

Intellectual property protection challenges public research

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44 Patents increasingly reduce the freedom to operate in plant breeding. Biotechnology companies are known to actively seek patent protection for their products, but also knowledge created by public universities and research institutes is often protected. This is legitimised by policies of these organizations themselves, their public funders, or the contracts underlying public-private partnerships in research.



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The trend to protect knowledge creates particular challenges for universities that want to contribute to reaching the Millennium Development Goals, such as Wageningen UR in the Netherlands. This was the reason for this university to collaborate with the Netherlands Centre for Society and Genomics to organise an international conference on April 10 to this year, to discuss the main tensions in the current intellectual property (IP) landscape, and possible ways to address the increasingly restricted access to publicly developed technologies for use in research for development.

Breeding for development

The face of plant breeding research has changed significantly. This is not only due to the rapid technological developments in the field of genomics, but also to revolutionary changes in the legal and policy environment in which plant scientists and breeders are working. Biotechnology introduced the patent system into breeding research. Moreover, international agreements on biodiversity increased the importance of contractual arrangements to access genetic resources. Patents provide a temporary exclusive right to the inventor of useful technologies in those countries where the patent is accepted. Whilst this is intended to stimulate innovation, it may also reduce access to technologies and increase transaction costs. The extension of the patent system into the field of plant breeding started in the 1980s in the USA and has extended to others countries since. The TRIPS agreement of the World Trade Organization and more recently bilateral trade agreements extend such rights to developing countries. Even though there is a broad consensus within the seed sector that intellectual property rights have a role to play in research for commercial markets, these legal systems also influence research for non-commercial use, i.e. 'basic research', research for non-commercial crops and research with the aim to reduce poverty and hunger. Several examples have been documented in the struggle to obtain all the licenses that are necessary for introducing technologies into developing countries. The dozens of patents resting on the nutritionally enhanced 'Golden Rice' is a well known example. Developed at universities in Switzerland and

Germany it required a major commercial company (Syngenta) to disentangle the thicket of rights and negotiate licenses for all these patents in their use for the poor. Even though many more examples exist, most are not documented simply because no agreement was reached, or more commonly because negotiations failed to start because the patent holders did not show any interest to negotiate at all. It is not only the usual suspects, 'the multinationals' that create such limitations to research for development. Universities also have patents and are not always eager to part with their rights for development oriented research. An example is the XA21 gene in rice which codes for an important disease resistance and patented by the University of California, Davis, based on earlier research by the International Rice Research Institute and its partners in India and Mali. Only after lengthy negotiations and public arousal, did UC-Davis release the patent for development purposes and even developed a benefit sharing mechanism for profits derived from the commercial use of the patent.

The conference

"I would also urge Dutch universities and research institutes to adopt institutional IP policies that take account not only of valorisation of knowledge and incentives for researchers, but also the importance of access to knowledge and freedom to operate for development purposes", said the Dutch Minister for Development Cooperation Bert Koenders during his closing speech at the 'Knowledge on the Move' Conference, held in The Hague. Responding to this statement a conference was recently organised at Wageningen University and Research Centre (Wageningen UR), aptly titled: 'Reconsidering intellectual property policies in public research - sharing the benefits of biotechnology with developing countries'. The meeting brought together participants from fields as distant as plant sciences, development studies and practice, research management and intellectual property practice, private sector seed industry, and civil society. The day discussed the role of public research organisations in supporting agricultural research for development in the light of the emerging restrictions to the freedom to operate. Wageningen UR



Developing countries

Plant breeding in developing countries is largely a public service for the emerging local seed enterprises and to support development programmes that reach near-subsistence farmers that are not likely to become customers of the private seed sector. The public sector also plays an important role in breeding crops that do not attract private investments, such as pulses and small grains. For the most important food crops, these national breeding programmes lean on international research by the centres of the Consultative Group on International Agricultural Research (CGIAR). These programmes have been at the basis of the Green Revolution which significantly contributed to regional (notably in Asia and parts of Latin America) and global food security through coordinated breeding efforts, the sharing of scientific data, the free distribution of the half-bred materials and finished varieties. One of the United Nations Millennium Development Goals aim to reduce extreme hunger and poverty by half before the year 2015. Innovation in agriculture is one of the methods to reach this goal, charging breeders and other agricultural researchers worldwide with an important responsibility. The new technologies may facilitate their work to reduce poverty only if they can access them.

plays an important role in genomics research in public-private partnerships, notably on potatoes and tomatoes. Contributing to the Millennium Development Goals is one of the priorities in its strategic plan. Wageningen UR was treated as a case study of the more generic questions arising at all public research organisations worldwide. The conference included presentations on changing trends of intellectual property (IP) management at Wageningen UR, the perspective of public funding organisations on the valorisation of research outputs, the limited freedom to operate as experienced by representatives of research for development, current practices of IP management in public-private partnerships, and potential strategies to increase the freedom to operate for 'research and development'. The day also included a panel discussion with representatives from the Dutch potato

breeding industry, 'research for development', civil society, and Wageningen UR management.

The outcome

The issue of IP in public research was tackled from different generic angles, including ethics - the role of science and academia in society - and political economy, but moved quickly to more practical levels. It was argued that public research organisations generally use patent protection as part of three strategies; maintaining their position at the frontier of science through maximizing their own freedom to operate, strengthening their position in public private partnerships, and obtaining a return on investment on their research through cash income. Humanitarian use licenses have been used to make individual technologies available for research for development. Wageningen UR has done so in a couple of projects, but it does not have a corporate strategy on the issue. Ideally, such licenses are generic, rather than dealing with individual transfers. Defining what 'humanitarian use' exactly entails and how it can be enforced in case of misuse remains complex. Such openings often require explicit action and communication to facilitate actual technology transfer. The strategies of the 'Public sector Intellectual Property Resource for Agriculture' (PIPRA) were presented as a model. PIPRA pools fragmented public sector IP and includes it in a searchable database, and bundles different technologies in packages to facilitate use. This is complemented by capacity building and IP research. It was argued that the model does not include a whole body of not-patented knowledge. Open-source is another model for increasing access and reducing transaction costs. This model supports the sharing of innovations on the condition that any further improvements on the technology are also shared without costs. A philosophy of innovation in networks with weak -informal ties, as



opposed to a linear organisational structure with formal contracts, would underlie an 'open innovation system'. It was argued that the large genomic programmes develop into quasi open source communities through the inclusion of large numbers of partners that share their results. Open-source sharing can be complementary with a more conventional patent-like protection of other research data, making embarking on open-source systems a less radical departure from common practice. Despite various initiatives to promote open source strategies, the models do not appear to gain much importance in more product oriented biotechnology research. In discussing, the limitations of current IP management in Wageningen, and the relevance of humanitarian licenses, patent pools, or open-source strategies, a number of other issues arose. First of all, patents in Europe represent only a minor mechanism for technology transfer. Increased access to information (publications) and various forms of capacity and institution building are important mechanisms to transfer technologies and facilitate their use. Secondly, the scope of the problem was placed in perspective by questioning the relevance of patents for plant breeding. Few patents are relevant in potato breeding where the private sector favours breeder's rights which keep new plant varieties available for further breeding, and claims it does not to seek profit from poor farmers in developing countries. Finally, the crucial role of research funding organi-

sations was indicated, in setting the rules for the valorisation of public research outputs. While a general agreement on the importance of 'science for impact' was reached, it was argued that patenting is clearly not the only – nor always the most appropriate – way of valorising the outcomes of public research.

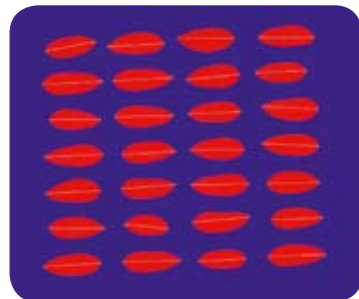
An outlook

The importance of patents in the field of plant breeding in the future is not very clear. If current trends in the extension of the patent system continue, the restrictions on freedom to operate are likely to get worse. However, at the same time, recent developments can be observed in the major patent offices (notably EPO), questioning and challenging the current patent systems for biological systems. This may have very important consequences for the legal and policy environment in which public research institutes such as Wageningen UR, and their public funding agencies operate, and therefore for the problems that have been discussed during this conference. Nonetheless, Wageningen UR has to deal with and respond to the current IP landscape, and its limitations. Since the Institute is currently discussing its corporate IPR policy, the debate was considered very timely and useful. The outcomes of the meeting will be taken into account in this process and may fuel the debate in other universities in the Netherlands and beyond. //

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