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Changes in Seed Vigour of Rice during Storage at Different Temperatures

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[Introduction]

Seed longevity or viability in rice, usually defined as the length of time a seed remains viable, is an important agronomic trait. Seeds with low viability show low-germination activity, resulting in poor seedling establishment and eventually reduced grain yield. Also, seeds undergo aging or deterioration and gradually lose germination vigor during storage. Therefore, we examined the germination rate of rice seeds preserved in low-temperature storage to identify the decreased seed vigour during storage period.

[Materials and Methods]

This study was carried out to investigate the changes in rice seed vigour during storage using 185 rice varieties in Korea Seed & Variety Service. The rice varieties have been conserved at a mid-term storage for 13 ~ 19 years ([15°C, 35% RH for 8 ~ 14 years] and [4°C, 35% RH for 5 years]) and long-term storage for 7 ~ 20 years ([5°C, 35% RH for 2 ~ 15 years] and [-18°C, 35% RH for 2 ~ 15 years]) in plastic bottle containing silica-gel. Germination test for all varieties was performed both before seed storage and after storage.

[Results and Discussion]

The reduction ratio of germination for varieties stored in long-term and mid-term storage condition ranged from 69 to 90% and 23 to 95%, respectively. The varieties stored in long-term storage condition showed no significant decline in germination until 9 years' storage. And it seemed that the time for 50% reduction ratio of germination in long-term and mid-term storage condition was 18.3 and 11.1 years, respectively. With longer storage periods, the germination rate of seed is reduced progressively and there was a difference in the decreasing rate of germination depending on the storage environment. These results show trends in decreasing seed vigour due to the storage environment.

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