

벼-자운영 무경운 순환 작파 재배체제에서 몇가지 수도품종의  
구조적 특성과 뿌리활력의 비교  
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Comparisons of Architectural Characteristics and Root Activity of Several Leading  
Cultivars under No-till Direct-sown Rice-Vetch Interrelaying Cropping Systems  
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**Objectives :** To evaluate the differences in architectural characteristics and root activity of cultivars released for direct sowing and cultivars under no-till direct-sown rice-vetch interrelaying cropping systems. The cultivars classified were direct-sowing type, high yielding Indica type and japonica type.

**Materials and Methods**

1. Cultivars used :

Direct-sowing type : Calose 76, Newbonnet, Nongan

High yielding Indica type : Dasan, Daesan, Dongan, Whasam

High yielding Japonica type : Chucheong, Dongjin, Whayoung.

2. Establishment of rice into Vetch canopy

Rice seeds (7.5kg/10a) were oversown into the canopy of Chinese milk vetch after seedset of Chinese milk vetch. The soil tested was clay loam (sand: 30.2, silt: 39, and clay : 30.8%) with pH 5.77 and organic matter 1.7%.

3. Characters observed :

1) Leaf orientation: angles of leaf blade on basal and ending part were measured.

2) Leaf length, leaf width, leaf thickness: flag, first and second leaf.

3) Diameters of medullary cavity (MC) and vascular bundle(VB) : Measured with digital vernier calipers.

4) Pulling resistance with bending degree: from 90 to 45o at 30cm position from the ground.

\* Measured pulling resistance(g/hill) = total pulling weight/hill numbers \*

5) Root activity:  $\alpha$ -naphthylamine method, Active root used were sampled and stored. Measurements were made within 3 hours.

**Results and Discussion**

1. Direct sowing cultivars showed erect leaf plant type. Leaf length of first and 2nd leaf blades were not significantly different among the cultivars (Table 1)
2. Cultivars for direct sowing showed higher diameters of dedullary cavity and vascular bundles.
3. Direct sowing cultivars showed significantly higher pulling resistance(Fig.1) and a positive correlation coefficients were found between pulling resistance and tiller numbers per hill, particularly. (Fig.2)
4. Root activity of high yielding Japonica type cultivars was higher than chose of high yielding Indica types after full heading stage. (Fig.3).

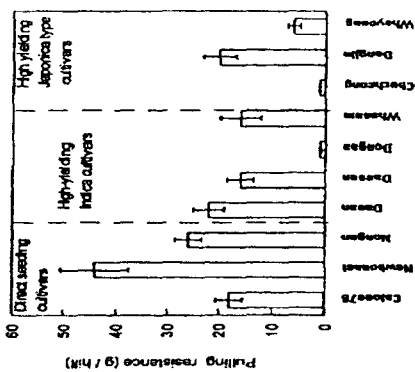


Fig. 1. Differences of pulling resistance by the various differences under root-disease resistance introgressing system. (Sep. 20, 1987)

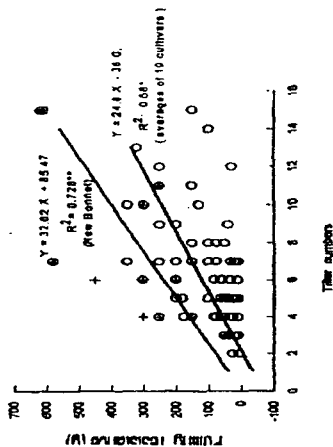


Fig. 2. Relationship between pulling resistance and No. of tiller of rice under root-disease resistance introgressing system. Measured on Sep. 20, 1987.

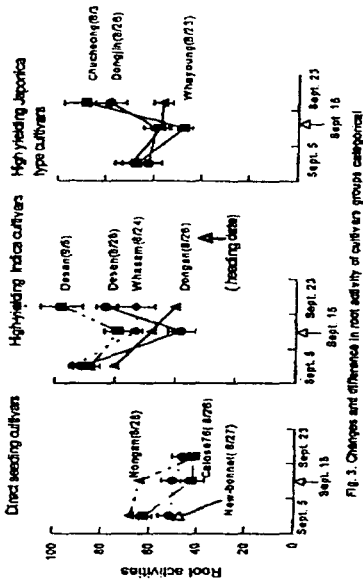


Fig. 3. Changes and difference in root activity of cultivars groups categorized into direct seeding, high yielding Japonica and high yielding indica types.

Table. Characteristics of vertical architecture in direct-sewn CMV-rice introgressing paddy in SACEDON

	Direct-sewn cultivars			High yielding cultivars			Japanese rice			
	Chaksoo76	Near-bonnet	Mongrai	Chaksoo76	Near-bonnet	Mongrai	Chaksoo76	Near-bonnet	Mongrai	
Plant height	26.3	32.7	45.0	42.7	45.2	22.8	16.0	17.5	26.3	30.5
Stem height	23.0	29.0	41.5	39.0	38.8	23.0	20.0	21.5	30.5	34.5
Difference	1.8	6.8	0.8	2.8	9.5	5.0	1.0	2.5	5.0	1.8
Plant height	23.0	14.0	7.8	18.5	5.2	22.5	15.0	15.0	23.0	18.5
Stem height	22.0	7.5	7.8	15.0	5.3	22.5	18.2	20.0	23.0	23.0
Difference	4.5	7.5	0.0	4.5	0.1	18.0	3.3	5.0	6.3	6.8
Plant height	23.3	35.3	14.0	26.2	3.2	29.2	21.3	24.0	25.0	22.3
Stem height	48.3	39.0	14.0	21.8	11.0	42.3	34.3	38.5	28.5	24.8
Difference	20.0	11.0	0.0	3.8	18.3	10.0	0.2	3.8	3.5	3.5
Plant height	25.3	34.3	20.0	28.0	29.0	23.0	27.3	27.3	26.3	31.3
Stem height	29.0	44.3	46.3	46.3	35.3	36.5	46.3	39.0	35.0	44.8
Difference	3.7	10.0	26.3	18.3	6.0	9.2	19.0	4.0	10.0	13.5
Plant height	13.8	16.8	18.8	18.8	18.8	15.3	15.3	11.5	11.5	11.5
Stem height	9.8	11.8	16.8	11.3	11.3	9.8	10.2	9.3	11.3	11.3
Difference	4.0	5.0	2.0	7.5	7.5	5.5	5.0	2.0	0.0	0.0
Plant height	19.0	27.0	18.0	25.0	25.0	20.0	20.0	19.0	19.0	19.0
Stem height	19.0	27.0	18.0	25.0	25.0	20.0	20.0	19.0	19.0	19.0
Difference	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plant height	20.0	21.0	23.0	18.0	27.0	18.0	23.0	18.0	23.0	22.0
Stem height	5.0	8.0	6.0	4.8	5.8	5.8	5.0	4.8	5.0	6.0
Difference	15.0	13.0	17.0	13.2	21.2	12.2	18.0	13.0	17.0	16.0

1: seeds from sites  
 \* 1: First and second last block from the last  
 SD: Mean difference between near-bonnet and Chaksoo76, from the direct seeding.  
 Plus indicate means of 10 rows trials