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GM seeds can remain in fields longer than previously thought

Despite management practices designed to reduce the risk of genetically modified (GM) volunteer plants setting seed, new research shows that rogue GM plants occur in fields which were planted with GM oil seed rape 10 years earlier.

Volunteer plants (plants that have not been planted deliberately) arise because some seed is spilled during harvest and remains in the field to germinate in a following season. Long term persistence of a crop such as oil seed rape can occur through two routes: either a few plants grow and set seed contributing to the seedbank each year or, seeds spilled during harvest survive over a number of years. Previous studies suggest that oil seed rape persists in agricultural fields for up to 8 years.

Strategies have been developed to minimise the occurrence of volunteer GM plants, following field trials of GM crops. In the case of oil seed rape, these include shallow stubble tillage which encourages seed germination, followed by late ploughing to eliminate seedlings. However, this new research found evidence of modified genes in oil seed rape seedlings 10 years after a GM field trial. The extensive control of volunteers at the study site suggests that these seedlings sprouted from 10 year old seeds.

Although levels were low (0.01 plants per square metre), the researchers point out that the field had received labour intensive efforts to eliminate any GM plants over a 10 year period. Such intensive efforts to eliminate GM plants are unlikely to occur in conventional field settings and the number of volunteer plants in commercial fields is likely to be higher.

This new study raises questions about the purity of crops grown in fields for some years after a GM crop. The spread of GM organisms into non GM crops may have implications for consumers, who are often less willing to buy products of mixed origin. The study also supports previous modelling work which predicted that volunteers from the seedbank could make it difficult to ensure GM content in conventional crops is below the 0.9 per cent EU threshold[1].

Genetically modified oil seed rape is currently not grown commercially in the EU, although field trials have been conducted in a number of countries. GM oil seed rape may be more likely to escape from cultivation or cross pollinate with non-GM varieties, making it more difficult to ensure the GM content of conventionally grown oil seed rape remains below the EU threshold: for example, it is attractive to insect pollinators, which could facilitate cross pollination, and it is able to survive outside cultivated fields, which makes escape from cultivation more likely. As this research shows, GM oil seed rape seeds also persist in the seedbank for a considerable time.

1. For information on the regulations governing the traceability of GM food and feed see Regulation 1829/2003 and 1830/2003. http://ec.europa.eu/food/food/biotechnology/index_en.htm

Source: D'Hertefeldt, T., Jorgensen, R.B., Pettersson, L.B. (2008). Long-term persistence of GM oilseed rape in the seedbank. *Biology Letters*. Doi:10.1098/rsbl.2008.0123.

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