

## ACTIVE OXYGEN METABOLISM DURING AGEING OF POTATO TUBERS CV DESIREE

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Ageing of potato tubers occurs during storage. As a consequence, tuber quality is altered and involves loss of sprouting vigour, accumulation of reducing sugars, oxidative stress (Kumar and Knowles 1993, 1996).

Previous studies have shown that increased tolerance to paraquat (an herbicide inducing oxidative stress) can be obtained by introducing an additional copy of a manganese superoxide dismutase (Mn-SOD) gene in tobacco (Bowler *et al.* 1991). More recently Kurepa *et al.* (1998) showed a relationship between tolerance to paraquat and longevity in *Arabidopsis thaliana* L., thus providing further support to the proposed link between active oxygen species (AOS) and ageing.

In order to study the active oxygen metabolism during tuber ageing, potato plants (cultivar Desiree) were transformed with a Mn-SOD from *Nicotiana plumbaginifolia* L. The gene introduced is under the control of a constitutive promoter (35S) and is either targeted to mitochondria (overexpression) or to plastids (ectopic expression).

In the transgenic plants, we are studying quality traits related with ageing like :

- tolerance to oxidative stress induced by paraquat,
- duration of dormancy,
- sprout vigour and morphology,
- cold sweetening and loss of membrane integrity during tuber storage,
- tolerance to photoinhibition.

Preliminary results indicate that Mn-SOD activity can be increased in potato plants by genetic modification, providing improved tolerance to paraquat. Tuberisation and/or sprouting behaviour are apparently altered in microtubers and/or in greenhouse grown tubers in some of the transgenics lines.

Other studies are in progress.

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