BIOLOGICAL CONTROL
MAKING IT WORK

PART 4: REGULATION OF BIOLOGICAL CONTROL AGENTS

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The United States government essentially regulates biological control agents under statutes enforced by the Environmental Protection Agency (EPA) and the Animal and Plant Health Inspection Service (APHIS) of the U. S. Department of Agriculture (USDA). The intent of this paper is to give a broad overview of these regulations only. Details should be obtained directly from the proper agency. Emphasis is placed on discussion of the current practice of viewing genetically modified organisms differently, although the policy of the Federal Government is that regulation should be by the product, not the process by which it was developed.

CURRENT REGULATION BY EPA AND USDA

Microbial pest control agents are currently regulated by EPA, since provisions of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) give EPA authority over the distribution, sale and use of pesticide products. The definition of pesticide used in FIFRA is: 1- any substance or mixture of substances intended for preventing, destroying, repressing, or mitigating any pest, and 2- any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant, except for animal drugs and animal feed containing an animal drug. The latter items come under the USDA and the Virus Serum Toxin Act.

Registration under FIFRA is required for all pesticides, chemical or biological. The registration is qualified by specifying conditions for approved use and distribution. Registration approval is based on data that allow EPA to conclude that the product, when it is used in accordance with the specified conditions, will not cause (or significantly increase the risk of) unreasonable adverse effects to humans or the environment. Investigators

must obtain the data to support the conclusion, including data in the areas of l-product analysis, 2-residue, 3-toxicology, and 4-non-target organism and environmental expression, according to end-use pattern and the test substance.

Initial testing of a pesticide for efficacy, and tests to obtain required data for registration maybe done under an experimental use permit (EUP) under FIFRA. Traditionally, EPA has maintained that small-scale tests are generally tightly controlled, involve small quantities of pesticides, and are conducted by highly-trained personnel, and thus pose minimal hazards. Thus, EUPs are not generally needed for tests such as those conducted on under ten acres of land, if the food or feed crops involved are destroyed or fall within an approved tolerance level. Microbial pesticides were included in such determinations, but were not automatically exempt. The Agency retained the authority, however, to require an EUP if it determines that EPA oversight is warranted. In addition, APHIS review might be needed if the organisms may be a plant pest.

Consideration of the issues surrounding small-scale tests of genetically modified or nonindigenous microbial pesticides led EPA to conclude in 1986 (51 *Federal Register,* 23302) that its new policy would be to require an EUP because it was judged that oversight was warranted. This was based on the presumption that even small-scale tests with genetically modified organisms may raise many of the same concerns as more extensive uses of conventional pesticides. In its policy statement, EPA requested that investigators notify EPA before starting any field testing with such pesticides so any small-scale test could be evaluated for possible risk to human health or the environment.

The notification allows EPA to make a determination as to whether an EUP is required. If it is, EPA issues the EUP; if not, the investigator has the EPA blessing to proceed. The purpose of the EUP, as originally stated by EPA in 1974 (39 *Federal Register,* 11306), is to strike a balance between facilitating—or, as a minimum, not unduly impeding—pesticide research and development and protecting against human and environmental injury. The statement recognized that hazards may be posed, yet acknowledged that experimental use and testing are essential to the development of new, less hazardous, more effective pesticides, including both chemical and biological agents.

EPA is currently drafting regulations for implementation of this policy. Comments were requested in February 1989 (Federal Register 54:7027) on the regulatory approach to biotechnology under FIFRA. It is expected that the new regulations will spell out details of the data requirements, and clarify issues relating to scope of coverage.

USDA-APHIS has traditionally provided oversight of introduction of organisms, such as insects, used in biological control under the Plant Quarantine Act and Federal Plant Pest Act. These allow APHIS to regulate the movement into and through the United States of plants, plant products, plant pests, and any product or article which may be or contain a plant pest at the time of movement. A plant pest means "any living stage of any insects, mites, nematodes, slugs, snails, protozoa, or other invertebrate animals, bacteria, fungi, other parasitic plants or reproductive parts thereof; viruses, or any organisms similar to or allied with any of the foregoing; or any infectious substances which can directly or indirectly injure or cause disease or damage in any plants or parts thereof; or any processed, manufactured, or other products of plants."

Additional rules were promulgated by USDA-APHIS in 1987 (7 CFR 340) to cover the introduction of organisms and products produced through genetic engineering (i. e., organisms modified by the use of recombinant DNA techniques) and which contain or use plant pests in their construction. Permits are currently issued by APHIS for the "introduction" (to move into or through the United States, to release into the environment, or to move interstate) of "regulated articles" (any organism altered or produced through recombinant DNA techniques if the donor organism, recipient organism, or vector or vector agent belongs to a genus or taxon that meets the definition of a plant pest, or is an organism of unknown classification).

Field tests with genetically modified plants have been approved by USDA-APHIS under this mechanism. APHIS permits are not required, however, for comparable field tests with organisms, i. e., plants, produced by methods which do not involve recombinant DNA techniques.

PROBLEMATIC ISSUES IN THE REGULATION OF BIOLOGICAL CONTROL AGENTS

Several issues relate to the overlapping authorities of Federal Agencies in the regulation of biological control agents, particularly if they are genetically modified. Although Agencies have been interacting quite nicely in the initial phases of research, several issues will need to be resolved before applications become widely used.

Some biological control agents, because of their end use characteristics or components, are subject to both EPA and USDA regulations. For example, *Clavibacter xyli* subsp. *cyanodontis* tested for control of the corn ear worm was regulated by APHIS because it has plant pest properties. Additionally, EPA is considering regulating plants modified to have resistance to plant pests as pesticides, and thus such plants could be called biological control agents. This concept markedly differs from traditional practice. If the end use of plants containing either of the above examples is used eventually as human food, the Food and Drug Administration (FDA) will become involved in the registration of biological control agents.

There is currently no mechanism in Federal regulations to obtain permits for research trials that do not envision a pesticidal product in the near future. The EPA regulations apply primarily to the development of a pesticide for registration and eventual commercial application. This poses a potential problem in the "passing of the baton" between the Agencies for certain tests.

Envision a scenario in which a permit was obtained from EPA to conduct small-scale field tests with genetically modified bacteria, involving collaborative arrangements between a company and an academic researcher. After the first year of the test, the company deems the efficacy too low to proceed and terminates the test and the relationship. Meanwhile, the researcher would like to continue observation of the site and/or repeat the test with different parameters to ask scientific questions relative to why the test did not work. However, since the test is not being conducted to obtain pesticide data, EPA is reluctant to provide an EUP for the test. The researcher is reluctant to proceed without any type of review.

WHERE DO WE GO FROM HERE?

The United States has been widely complemented for progressing as rapidly as it has in the regulation of genetically modified organisms. Continued efforts need to be made, particularly with bacteria and other microorganisms, where the greatest promise as biological control agents exists. A sound, but scientifically sensible, regulatory system is essential for making biocontrol work.

Scientists need to be encouraged to apply the most powerful techniques to improve microorganisms, e. g. molecular methods, to achieve better activity as biological control agents. The current regulatory climate, however, has not provided that encouragement. On the contrary, the fact that investments by the private sector have been decreasing has been attributed in part to the regulatory climate. The situation must improve before we can go forward.