

/INTERNATIONAL PATENTS

AGRICULTURAL BIOTECHNOLOGY NEEDS STRONG PATENTS

New biological sciences are leading us to an incredible explosion of knowledge that has particular importance to world agriculture. Researchers in biotechnology, genetic engineering, and plant genetics see the potential to change the ways we think about developing crops, controlling pests, and increasing productivity. At the same time as our knowledge is expanding, however, the collections of laws, regulations, and practices that reward innovation through patent protection, recognize trademarks, and protect scientific data from competitive use are eroding. These property rights are, and will continue to be, vital to the worldwide diffusion of the products and techniques that will result from biotechnological research.

If world agriculture is to share the benefits of agricultural research, particularly the exciting products of tomorrow, this erosion of property rights must be halted. Strong property rights are the vital first step toward accessing new technology, and the knowledge, skills, and techniques that collectively make up the technology are the real generators of economic development.

Experience has shown that, eventually, most technology will reach around the world, even with weak or non-existent property rights. But in many cases, the transfer occurs when the technology is old and inferior, a generation behind new products and techniques; there is no assurance that even this late access will continue. Immense costs for today's research and development, especially in the new sciences of biotechnology, put great pressure on managers not to expose new technologies. The threat of losing an invention will be greater than the benefit of selling in every available market.

Quick access to new technology, now and even more so in the future, will depend upon strong property rights. Take the case of patents. Patents are central elements in recognizing the importance of property rights in a nation's development. They acknowledge the value of inventive activity. By offering protection, they stimulate innovation and the rapid diffusion of new technologies. Unfortunately, some major countries have no patent laws, while other nations offer only variations of patents that sometimes give inadequate protection for chemical products.

I believe that we must encourage a basic understanding that patents are vital to every nation, and that more than one type of patent is often needed to provide a full range of protection. For example, the best protection for a newly discovered chemical is a compound *per se* patent, which recognizes proprietary ownership of the chemical molecule that makes up the active ingredient for a product. This is the best assurance of strong, thorough protection for new inventions, and can provide a very effective incentive to research and development.

Another type of patent protection, called composition patents, does not cover newly discovered chemical molecules. They include, instead, the entire product formulation. While not always as strong as compound patents, they can be very effective. The key is to ensure that the

composition patent is written broadly enough to cover the full scope of the invention.

A third major category of protection, use patents, also can be very effective. These patents cover the actual use of a product rather than its chemical composition and are very important to protect new uses for existing chemicals. These new uses often represent significant technical advances and large development costs.

The best patent system is one that provides a range of coverage, including both new compounds and new uses for existing chemicals. This type of thorough patent protection is an essential step toward quick access to new technology. This is an issue that all of us involved in the new biological research must consider. Are these and other types of patents adequate for whatever products may result? What are the best kinds of patents for biotechnology? The property rights of biotechnological products must be carefully considered and evaluated. Perhaps the time is now to study and recommend any changes that may be needed.

Strengthening patent protection is a major challenge for those of us involved in biotechnology research and for the nations of the world. Patents provide an incentive to introduce new technology to a nation as quickly as possible.

With the immense possibilities of the new biological sciences, the need for strong property rights protection around the world has never been greater. Governments, their farmers, and all their citizens stand to gain from access to new agricultural technology. Strong property rights increase the speed with which these benefits are made available to world agriculture where they really count—on the farm.

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VIRUSES PREVENT CROP DAMAGE

TITLE: Protection of Plants Against Frost Injury Using Ice Nucleation-Inhibiting Species-Specific Bacteriophages

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The patent protects a method for preventing frost injury to crops by destroying ice nucleating bacteria with viruses. Bacteria on the surface of plants, such as *Erwinia herbicola* and *Pseudomonas syringae*, serve as focal points (nucleation sites) for ice crystal formation. Frost damage occurs at lower temperatures in the absence of the bacteria than when the bacteria are on the leaves. Viruses can infect and destroy the bacteria without affecting the plant; thus virus