

## How can Africa Gain Access to Genetic Engineering (GE) Technology?

The technology of genetic engineering (GE) includes both the genes of interest and the methods for getting them into plants. Isolating the right genes and then developing plants which contain the new genes has often already been done in other countries by public and private enterprises. The main issue for many developing countries is getting access to the existing technology, rather than re-inventing it.

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### WHO OWNS THE GENES AND THE TECHNOLOGY?

Nobody "owns" genes. However, because it takes time and effort to isolate a gene and discover how to use it for a particular purpose, many genes and the technologies to use them (for example, transferring them into a plant) are protected by patents. Patents are granted for inventions and must show utility; that is, they must have a practical use. Furthermore, this use must be defined specifically in the claims of the patent. Often, the underlying inventions were made at universities, but because of the large investments needed to turn an invention into a product, commercial companies now hold rights to most of the genes and technologies.

### WHAT DOES IT MEAN WHEN A GENE IS PATENTED?

Patents give the holder the right to prevent others from using the genes in the ways specified in the patent, but only in the countries where the patent is valid. Not only do different countries have different standards over what can be patented, patenting is expensive, so most companies only apply for a patent in countries where they can sell a product for a profit. Many developing countries do not have a system which allows patenting of genes, but sometimes the techniques or the final products may be protected in the context of the national law relating to intellectual property protection.

### WHY ARE PATENTS ON GENES ALLOWED?

The idea of patents is to reward inventors not just for having the idea, but for making it public. A requirement of granting a patent is the publication of all of the information needed for someone to repeat the work. It also recognizes that there is a lot of investment needed to make a product out of an invention. A patent is granted for a limited period of time so that the inventor can get a return on that investment. In particular, GE plants take many years to reach the market because of lengthy regulatory approval processes and the time it takes to breed varieties even after new genes have been introduced. It is hard to see how companies would make the long-term investments necessary for research and development related to GE technology if they could not expect a return.

### ARE PATENTS THE ONLY METHOD OF OWNERSHIP?

No, plant varieties are often protected under a different mechanism referred to as Plant Variety Protection (PVP) or Plant Breeders' Rights (PBR). This isn't as strict as a patent in terms of needing to be an invention – any plant variety can be protected as long as it is distinguishable from other registered varieties and has not been registered previously, but there are also some limitations to the protection this gives. There is an exemption for farmers to retain seed for re-planting and there is also an exemption for another breeder to use the variety in a breeding program. The idea is to give breeders some return for their time and effort in breeding, but at the same time to encourage more breeding and wide use of new varieties if farmers think they are better.

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### HOW CAN DEVELOPING COUNTRIES ACCESS GE TECHNOLOGY?

Patents on genes and GE technology have only rarely been applied for in developing countries. If a product is exported to a country where there is a valid patent, the patents in that country apply and a license would be required. However, since the time needed to develop a GE product is so long, it is usually more efficient to get a license for existing technology even if there isn't a patent locally. What will be needed is an institution (public or private) that can be a license-holder for the technology. As most agricultural research is publicly funded in developing countries, this means that national policies have to allow public institutions to sign commercial licenses.

For instance in Egypt, extensive capacity building in Intellectual Property Right (IPR) and technology transfer led to the establishment of an Office of Technology Transfer and Intellectual Property (OTTIP) in Egypt's Agricultural Research Center. In addition a technology transfer policy was adopted by the Ministry of Agriculture, which makes Egypt one of the first developing countries to have developed a government strategy on the management of IPR in agriculture

### WOULD A COMPANY LICENSE THE USE OF A GENE TO A PUBLIC INSTITUTION?

Yes. While companies must make a profit to justify investments, from time to time they will license technology for free. However, payments are commonly royalties on sales or profits. Such amounts may not be easy to determine where the GE product doesn't have a market or isn't sold (often the case for crop plants developed by public institutions for resource-poor farmers). In some recent instances, private companies have been willing to sign a royalty-free license for defined humanitarian uses—sometimes defined as use in a poor country or by poor farmers. This is good public relations for a company, but also may be good business, as raising poor farmers' incomes can make them potential customers in the future.

