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The Growth Characteristics as affected by the Basal Fertilizer Application and the Rotary tillage method before Transplanting in Rice

Young-Rip Kwon*, Seung-Hyun Cho,

Deok-Ryeol Lee, Suk-Ju Kwon, Hyun-Cheol Park and Joung-Sik Choi
Jeonbuk Agricultural Research and Extension Services, Iksan, 570-140, Korea

Objectives

To investigate the effect of the chemical properties of soil and rice growth characteristics as fertilizer application time of basal fertilization and method of rotary in transplanting culture.

Materials and Methods

- o Variety and location : Nampyoengbyeon, Iksan(Jeonkuk)
- o Method of fertilizer application : Whole layer, Surface
- o Basal fertilization time : Application before plowing, Before first rotary, After first rotary, Surface application fertilizer
- o Method of rotary : Puddled soil rotary, Dry soil rotary
- o N - P₂O₅ - K₂O(kg/10a) : 11 - 4.5 - 5.7
- o Seeding day : 30 April 2002
- o Transplanting day : 30 May 2002
- o Planting space(cm) : 30 × 14
- o NIRS Model : 6500, Program version : WinISI 1.5

Results and Discussion

- o The potassium and phosphate contents in soil showed an increase during the growing period as compared with before treatment. And also in whole layer application and dry soil rotary, they showed a decrease as compared with puddled soil rotary and surface fertilizer application.
- o The total nitrogen contents showed a decrease as time goes by growth stage, but high at the meiosis stage.
- o The yield by effect of yield component was lower in application before plowing and surface application of fertilizer than fertilization after and before the 1st rotary.

*Corresponding author: Tel : 063-839-0325 E-mail : kyrkwon@hanmail.net

Table 1. The potassium and Av. P₂O₅ contents in soil by the basal fertilizer application and the rotary tillage method.

Item	Before treatment	Whole layer application	Surface application fertilizer	Puddled soil rotary	Dry soil rotary
K (cmol ⁺ /kg)	0.20 ^c	0.35 ^{ab}	0.30 ^b	0.36 ^{ab}	0.38 ^a
Av. P ₂ O ₅ (mg/kg)	100 ^c	163 ^a	154 ^a	168 ^a	170 ^a

The same letters in a column are not significantly different the 5% level by DMRT

Table 2. The total nitrogen contents by the basal fertilizer application. (unit : %)

Method	Critical effective tillering stage	Panicle formation stage	Meiosis stage	Before heading stage
Application before plowing	4.545 ^b	3.065	3.254	2.570
Before first rotary	4.551 ^b	3.211	3.316	2.783
After first rotary	4.701 ^a	3.758	3.446	2.792
Surface application of fertilizer	4.548 ^b	3.170	3.262	2.762

The same letters in a column are not significantly different the 5% level by DMRT

Table 3. The yield and yield components by the basal fertilizer application and the rotary tillage method.

Method	No. of spikelets /m ²	Grain filling ratio	1000grain weight (/g)	yield (kg/10a)
Application before plowing	34,352 ^b	78.2 ^b	20.7 ^a	486 ^c
Before first rotary	36,612 ^a	85.1 ^a	20.9 ^a	513 ^{ab}
After first rotary	31,995 ^c	78.6 ^b	20.7 ^a	515 ^{abc}
Surface application of fertilizer	36,465 ^a	84.0 ^a	21.0 ^a	489 ^{bc}
Puddled-soil rotary	35,607 ^{ab}	83.4 ^a	20.7 ^a	518 ^{ab}
Dry-soil rotary	32,604 ^c	79.1 ^b	20.5 ^a	523 ^a

The same letters in a column are not significantly different the 5% level by DMRT.