

Effect of Nitrogen Fertilization on Ripening Characteristics and Minute Structure in Stems of High Amylose Rice Cultivar "Goami 2"

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Objectives

A new cultivar, Goami 2 (*Oryza sativa* L.), of japonica type rice exhibited high amylose content. This study has examined the ripening characteristics, minute structure in stems of Goami 2 and Daeanbyeo that were grown in a field with different levels of N supply in 2005.

Materials and Methods

- Experimental material
 - Soil : Fluventic Haplaquepts soil (fine loamy mixed, non-acid, mesic family of Aeris).
 - Cultivars : Goami 2, Daeanbyeo (reference cultivar)
- Treatments
 - No nitrogen (N 0), 50 kg N ha⁻¹ (N 50), 70 kg N ha⁻¹ (N 70), 90 kg N ha⁻¹ (N 90), 110 kg N ha⁻¹ (N 110), 130 kg N ha⁻¹ (N 130), and 150 kg N ha⁻¹ (N 150)

Results

- The brown/rough rice ratio, grain weight per liter, and 1,000 brown rice weight of Goami 2 were less than those of Daeanbyeo.
- When grains were submerged for 3~5 minutes, the ripening rate of Daeanbyeo ranged from 90.6 to 94.6 but zero in the ripening rate of Goami 2. As it passed soaking time longer, the ripening rate of Goami 2 was higher. After submerging for 6~7 hours, it was possible to distinguish from treatments.
- Among nitrogen levels, large and small vascular bundle of rice stems were not different. But small vascular bundles(SVB) of Daeanbyeo was higher than SVB of Goami 2.

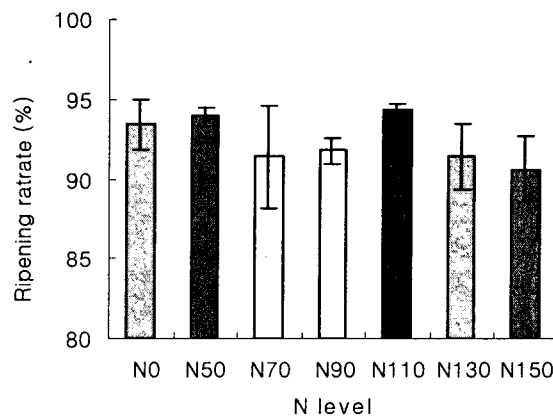
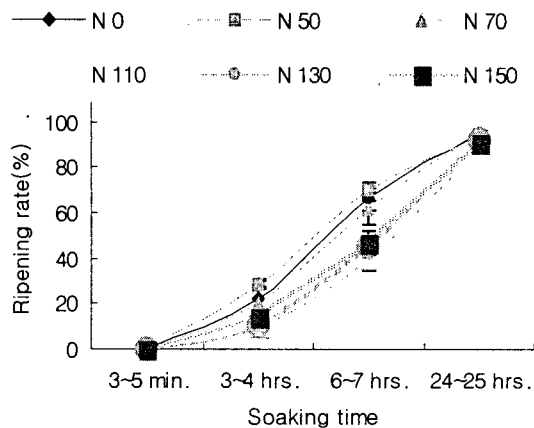


Fig. 1. The changes of ripening rate by different soaking time in Goami 2.

Fig. 2. The changes of ripening rate at the 3-5 minutes soaking time in Daeanbyeo.

Table 1. The varietal difference of large and small vascular bundle of rice stems¹⁾ in grown under different nitrogen levels

| N level (kg/10a) | Goami 2 | | Daeanbyeo | | Ilpumbyeo | |
|---------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | LVB ²⁾ | SVB ³⁾ | LVB ²⁾ | SVB ³⁾ | LVB ²⁾ | SVB ³⁾ |
| N 0 | 11.0±0.00 | 15.6±0.79 | 10.0±0.45 | 17.0±0.45 | - | - |
| N 9 | 12.0±0.00 | 15.0±0.73 | 10.0±0.00 | 19.3±0.49 | 12.3±0.30 | 16.0±0.45 |
| N 15 | 11.7±0.34 | 14.3±0.34 | 10.7±0.34 | 18.3±0.69 | - | - |

1) Neck of panicle under 1cm.

2) LVB : Large Vascular Bundle

3) SVB : Small Vascular Bundle.