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Characteristics of Rice as affected by Period of Drought Treatment under the Upland Condition

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Objectives

This study was carried out to investigate characteristics of rice yield with period of drought treatment under the upland soil.

Materials and Methods

Materials - Soil texture : loam

Cultivars : Nonglimna 1, Hwayeongbyeo

Drought treatment stage : 11 days before heading,

6 days before heading, heading stage

Suspension periods of water supply : 10, 15, 20days

Methods - Experiment place : Greenhouse with sheltered from rain

Pot size : 80×50×50(cm), Completely randomized design six replication

Seeding methods : hill seeding(40×12cm) at May 10

Fertilization rate ; N-P₂O₅-K₂O = 6.80-1.2-3.16g/pot

Stop time of irrigation : pF 2.0

Results and Discussion

The delayed heading days were 7 days in Nonglimna 1 and 6 days in Hwayeongbyeo when water supply were suspended 10 days at meiosis and 1~2 days delayed as suspension period was longer 5 and 10 days. The panicle number per hill at meiosis and booting stage as influenced by drought treatment was remarkably decreased as suspension period was longer. Grain number per panicle and were same tendency as Panicle number per hill. percent sterility was remarkably increased as suspension period was longer. Most lowest stage of percent ripened grain as influenced by drought treatment was heading stage in Nonglimna 1 and booting stage in Hwayeongbyeo. Unhulled rice yield of hill was remarkably decreased as suspension period was longer.

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Table 1. Change of moisture content in soil as affected by period of drought treatment under upland condition.

Soil Texture	Suspension periods of water supply				
	Before tre.	5DAT [†]	10DAT	15DAT	20DAT
Loam	25.3±2.2	14.8±1.6	10.1±1.0	8.4±0.6	7.5±0.3

[†] DAT : Days after treatment, Oven dry method : moisture weight in soil/(soil weight-moisture weight in soil)

Table 2. Heading date as affected by period of drought treatment under upland condition.

Cultivar	Gerowth stage	Heading date		
		Suspension periods of water supply		
		10DAT [†]	15DAT	20DAT
Nonglimna 1	Meiosis stage	Aug. 22	Aug. 23	Aug. 24
	Booting stage	Aug. 20	Aug. 21	Aug. 21
	Heading stage		Aug. 15	
Hwayeongbyeo	Meiosis stage	Sept. 2	Sept. 2	Sept. 4
	Booting stage	Aug. 31	Sept. 1	Sept. 2
	Heading stage		Aug. 27	

[†] DAT : Days after treatment

Table 3. Panicle per hill and spikelets number per panicle as affected by period of drought treatment under upland condition.

Cultivar	Growth stage	Panicle per hill			Spikelets per panicle		
		Suspension periods of water supply					
		10DAT [†]	15DAT	20DAT	10DAT	15DAT	20DAT
Nonglimna 1	Meiosis stage	13.3	12.7	10.2	112	107	106
	Booting stage	13.2	13.0	9.7	111	108	108
	Heading stage	13.2	12.3	11.0		118	
Hwayeongbyeo	Meiosis stage	15.0	13.8	11.8	80	75	68
	Booting stage	15.4	12.2	10.9	94	87	85
	Heading stage	15.7	14.4	12.0		95	

[†] DAT : Days after treatment

Table 4. Percent sterility and ripened grain as affected by period of drought treatment under upland condition.

Cultivar	Growth stage	Percent sterility(%)			Ripened grain(%)		
		Suspension periods of water supply					
		10DAT [†]	15DAT	20DAT	10DAT	15DAT	20DAT
Nonglimna 1	Meiosis stage	30.8	45.3	60.6	65.0	52.7	36.5
	Booting stage	27.3	36.6	48.2	67.9	56.5	18.9
	Heading stage	24.4	28.9	34.4	70.5	34.3	12.0
	Control		7.2			80.7	
Hwayeongbyeo	Meiosis stage	5.7	19.7	30.6	87.2	75.9	53.3
	Booting stage	9.9	21.8	30.9	75.0	62.6	31.7
	Heading stage	6.5	17.1	23.0	83.3	67.7	33.3
	Control		4.6			88.2	

[†] DAT : Days after treatment