

## Changes of Rice Growth and Soil Chemical Properties by Cropping System in Green House Soil

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### Objectives

This experiment was carried out to investigate the changes of rice growth and soil properties according to cropping system in green house soil.

### Material and Methods

- Soil properties
  - Drainage : Moderately Well Drained(MWD), Imperfectly Drained(ID)
  - Texture : Coarse loamy, Coarse silty, Fine silty
  - Series
    - MWD : Gangseo, Gyum, Cheongweon
    - ID : eogcheon, Nampyeong, Pyeongtaeg
- Cultivar : Hwayoungbyeon
- Fertilization : No fertilization

### Results

- Green house soil was higher soil nutrition than monoculture soil. Between cropping system, multi-cropping system area was higher than double cropping system. Rice yield was the same trend.
- We suggested that fertilization amount should be adjusted for rice cultivation by cropping system in green house soil.

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Table 1. Soil chemical properties by cropping systems

Cropping systems	Sample No.	EC (dS m <sup>-1</sup> )	O.M (g kg <sup>-1</sup> )	Av. P <sub>2</sub> O <sub>5</sub> (mg kg <sup>-1</sup> )	Ex. cations(cmol <sup>+</sup> kg <sup>-1</sup> )			Av. SiO <sub>2</sub> (mg/kg)
					K	Ca	Mg	
Rice	7	0.38	16.4	282	0.38	3.79	1.09	213
Barley - rice	9	0.47	26.0	687	0.66	5.28	1.45	130
Green house - rice	47	3.45	28.0	838	1.31	7.49	2.40	182
Rice	8	0.45	18.0	229	0.29	4.54	1.14	59
Barley - rice	6	0.49	19.0	449	0.41	4.85	1.21	68
Green house - rice	48	2.78	21.9	740	0.87	6.50	2.11	117

Table 2. Rice yield and yield components by different cropping system

Cropping system	No. of panicle hill <sup>1</sup>	No. of spikelets panicles <sup>1</sup>	Ripened grain(%)	1,000 grains weight(g)	Grain Yield (kg/10a)
Watermelon-Rice	20.7	88.6	67.7	23.6	585
Strawberry-Rice	18.4	93.5	64.2	24.0	546
Melon - Rice	17.4	84.2	78.8	24.2	516

Table 3. The changes of soil chemical properties before and after rice transplanting by cropping system

Cropping systems		pH (1:5)	EC (dS m <sup>-1</sup> )	O.M (g kg <sup>-1</sup> )	Av. P <sub>2</sub> O <sub>5</sub> (mg kg <sup>-1</sup> )	Ex. cations(cmol kg <sup>-1</sup> )		
						K	Ca	Mg
Before rice transplanting	Watermelon-Rice	6.86	1.41	33.7	765	1.59	9.38	2.85
	Strawberry-Rice	6.63	4.38	21.6	710	1.68	8.85	3.66
	Melon - Rice	7.77	4.89	32.8	738	1.79	16.6	3.30
After harvesting rice	Watermelon-Rice	6.69	0.51	32.9	643	0.85	8.87	2.47
	Strawberry-Rice	6.70	1.13	19.7	693	0.51	5.91	2.02
	Melon - Rice	7.29	0.59	25.7	327	0.72	6.61	2.38