

introgressed individuals unfit and non-competitive. Thus introgression can both be delayed as well as mitigated, thereby lessening the hazards. [L]

Pollen-Mediated Gene Transfer: A Holistic View

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For the first time, transgenic plants will be sown on a large scale during the coming years. Newly implanted genes in the modified crops could escape through cross pollination with related wild strains. This genetic flux varies widely depending on the strain and the region. The risk is low or non-existent in Europe and North America in the case of soybean, maize, wheat, rye, barley, potato, tomato and some types of clover; by contrast, it is moderately high for endive, turnip, oilseed rape, cabbage, radish and chicory; and for carrot, alfalfa, and most species and strains of wild grass which today are subject to intensive cultivation (for lawns, sports fields and golf courses), the risk is very high. In the last group of crops it is in fact highly probable that genes will escape, which does not necessarily mean that this will have a negative effect on the environment. Mass cultivation of transgenic crops with an extremely high gene flow and high dissemination dynamics should be carefully monitored on a long-term basis. Unwelcome outcrossing can be avoided: in many crops traits have been developed which express the transgenes in the chloroplasts of plant cells, which then would make outcrossing impossible. However, we should also bear in mind that new oilseed rape traits have already outcrossed to other rape fields and certainly also to their wild relatives. In a truly holistic view this has to be balanced out with the new outcrossing events. [L]

Potential Effects of the Introgression of Virus Resistance Transgenes into Natural Populations of *Brassica oleracea*

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A study was conducted to assess the impacts of turnip mosaic virus (TuMV), turnip yellow mosaic virus (TYMV) and cauliflower mosaic virus (CaMV) on the survival, growth and reproduction of wild cabbage plants. Three groups of 200 wild cabbage seedlings with TuMV, TYMV or water (control) were inoculated. The plants were transplanted into a common garden and their survival, growth, flowering and seed production were measured. In a separate trial, we compared CaMV-inoculated seedlings with controls. After 18 months, mortality was significantly higher in the TYMV-inoculated and TuMV-inoculated groups (51.3% and 34.1%, respectively) compared with the control group (21.7%). TYMV also suppressed flowering (75% of survivors) compared with TuMV (89.2%) and the controls (85.2%). Although only TYMV-inoculated plants had significantly reduced dry weights, both TYMV and TuMV reduced seed production per plant to *ca* 50% of the controls. We have detected no effects from inoculation with CaMV. It is concluded that introgression of transgenes for TYMV or TuMV resistance has the potential to alter the dynamics of wild cabbage populations, whereas CaMV genes are much less likely to have any effect. Risk assessment of transgenic virus resistance in a given species must be virus-specific. (L)

I: TRANSGENIC CROPS RESISTANT TO PATHOGENS AND INSECTS

Transgenic Plants Resistant to Bacteria and Fungi

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