

## Development of genetically engineered turfgrass varieties with high commercial values

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Turfgrass plays an important role in our life adding beauty to the environment and providing the foundation for recreational sports. Turfgrass is a good commercial target plant for biotechnological application because of its big and fast-growing market potentials in the world. Thus, the turfgrass with new traits genetically engineered will have substantial marketability. The most attractive target trait in this regard is to reduce management cost of turfgrass including significantly reduced watering, mowing and agrochemical application, and resistant to environmental stresses and diseases. In the United States, more than thirty billion dollars are spent annually for the maintenance of turfgrass. Therefore, it is economically and environmentally useful to develop the turfgrass requiring low-maintenance. The immediate goals of this project are to establish the core technology for genetic transformation of turfgrasses and to make genetically modified (GM) turfgrasses that is commercially valuable, including herbicide resistant (lower maintenance cost and lower environmental problem), shade tolerant (shorter and greener), stress-tolerant (lower maintenance and higher value), disease-resistant, well-being (pollen-free), colored, and multiple traits-containing turfgrasses. Herbicide resistant turfgrass will provide a useful tool for controlling weed species in the turfgrass area and reduce the number and amount of agrochemicals, which can decrease the environmental pollution. The shade avoidance-suppressed turfgrass is expected to be greener, shorter and healthier than wild-type turfgrass. Stress-tolerant and disease-resistant turfgrasses are very useful for lowering the maintenance cost. Well-being concept turfgrass in which potent allergen (pollen) is removed, colored turfgrass, multiple traits-containing turfgrasses will be expected to have substantial marketability. In the presentation, we will introduce the current status and progresses of our project, including environmental risks assessments of developed genetically engineered turfgrasses on the fields located in Cheju.

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