

TRANSGENIC CROPS AND BIOSAFETY CONCERNS

GURINDER JIT RANDHAWA* AND MANISHA MANGAL

Modern biotechnological techniques have enabled the introduction and expression of novel genes into plants. As a result plants can now be engineered to produce significantly higher yields, better quality as well as with resistance against insects, pests and tolerance to herbicides. Despite the potential benefits of transgenic crops, there are also concerns regarding the possible environmental and agronomic impacts if the transgenes escape and get established in natural or agricultural ecosystems. From an agronomic point of view, the transfer of novel genes from one crop to another may have many implications, including depletion in the quality of seeds leading to a change in their performance and marketability. Concerns over the ecological impacts of transgenic crops largely depend upon whether a crop has wild relatives and the ability to cross pollinate them. If crops hybridize with wild relatives and gene introgression occurs, wild populations could incorporate transgenes that change their behaviour and they could present a serious threat as weeds or competitors in natural communities. Risk assessment protocols of transgenic crops have largely been based on assumptions that genetic modifications of plants will not alter their behaviour, or that of other organisms in the natural environment. These assumptions are made from limited information on the level of gene flow occurring between crops and their wild relatives, and small scale experiments with transgenic plants and untransformed plants. However, there is a need to study the impact of transgenic crops on the environment on a long term basis. In addition, strategies have to be devised for minimizing crop to crop gene flow and environmental exposure to transgenes by developing transgenic plants, which can address biosafety concerns in proper perspective. This can be achieved by avoiding or minimizing cross pollination, avoiding antibiotic markers or switching on the expression of inserted genes only in the specific tissues and at specific developmental stages.
