

# Herbicide resistance in Switzerland

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## Historical development of herbicide resistance in Switzerland

In 1977 lamb's quarter (*Chenopodium album*) developed, in Switzerland, a confirmed resistance towards triazine herbicides. From that date on, 18 other weed species presenting various types of herbicidal resistances appeared.

## Chronological resistance development

Year	Species	Herbicide chemical family
1977	<i>Chenopodium album</i>	triazine
1982	<i>Amaranthus blitum</i>	triazine
1982	<i>Amaranthus cruentus</i>	triazine
1982	<i>Amaranthus retroflexus</i>	triazine
1982	<i>Chenopodium polyspermum</i>	triazine
1982	<i>Conyza canadensis</i>	triazine
1982	<i>Senecio vulgaris</i>	triazine
1983	<i>Solanum nigrum</i>	triazine
1986	<i>Chenopodium ficifolium</i>	triazine
1986	<i>Amaranthus bouchonii</i>	triazine
1986	<i>Poa annua</i>	triazine
1986	<i>Stellaria media</i>	triazine
1988	<i>Amaranthus lividus</i>	triazine
1988	<i>Conyza canadensis</i>	urea
1989	<i>Senecio vulgaris</i>	urea
1991	<i>Galinsoga ciliata</i>	triazine
1996	<i>Apera spica-venti</i>	urea
2006	<i>Apera spica-venti</i>	sulfonylurea
2010	<i>Alopercurus myosuroides</i>	sulfonylurea
2010	<i>Alopercurus myosuroides</i>	FOP
2010	<i>Alopercurus myosuroides</i>	DEN
2012	<i>Alopercurus myosuroides</i>	DIM
2012	<i>Chenopodium album</i>	triazinone
2013	<i>Lolium sp.</i>	glycine

## Low levels of herbicide resistances in Switzerland ?

### Some possible reasons :

- Commonly the diverse crop rotations span over 3 to 4 years and may include temporary grass production, fodder and cover crops.
- Hardly any crop species occur more than once per rotation cycle.
- The first herbicide resistances in loose silky bent (*Apera spica-venti*) and black grass (*Alopercurus myosuroides*) arose in areas where cereal crops were prominent.



View of a resistance test

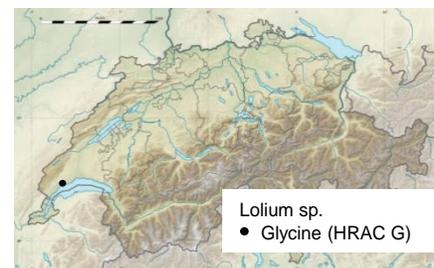
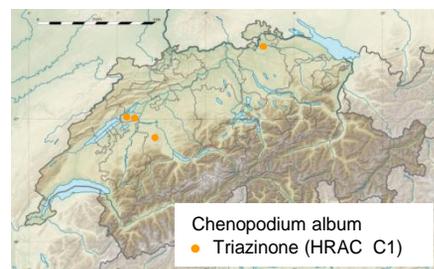
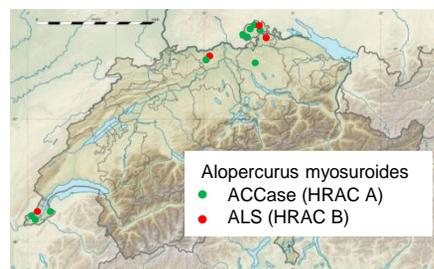
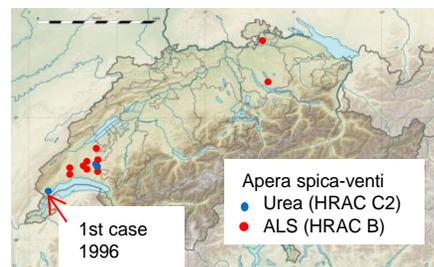
### Agronomical trends

No-till technics and the reduction of fodder production through the specialisation in cash crops or dairy and meat productions tend to change either the rotations and favour certain weeds such as black grass.

### Current developments

In 2013, the first occurrence of a resistance against glyphosate in hybrid ryegrass (*Lolium sp.*) was confirmed in a vineyard in western Switzerland . This year, 3 similar yet to be confirmed cases have been announced and are currently under investigation.

## Areas with confirmed resistances



Glyphosate resistance in *Lolium sp.*

## Herbicide monitoring in Switzerland

Since 2010 and in partnership with the cantonal agricultural support services, Agroscope's Herbology group monitors the development of weed resistances in the country's field crops.

