B EFBS CFSB
Eidgenössische Fachkommission für biologische Sicherheit
Commission fédérale d'experts pour la sécurité biologique
Commissione federale per la sicurezza biologica
Swiss Expert Committee for Biosafety

Bern, 1 May 2000

# 1999 ANNUAL REPORT OF THE SWISS EXPERT COMMITTEE FOR BIOSAFETY (SECB) SUBMITTED TO THE FEDERAL COUNCIL

## Introduction

The Swiss Expert Committee for Biosafety (SECB) is a permanent federal advisory Committee, with the task of advising the Federal council and the authorities on the protection of people and the environment in the fields of biotechnology and gene technology.

The legal base for the SECB is provided by Article 29h of the Law relating to the Protection of the Environment (LPE) and Article 29e of the Law on Epidemics, which require the establishment of an expert committee for biological safety. As the SECB commenced its work on 1 January 1997, the Ordinance covering it simultaneously came into force.

The SECB advises the Federal Council on the drafting of regulations, and the authorities on enforcement of the law. It is consulted on authorisation applications and makes recommendations. It can request expert statements and commission investigations. Periodically, it also informs the public on important findings and the need for further research, and it reports to the Federal Council annually.

## Composition of the SECB

According to the Ordinance on the SECB, the Committee should be composed of experts representing the various protection and users' interests (universities, business, agriculture and forestry, environmental and consumer organisations). A list of the Committee members appointed by the Federal council for the period up to 31 December 2000 can be found on the following page.

## Secretariat

The Secretariat is run by Dr Karoline Dorsch-Häsler. Since September 1998, Dr Kathrin Fischer has also been employed 40% as a scientific assistant. The Secretariat supports the members of the Committee in their duties, prepares its Meetings and draws up the Statements. It also takes care of contacts with committees and public offices, both in Switzerland and abroad, with similar areas of responsibility.

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**Members of the SECB**

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| **President** | |
| Riccardo Wittek | Prof. Dr. phil. II, Institute of Animal Biology, University of Lausanne, Lausanne |
| **Vice-President** | |
| Geneviève Défago | Prof. Dr. sc. nat., Institute of Plant Science, ETHZ, Zurich |
| **Members** | |
| Patricia Ahl Goy | Dr. ès. sc., Seeds/Biotechnology, Novartis Seeds S.A., Basel |
| Daniel Ammann | PD Dr. sc. techn., ETHZ, Office for Environmental Chemistry, Zurich |
| Klaus Ammann | PD Dr. phil. nat., University of Bern, Botanical Gardens, Bern |
| Irène Corthésy-Theulaz | Dr. ès. sc., Division of Gastro-enterology, Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne |
| Joachim Frey | Prof. dr. ès. sc., Institute for Veterinary Bacteriology, University of Bern |
| Ursula Gabathuler | Dipl. phil. II, Swiss Consumers' Forum, Zurich |
| Rolf Christian Gaillard | Prof. dr. méd., Division of Endocrinology and Metabolism, Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne |
| Martin T. Küenzi | Dr. sc. techn., Biotechnology, Novartis Pharma AG, Basel |
| Urs Niggli | Dr. sc. techn., Research Institute for Organic Farming, Frick |
| Bernadette Oehen | Dipl. phil. II, World Wide Fund for nature (WWF) Schweiz, Zurich |
| Jean-Claude Piffaretti | Prof. dr. ès. sc., Cantonal Institute of Bacterial Serology, Lugano |
| Jürg E. Schmid | Dr. sc. techn., Institute for Plant Science, ETHZ, Lindau |
| Beat Wipf | Dr. sc. nat., Pharmaceutical Research, Preclinical Biotechnology, F. Hoffmann-La Roche AG, Basel |
| Josef Zeyer | Prof. Dr. sc. nat., Institute of Terrestrial Ecology, Zurich |
| **Executive Secretary** | |
| Karoline Dorsch-Häsler | Dr. phil. nat., c/o Swiss Agency for the Environment, Forests and Landscape, Bern |

Ms Gabathuler resigned from the SECB in 1998, Dr Corthésy in 1999. These seats will be refilled at the elections for new members for the coming term of office from 2001 to 2004.

## Meetings

During the period covered by this report, the Committee held six meetings. These took place in Bern, on 12 and 22 January, 25 March, 3 June, 7 September and 11 November 1999.

## Statements

In 1999 the SECB issued seven Statements. A list of the Statements is enclosed with this report. The Statements are not necessarily the result of consensus: votes are often taken, and minority positions are recorded as such.

## Statements on draft laws and ordinances

### *Statement on the drafts of the three new ordinances in the field of biotechnology and gene technology (version of 6.1.1999) submitted to SAEFL*

These three ordinances came into force on 1 November 1999. The Containment Ordinance (CO) regulates the use of genetically modified and pathogenic organisms in contained systems (research and production laboratories), and the Release Ordinance (RO) the use of genetically modified and pathogenic organisms in the environment. The third ordinance concerns the protection of employees (Ordinance on Occupational Safety in Biotechnology, SAMV).

The SECB supported the drawing up of the ordinances and issued Statements in 1997 on the drafts and in 1998 in the consultation phase. In these Statements the SECB declared itself fundamentally in agreement with the idea of the ordinances, but identified some faults and made suggestions for modifications (see Annual Report 1997/1998).

In its Statement on the drafts of 6 January 1999, the Committee asked for some more changes, including the demand that, as in earlier Statements, the ordinances should as far as possible be in line with the corresponding Directives of the European Union (EU). The CO and SAMV should also agree as closely as possible.

Most important suggestions for modifications to the Release Ordinance (RO)

- The RO intends to prohibit field trials using genetically modified or pathogenic organisms in particularly sensitive habitats or those in need of protection. In specific exceptional cases, however, release in these habitats for experimental purposes should be permitted. The SECB demanded that an additional criterion for exemption should be mentioned, namely that the field trial should make a contribution to sustainable development and must not lead to any damaging impact on the environment. Further, the SECB required that prohibitions that apply to field trials should also apply to placing on the market.
- According to the RO, it should be possible under particular conditions to apply for an accelerated and simplified authorisation procedure for field trials. The SECB asked for an additional criterion for a simplified authorisation procedure, namely the urgency of remediation of harmful impacts.

Most important suggestions for modifications to the Containment Ordinance (CO) and Ordinance on Occupational Safety in Biotechnology (SAMV)

- Activities using pathogenic, non-genetically modified organisms of group 3 (organisms with a moderate risk, e.g. HIV, tuberculosis bacilli) and group 4 (organisms with a high risk, e.g. Ebola virus) should according to the ordinances be subject to authorisation. The SECB was however of the opinion that diagnostic or reference laboratories should be covered by special regulations, so that they could fulfil their tasks within a reasonable time and not experience delays waiting for authorisation.
- The Committee members were of the opinion that the planned transport regulations for Group 1 organisms (organisms with no or negligible risk) were too stringent and could not be adhered to in practice.

***Statement on the Gen-Lex draft (2nd official consultation), submitted to SAEFL***

The Gen-Lex is intended to cover existing gaps in the legislation on non-human gene technology in Switzerland. The gaps are mainly in the implementation of ethical principles that should be observed in the use of organisms. In addition, the provisions on liability and dialogue with the public will be extended. A range of laws is affected by the changes; significant regulations will be built into the LPE (framework law).

The SECB has already made a Statement on the consultation draft of the Gen-Lex (1st official consultation, see Annual Report 1997/1998). In its Statement on the 2nd official consultation the SECB concentrated on the LPE, but also commented on the Animal Protection Law, the Law on Foodstuffs and the Law on Agriculture.

The opinions of the SECB members on the draft Statement on the LPE were very varied. The differences in opinion principally concerned the following points:

Moratorium on field trials: the majority of members rejected the moratorium. A minority of members on the other hand were in agreement with the principle of a moratorium, and even demanded more stringent measures to cover exceptions from the moratorium. A range of arguments for and against a moratorium was listed. As a compromise, a 5-year moratorium was proposed, which should apply only to organisms that are used as food or fodder, but not for medical applications. This proposal was however only supported by a minority of the Committee members.

Proof of benefit to society: the majority of voting members asked that the requirements for a demonstration of the expected benefits of field trials or the placing on the market of genetically modified organisms should be deleted, if they go beyond what is required as part of previous authorisation procedures. If the provision is not deleted in a later draft of the Gen-Lex, the wording “to society” should be deleted. The minority, on the other hand, welcomed the draft’s proposed demand for a weighing up of the risks of a gene technology project and proof of its benefit to society.

Provisions on liability (general): approximately half of the voting members welcomed the liability regulations, pointing out that it was correct that the owner of a company or installation should be liable for damage caused through the realisation of a hazard. A bare majority of voting members proposed that no special liability be introduced for GMO products, and the corresponding parts of the draft be deleted.

Pollen movement: the majority of voting members were of the opinion that declaring the unintended pollination of plants generally as a risk, and placing it under the liability for damage caused through hazard realisation, went too far and was not scientifically tenable. They demanded that the provision on pollen movement be deleted. Regulation at the level of an ordinance, which would permit a differentiated, project- or product-specific evaluation, was significantly more sensible. A minority were in favour of making pollen movement explicitly subject to the liability as above, and demanded that in addition to damage liability the operator should also be required to undertake everything possible to prevent contamination through pollen movement. This was necessary since the problem of pollen movement is unresolved and it is a risk factor that is difficult to gauge.

Statute of limitations: the majority of voting members supported the 30-year limitation period. It was noted that long liability periods are sometimes justified, but may not be suited to rapid changing conditions in business, if for example the institution responsible no longer exists.

***Statement on the modifications to the Law on Seed of 7 December 1998 (introduction of a tolerance level for genetically modified organisms (GMOs) in seeds, consultation), submitted to the Swiss Federal Office of Agriculture***

In summer 1999 the Confederation withdrew seeds (maize) that were mixed with genetically modified organisms from the market: strips that had already been sown had to be destroyed. To avoid a similar problem in future, the Swiss Federal Office of Agriculture (SFOA) proposed introducing a tolerance level of 0.5 % for genetically modified organisms in seeds. The tolerance levels should apply only to genetically modified seeds that have been authorised by an EU member state for the purpose of placing seeds and plants on the market. Further, if the seeds are destined for the production of food or fodder, the tolerance levels should only apply if the genetically modified seeds are authorised for this purpose in Switzerland.

The majority of members were fundamentally in agreement with the introduction of tolerance levels proposed by the SFOA. They were of the opinion that no foreseeable danger to the environment was associated with the application of this regulation.

The members nevertheless demanded that not only the SFOA but also other federal offices (Federal Office of Public Health, SAEFL and Federal Veterinary Office) should be able to annul or modify tolerance levels, if there is reason to assume that a genetically modified organism can endanger people or the environment. In addition the criteria for annulling or adapting the tolerance levels should be put into concrete terms.

Additional Commentary on separating commodity flow and freedom of choice:

A bare majority of members proposed that the SFOA should draw up additional data on the separation of commodity flows (comparable with the current large-scale project of the Federal Office of Public Health on the 1% declaration limit for foodstuffs). The tolerance levels should be examined on the basis of these data and adapted if necessary. The proposal was justified by the fact that tolerance levels for seeds which are too high would make it impossible to adhere to the current declaration limits for foodstuffs and fodder. To guarantee consumers freedom of choice between GMO-containing and GMO-free food, it was necessary to evaluate the realisability (effort, costs) of a market for GMO-free seeds.

Minority proposal:

A minority of members rejected the SFOA proposal. Their justification was that the seeds represent living material, capable of reproducing from the start of the commodity flow. The introduction of tolerance levels for seeds would remove freedom of choice (see also the Commentary on the separation of commodity flows), and also contravene the Release Ordinance, which came into force on 1 November 1999. Among other things the minority proposal intends that in placing seeds on the market, quality assurance should be introduced, which together with the necessary precautions would prevent or at least help to avoid GMO mixtures. The tolerance level should lie as close as possible to the latest analytical detection limit. For seeds and plants already placed on the market, a tolerance level of 0.1% should apply.

***Statement on medicines and gene technology (duty to declare; consultation procedure), submitted to the Intercantonal Office for the Control of Medicines***

For medicines that contain genetically modified organisms or consist of them, a duty to declare should be introduced. Substances or mixtures of substances obtained from

genetically modified organisms will have to be declared, where this is required by the duty to declare according to the Ordinance on Foodstuffs.

In its Statement submitted to the Intercantonal Office for the Control of Medicines the SECB fundamentally welcomed the introduction of a duty to declare. It pointed out, however, that the declaration should serve transparency and freedom of choice, and is not based on question of biosafety. In addition the SECB also demanded that the declaration be uniform and understandable by the general public. Further, the SECB demanded that low molecular weight substances should also be subject to the duty to declare. The division into high molecular weight contents that have to be declared and low molecular weight substances that do not, is not justified and contradicts the policy of transparent information.

## Statements on applications for authorisation

Statements on permit applications can be published only when the competent authority has made its decision and stated its agreement.

### *Statement on the application for authorisation of placing the genetically modified live vaccine Orochol Berna™ of the Swiss Serum and Vaccine Institute on the market (environmental impacts), application no. C98003*

Orochol is a vaccine against cholera, consisting of genetically modified, no longer pathogenic bacteria of the strain *Vibrio cholerae* CVD 103-HgR. Orochol will be used as immune prophylaxis for people travelling to countries where cholera is endemic.

The genetically modified bacteria contain a DNA insert with the mercury resistance gene *mer* (origin: enterobacterium *Shigella flexneri*) as a marker for the detection of genetically modified *Vibrio cholerae* and to differentiate them from the pathogenic *Vibrio cholerae* wildtype. The removal of the ctx-A portion of the toxin gene, which inhibits the pathogenic effect of the bacteria, does not count as a genetic modification.

The Federal Office of Public Health was the competent authority and SAEFL had to give its approval on the aspect of “environmental impacts”. The SECB also considered this aspect.

The members discussed a number of the vaccine’s safety aspects, for example the mercury resistance gene used as a marker, the survival behaviour of excreted genetically modified *Vibrio cholerae* in the environment, and possible transmission of genes to other organisms.

The members came unanimously to the conclusion that placing Orochol on the market carries no foreseeable risk to the environment.

### *Statement on the application for authorisation of a field trial using genetically modified potatoes by the Federal Research Station for Plant Production Changins (RAC), application no. B98002*

The objective of the trial was to investigate whether the transgenic Bintje potatoes also demonstrated an increased resistance against Late Blight in the wild, and also to reproduce the transgenic potato clones.

An increased resistance to Late Blight infestation may be achieved through the introduction of the following genes or gene combinations: one group of clones contains an oxalat-oxydase gene, the second group a 5-amino laevulinic acid synthase gene, and the third

group a beta-1,3-glucanase gene and chitinase gene. All the clones contain a kanamycin resistance gene as a marker.

At the centre of the discussion was the presence of the kanamycin resistance gene in the transgenic plants, since kanamycin resistance can also have an effect on medically relevant antibiotics. Expression of the kanamycin resistance gene in the transgenic plants however seems unlikely, since a bacterial promoter is upstream of the gene. Dissemination of the resistance gene also appears unlikely if the necessary safety measures are adhered to (see below), since the trial is time-limited and local. There was further discussion about the fact that little knowledge on ecological relationships is available. For example, it is not known how the Late Blight pathogen (*Phytophtora infestans*) will react to the new resistance mechanisms of the plants; the impacts of chitinase activity on the root area are also unknown. The application however relates to basic research. Some members were of the opinion that this kind of experiment would need to fulfil less strict conditions than one representing a final step in the commercialisation of a product.

The majority of members concluded that carrying out the field trial contained no foreseeable risks to the environment.

The SECB nevertheless attached the following conditions to the field trial:

Infection with *Phytophtora infestans* must be carried out according to the Environmental Protection Law. As a safety measure to prevent spread of the kanamycin resistance gene, the plants and tubers which are no longer of use, as well as plants that have reshooted, must be collected and incinerated. The Committee also pointed out that it permitted the use of the kanamycin resistance gene in an early stage of research, but this did not constitute a final decision on authorising the placing on the market of this resistance gene.

***Statement on the application for authorisation of a field trial using genetically modified maize, Construct T25 by the company Plüss-Staufer AG, application no. B98001***

The goal of the trial was to investigate the efficacy of the herbicide Liberty (glufosinate-ammonium) and to examine the selectivity of the herbicide with reference to genetically modified maize. For official authorisation as a plant protection product, these data must stem from trials in Switzerland.

The gene for the enzyme phosphinotricin-acetyltransferase (*pat* gene, origin: soil bacterium *Streptomyces viridochromogenes*) was integrated into the maize T25. This enzyme gives the maize plants tolerance to the herbicide glufosinate. The pat gene is regulated by the 35 S promoter and 35 S terminator from *cauliflower mosaic virus.* The plants also contain about 75% of the ampicillin resistance gene (β-Lactamase), which serves as a marker.

Here again the discussion covered the presence of antibiotic resistance genes in transgenic plants. The possibility of horizontal gene transfer of the ampicillin resistance gene is however very small, and furthermore expression of the protein appears to be very unlikely, since both the promoter and the start codon are lacking. The members were unanimous that distances from other maize fields should be increased, to prevent as far as possible the transmission of genetically modified maize pollen to other fields. In addition, the applicant should determine whether the farmers wanted to plant maize on neighbouring fields, and whether they would want to obtain seeds from these fields. Some of the members wanted to authorise the trial only under the condition that supporting research on pollen movement should be carried out. As in other discussions, the ecological benefits and

the benefits to society of genetically modified plants, in particular of herbicide-resistant plants, were also discussed.

On the basis of current knowledge, the majority of members came to the conclusion that carrying out the field trials contained no foreseeable risk to the environment, but made the following conditions and commentaries in its Statement:

Distances of 200 metres to the neighbouring maize fields, according to the ordinance on Seeds, must be adhered to. It also requested SAEFL to invite the Federal ethic Committee for Non-human gene Technology (ECNH) for an extended evaluation of the field trial, since statements on ethical questions and the benefits of a product are not the task of the SECB. The SECB also required that in future applications the answers to the questions according to the Release Ordinance must be justified using experimental data from the applicant or citations from the literature. It was recommended that, in addition to purely agronomic investigations, supporting research on pollen movement, soil microbiology, beneficial organisms, toxicology, and residues and metabolites of the herbicide should be carried out during the first year of the trial, since such investigations should be a precondition for placing on the market.

SAEFL rejected the two field trials. The SAEFL Statement and further information on the applications above can be found on SAEFL's Internet pages (http://www.buwal.ch/stobobio/projekte/registre/d/registre.htm). The majority of the SECB members were not in agreement with the reasons (safety considerations) given by SAEFL for its rejection of the two field trials. A meeting of an SECB delegation therefore took place with Philippe Roch, the Director of SAEFL.

## Commentary of the SECB

In 1999 the SECB issued a series of Commentaries. A list of the Commentaries drawn up in 1999 is enclosed with this Report.

### *Commentary on the CO's regulation of work using non-genetically modified, plant-pathogenic organisms, submitted to SAEFL*

In the original version of the CO, non-genetically modified, plant-pathogenic organisms endemic to Switzerland were so strictly regulated that work using these organisms was disproportionately difficult. Relying on the Release Ordinance in which these organisms are freed from the need for authorisation if they fulfil particular criteria, SAEFL drew up two versions of possible regulation of these organisms.

The Committee supported the proposal to make activities using such organisms subject to the notification obligation, and to require Level 1 safety measures. This should guarantee safety and avoid a disproportionate amount of administrative effort.

### *Commentary on the consultative survey by the Canton of Zurich concerning the transport of pathogenic / genetically modified organisms*

The Canton of Zurich (Koordinationsstelle für Störfallvorsorge) carried out a study on the transport of genetically modified and pathogenic organisms and asked the SECB for its comments.

The members were of the opinion that the study represented a comprehensible summary of the current regulations. They agreed that the international transport regulations are sometimes so strict that reasonable implementation is very difficult. Packaging and safety regulations should aim to be adapted to actual risks, in particular for genetically modified organisms, and the transport regulations for diagnostic samples should not be unnecessarily complicated in relation to current practice.

The SECB has made Comments on a range of further questions and studies:

- the motion by the Green Fraction in Parliament of 16 December 1998: ban on foodstuffs and organisms that contain antibiotic-resistance genes;
- the notification and authorisation procedures for the contained use of pathogenic or genetically modified organisms (proposal by SAEFL/Federal Office of Public Health);
- regulations on diagnostics in the CO;
- a study on the disposal of biologically contaminated air filters.

## Conference for biosafety coordinators

In collaboration with SAEFL and the technical colleges of Canton Zurich in Wädenswil and Winterthur, the SECB organised a conference for people responsible for biosafety. The conference took place on 21 and 22 April 1999 at the Wädenswil college. Its main subject was the three new ordinances in the field of biotechnology and the associated new requirements for the use of genetically modified and pathogenic organisms. The conference was very well attended and was generally appreciated by the participants.

## Internet

The SECB Internet pages are accessible since end of April 2000 (http://www.efbs.ch or http://www.cfsb.ch). Dates of Meetings, agendas of individual Meetings, and the Annual report are all available. The SECB Statements are also available on the Internet, as soon as the business they concern has been concluded.

**The Swiss Expert Committee for Biosafety**

| President | Executive Secretary |
|---|---|
| Prof. Dr. Riccardo Wittek | Dr. Karoline Dorsch-Häsler |

| SECB Statements on draft laws and ordinances | |
|---|---|
| Release Ordinance, Containment Ordinance, Ordinance on Occupational Safety in Biotechnology (version of 6 January 1999) | Meeting of 22 January1999 |
| Medicines and gene technology (duty to declare, consultation procedure) | 31 March 1999 |
| Modification of the Environmental Protection Law (Gen-Lex Draft, 2nd official consultation) | 30 August 1999 |
| Modification of the Ordinance on Seeds (introduction of a tolerance level for GMOs, consultation procedure) | 16 December 1999 |
| **SECB Statements on applications for authorisation to place products on the market** | |
| Swiss Serum and Vaccine Institute, placing the genetically modified live vaccine Orochol Berna™ on the market (impacts on the environment) | 2 March 1999 |
| **SECB Statements on applications for authorisation of field trials** | |
| Swiss Federal Research Station for Plant Production Changins (RAC), field trial using genetically modified potatoes | 2 March 1999 |
| Plüss-Staufer AG, field trial using genetically modified maize, Construct T25 | 3 March 1999 |

| SECB Commentaries | |
|---|---|
| Motion by the Green fraction (of Parliament) of 16 December 1998: ban on foodstuffs and organisms that contain antibiotic-resistance genes | Meeting of 12 January 1999 |
| New forms for notification and applications for authorisation for the contained use of organisms: proposal by SAEFL/FOPH | Meeting of 25 March 1999 |
| Consultative survey by the Canton of Zurich concerning transport of pathogenic / genetically modified organisms | Meeting of 25 March 1999 |
| Consultative survey by Brunner Haustechnik AG: disposal of biologically contaminated air filters | Meeting of 3 June 1999 |
| Regulation of work using non-genetically modified, plant-pathogenic organisms in the CO | Meeting of 3 June 1999 |
| Regulation of diagnostics in the CO | Meeting of 3 June 1999 |