



# GMO Safety

Genetic engineering - Plants - Environment

- Home
- News**
- Science live
- Database
- Glossary
- Links
- Photos
- New
- Archive

## ■ Fungus-resistant vines

### Vine trials abandoned

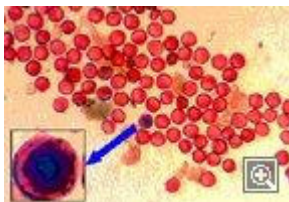
**The first release experiment with genetically modified vines in Germany is being called off early. The Institut für Rebenzüchtung Geilweilerhof (Institute of Grapevine Breeding) has been testing different varieties of vine with a genetically engineered resistance to certain fungal diseases at two locations in Rhineland-Palatinate and Bavaria. However, they proved as susceptible to fungi as conventional vines. The trial also investigated biological safety issues.**



Prof. Reinhard Töpfer, IRZ Geilweilerhof



Young genetically modified vines in the greenhouse



Transgenic vine pollen (blue) under the light microscope after application of saffron dye and GUS test.

"With regard to fungal resistance, the genetically modified vines showed no advantages over the controls", said Prof. Reinhard Töpfer, head of the Institut für Rebenzüchtung Geilweilerhof (IRZ) in Siebeldingen. The results obtained so far made a continuation of the trials appear unnecessary. They had been approved for ten years in 1999.

The genetically modified vines had been developed at the IRZ under Töpfer's direction. To achieve increased resistance to fungal diseases like mildew and grey mould (botrytis), various barley genes were transferred to the trial plants. These genes cause the vines to produce the enzymes chitinase and glucanase as well as another protein (RIB), which inhibit cell wall development among many fungal pathogens or inhibit fungal growth.

In the past few years, conventionally bred fungus-tolerant vine varieties like Regent have become widespread, but there is a firm desire among farmers to make traditional vine varieties like the Riesling less susceptible to fungal diseases. The cultivation of fungus-resistant varieties can significantly reduce pesticide use.

The field experiments were designed to answer a range of questions:

#### Site Search

Your search term

Full text search of a content

#### personal memo

0 document is at present noted on your personal memo.

add this document

#### Change font size

1 2

#### Safety research

##### Grapevines

Genetically modified resistant grapevines: consequences for organisms SLFA and a.d.Wstr.

#### Related links

##### Information on resistance grape varieties

Institute of Grape Breeding Geilweilerhof (Siebeldingen)



A safety research project investigated whether the genetic modification had impacts on vine pests and beneficial organisms.

Photo: Grape-berry moth larvae are fed doses of chitinase in droplet form.

In particular, they whether the insert result in increased

Since vines live a long time, it is important to know whether the introduced traits remain stable over several years under field conditions.

Experiments were carried out to investigate pollen spread and the outcrossing rates for vines.

And finally, the trials were supposed to answer an important question for wine consumers: whether the genetically modified vines produce the same wine quality.

#### **Field test for fungal resistance**

In July 1999, IRZ Geilweilerhof, part of the Federal Centre for Breeding Research on Cultivated Plants (BAZ), together with the Bayerischer Landesanstalt für Weinbau und Gartenbau in Würzburg planted genetically modified vines in the open. They contained various genes which, it was hoped, would produce significantly improved resistance to fungal diseases. At the Geilweilerhof site, plants were released with three different gene constructs. In Würzburg only one resistance concept was tested (see table below).

Three trial years have now been evaluated, showing that increased fungal resistance was not achieved. There therefore seems little point in continuing the trials.

#### **Outcrossing**

Possible pollen dispersal and outcrossing of transgenes from GM vines to other vines was investigated only at the Geilweilerhof trial site. Pollen traps were set up around 36 GM pollen donor plants at distances of 5, 10, 20 and 50 metres. The presence of the transgene in the pollen can be detected very quickly thanks to the blue colour produced by a marker gene inserted into the GM vines. At the same time, seeds were harvested at distances of 5, 10 and 20 metres from the pollen donor plants. Whether the seedlings that emerge from the seeds really are transgenic plants will be seen only after germination experiments. However, first indications of outcrossing have been found. Final data on the outcrossing experiments will not be available until sometime in 2005.

The wine quality question has, however, been answered. The Siebeldingen "GM Riesling" was tasted several times during the trial years. Prof. Töpfer says "The sensory test found no differences compared with the non-genetically modified control".

#### **Overview: Release of GM vines**

Transformed variety	Transformed genes	Aim/effect	Release site
Dornfelder	$\beta$ -glucuronidase (GUS) from colibacillus	GUS can be detected very easily because of its blue colouring and is used to determine the outcrossing rate	Geilweilerhof
Seyval Blanc	Chitinase and RIP (ribosome-inhibiting protein) from barley	To increase fungal resistance	Geilweilerhof

Riesling	Chitinase and RIP from barley	To increase fungal resistance	Geilweilerhof and Würzburg
Riesling	Chitinase and glucanase from barley	To increase fungal resistance	Geilweilerhof

The research project on fungus-resistant vines was sponsored by the Stiftung Rheinland-Pfalz für Innovation, Mainz (project no 543)

---

January 7, 2005

