

# Biosafety Assessment of Transgenic Plants in Isolated Field Trials - A Case Study of Transgenic Broccoli

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## Motivation

Floret yellowing in harvested broccoli (*Brassica oleracea* var. *italica*) is a typical postharvest problem. The transgenic broccoli were obtained by cytokinin synthesizing isopentenyltransferase(ipt) gene transformation into their original plants, Green King. The biosafety assessment of transgenic broccoli was carried out under regulatory guidelines in isolated field.

## Material and Methods

The biosafety assessment was carried out successively in full-containment greenhouse, semi-containment greenhouse and isolated field.

Isopentenyltransferase(ipt) transgenic broccoli was assessed for growth traits and its effect on the environment in the isolation field of ARI (Fig 1).

## Results and Discussion

### 1. Morphological and growth traits

Employing the LSD test indicates no significant difference between transgenic and non-transgenic broccoli plants (Table 1).

### 2. Environment effect

#### (1) Influence on soil microflora

Number of microorganisms in the soil, in which transgenic or non-transgenic broccoli plants were grown, is indicated in Fig 2.

#### (2) Influence on pests and insects

Visiting insects were mainly aphids, *Phyllotreta striolata* (Fabricius), *Plutella xylostella* (Linnaeus), *Pieris (Artogeia) rapae crucivora* Boiduval and *Liriomyza bryoniae* (Kaltenback). There was no difference in flower visiting insects between transgenic and non-transgenic broccoli.



Fig1. The biosafety assessment experiment of the ipt transgenic broccoli in the isoated field of ARI.

Table1. Comparison of traits between transgenic and non-transgenic broccoli

Variety line	Stem height (cm)	Plant height (cm)	Plant width (cm)	Stem width (cm)	Leaf length (cm)	Leaf width (cm)	Petiole length (cm)	Petiole width (cm)	Number of leaves
101	12.10a ±0.56 <sup>(1)</sup>	33.83a ±1.32	73.50a ±0.99	3.25a ±0.28	41.73a ±0.98	18.80a ±0.23	14.97a ±1.13	1.32a ±0.06	15.07a ±0.15
102	15.13a <sup>(2)</sup> ±0.41	40.17a ±4.13	74.37a ±7.01	2.82a ±0.06	39.13a ±1.02	18.53a ±0.45	15.23a ±1.80	1.12a ±0.01	14.70a ±0.20
103	10.07a ±0.18	28.07a ±0.38	56.50a ±1.25	2.55a ±0.03	32.77a ±0.28	17.37a ±0.43	10.05a ±0.16	1.09a ±0.01	13.87a ±0.09
ck	13.70a ±0.35	36.23a ±1.22	73.43a ±0.38	2.64a ±0.04	41.67a ±0.75	16.47a ±0.15	14.67a ±0.09	1.15a ±0.03	14.73a ±0.15

(1) Variable mean ± standard error of the mean; means of three replicates.

(2) Each value in the same column followed by the same letter are not different at 5% significant level by using LSD test.

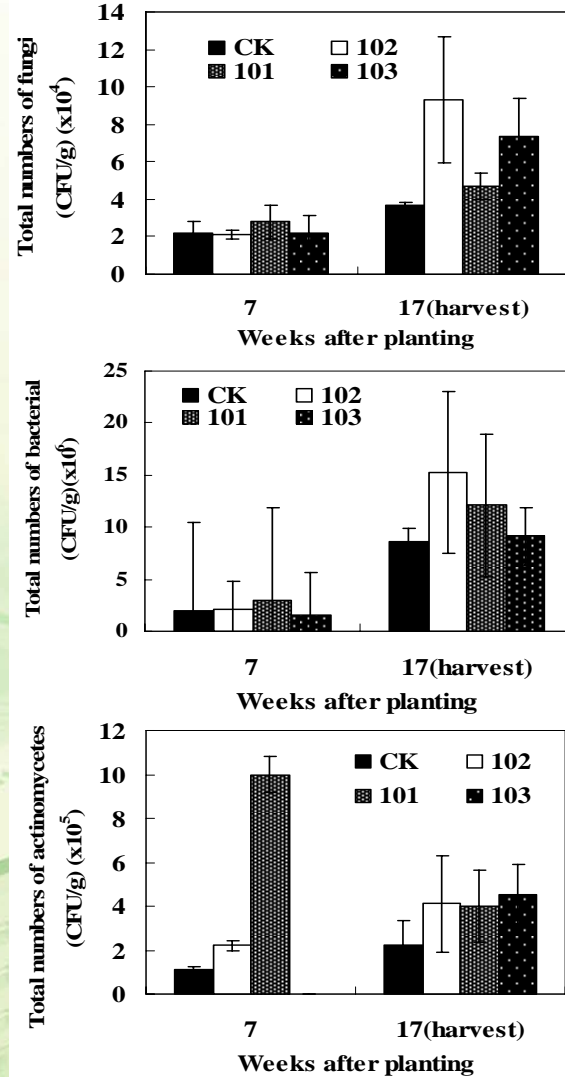


Fig2. Number of microorganisms in the soil in which transgenic or non-transgenic broccoli plants were grown