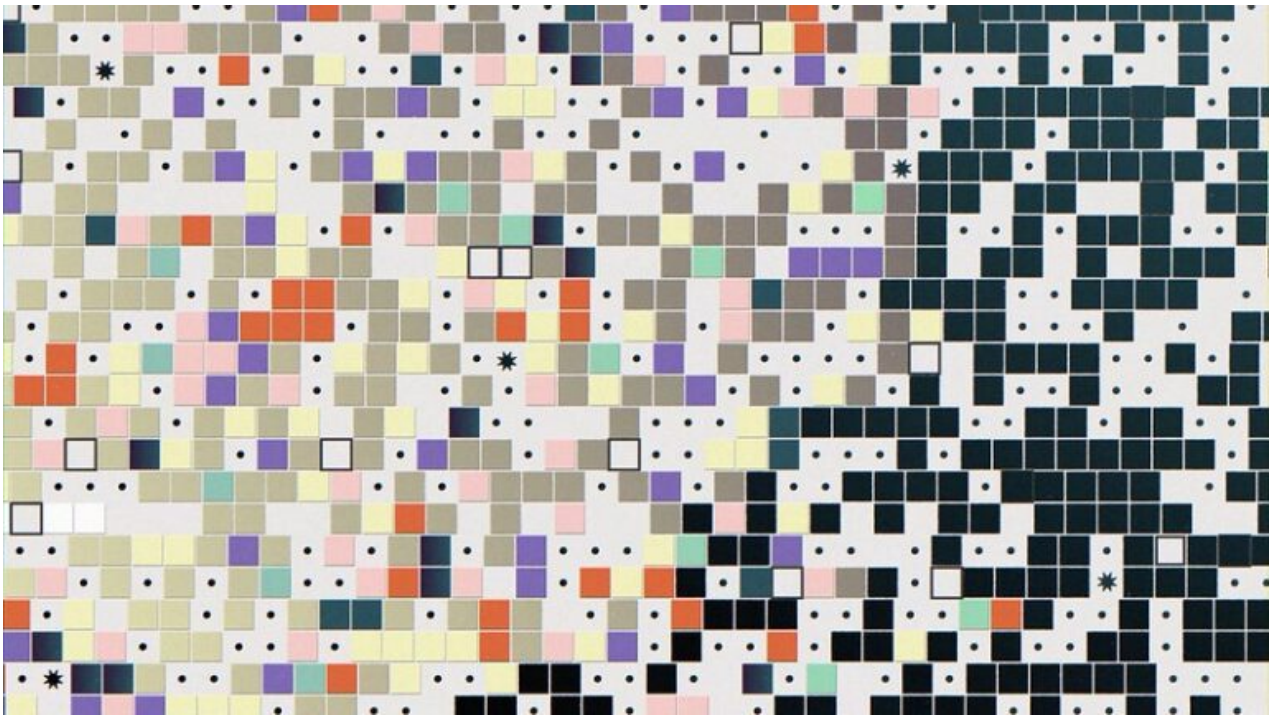
Veille citoyenne d'information sur les OGM et les semences

The United States is sequencing its national seed bank without sharing the data

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The US Department of Agriculture has just announced that it is releasing $180 million to sequence its national seed bank. It states that the digital sequencing information (DSI) generated will be "*United States intellectual property*" and that international benefit-sharing mechanisms do not extend to this DSI. Whilst this issue of sharing is still being debated internationally, this project illustrates the US's logic of appropriation and economic exploitation. Yet this DSI is derived from biodiversity that farmers and communities have developed, selected, preserved and renewed over millennia.



Rosa Luxemburg-Stiftung - The Last Seed

On 6 October, the US Department of Agriculture (USDA), through its Secretary Brooke Rollins, announced the launch of a major agricultural research programme: Seed Sovereignty. This programme includes, amongst other things, the sequencing – or "*digitisation*" – of all the seeds held in the national seed bank and, consequently, the recording of this sequencing information in digital form (DSI)[1]. Without going into great detail, Brooke Rollins refers to the granting of non-

exclusive licences (which may be granted to several licensees) based on the DSI generated by this sequencing. Theoretically, however, this database should also serve as a source for the filing of patent applications by the USDA itself[2] or by any licensee on that basis. If the United States maintains the announced policy, the patents could cover its own territory and other countries without a fair and equitable sharing of the benefits derived from the DSI with those countries, even though they are the providers of some of the physical genetic resources comprising the US national seed bank.

"US intellectual property"…

The Seed Sovereignty initiative, which concerns the national seed bank known as the National Plant Germplasm System (NPGS), held, according to the USDA, 621,600 seed samples representing more than 16,737 different plant species in 2024[3], of which approximately 10 per cent are reported to have been sequenced to date. The Ministry plans to utilise funding and "*artificial intelligence*" (AI) tools (in this case, Genesis, developed by the US Department of Energy) to accelerate the identification of genetic traits of interest, particularly resistance to drought or pests. This digital information, provided by sequencing and AI, would be made available to companies – notably multinational seed companies – under certain conditions *via* non-exclusive licensing programmes. The USDA states that it "*intends to make that [the sequencing results] United States intellectual property, make it available to United States farmers for the benefit of the Unitd States agriculture*", adding that *"while we do have treaties around the world to share seeds* (sic) [presumably including the ITPGRFA (International Treaty on Plant Genetic Resources for Food and Agriculture)]*, those treaties do not extend to the sequencing and the genome information"*.

The USDA exploits the ambiguities surrounding the concept of DSI and the lack of a stable, official legal definition of this information, which can therefore be presented in different forms and even with varying scopes (see box). A distinction must be made between data indicating the existence and composition of a genetic sequence and supplementary information enabling a link to be established between that sequence and one or more specific biological functions. This latter type of information, which results from further research, may enable the identification of genetic traits of technical or economic interest. In other words, mere knowledge of a genetic sequence is not sufficient to identify its functions or to characterise a patentable invention. Conversely, the identification of specific biological functions may contribute to the development of technical applications that may be the subject of patent applications, provided they meet the conditions for patentability. Consequently, it is necessary to know precisely what information is covered by the licences announced by the USDA and what the potential intellectual property rights claimed relate to.

This move by the United States exacerbates the tensions currently unfolding at international level between, on the one hand, the conservation of and facilitated access to plant genetic resources that make up plant biodiversity, and, on the other, the appropriation of this biodiversity through the imposition of licence fees for access to information on the DSI they contain and their function (rather than for access to the plant genetic resources themselves). It also ignores the fact that seeds should not be viewed as mere national resources, but as the result of a very long collective history - millennia of domestication, cross-breeding, selection, conservation and exchange carried out by farmers, indigenous peoples and local communities, the majority of whom are from countries other than the United States. This history is so fundamental that the international community has put in place the necessary tools to protect these resources against biopiracy – protection which is now under attack, notably by countries that want these DSI to be exempt from the same rules.

… which can extend internationally

Digital sequencing data is produced from plants that may originate from various sources, whether wild or cultivated, including seed banks, not all of which originate from the territory in which they are housed. Since the adoption of the Convention on Biological Diversity (CBD), these sources have been regarded as *"historically belonging to the nation of origin*" and as being eligible for sharing under the terms of the TRIPS Agreement and/or the CBD – terms that remain a subject of debate within both these international bodies.

The National Plant Germplasm System (NPGS) organised collection expeditions to at least 20 foreign countries between 2007 and 2017, as documented in an article in *Plants* published in October 2020[4]. This confirms – if confirmation were needed – that the US seed collection does not consist exclusively of resources of US origin. Describing all the results derived from the sequencing of the national seed bank as *"US intellectual property*" illustrates the USDA's purely economic perspective. The US Department of Agriculture may well assert, in its statement of 6 October, that it intends to make this intellectual property "*available to United States farmers*", but through the use of patents it is merely contributing to the concentration of the seed sector, both locally and internationally.

Indeed, this US project will undoubtedly have repercussions beyond its borders. The comprehensive sequencing of seeds from the US national seed bank, combined with AI, is already producing – and will continue to produce – plant genetic resources that may be the subject of patent applications which, if granted, can be enforced in many countries. Companies – many of them multinationals selected by the US administration – will benefit from licences granting access to these DSI and will be able to claim patents on "*inventions*" utilising them.

International monopolies could thus be established over a number of "*inventions*" derived from the natural resources – namely the seeds held in this US national seed bank – provided that the countries concerned authorise patents on such *"inventions*". The rights associated with any patents granted on these DSI will then relate to native traits, genetic sequences with a specific function, and processes for obtaining, detecting and identifying them, amongst others. This appropriation will create legal and economic risks for small and medium-sized seed producers and farmers who are ill-equipped – or often completely unprepared – to determine whether they are using *a* patented "*invention*" and, consequently, whether they are becoming potential infringers. Yet it is their long-standing work as farmers that has enabled these seeds to exist.

This example is not unique. Other countries have embarked on programmes to sequence their genetic resources and, in some cases – such as the United States – to identify functions associated with various sequences. For example, in May 2020, Japan published the complete sequencing of 69 accessions from its rice seed collections[5] and, in June 2026, the Netherlands announced that it had sequencing data for the complete genomes of 519 lettuce accessions[6]. India and China have also had sequencing programmes for certain species in place for several years. However, the US Seed Sovereignty project is particularly noteworthy for its scale, its comprehensiveness and its use of AI to identify potential functions associated with genetic sequences. In particular, it raises concerns about the risk of a failure to share the benefits arising from the use of DSI derived from seeds presented as "*domestic*", even though most of these seeds originate from other countries.

A loophole in benefit-sharing

Seed Sovereignty does not provide for the sharing of benefits, as the Secretary of Agriculture emphasises in her statement that "*international treaties governing the sharing of seeds do not extend to sequencing and genome information*". This interpretation is not shared by the majority of

countries in *the "Global South*" that are parties to these international treaties, in this case the TRIPS Agreement, the only treaty on this subject ratified by the United States. Brooke Rollins's comments highlight the US's international stance on the issue of benefit-sharing arising from DSI. It should be noted that the United States is not a party to the CBD, nor to the Nagoya Protocol, which established the principle of sharing benefits arising from the use of genetic resources.

The United States has, however, been legally bound by the obligations of the Tirpaa since March 2017, which does indeed contain provisions on this issue of benefit-sharing[7]. In 2017, the United States announced the inclusion of approximately 500,000 samples from its national collections in the Tirpaa's Multilateral System (MLS). This figure, which is lower than the total number of accessions held by the NPGS (621,600 in 2024), suggests that not all resources within this network have been explicitly declared in the SML.

However, the ITPGRFA does not explicitly provide for a specific mechanism for the sharing of benefits arising from the use of DSI. This shortcoming is the subject of discussions that have not yet been resolved, as countries and multinationals from the "*North*" refuse to legally recognise DSIs as genetic components of genetic resources[8]. These controversies perpetuate uncertainty regarding the regime currently applicable to such information[9].

Even though the United States is a party to the CBD, it has long held the view, as have France, Japan and the European Union, that a distinction must be made between DSI and the physical genetic resources from which they are derived. In their view, DSI are a product of research, rather than components of genetic resources, and play an essential role in scientific research. Their rapid and open exchange is, in itself, a source of non-monetary benefits, though this does not prevent the United States from seeking to monetise them. This position leads them to oppose international mechanisms that might regulate the use of these DSI, particularly where these involve obligations regarding traceability, benefit-sharing, prior informed consent under the CBD, or the prohibition on patentability set out in Article 12.3(d) of the TRIPS Agreement[10].

The US position therefore appears to be more of a political and legal stance than an accepted conclusion regarding the scope of treaties relating to seeds and their *"utilisation*". Nevertheless, the US will be in a position – notably through patents and free trade agreements that require other countries to recognise them – to control access to other countries' plant genetic resources. This control will be exercised under the guise of so-called "*inventions*", which are, however, recognised as patentable in many patent systems, notably that of the EPO (European Patent Office), and without any sharing of benefits with the countries providing this heritage.

DSI still not officially defined at international level

The term "*DSI*" may refer to sequencing data that provide information on the composition of a genetic sequence, but also to supplementary information enabling a link to be established between that sequence and one or more specific biological functions. However, these two categories of information do not necessarily have the same scientific, technical and legal scope.

This distinction is fundamental to assessing the benefit-sharing obligations set out in the Tirpaa. The digitisation of plant genetic resources may constitute a research activity, the results and non-confidential information from which must be shared in accordance with the Tirpaa's provisions on the exchange of information and research results.

This sharing of information is distinct from the monetary sharing of benefits. The issue arises differently when the information derived from such research is commercially exploited, in particular through the granting of licences or the exploitation of intellectual property rights. It is then necessary to determine precisely which information is being exploited, whether it constitutes genetic components of the plant genetic resources concerned, and what benefit-sharing obligations may arise from this.

Thus, making research results available, granting licences for databases, and the commercial exploitation of information relating to the functions of genetic sequences do not constitute a single and identical operation. They raise distinct legal issues, which cannot be resolved solely by resorting to the generic term "*DSI*". The commercialisation of information derived from sequencing therefore does not automatically mean that all financial benefit-sharing obligations apply, but it clearly raises the question of whether they might apply.

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