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Growth Simulation of Ilpumbyeo under Korean Environment Using ORYZA2000: Ⅰ. Estimation of Genetic Coefficients

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Objectives

This experiment was conducted to calculate new genetic coefficients for growth simulation of Korean varieties under Korean environments using ORYZA2000.

Material and Methods

○ Varieties : Ilpumbyeo

○ Data set for estimation of genetic coefficients

Year	Date (day-month)		N fertilizing (kg/ha)	No. of sampling	Measured item
	Sowing	Transplanting			
2000	26 Ap 16 May	26 May 10 June	110, 150	4	LAI, dry weight of leaf, stem and panicle
2001	21 Apr 14 May	21 May 8 June	110, 150	5	LAI, dry weight of leaf, stem and panicle
2003	26 Apr	26 May	0, 60, 120, 180, 240	10	LAI, dry weight and nitrogen concentration of leaf, stem and panicle

※ Method 1 : using data under high nitrogen applicated condition (180, 240 kg N/ha in 2003)
Method 2 : using pooled data under various condition

○ Calculated genetic coefficients

Development rates, Partitioning factor, Specific leaf rate, Leaf death rate, Fraction of stem reserves, Nitrogen fraction in leaves on leaf area base

Summary

○ In the growth simulation using genetic coefficients calculated with fooled data under various condition, WAGT was not higher and LAI, WLVG, WSO were higher, but WST was similar before grain-filling stage after then became lower because of higher translocation of carbohydrates than in the growth simulation using genetic coefficients calculated with data under high nitrogen applicated condition.

○ Genetic coefficients should be calculated with data showing potential yield in ORYZA2000, but under 180 kg and 240 kg N condition in 2003, plants were infected by panicle blast and also yield was not higher than under 120 kg N condition showing not potential condition and therefore not appropriate for genetic coefficients estimation compared with pooled data from various condition.

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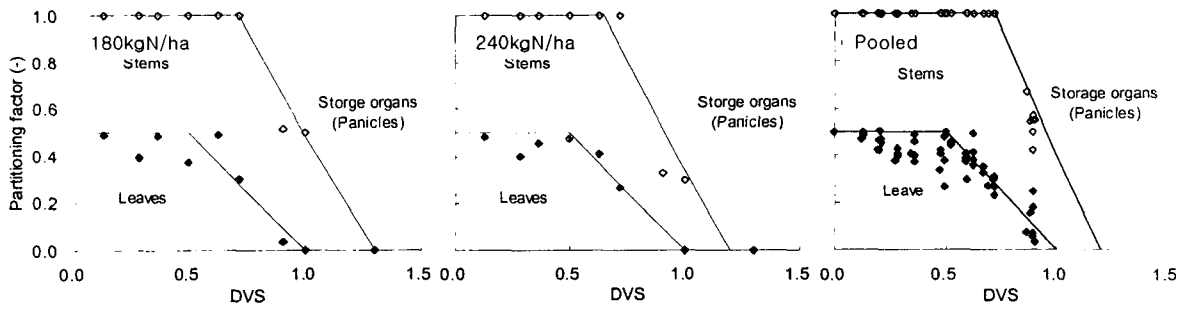

Fig. 1 Partitioning factor of aboveground dry matter over leaves, stems, and panicles.

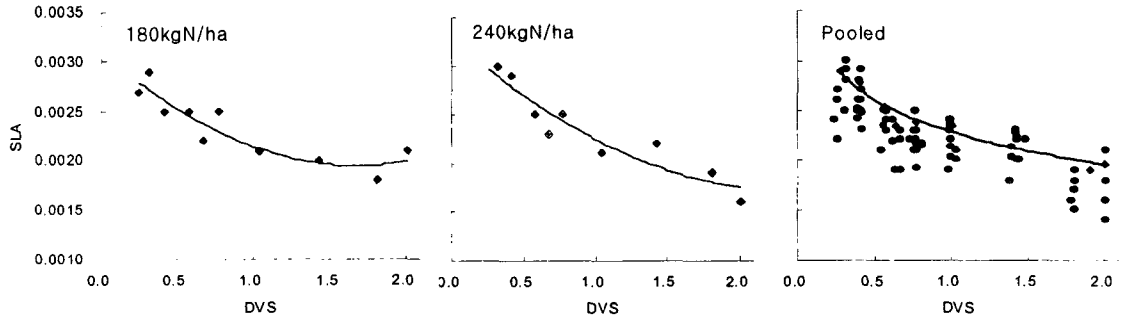

Fig. 2 Specific leaf area(SLA) as function of DVS.

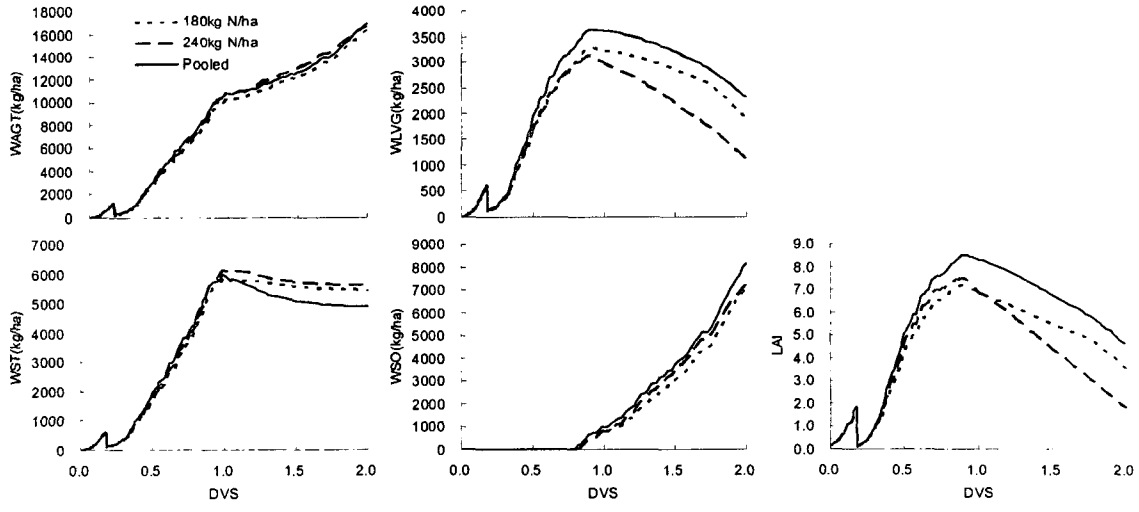

Fig. 3 Change of simulated dry weight of total aboveground(WAGT), leaves(WLVG), stems(WST), panicles(WSO) and LAI according to DVS.