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Evaluation of Agricultural Characters and Resistance to Bacterial Soft Rot of Transgenic Potatoes with Shiva Gene in Field

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Objectives

To investigate how the shiva-expressing potato plants behave under environmental conditions and whether the induced resistance also functions in field-grown tubers.

Materials and Methods

1. Plant materials : Transgenic potato 'Irish Cobbler' tubers with shiva-1 gene

2. Methods

(1) Cultivation : Tubers were hand planted in April (2002-2003) in Daegwallyeong.

Each plot comprised five rows 75 cm wide of 10 plants 25 cm apart.

(2) Infection : In the net house where the transgenics were planted, soft rot was present every year in a moderate to severe form. Therefore, different transgenic potato lines were screened in a naturally infested field to identify the resistance reaction of that lines under normal growing practice for Daegwallyeong area.

Results and Discussion

Analysis of leaf samples collected in the field revealed a stable expression of Shiva gene throughout the growing season. This resulted in a large decrease in soft rot incidence among clonal progeny obtained from previously infected 'Irish Cobbler' clones. Based on evaluation of 10 defined morphological characteristics, tuber yield and grading, all the transgenic clones proved to be true to type. Using the polymerase chain reaction (PCR) with NPTII and Shiva primers spanning transgenic sequences, true to type clones could be distinguished clearly from the corresponding untransformed clones.

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