수도의 유관속발육에 관한 연구

제2보. 수도의 소유관속 발육에 미치는 질소수준의 영향

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Studies on the development of vascular bundles in rice.

2.Development of small vascular bundles at different tillers as affected by nitrogen levels in rice plants

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Objective:

To study the effect of nitrogen levels on development of small vascular bundles in rice.

Materials and Methods:

Rice cultivars used were IR58(indica type) and Unbong 7(japonica type). Germinated seeds were sown in seedling trays at 1 seed per cell of 1.0cm^2 in 1989 dry season, IRRI. Fourteen day-old seedlings were transplanted in 4-liter plastic pots containing 3.5Kg soil. Ammonium sulfate(21%N) was applied at 0,2,4,8 g/pot. Factorial in CRD with 3 replications were used for this experiment. The number and cross sectional area of vascular bundles were determined from the peduncle,flag leaf blade and sheath using a microscope at ripening stage.

Results and Discussion:

1)The number of vascular bundles in peduncle increased considerably with increasing level of nitrogen at different tiller positions in IR58 but not in Unbong 7.

2)In IR58,the number of vascular bundles in the main leaf blade increased from 46.0 to 61.3 while in Unbong 7 the vascular bundle increased from 47.3 to 56.7.

3)The increases in the number of vascular bundles in main leaf sheath N2 to N8 compared to NO was 11,18 and 23% for IR58 and 9,13 and 13% for Unbong 7,respectively.

4)The cross sectional area increased with high nitrogen in two cultivars as compared to fertilizer-free treatment.

5)The number of small vascular bundles in peduncle was highly correlated with the number of spikeiets and grain yield.

Optimum nitrogen level increases the number and area of vascular hundle in both cultivars. The enhancement of vascular bundle development resulted to higher number of spikelets and can increase grain yield potential.

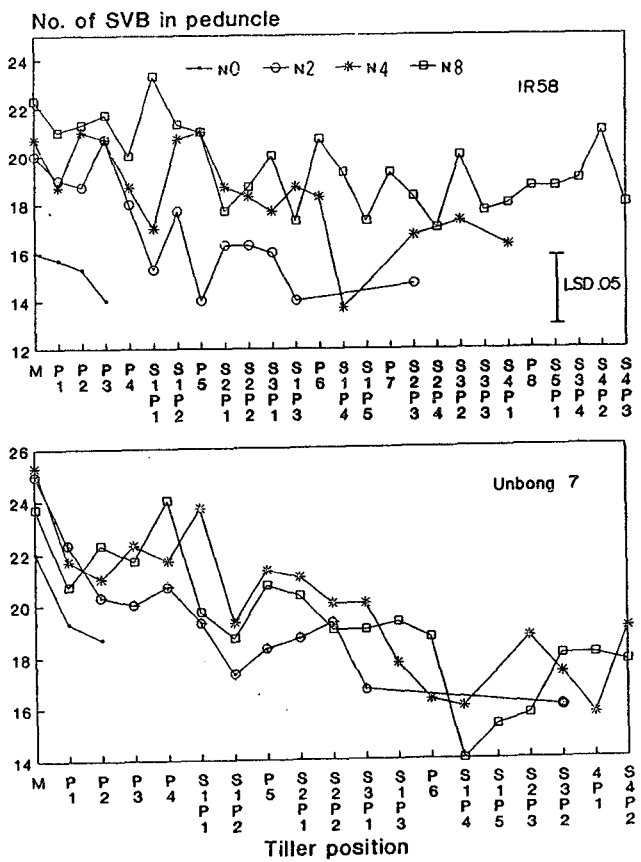

Fig. 1. Number of small vascular bundles (SVB) in the peduncle at different tillers (arranged in development order) as affected by four levels of nitrogen in IR58 and Unbong 7.

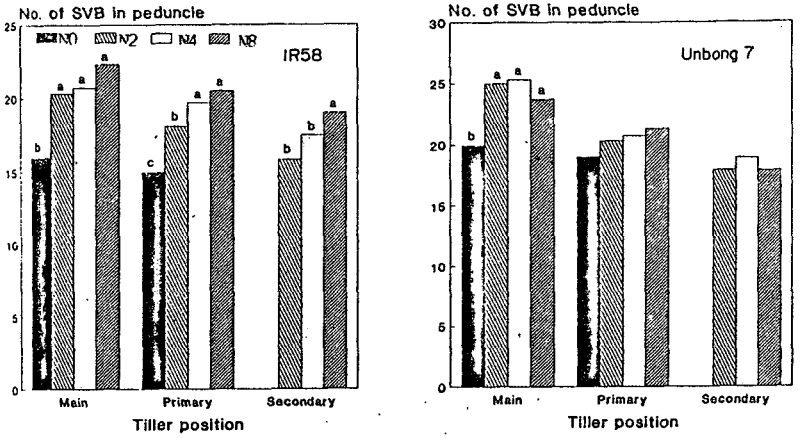

Fig. 2. Number of small vascular bundles (SVB) in the peduncle at different tiller positions as affected by four levels of nitrogen in IR58 and Unbong 7. Means with the same letter within a tiller position is not significantly different at the 5% level by DMRT.

Table 1. Number of small vascular bundles(SVB) in the leaf blade and sheath of the main culm as affected by four levels of nitrogen in IR58 and Unbong 7.

N-level	Number of SVB			
	Leaf blade		Leaf sheath	
(g/pot)	IR58	Unbong 7	IR58	Unbong 7
0	46.0	47.3	18.7	17.7
2	58.7	54.7	20.0	19.3
4	61.0	57.7	22.0	20.0
8	61.3	56.7	23.0	20.0
F-value Cultivar	5.60*		22.22**	
F-value N-level	27.88**		17.85**	
F-value Interaction	1.46ns		2.22ns	