

The relation with the total nitrogen contents in fresh rice leaf and NNI

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Objective

It was developed the total nitrogen contents in fresh leaf measurement method which omits a drying of the rice plant and a course of pulverization and it was investigated the change of nitrogen contents in fresh leaf on rice culture method. To investigation the relation of the character which related with the nitrogen contents in fresh leaf, it was carried out an examination to apply in fertilization diagnosis and prescription in the field.

Materials and Methods

- o Variety and location : Nampyoengbyepo, Iksan(Jeonbuk)
 - o Planting space(cm) : 30×11, 30×13, 30×15
 - o Transplanting day : May 27 2004
 - o Amounts of nitrogen application(kg/10a) : 7, 11, 15, 19
 - o Application amounts of fertilization at panicle initiation stage(kg/10a) : 0, 4, 8, 12kg/10a
 - o P₂O₅-K₂O : 4.5 - 5.7kg/10a
 - o NNI = N_m / N_c
- NNI = Nitrogen Nutrition Index
 N_m : Critical nitrogen concentration(%)
 N_c : Nitrogen concentration(%)
- o NIRS Model : 6500, -Program version : WinISI 1.5

Results and Discussion

The total nitrogen contents in fresh leaf showed a decrease as a time goes by growth stage, but increased after the nitrogen application at panicle stage. Effect of the planting spacing on total nitrogens contents was higher by increased the nitrogen fertilization but there is no significance spacing in the row 13 and 15cm. The total nitrogen contents in fresh leaf was increased as the nitrogen application amount of panicle stage. The nitrogen application amount, as a planting time, nitrogen application amount at panicle stage were significance by year. The NNI(Nitrogen Nutrition Index) of fresh leaf were increased as a time goes by growth stage, but decreased at panicle and heading stage. According to this result, the total nitrogen contents in fresh leaf showed a decrease as a time goes by growth stage, but the NNI of fresh leaf were increase.

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Table 1. The concentration of nitrogen in fresh rice leaves by the rice growth stages as nitrogen application amount (unit : %)

nitrogen application amount (kg/10a)	non-productive tillering stage	reproductive growth	panicle formation stage	Meiosis stage
7	3.663	3.172	2.487	1.855
11	4.233	3.241	2.503	2.339
15	4.254	3.295	2.521	2.537
19	4.420	3.310	2.528	2.602

Table 2. The concentration of nitrogen in fresh rice leaves by the planting space (unit : %)

planting space(cm)	nitrogen application amount(kg/10a)			
	7	11	15	19
30×11	2.604	2.890	3.067	3.087
30×13	2.643	2.967	3.091	3.251
30×15	2.646	3.071	3.192	3.282

Table 3. The concentration of nitrogen in fresh rice leaves by the application amount of fertilization at panicle initiation stage (unit : %)

application amount of fertilization at panicle initiation stage (kg/10a)	nitrogen application amount(kg/10a)			
	7	11	15	19
0	1.855	2.157	2.303	2.342
4	2.056	2.352	2.451	2.505
8	2.066	2.414	2.590	2.712
12	2.212	2.574	2.595	2.778

Table 4. The NNI index by the rice growth stages as nitrogen application amount in fresh rice leaves

nitrogen application amount (kg/10a)	non-productive tillering stage	reproductive growth	panicle formation stage	Meiosis stage
7	1.050	1.660	1.684	1.772
11	1.522	1.715	1.826	2.389
15	1.548	1.845	1.846	2.829
19	1.627	1.866	1.900	2.909

Table 5. The NNI index by the planting space in fresh rice leaves

planting space(cm)	nitrogen application amount(kg/10a)			
	7	11	15	19
30×11	1.688	2.078	2.264	2.299
30×13	1.843	2.215	2.358	2.493
30×15	1.920	2.373	2.498	2.664