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S Y M P O S I U M H A N D B O O K

BIOSAFETY RESEARCH OF GMOS: PAST ACHIEVEMENTS AND FUTURE CHALLENGES

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P3.15 Assessment of the effects of Cry1Ac toxin to the butterfly *Chlosyne lacinia*Paula D¹, Magalhães M², Sujii E¹, Pires C¹, Fontes E¹, Nakasu E²

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The integration of genes for synthesis of substances, which are not naturally part of the potato, is of research interest. One example is the fructan-producing potato as a prebiotic food. Six lines of the fructan-producing potato (*Solanum tuberosum* cv. Désirée) were investigated. Three transgenic lines of each of the following two constructs, were transformed and selected in the Max Planck Institute of Molecular Plant Physiology in Potsdam (Germany): the single transformed construct 1-SST, and the double transformed construct 1-SST/FFT. Both genes, *sst* and *fft* originate from artichoke (*Cynara scolymus*).

All three SST/FFT lines showed delays in crop emergence and bud development and flowering. The main sprout length was shorter and some crop cover was missing at completed vegetative growth. The number of the single flowers on the first order inflorescence was reduced. The leaf hairs of the lower side were more or less dense in comparison to the wild type. The starch content of the SST/FFT lines was reduced by 2-3 %. This decrease correlates with the fructan-content. The above mentioned changes were noticed in all three SST/FFT lines. A direct influence of the integrated SST-line or direct impact of the second transformation (the integration of the FFT-construct) is thus probable.

The leaf susceptibility to *Phytophthora infestans* remained unchanged in all SST and SST/FFT lines. Nevertheless, the tuber susceptibility was reduced in the SST/FFT lines as a result of the fructan-content. The negative correlation between the fructan-content of the tubers and the mycel growth was also confirmed in liquid cultures. The tuber reaction of the SST and SST/FFT lines with the pathotype 1 and 18 of the potato wart (*Synchytrium endobioticum*) was identical to the wild type. All SST and SST/FFT lines and the wild type showed an identical reaction towards the yellow cyst nematode (*Globodera rostochiensis*). Compared to the wild type, the SST/FFT lines showed a reduction in the reproduction of the root-knot nematode (*Meloidogyne incognita*). The development of the larvae and the reproduction of the females of the Colorado potato beetle (*Leptinotarsa decemlineata*) in SST and SST/FFT lines were not influenced in the short or in the long term under greenhouse conditions. An influence of food quality on the weight of the larvae and on the host preference for the reproduction of *L. decemlineata* was observed under field conditions. The different parameter values in the selected traits of the Colorado potato beetle on the one hand and in the carbohydrate contents between greenhouse and field plants, on the other hand, show that field cultivation is indispensable in order to generate a robust risk evaluation of the fructan potato.

All above mentioned changes in the phenotype, morphology and susceptibility of the three SST/FFT lines would not lead to a new classification of the susceptibility reaction of the potato variety Désirée according to the criteria of the German Federal Office of Plant Varieties.