DELIBERATE RELEASE

FULL STEAM AHEAD FOR U.K. FIELD TESTS

LONDON—Barring some last-minute hitch, three experiments involving the deliberate release of genetically manipulated organisms will be carried out in the U.K. this summer, and a fourth is likely to follow. In British style, the experiments are all a good deal more cautious than the U.S. release of "ice-minus" bacteria and have excited much less public interest or concern. Nevertheless, it seems likely that at least a nominal toughening of U.K. regulations is in store.

All three experiments have undergone considerable revision since first being presented to the Advisory Committee on Genetic Manipulation (ACGM), which reports to the U.K. government's Health and Safety Commission. The go-ahead for the tests was signaled when ecologists raised no further objections at a mid-May meeting of ACGM's subcommittee on "planned release."

Potatoes feature in two of the experiments. At the Agricultural and Food Research Council's (AFRC) Rothamsted Experimental Station, cells of a domestic potato have been fused with cells of a wild South American species that is resistant to leaf roll virus; resulting plants will be grown and tested for viral resistance.

In the other potato experiment, to be carried out at AFRC's Plant Breeding Institute in Cambridge, new genes have been introduced into the plants by recombinant DNA technology, using an agrobacterial vector. But for now they are genes of convenience rather than of agronomic value. One is an antibiotic (kanamycin) resistance gene that serves as a selection marker. The other is the gene for a bacterial beta-glucuronidase, engineered to be under the control of the promoter of the gene for patatin, the major protein in potato tubers. In the first year of the two-year experiment, expression of the readily detected beta-glucuronidase will be measured and any effects on the plants or tubers will be monitored. This year's results may be complicated by the inevitable variations between plants produced by tissue culture techniques. Such variation should be eliminated next year by the use of tubers harvested from this summer's experiment.

The third field test merely involves the release of a genetically marked strain of Rhizobium, the nitrogen-fixing bacterium of legume root nodules. The marker gene, *Tn5*, is from a different species of bacterium; the experiment, funded by the European Economic Community's risk assessment program, is designed to test the extent of gene transfer between rhizobial strains in the soil.

As would be expected, ACGM's major concern with each experiment was to minimize chances of unplanned spread of novel genetic information. Insufficient attention to such possibilities in the original proposals resulted in considerable modifications. For example, the potato experiments now include such precautionary measures as deflowering and deberrying of the plants, and hand weeding and harvesting. To increase the chance that future proposals include adequate precautionary measures, ACGM is to issue additional advice on the points that should be considered in designing experiments. At present, there is no compulsion to notify ACGM of deliberate release experiments nor to follow its advice. Although the pressures are such that it is unlikely that the procedure would not be followed voluntarily, ACGM will soon be putting forward a recommendation that notification should be made statutory.

ACGM advises on the deliberate release not just of organisms "with novel combinations of genes" but also of all "organisms constructed by techniques that involve the exchange of genetic information between species." This is why all three experiments came under its wing, even though only one involved recombinant DNA technology. By casting its net so wide, the committee has included some experiments that used to proceed unfettered by regulations.

Rather than issuing detailed regulations, ACGM has adopted a "case-by-case" approach. Before this year's batch of proposals, the committee had only considered one case, the first experiment in a series designed to increase the efficiency of viruses already used in biological control. That experiment went ahead last year. Its successor, involving the release of a baculovirus that has had its polyhedron gene removed, is being prepared for this year, but its final form has not yet been submitted to ACGM.

—Peter Newmark

GOVERNMENT STUDIES

CONTRASTING VIEWS IN TWO AGBIOTECH REPORTS

WASHINGTON, D.C.—A National Research Council committee is reiterating a familiar theme about agricultural biotechnology: For U.S. farmers to stay competitive in the world market, the federal government needs to increase spending for basic and applied research in agriculture, particularly in biotechnology, and to foster interdisciplinary programs. However, another prestigious group that oversees federal agricultural research, the National Agricultural Research and Extension Users Advisory Board, recently sounded some cautionary notes on biotechnology.

Such research can "be expensive and, particularly in agriculture, financially risky," says the Users Advisory Board report in its analysis of the U.S. Department of Agriculture (USDA) budget for fiscal year 1988. For instance, the study examines the expected impact on the dairy industry of bovine somatotropin, whose "shortcoming lies in its high cost in a glutted farm category." Generalizing, the report recommends that the biotechnology research agenda be "adjusted to place higher priority on finding new, inexpensive technologies to support today's inexpensive commodities" and that, before being implemented, biotechnological innovations be "analyzed carefully to determine whether they can contribute to increased profitability on a long-term basis..."

By contrast, the report, "Agricultural Biotechnology: Strategies for National Competitiveness," which was released late in May by the National Research Council of the National Academy of Sciences, wholeheartedly endorses an expansion of federal efforts in agricultural biotech. It criticizes USDA for being too slow in adapting peer and merit review procedures for evaluating research proposals, for training too few new scientists in biotechnology and other basic sciences, and for not putting more money into the emerging field. It recommends that USDA support 400 postdoctoral researchers and retrain 150 established scientists per year; that the agency boost annual biotechnology research spending to $500 million by 1990; and that it explore new ways of transferring technology into the private sector.

—Jeffrey L. Fox