

## Genetic engineering

# Approval for first British virus release experiment

In advance of the expected publication at the end of this month of the British guidelines for the release of genetically engineered organisms into the environment, approval has been given for the first such release experiments. The experiments, which will involve the release of slightly engineered versions of viruses that are used in the biological control of pests, are said to have been a useful first exercise for the Advisory Committee on Genetic Manipulation (ACGM) that has produced the guidelines and awaits their approval by the Health and Safety Commission.

The guidelines will be just that, and are intended to evolve on a case-by-case basis. It will not be compulsory either to notify ACGM of planned releases or to heed their advice, but the expectation is that nobody will risk bypassing the voluntary procedures. Drawn up by a subcommittee chaired by Sir Robert Williams, but with a membership that has not been made public, the guidelines will put the initial onus on the experimenter to show that adequate safety tests have been, or will be, carried out in advance of release and that there are adequate plans to monitor the release and to abort the experiment if it proves necessary.

Questioned by ecologists at a meeting organized by the Ciba Foundation in London last week, Mr Brian Agar, secretary of ACGM, gave assurances that ecologists were represented on the drafting committee, and Sir Robert emphasized that the proposer of an experiment will be expected to have given consideration to ecological aspects before notifying ACGM.

Half of the meeting was given over to leading British ecologists, Professors John Lawton and Mark Williamson of York University, who offered a perspective from what has been learnt of the results of accidental or deliberate release of animals or plants into novel environments. Drawing particular attention to the inadequacy of ecological modelling to predict with accuracy the outcome of such releases and to a number of disasters that have been documented, Williamson emphasized the need for contingency plans.

Lawton, on the other hand, drew attention to the fact that rigorous screening has so far avoided any serious ecological mishap associated with the several hundred successful applications of biological control of pests. Based on the data for the adaptation of insects to trees newly introduced into Britain, he estimated that the probability of an insect of fastidious diet switching to a newly encountered species

of tree was of the order of  $10^{-8}$  per year. Nevertheless, just as there had been a number of completely unpredictable switches, so the unpredictable has to be reckoned with in the release of genetically engineered organisms. One difficulty is the absence of natural history for such organisms and the difficulty of devising adequate pre-release screening.

What may well be the first release experiment in the United Kingdom will combine a very minor piece of genetic engineering with a major project in biological control. The problem is that of the damage brought about by the moth *Panolis flammea* on the lodgepole pine trees planted in great numbers in the hills of Scotland by the Forestry Commission.

In many areas of Britain the caterpillar stage of the moth is subject to natural control by a baculovirus that infects and kills it. But the virus is not present in the lodgepole pine plantations and so is being introduced: this year several hundred hectares will be sprayed with virus in a full-scale trial of the technique.

But the Natural Environmental Research Council's Institute of Virology in Oxford has plans to improve the effectiveness of the virus by engineering its genes. As a first step in the direction of releasing altered viruses, workers at the institute have engineered a very small change into the virus and are now busy testing its stability and biological activity in the laboratory. The change is carefully designed not to affect of the proteins produced by the virus and is meant merely to serve as a marker by which the virus can be distinguished from its parent.

Dr David Bishop, director of the institute, has already gained approval in principle for release of the virus from ACGM and the Ministry of Agriculture Food and Fisheries as well as support from the Forestry Commission and the Nature Conservancy Council. The first release experiments could take place this summer, says Bishop.

The prediction is that the slightly altered virus will behave just like its natural parent, but the variation will serve as a marker to help test the prediction. If all goes well, the next stage will be to engineer into the virus some self-destruct mechanism for use in conjunction with any of the major modifications that might be tried in the future — such as the introduction of a gene for a caterpillar-killing toxin.

Peter Newmark

## Ice-minus bacteria

# Further snag and further delay

### Washington

A NEW controversy has sprung up around Advanced Genetic Sciences (AGS), the California biotechnology company hoping to begin field tests of a genetically altered bacterium designed to protect crops from frost damage. The field test was to be the first environmental release of genetically altered material, but allegations have surfaced that the company may have released the altered bacteria into the environment during experiments as long as a year ago.

Both the Environmental Protection Agency (EPA), the government regulatory agency that has approved the field test of the bacteria, and the House of Representatives subcommittee that has been overseeing genetic research, have indicated they will investigate the incident.

According to AGS, the experiments in question involved injecting 20 ml of a solution with a low concentration of the altered bacteria into the branches of 45 trees of 6 different species. The trees stand on the asphalt-covered roof of AGS's Oakland headquarters. The roof is surrounded by a 3-foot-high wall, but otherwise is exposed to the environment. The trees were inoculated to test for any pathogenicity from the bacteria.

John Bedbrook, AGS vice-president

and director of research, argues that "since the trees were inoculated in a non-aerosol-producing manner, and the bacteria were contained within the woody plant tissue . . . the conditions of the test were under physical containment" and there was no environmental release.

But EPA believes the roof-top inoculations did constitute environmental release, and that AGS should have notified the agency before proceeding. In fact, AGS did notify EPA about the experiment, but only after the event. The results showed that the bacteria were not pathogenic, and bolstered the AGS application for approval of the field trial.

AGS is hopeful that the current controversy will not further delay the field test of its "ice-minus" version *Pseudomonas syringae* (see *Nature* 319, 254: 1986). The test is for the time being suspended while AGS negotiates with local government officials in Monterey County, California, where the test is to take place, over a suitable site. Objections were raised to the initial site because it is in too populous an area. A further potential complication is a lawsuit brought by the Foundation for Economic Trends, headed by Jeremy Rifkin, that asks for an injunction blocking the trial.

Joseph Palca