

Biofumigation research activity in Switzerland

In Switzerland, research on biofumigation is mainly done by Agroscope Changins-Wädenswil ACW (www.agroscope.ch), a research station of the governmental agricultural research system. Field research started in 2003 with a trial to control *Verticillium* wilt of strawberry using biocidal mustard plants. Since then, several more trials were conducted or are ongoing, implicating the use of different biocidal mustard cultivars, but also of defatted mustard seed meal pellets and a liquid formulation based on mustard seed meal.

The major effort of biofumigation research focuses on the control of soilborne diseases and nematodes. The main topics are:

- Control of *Verticillium* wilt (causal agent: *Verticillium dahlia*) of strawberry
- Control of Corky root (causal agent: *Pyrenochaeta lycopersici*) and black dot disease (causal agent: *Colletotrichum coccodes*) of tomato
- Control of root-knot nematodes (*Meloidogyne* spp.) under protected cultivation systems (mainly tomato, pepper, cucumber, chard and salad)

The impact of biofumigation on other soilborne diseases such as *Phytophthora* root rot of red raspberry (causal agent: *Phytophthora fragariae* var. *rubi*) and black root disease



Field trial at Conthey (2011)

(causal agent: *Thielaviopsis basicola*) of red currant was also studied during the last years.

In addition to the evaluation of the effect of biofumigation on different soilborne pathogens, the impact on the soil microbial activity of biocidal green manures and defatted seed meal pellets are investigated. Special attention is put on the interaction of biofumigation green manure species with different soil types.

An important part of the research is done in field and greenhouse trials. The infrastructure of Agroscope Changins-Wädenswil with its research centres located all over Switzerland allows to test biofumigation in different environments. In the future, a network with extension officers and interested growers will be set up to facilitate the transfer of biofumigation related information. Such a network will also be part of the implementation of biofumigation in the real world, which will start with a series of on-farm trials.

Researchers working on biofumigation are:

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Field trials at Bruson (2003)



On-farm trial at Riddes (2005)



Application of Biofence FL (flowable), a mustard seed meal based formulation



Greenhouse trial with pellets (2010)



Greenhouse trial with pellets at Cadenazzo (2010 and 2011). Soil sampling (top) and evaluation of roots (bottom) at the end of season.

Biofumigation on YouTube

A short movie on the principles and application of biofumigation. Only in French, but an English and a German version are in preparation.

<http://www.youtube.com/watch?v=80mbHbXmEcQ>