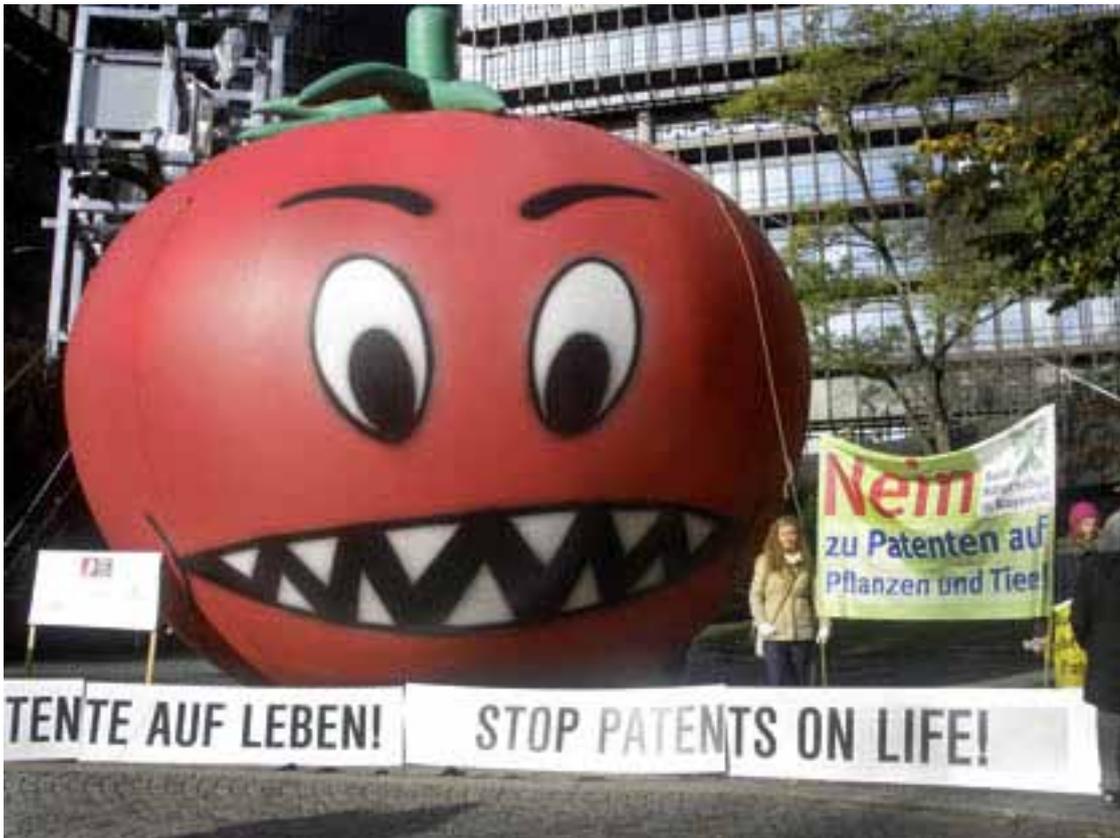


no patents on seeds



European Patent Office at Crossroads

Report – Patents on Plants and Animals Granted in 2011

Christoph Then & Ruth Tippe
www.no-patents-on-seeds.org

Publisher of this report is the international coalition
No Patents on Seeds

March 2012

Content

Summary	3
1. Introduction	4
2. Recent legal and political developments	5
EPO decides on “essentially biological processes”	5
EPO refers same case twice to the Enlarged Board	6
Resolutions passed by parliaments in Germany and in The Netherlands	6
Further developments at EU level	7
3. Overview of European patents on plants and animals	8
Granted patents	8
Patent applications	8
4. Examples: Patents granted on conventional plant breeding	10
Example 1: Monsanto Indian Melons	10
Example 2: Stress resistance by Bayer	10
Example 3: Spanish sunflowers	10
Example 4: Syngenta’s Sour-Sweet Melons	11
5. Particular background of patents on conventional breeding	11
Examples of patents granted on mutational breeding	11
Examples of patents granted on the basis of a phenotypical description	13
Examples of patents granted on the basis of marker assisted selection	13
6. Examples of patents granted on genetically engineered plants	14
Example 1: Bayer’s Basta Beans - monopoly to control contamination	14
Example 2: Del Monte’s tomatofied pineapples	14
7. Patents on animal breeding	15
8. How patents hamper further breeding	15
Example 1: Syngenta proprietary claims	15
Example 2: Pioneer HiBred proprietary claims	16
9. How patents concern consumers	17
10. Stakeholders see need for change	19
11. Conclusions	21

Summary

More than 10 years after the adoption of the EU Patent Directive “Legal Protection of Biotechnological Inventions” (98/44 EC), there are an increasing number of problems in plant breeding. The current prohibitions on patenting plant varieties and “essentially biological breeding” are being interpreted in a way that will make it meaningless in current European Patent Office (EPO) practice.

As shown in this report, the consequences are of concern to farmers, breeders, food producers and consumers. The patents currently granted are blocking access to breeding material and biological diversity, hampering innovation, reducing choice for farmers and introducing new dependencies for food producers and consumers.

The legal and political situation is highly dynamic. National parliaments such as those in Germany and the Netherlands have already taken up a position against further monopolisation of the seed market and the patenting of conventional breeding. Breeders and farmers’ organisations as well as some food producers are publicly raising their concerns. The European Patent Office is about to re-examine its current practise.

Under these circumstances, the next weeks and months will be decisive for further developments. If this trend is not stopped, companies such as Monsanto, which not only apply for patents, but also have the economic power to access and dominate markets, will be able to decide which seeds are used in agriculture, which products are available for the food market and which prices will be paid by farmers, food producers and consumers.

This report shows that political action is needed to push developments in a new direction. There are already around 1000 patent applications pending that are connected to conventional breeding – around 100 were filed in 2011 alone. More than a dozen patents on plants as granted in 2011 are connected to conventional breeding. Around a dozen patents are connected to farm animals; related to sex selection, marker assisted selection, cloning or genetic engineering. All in all, by the end of 2011, nearly 2000 patents on plants and around 1200 patents on animals were granted by the EPO.

The examples of patents granted on conventional breeding, include amongst others, melons, sunflowers, cucumber, rice and wheat. They bear upon all levels of food production – from farm to food. Special emphasis is placed upon patents on mutational breeding since these methods are widely used in conventional breeding but are, nevertheless, being routinely being patented by the EPO. In animal breeding, the patentability of breeding material (such as sperm cells) was confirmed by the EPO – this means the patent holder can control breeding as if he were able to claim the animal itself.

The *No Patents on Seeds* initiative is urging clarification in European patent law to exclude patents on

- plants and animals
- breeding material
- processes for breeding
- selecting of plants and animals for breeding purposes
- food and other products derived from plants and animals

1. Introduction

In recent years, there have been an increasing number of patent applications for conventionally bred plants and animals. Patents are being filed for seeds and breeding material, processes for breeding, on plants and animals and food derived thereof, such as oil, flour, tomatoes, melons, milk and eggs. While the technical innovation in most cases is only minor, the scope of the patents is extremely broad, covering the whole chain of food production, from farm to fork. Several such patents have already been granted.

The legal basis of these patents is an interpretation of European patent law that makes the existing prohibitions more or less meaningless. In this context, Art 53 (b) of the European Patent Convention (EPC) in particular and Art 4 of the EU patent directive “Legal Protection of Biotechnological Inventions”, 98/44 EC are the relevant legal provisions. Both regulations exclude patents on plant and animal varieties as well as patents on “essentially biological breeding”. For example, Art 4 of EU patent directive 98/44 says:

1. The following shall not be patentable:

(a) plant and animal varieties;

(b) essentially biological processes for the production of plants or animals.

However, the reality is different: Plant varieties as well as conventional breeding methods are being increasingly subjected to patents. In addition, industry is even trying to change legislation on plant variety protection (PVP) and to eliminate the rights and privileges accorded to breeders and farmers.

This current development is a major threat to farmers, breeders and food producers in Europe. Patent law is being abused in an attempt to take control of genetic resources and the process of food production. Especially Monsanto, which is already number one in the international seed market, will be able to realise its interests in global markets¹. It has already acquired the biggest vegetable breeders such as Seminis and DeRuiter and dominates the seed markets for maize and soy. There are several other companies in the agrochemical sector, which have become major players in the seed business. Market concentration in this sector has steadily intensified within the last decade and patents are a main driving factor in this context.

In this report, we present an overview of research on patents granted in 2011 at the EPO covering conventional breeding as well as on recent legal and political developments. We have included some examples of the negative impacts of patents in the field of conventional plant breeding.

¹ P. H. Howard, Visualizing Consolidation in the Global Seed Industry: 1996–2008, Sustainability (2009), 1, 1266–1287; doi:10.3390/su1041266.

2. Recent legal and political developments

EPO decides on “essentially biological processes”

In December 2010, the Enlarged Board of Appeal at the European Patent Office (EPO) gave a binding interpretation of the prohibition of patents on „essentially biological processes for the production of plants or animals“ (Art 53 (b), EPC). Decision G1/08 states:

1. *A non-microbiological process for the production of plants which contains or consists of the steps of sexually crossing the whole genomes of plants and of subsequently selecting plants is in principle excluded from patentability as being „essentially biological“ within the meaning of Article 53(b) EPC.*
2. *Such a process does not escape the exclusion of Article 53(b) EPC merely because it contains, as a further step or as part of any of the steps of crossing and selection, a step of a technical nature which serves to enable or assist the performance of the steps of sexually crossing the whole genomes of plants or of subsequently selecting plants.*
3. *If, however, such a process contains within the steps of sexually crossing and selecting an additional step of a technical nature, which step by itself introduces a trait into the genome or modifies a trait in the genome of the plant produced, so that the introduction or modification of that trait is not the result of the mixing of the genes of the plants chosen for sexual crossing, then the process is not excluded from patentability under Article 53(b) EPC.*
4. *In the context of examining whether such a process is excluded from patentability as being „essentially biological“ within the meaning of Article 53(b) EPC, it is not relevant whether a step of a technical nature is a new or known measure, whether it is trivial or a fundamental alteration of a known process, whether it does or could occur in nature or whether the essence of the invention lies in it.*

While this decision is very explicit on breeding processes that involve sexually crossing the whole genomes of plants and of subsequently selecting plants, unresolved questions remain in relation to plants and animals derived from those processes. Other products such as seeds, fruits, meat, milk, eggs are not mentioned. If these products can still be patented, the prohibition on patenting the process for breeding will be rendered more or less meaningless. As a result, the conventional breeding of plants and animals will be patentable – which is a clear contradiction to Article 53(b), EPC.

Furthermore, there is no explicit mention of particular methods used in conventional plant breeding such as mutational breeding. According points 3 and 4 of the G1/08, breeding processes might even be patentable if the technical features included in the claims are not necessary, are not the true essence of the invention, or are trivial. Therefore, the applicant might be tempted to include technical features into their process claims such as protoplast fusion (regardless of whether they are necessary) just to circumvent the prohibition in Article 53(b).

In addition, the material that is necessary for conventional breeding (such as semen or pollen or other plant and animal material) still might be considered patentable – which could also allow circumvention of the current prohibitions. As a result, Article 53(b) could no longer be applied in a meaningful way.

EPO refers same case twice to the Enlarged Board

Apparently, the EPO is aware of the unresolved questions. In November 2011, in a Board of Appeal hearing on the tomato patent EP1211926, which was one of the precedent cases leading to G1/08, no decision was taken. Instead, it was announced that further questions would be forwarded to the Enlarged Board of Appeal.

This is a quite an unusual decision. As far as we know, it is the first time that a single case has been forwarded twice to the Enlarged Board of Appeal. However, by March 2012 the questions forwarded to the Board have not as yet been published. There are many unresolved questions related to the field of patents and conventional plant breeding that are relevant in this context, and have not been answered by the previous decision G1/08 (see above). It seems unlikely that all these questions will now be answered. Furthermore, it can be expected to take years until this case is finally decided.

As things are, the legal situation is unclear. At the same time, as this report shows, the EPO continues to grant patents in this field. The chances that the EPO will finally come up with a decision that clearly excludes conventional plant breeding from patentability are quite low. There is clearly a challenge at the political level to find a solution to help the EPO and concerned stakeholders to end this period of legal uncertainty. The German and the Dutch parliaments have already taken the first steps in this direction.

Resolutions passed by parliaments in Germany and in The Netherlands

In February 2012, the German Parliament passed a resolution with no votes against which states:

Conventional breeding methods are not covered by patent law. This concern is also acknowledged by the ruling of the Enlarged Board of Appeal of the European Patent Office on the so-called broccoli-tomato-patents, dated 9 December 2010. According to this path-breaking decision, processes are also “essentially biological”, and therefore not patentable when technical steps are used to carry out plant cross-breeding processes and subsequent selection of useful plants. The ruling of the Enlarged Board of Appeal clarified that when making use of an essentially biological process the subsequent plants as well as the seeds and edible parts cannot be patented. The open question is whether pure product claims on plants with specific properties are still permissible, and this decision has been re-referred to the Enlarged Board of Appeal in the tomato-patent case. However, one can expect further attempts to use legal loopholes in order to obtain wide-ranging patents. Therefore, there must be a guarantee that conventional breeding methods and products derived through such methods remain excluded from patentability in the future.²

In addition, in February 2011, the Dutch Parliament passed a similar text that aims to introduce a full breeders' exemption to escape the current problems with patents in the context of plant breeding.³

In the light of these legal and political developments, the recent patents granted by the European Patent Office in Munich must be reviewed. Below is an overview and some detailed examples.

² Deutscher Bundestag, Drucksache 17/8614 (inofficial translation)

³ Tweede Kamer der Staten-Generaal, MOTIE VAN HET LID KOOPMANS C.S: Voorgesteld 16 februari 2012

Further developments at EU level

After roughly 40 years of discussion, EU wide unitary patent protection seems to be within reach. It is likely the European Parliament and the Council of the European Union will adopt a regulation “implementing enhanced cooperation in the area of the creation of unitary patent” in 2012. This regulation does not directly affect current prohibitions in European patent law, but it does deal with national exemptions on the extension of patent rights. Therefore existing breeders’ exemptions in France and Germany and regulations in France on the scope of protection in human gene sequences might be affected.

In this context, the biggest European breeders association Plantum from the Netherlands is demanding the introduction of a European wide breeders’ exemption that is comparable to the one in plant variety protection law (PVP). This means the rights conferred by patents would not impinge on the ability of other breeders to have access to the plant material needed for further breeding. Newly developed plant varieties can be sold freely and without incurring licence fees. It is unclear that if there were such an exemption, whether it would be effective in animal breeding. The demand to introduce or maintain breeders’ exemptions in patent law already has the support of the German and the Netherlands parliaments.

A further issue about to surface at EU level is the long expected EU Commission report on the development of patents granted in plant and animal breeding. The Commission has announced this report will be out in 2012. It is likely to fuel debates in the European Parliament on possible changes or correct interpretation of Directive 98/44, which prohibits patents on plant varieties as well as “essentially biological breeding”. Both prohibitions are currently being severely challenged and substantially undermined by current EU practice.

3. Overview of European patents on plants and animals

Our survey is based on the official EPO classification as well as on our own research. By using these resources, we are confident that our report gives a reliable overview of patent applications and patents granted in the fields of plant breeding and livestock.

Granted patents

On plants, according to our own research, around 140 patents were granted in 2011 (according to EPO classification C12N15/82 or A01H nearly 200 patents were granted). The companies awarded most patents on plants were BASF⁴ (24), Bayer⁵ (22) Monsanto⁶ (15) Dupont/ Pioneer HiBred (11) and Syngenta (10).

More than a dozen patents on plants are on conventional breeding. On the one hand, this is a relatively low number of patents granted on conventional breeding. On the other hand, it is remarkable that despite G1/08 and unresolved legal questions pending at the Enlarged Board of Appeal, further patents on conventional breeding were granted at all.

There were around 65 patents granted on animals in 2011, most of them on laboratory animals. Around a dozen patents connected to farm animal breeding were granted, for example, on sex selection, marker assisted selection, cloning or genetic engineering.

All in all, at the end of 2011, the EPO had granted nearly 2000 patents on plants and around 1200 patents on animals (with and without genetic engineering).

Patent applications

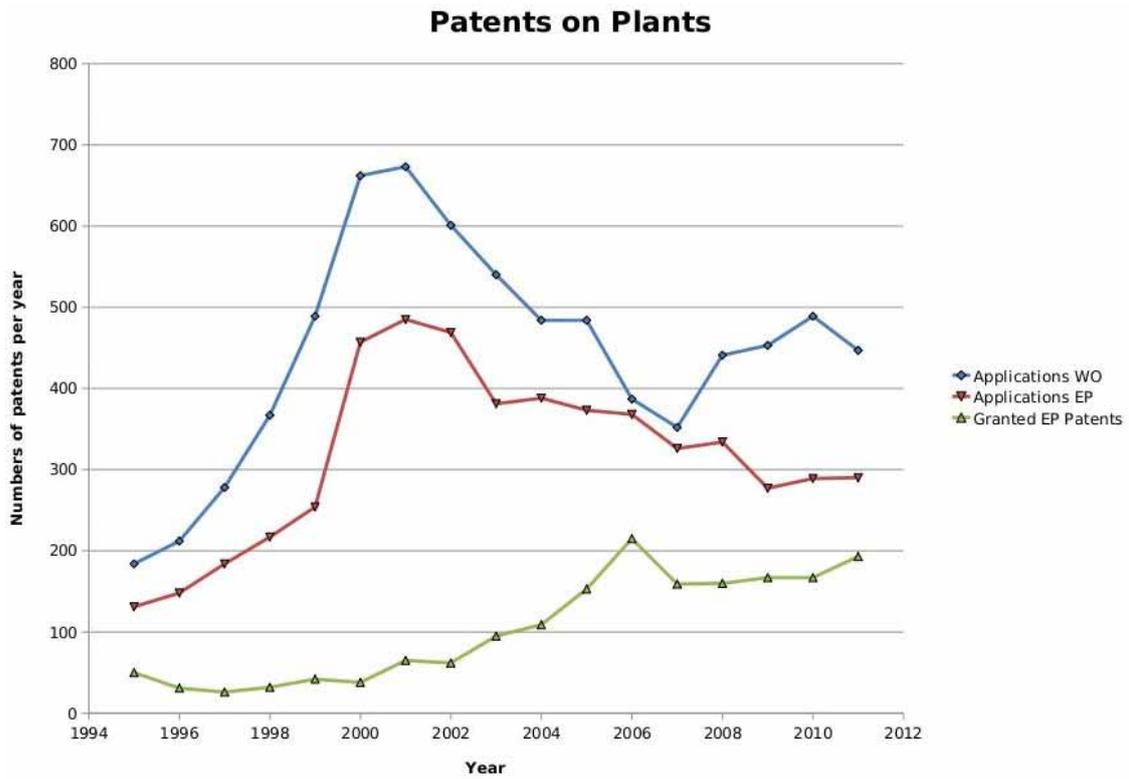
When it comes to applications, in 2011, around 450 new applications on plants were registered under PCT / WIPO (A01H or C12N15/82) and 290 new applications at the EPO. Around 150 applications were filed on animals (A01K67).

All in all, at the end of 2011, 8226 PCT / WIPO applications on plants were pending, 6218 were registered as EPO applications. Around 1000 patent applications are on conventional plant breeding. On animals, 5120 PCT / WIPO applications were pending, 3978 were registered as EPO applications.

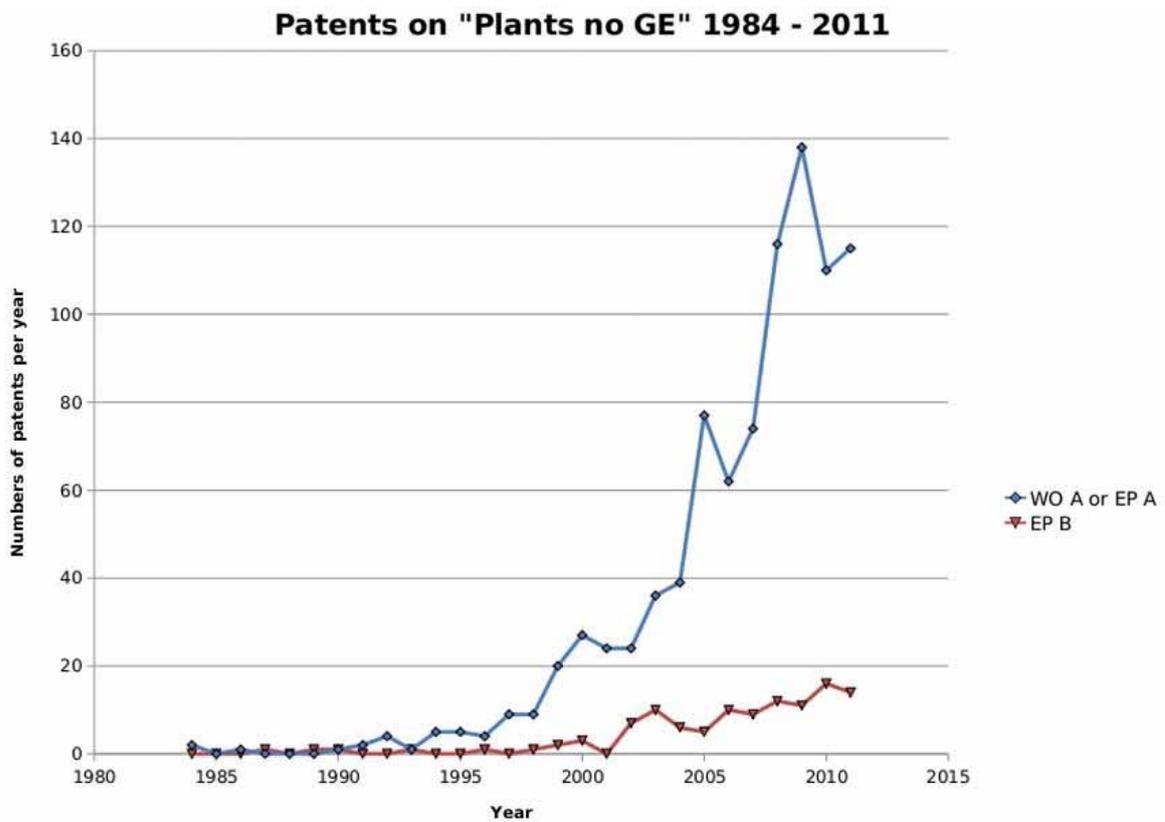
4 together with Sungene, CropDesign, Metanomics

5 together with Icon, Athenix, Nunhems

6 together with De Ruiter



Overview of patent applications on plants under PCT/WIPO (WO) and at the EPO as well as of patents granted by the EPO. Research according to official classifications (IPC AorH or C12N001582).



Overview of patent applications (EP A) and patents on conventional plant breeding granted (EP B) by the EPO (own research).

4. Examples: Patents granted on conventional plant breeding

In 2011, several granted patents provoked public debate. Below we list some of the examples exposed by *No Patents on Seeds*:

Example 1: Monsanto's Indian Melons

In May 2011, the US company Monsanto was awarded a European patent on conventionally bred melons (EP 1 962 578). These melons which originally stem from India have a natural resistance to certain plant viruses. Using conventional breeding methods, this type of resistance was introduced to other melons and is now patented as a Monsanto "invention". The actual plant disease, Cucurbit yellow stunting disorder virus (CYSDV), has been spreading through North America, Europe and North Africa for several years. The Indian melon, which confers resistance to this virus, is registered in international seed banks as PI 313970. With the new patent, Monsanto can now block access to all breeding material inheriting the resistance derived from the Indian melon. The patent might discourage future breeding efforts and the development of new melon varieties. Melon breeders and farmers could be severely restricted by the patent. At the same time, it is already known that further breeding will be necessary to produce melons that are actually protected against the plant virus. DeRuiter, a well known seed company in the Netherlands, originally developed the melons. DeRuiter used plants designated PI 313970 – a non-sweet melon from India. Monsanto acquired DeRuiter in 2008, and now owns the patent. The patent was opposed by several organisations in 2012.⁷

Example 2: Stress resistance by Bayer

In August 2011, the European Patent Office (EPO) in Munich granted a patent to the German company Bayer to breed plants with a higher stress tolerance (EP1616013). The comprehensive patent will give Bayer monopoly control over important food crops including both genetic engineering in plants and the process for conventional breeding and plants derived thereof. The patent conflicts with G1/08 that excludes patents on processes for conventional breeding, based on crossing and selection. However, in claim 14 of the Bayer patent nothing else is patented than what should be excluded according to G1/08. Additionally, the other patent claims granted to Bayer are in a legally grey area. The patent also covers plant varieties. Furthermore, mutational breeding was patented despite the fact that this technology has been used for a long time in conventional breeding and lacks inventiveness.

Example 3: Spanish sunflowers

In September 2011, the EPO finally granted a patent on conventionally bred sunflowers, EP1185161. The patent granted to *Consejo Superior de Investigaciones Cientificas* in Spain, was opposed by Greenpeace. In a public hearing in May 2010, the EPO decided that even in cases in which breeding methods are not able to be patented, the products derived thereof can be regarded as an invention (T1854/07). Seeds, oil, plant and progeny, the use of oil in production of margarine, confectionary or bakery were patented.

⁷ <http://www.no-patents-on-seeds.org/en/information/news/opposition-monsanto-s-patent-indian-melon>

Example 4: Syngenta's Sour-Sweet Melons

In December 2011, after an opposition filed by another seed company had been rejected, the European Patent Office awarded Syngenta a patent on melons “with a pleasant taste”. It is the first European patent protecting a conventionally bred plant for its taste. In the patent application (EP1587933) the taste of the melon is described as “tart-refreshing-sour-sweet”. With this patent Syngenta can claim intellectual ownership of all melons with a certain citric acid and sugar content as well as a specific pH-value, including everything from the plant and seeds to the pulp and its uses. The “invention” is the result of common breeding and selection techniques (no genetic engineering), using, as source materials, amongst others, melons of Indian origin.

5. Particular background of patents on conventional breeding

For the analysis of legal details used to circumvent prohibitions in patenting “essentially biological processes”, the patents can be classified according to the following criteria:

Mutational breeding, phenotypical description, marker assisted selection and others such as particular methods for propagation.

It is apparent that most patents granted in this field are based on mutational breeding.

Mutational breeding is based on a natural mechanism that occurs in evolution: The DNA permanently undergoes changes in its structure. The changes are not targeted and only a very small number of these mutations are maintained through next generations.

A number of natural mutations are used for selection in conventional breeding. Some breeders artificially enhance the number of mutations in the plants by mutagenic stressors such as radiation or chemical compounds, and, for the purpose of selection, in order to grow a larger number of plants in a shorter time. Some breeders try to change a specific genetic locus by mutagenesis (so called TILLING). This does not entail inserting anything into the plant's genome it is simply selecting those plants that show particular changes in the genome.

While it cannot be denied that some technical tools are used in mutational breeding (such as gene analysis or exposure to mutagenic compounds) the overall process is “essentially biological”. Nevertheless, in recent years the EPO has granted many patents on the usage of mutations in plant breeding.

Similar criteria can be applied to marker-assisted selection, particular methods for propagation and analysis of phenotypes: All are used in conventional plant breeding to support essentially biological processes for the production of plants and to some extent also animals.

Examples of patents granted on mutational breeding

- **EP965265, BASF**

Title: AHAS-inhibiting herbicide resistant wheat and method for selection thereof

Claims: Method of growing wheat, planting wheat with resistance to AHAS-inhibiting herbicide, treating with herbicide; wheat plant or seed.

- **EP1793661, Biogemma**
Title: Maize having an improved digestibility
Claims: Maize having an allele of CCR1 gene comprising insertion of a transposon; use of maize for preparing feed, also comprising ensilage of maize.
- **EP1616013, Bayer,**
Title: Methods and means for increasing the tolerance of plants to stress conditions
Claims: Method to produce plants tolerant to stress; also transgenic plant, seed; method to produce plant by mutagenesis.
- **EP1649022, Commonwealth Scientific and Industrial Research Organisation,**
Title: Wheat with altered branching enzyme activity and starch containing products derived therefrom
Claims: Grain from wheat plant comprising genetic variation induced by mutagenesis; plant, starch, products (flour,.. also non-food products).
- **EP1714543, Cargill**
Title: Plants having mutant sequences that confer altered fatty acid profiles
Claims: DNA from Brassica or Helianthus, mutant desaturase gene; Brassica or Helianthus plant containing gene.
- **EP1561375, Pristine Forage Technologies Pty Ltd**
Title: Improved pasture, forage and seed production technology through pod and leaf retention on annuals of medicago genus (annual medic)
Claims: Plant, medicago, mutant form of pod shedding; method for producing plant by mutagenesis and breeding.
- **EP1414976, University of Saskatchewan**
Title: Wheat plants having increased resistance to imidazolinone herbicides
Claims: Wheat comprising IMI DNA, seed; DNA from Einkorn; method for controlling weeds; wheat plant is transgenic or not transgenic.
- **EP1346030, Carlsberg, Heineken, Kronenbourg**
Title: Low-lipoxygenase 1 barley
Claims: Barley plant comprising mutated LOX-1 protein, grain, progeny; malt or wort (Würze); use of malt and of barley for manufacture of beverage, beer; process for producing beer.
- **EP1659855, Instituto Nacional de Tecnología Agropecuária**
Title: Rice plants having increased tolerance to imidazolinone herbicides
Claims: Rice plant comprising AHAS-DNA variant (not transgenic); seed; method of controlling weeds; rice plant derivatives, mutant, recombinant, also transgenic.

Examples of patents granted on the basis of a phenotypical description

- **EP1433378, Nunhems BV**

Title: Resistance to powdery mildew infection and absence of necrosis in cucumber, Cucumis sativus

Claims: Plant Cucumis sativus, resistant to powdery mildew, absence of necrosis; hybrid plant, plant derived from cloning, selfing, crossing; fruit with non-viable seeds; seeds;

- **EP1587933 Syngenta**

Title: Novel melon plants

Claims: Cucumis melon plant producing fruit; melon that is orange, white, green, yellow; hybrid, dihaploid, seed, fruit; use of fruit in fresh product;

- **EP1185161, Consejo Superior de Investigaciones Cientificas**

Title: Oil from seeds with a modified fatty acid composition

Claims: Sunflower seeds, oil, plant and progeny; method for preparing oil; use of oil at high temperature in production of edible fats, margarine, confectionary or bakery;

Examples of patents granted on the basis of marker assisted selection

- **EP1539996, The Australian National University**

Title: Method for producing plants having enhanced transpiration efficiency and plants produced therefrom

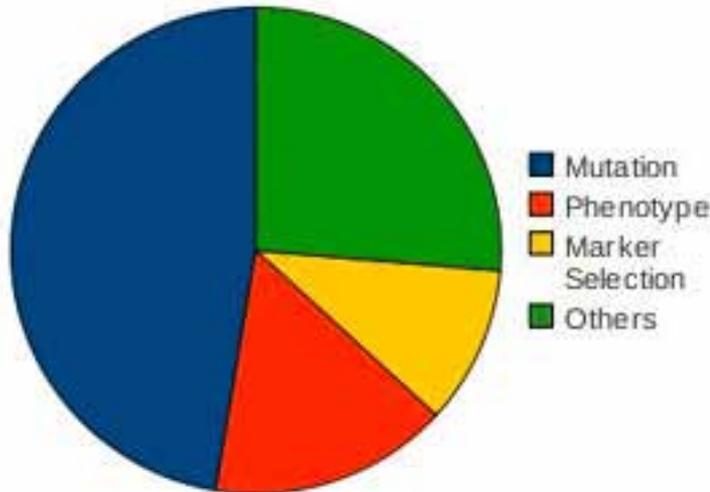
Claims: Method of selecting plant, method wherein plant is Arabidopsis, rice, sorghum, wheat, maize; method of transforming using ERECTA gene; method increasing stress resistance and seed weight; also transgenesis;

- **EP1962578, Monsanto**

Title: Closterovirus-resistant melon plants

Claims: CYSDV-resistant species of Cucumis melo comprising introgression of resistance from melon; Cucumis melo varieties; plant inbred or hybrid; seed, fruit.

In five other cases, patents were granted for propagation, cultivation or treatment of plants. Some of them cannot be considered as breeding technologies, but the patents as granted might affect the usage of the plants for further breeding (EP1714545, EP1896567, EP1371284, EP1890709, EP1765060).



Overview of proportion of particular areas where patents on conventional breeding were granted

6. Examples of patents granted on genetically engineered plants

In the case of genetic engineering, the patents granted by the EPO are also at the centre of controversial legal debate, since these patents cover plant varieties that are excluded from patentability according to Art 53(b) EPC. Further, in many cases very broad claims are granted that can severely impede further plant breeding or even risk research or the control of contaminations because access to relevant biological material is blocked.

Example 1: Bayer's Basta Beans - monopoly to control contamination

In June 2011, Bayer was awarded the patent EP1871901 on its genetically engineered soybean A5547-127 that is resistant to the herbicide glufosinate. This crop, which is also named Bayer's Basta Bean, was recently allowed for import into the European Union.⁸ According to the claims as granted, Bayer is the only company that is allowed to screen for contamination of seeds with this event. Interestingly it is the same company, which had to pay 750 Million US Dollars to US Rice farmers in 2011 because of seed contamination. So, Bayer might use this patent to prevent any independent controls in the future.

Example 2: Del Montes tomatofied pineapples

The well-known fruit company Del Monte (US) might in future try to market genetically engineered pineapples with an enhanced content of carotinoids to European consumers. The EPO granted the respective patent EP1589807 in November 2011. While the controversial genetically engineered "Golden Rice" (that is also supposed to produce carotinoids) will allegedly save poor people from malnutrition, this product is likely to be placed on the market for the rich who want to stay young and healthy. The pineapples are likely to be a reddish colour since lycopenes are the particular carotinoids that will be enhanced in the fruits. Lycopenes give tomatoes their typical red colour.

⁸ <http://www.testbiotech.org/en/node/534>

7. Patents on animal breeding

In 2011, the Board of Appeal at the European Patent Office held a public hearing on EP 1257168 owned by XY LLC, a subsidiary of the US company, Inguran LLC. The patent was opposed by the Green Party in the European Parliament and by Greenpeace, Germany. The patent claims a process to select the sex of offspring in animal breeding.⁹ For this purpose, the sperm cells are sorted by a technical device. The sperm selected through this process are then claimed as an invention. The patent could greatly impact animal breeding and agriculture because artificial insemination is widely used in cattle and pig breeding. Other companies have likewise already applied for patents on breeding material and farm animals. No final decision has been taken, but the EPO left no doubt that it considers sperm cells used in conventional breeding to be patentable. If patents like this are granted, it will be easy to circumvent the prohibition on the patenting of “essentially biological breeding” just by having a patent on the breeding material. A final hearing will be held and final decision will be taken in May 2012.

A similar patent (EP 1263521), that even covers human sperm cells, was granted to Ovasort by the EPO in 2011. In this case, the method of producing non-human embryos was also patented – which means that the resultant animals are within the scope of the patent.¹⁰

Further patents were granted on the cloning of farm animals (EP1356035, EP1356031), on gene selection, (EP1896616, EP1943345, EP1718770, EP2186915), on genetically engineered farm animals (EP1943345), on gene diagnosis of bovine diseases (EP1785495, EP2175039) as well as on oysters (EP2146569).

Some patents were also granted on insects such as the cultivation of mites (EP2042036), on transgenic silkworm (EP 1811027) as well as genetic engineering of insects to control insect populations (EP1624749). Oxitec, the company holding this patent, started field trials with genetically engineered mosquitoes in 2011, and raised major public controversy.

8. How patents hamper further breeding

In 2011, *No Patents on Seeds* was made aware of the particular problems a German breeder had encountered with plant patents. This case shows how proprietary claims can be used to hamper further breeding and highlights just how alarming the situation has become. Upon request, the breeder received sunflower seeds from Syngenta and from Pioneer, which he needed to develop his own, new varieties. Contrary to plant variety protection, where unrestricted use of genetic material is provided to enable further breeding, he found that in this case the usage of the material was greatly restricted, as explained by the intellectual proprietary claims attached to the seed packages (see quotes in following examples). As a result, any independent breeding with these sunflowers as possible under plant variety protection might be hampered or even made impossible.

⁹ <http://www.no-patents-on-seeds.org/en/information/news/no-patents-breeding-animals>

¹⁰ <http://www.testbiotech.de/node/584>

Example 1: Syngenta proprietary claims

You have purchased an Oleic Sunflower variety: Important notice: The use of this product is restricted. [...] By opening and using this bag of seed, you confirm your commitment to comply with these use restrictions. This product [...] is proprietary to Syngenta Crop Protection AG or its licensors and is protected by intellectual property rights. Use of the seed in this package is limited to production of a single commercial crop of forage, fiber or grain for food or feed. Unless expressly permitted by law, use of the seed for producing seed for re-planting, research, breeding, molecular or genetic characterization or genetic makeup is strictly prohibited.

Since Syngenta does not hold patents on sunflowers, it might be that Syngenta holds licences on the patents of other institutions such as EP 1185161 held by Consejo Superior de Investigaciones Cientificas in Spain (see above) and applies these to restrict other breeders from using the material.

Syngenta is not actually saying which kind of IPR protects the seeds, hence overtly intimidating breeders and stopping them from using the seeds for further breeding. If the IPR in question comes under plant variety protection then breeders would be free to use the seeds for further breeding because this is expressly permitted by law. If the IPR in question is a patent then the seeds probably could not be used for further breeding, at least in some countries. By not revealing the kind of IPR, Syngenta is creating a very tricky situation for breeders.

Example 2: Pioneer HiBred proprietary claims

By opening this bag [...] you agree with the terms set hereafter:

The material contained in this [...] seed sample is proprietary and owned by or licensed to Pioneer Overseas Corporation ("Pioneer") [...] The Recipient acknowledges that he does not acquire ownership of this material.

The Recipient expressly undertakes:

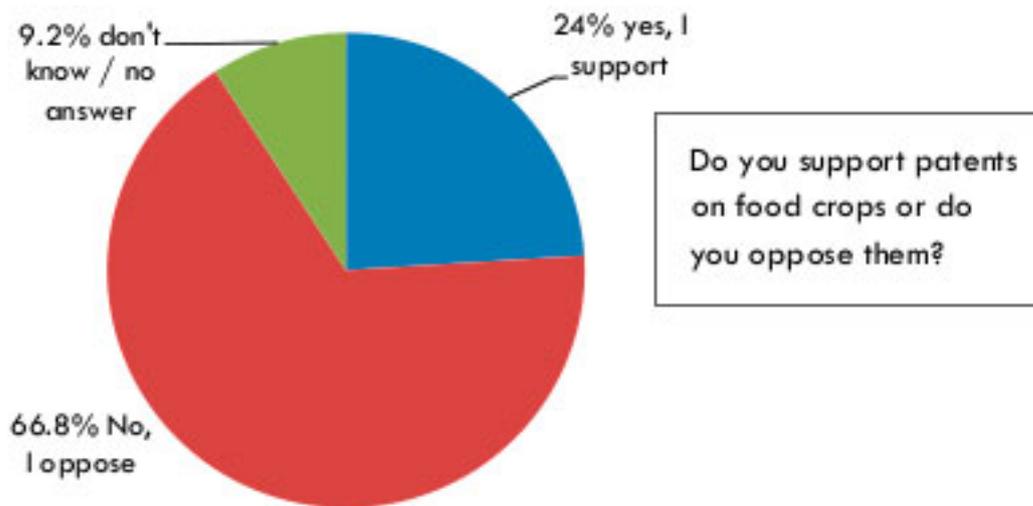
- *To sow all the seed supplied by Pioneer exclusively on Recipient's own farmland.*
- *Not to sell, transfer or use the seeds, plants, pollen of plants or grain for breeding, research and unauthorised reproduction, or otherwise assign or distribute to any third party. However, the harvested grain may be fed to livestock on the Recipient's farm or sold as grain in accordance with applicable rules and regulations.*
- *Not to use, nor allow any third party to use the seeds, plants, parts of plants, pollen or seed produced from these seeds for the purpose of plant breeding.*
- *Not to apply, nor allow any third party to apply, any biotechnological process(es) to the seeds, plants, parts of plants, pollen or grains produced from these seeds. "Biotechnological process" includes, but is not limited to, the isolation of genes, genetic or protein fingerprinting techniques, tissue culture, mutagenesis or transformation. [...]*

In the light of possible restrictions imposed by patent law, Dutch and German breeders as well as the *European Seed Association* have repeatedly voiced their concerns that access to biological resources needed for plant breeding will be particularly hampered if patents are granted on conventional breeding.¹¹

¹¹ See for example: http://www.no-patents-on-seeds.org/sites/default/files/news/louwaars_en.pdf,
http://www.bdp-online.de/de/Ueber_uns/Our_positions/BDP-Positionspapier-Patentschutz_2011-03-23.pdf

9. How patents concern consumers

As opinion polls in Norway¹² and Switzerland, carried out with the support of *No Patents on Seeds*, show, the majority of consumers object to patents on food plants. According to the recent opinion poll, two thirds generally oppose the patenting of food crops. 68% would like patented fruit and vegetables in stores clearly labelled as such and nearly 50% would refrain from buying these products.



Outcome of opinion poll amongst Swiss consumers.¹³



At the same time, the first patented vegetables are entering the European market. For example, patented broccoli is being sold as Beneforte in license with Monsanto (EP 1069819) at UK supermarkets.

Another product that might also be patented is a broccoli produced by Seminis (a subsidiary of Monsanto) which is called Bellaverde. Consumers in the UK found this product for sale at the retailer Waitrose, a controversial debate evolved in the internet.¹⁴

In the Netherlands, breeders started legal proceedings to gain access to patented cress plants (EP1290938). In the first instance, Dutch breeders were successful in the Dutch national court and the patent was patent revoked in February 2012.

¹² <http://www.utviklingsfondet.no/om-oss/presse/pressemeldinger/nordmenn-vil-ikke-ha-matpatent/>

¹³ http://www.evb.ch/cm_data/Survey_result_patents_on_food_crops.pdf

¹⁴ <http://www.thegrocer.co.uk/fmcg/fresh/fruit-and-veg/waitrose-hit-by-facebook-fury-over-broccoli-link-to-biotech-giant/225940.article>

In 2011, Syngenta published a first list of their patents on marketed vegetable and conventional plants. The result is surprising: The list as published on-line (and pictured here)¹⁵ not only shows that several food plants are affected by patents, but also plant varieties.

These patents are clearly in conflict with both prohibitions in Article 4 of Directive 98/44/EC, since they cover plant varieties and conventional breeding.

These examples show that current EPO practise is not compliant with the intention of the provisions in the European Directive.

There are good reasons why consumers are concerned: Without such patents, other breeders could further improve plants such as broccoli and consumers would

have a much wider choice of products from several producers. The patents will stifle further breeding developments, prices of food are likely to increase, choice will be restricted and further improvements in growing even better food crops will be hampered.

Food derived from animals will be affected if this development is not halted. For example, one Monsanto patent application WO 2009097403 claims:

“a pork product for human consumption ...” (claim 1), “(...) consisting of bacon, ham, pork loin, pork ribs, pork steaks (...)” (claim 18), “A method of producing pigs comprising: a) providing a nutritious composition (...), b) feeding said nutritious composition to at least one pig; and c) producing progeny from said at least one pig ...” (claim 34).

In times when nearly a billion people are starving, it is simply immoral to artificially increase prices of foods through patent monopolies. Companies such as Monsanto will be attempted to turn food resources into financial ventures, if patents on plants and animals are granted.

Vegetable Crop	Technology	Syngenta Variety	Patent Number	Standard Terms
Brassica	TopRes® clubroot resistance	Clarify and Clapton (Cauliflower), Tekila, Kilazol, Kilaton and Kilaxy (White cabbage), Crispus (Brussels sprout)	EP1525317	Cauliflower € 2.20 / ks Cabbage € 2.60 / ks Brussels sprout € 1.70 / ks
Cucurbits	Fusarium resistant melon	Godiva, Pendragon, Ectorius	EP2164970	5%
Cucurbits	CMV resistant Cucurbita plant	Topazio, Pascola	EP1973397	5%
Solanaceae	Pepper having extended storability on plant	Rapido	EP1553817	5%

15 <http://www.sg-vegetables.com/licensing/about/3-overview-of-technologies>

10. Stakeholders see need for change

On 8 February 2012, *No Patents on Seeds* organised a public debate at the European Parliament in Brussels, hosted by MEPs from three different political groups.

Speakers included representatives from the various sectors along the food chain – starting with seed breeders and farmers, up to the food processing industry. The picture that emerged was that all sectors rejected the patents and of a common understanding that changes are urgently needed.

Below are some of the documented statements from different stakeholders.

Seed sector

The seeds sector was represented by Plantum, the Dutch seeds breeders association. Plantum stressed the fact that the seeds industry needs IPRs, but there has to be a balance between IP protection and access to breeding material. According to Plantum, this balance – expressed in the provisions of the “breeders’ rights” – had been severely disturbed by patents. Plantum is calling for an urgent re-balancing. Such a re-balancing could be achieved by restricting the patentability of plants and varieties and by limiting the scope of patents. *“National seed associations such as Plantum and the European Seed Association have developed clear positions about the need for such re-balancing.”* In addition, Plantum is strongly endorsing an EU wide breeders’ exemption. The German plant breeders association, BDP, and the *European Seed Association*, ESA, have repeatedly voiced similar opinions.

Farmers

COAG, the largest Spanish farming association, presented the farmer’s point of view. COAG pointed out the need for a clear restriction in patent law: “While Directive 98/44 formally prohibits patents on plant varieties, the Directive in fact extends the patent protection over a gene to any biological complex in which a gene (or a technique) expresses a role. What is needed is a clear legal prohibition on the patenting of all life and especially on plants and farm animals, in the reproduction processes, biological materials and foods derived. Therefore we call on the EU institutions to protect the farmers’ and ranchers’ interests by clear legal rules that exclude patents on plants and animals.”

These concerns are also echoed by many other farmers’ organisations in Europe e.g. the German Farmers’ Association, DBV. The European farmer organisation COPA-COGECA, in an older but still valid position paper very similar states: *“It is clear that the legal decisions of the European Patent Office have revealed the deficiencies of the Directive for plants. It is now time for a political decision to remedy them. COPA and COGECA request the Commission to make proposals for amendments to Directive 98/44 EC which will solve the urgent problems facing agricultural producers.”* (Position paper 25 April 2002)

Food industry

Mars Inc., a major global player in the food and pet-food sector and one of the largest chocolate producers, has actually acted to prevent patents on cocoa. In 2010, the company (together with the US Department of Agriculture, and IBM) had the plant gene-sequenced and immediately put the result into the public domain – to prevent any form of patenting.

The reason behind is to make sure that all can benefit from the knowledge, and that scientists can immediately begin using the findings to improve their traditional methods of cultivation, demonstrating the role business can play in addressing global issues.

Development organisations

Misereor, the development organisation of the German Catholic Bishops, stressed the fact that creating monopolies in the food sector causes severe problems for farmers and food security especially in poor countries.

Patent monopolies on seeds and animals are a threat to global food security. Farmers in developing countries lose the rights to their own seeds through such patents. Patents on seeds can also make farming more expensive and thus aggravate the global food situation. Patenting of seeds does not protect an invention, but protects the greed of international companies. What we need is the exact opposite to patents – the unrestricted access to seeds! Locally adapted varieties will also help confront the effects of climate change. Instead of patents and limitations we need more participation and inclusion of the farmers.

Patent experts

From a legal point of view, Prof. Fritz Dolder from the Faculty of Law at the University of Basel, described what he termed as “the fine art of avoiding patent prohibitions” by industry and the EPO. Prof. Dolder presented a list of “tricks” inventors and patent applicants can use to easily circumvent any patent prohibition.

Examples:

- 1. Cutting-off: If a breeding process as a whole is barred from being patented under Art. 53 b) since it contains conventional (i.e. biological) steps, the skilful inventor will cut off the critical steps and will draft a patent claim containing only non-critical technical steps (but so-called technical bottlenecks) which will nevertheless allow to monopolise the whole process.*
- 2. Avoiding species-specific claims for plants: If a transgenic plant variety is excluded from patenting, the skilful inventor will draft his claims not species-specific and will thereby cover a (great) number of plant species in which he is not even interested.*

To remedy these obviously unintended legal loopholes Prof. Dolder suggested the “whole content approach”:

To prevent the far too easy avoidance of patenting prohibition of Art. 53 b, EPC & Art. 4, Dir 98/44 EC, in the future it is recommended to add a new paragraph to both articles stating that the whole content of the technical teaching of an invention should be considered (whole content approach) including the inevitable technological context of the invention, and not only the skilfully drafted claims (claims only approach):

- *For evaluating the patentability of an application under this article the whole content of the invention will be considered.*

- *In the same way contents of the invention which are not explicitly disclosed will be considered for evaluating patentability, such as inevitable pre-treatment steps, unavoidable consequences and exclusive and unavoidable uses.*

The broadening to pre-treatments, consequences and unavoidable uses is recommended to prevent applicants from concealing and cutting off potentially critical steps (contents) of their inventions in order to circumvent patenting prohibition.

11. Conclusions and recommendations

In conclusion, current interpretation of the existing prohibitions in European patent law does not provide the necessary legal certainty and clarity. Patents on conventional breeding are still being granted. The scope of the claims is extremely broad and can be expanded over the whole chain of food production.

Modern patent law is in danger of being abused to gain control of resources and products needed for global food production. If conventional breeding is seen as patentable, the consequences will not only impact farmers and breeders. In patents such those on broccoli, tomato and melons, the food products are within the claims as granted. The main purpose of these patents is not to protect inventions, but to monopolise resources.

If this trend is not stopped, companies such as Monsanto, which not only apply for patents, but also have the economic resources to access and dominate markets, will be able to decide which seeds are used in agriculture, which products are available for the food market and which prices will be paid by farmers, food producers and consumers.

In the light of this development, the *No Patents on Seeds* initiative is urging clarification in European patent law to exclude patents on

- **plants and animals**
- **breeding material**
- **processes for breeding**
- **selecting of plants and animals for breeding purposes**
- **food and other products derived from plants and animals**

Christoph Then & Ruth Tippe
www.no-patents-on-seeds.org

March 2012



UTVIKLINGSFONDET
 THE DEVELOPMENT FUND • EL FONDO DE DESARROLLO



MISEREOR
 • IHR HILFSWERK

