sam-cheon	Hwa-seong	Nam-pyeong	Sam-cheon	Hwa-seong	Nam-pyeong	Sam-cheon	Hwa-seong	Nam-pyeong
0	408(78)	459(85)	461(84)	358(84)	429(92)	436(93)	6.7	6.5	6.7	63	76	77
7	464(88)	489(91)	504(91)	401(95)	446(95)	468(99)	6.9	7.0	7.1	63	75	76
11	490(93)	497(92)	520(94)	415(98)	454(97)	478(101)	7.0	7.1	7.2	62	74	76
15	518(98)	515(96)	533(97)	430(101)	456(97)	483(102)	7.3	7.3	7.4	60	74	76
18	523(99)	533(99)	544(99)	424(100)	470(100)	492(104)	7.4	7.5	7.6	60	73	75
20	526(100)	538(100)	551(100)	423(100)	469(100)	471(100)	7.6	7.7	7.8	57	73	73
24	535(102)	525(98)	558(101)	418(101)	444(95)	470(100)	7.8	8.0	8.1	56	71	73
Mean	495	508	524	410	453	471	7.2	7.3	7.4	60	74	75
LSD(5%)	28	31	30	26	21	23	-	-	-	-	-	-