

## Phytoremediation of N and P salts in soils and wastewater with high-performance transgenic plants

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### Summary

Studies on phytoremediation, that is, use of plants for removing pollutants from the environment, are in progress. This technology has the advantage of employing genetically engineered plants with increased efficiency. Phytoremediation can be used for removing  $\text{NO}_3\text{-N}$  and P from heavily fertilized soils and wastewater from livestock houses. Recently, it was shown that recombinant tomato plants with suppressed ethylene production had an increased ability to absorb heavy metal ions, suggesting a possibility of generating phytoremediators with increased ability by genetic engineering with ethylene-related genes.

The aim of this research was to evaluate tobacco plants as a phytoremediator for removing N and P salts. We compared the total-N-absorbing ability of the non-transformed tobacco plant (cv. Ky 57) and the transformants with suppressed ethylene sensitivity (strains No.11, 32, 44, 49). These transgenic tobacco plants were expected to have increased ability to absorb N, since their stress reactions under high salt concentrations is decreased.

Tobacco plants absorbed N efficiently from culture media containing total-N and NaCl at high concentrations. Transgenic tobacco plants with suppressed sensitivity to ethylene absorbed more total-N than the non-transformed control plants. These results indicated that tobacco plants could be used as phytoremediators for removing N from soils and wastewater, and that this activity could be enhanced by genetic engineering.