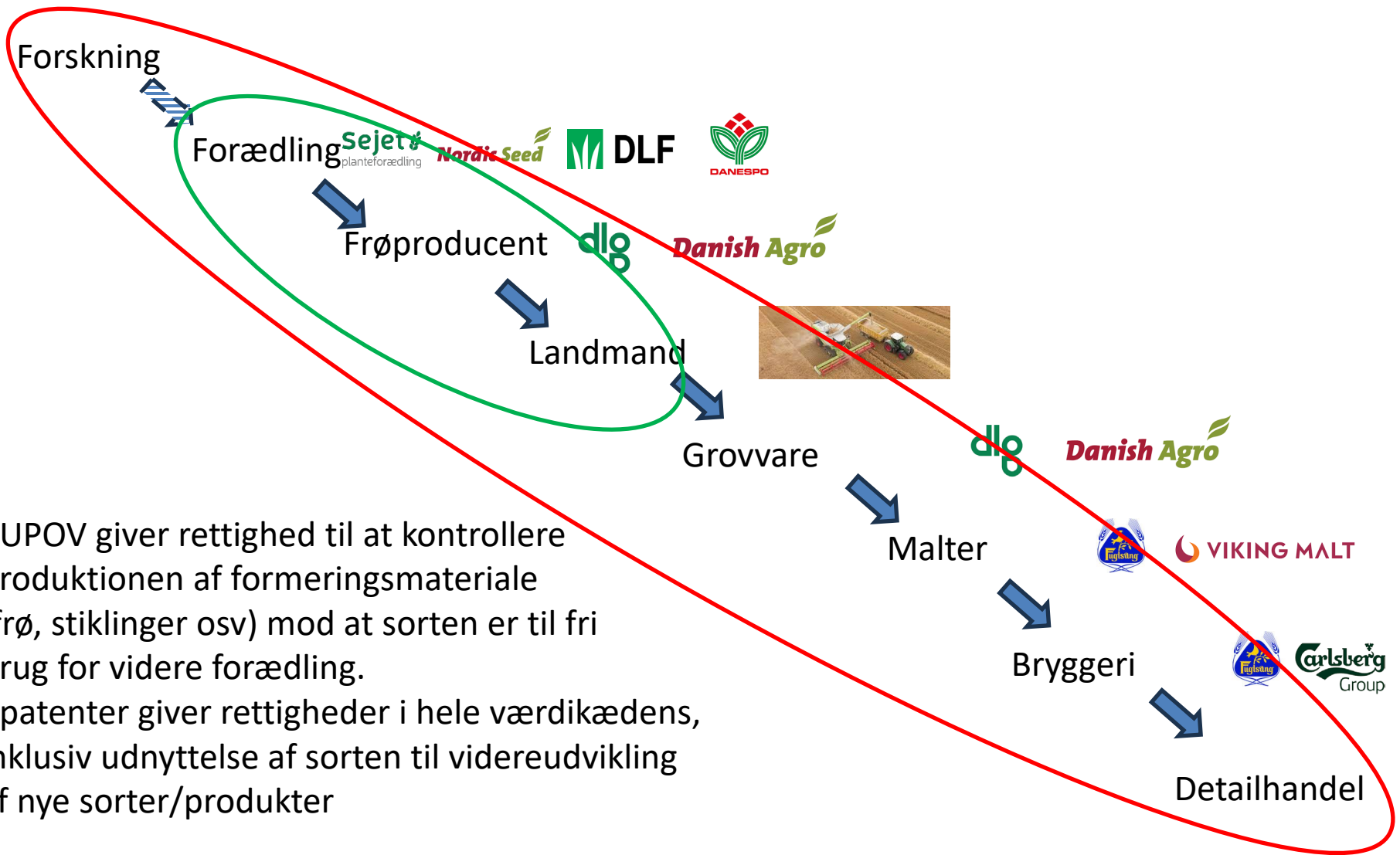




Patenter, sortsbeskyttelse og IP-rettigheder



PVR(UPOV) vs patentering i værdikæden



- UPOV giver rettighed til at kontrollere produktionen af formeringsmateriale (frø, stiklinger osv) mod at sorten er til fri brug for videre forædling.
- patenter giver rettigheder i hele værdikædens, inklusiv udnyttelse af sorten til videreudvikling af nye sorter/produkter



PVR(UPOV) vs patentering

2 systemer – begge IP!!

Patenter;

- Belønner en **teknisk** løsning på et problem.
- Gælder for produkter og metoder (og brug af metoder)
(feks specific egenskab eller locus).
- **Forhindrer** andre i at bruge opfindelsen = **monopol** (uden licensaftale).
- **Bred beskyttelse, brede krav mulige; processer + produkter afledt af processen** (“product by process” = plante sorter).

Opfinder definerer hvad der gøres krav på, dvs hvad der skal beskyttes af patentet

PVR;

- Belønner en **indsats** – gjort i en forædlingproces.
- **Beskytter en plantesort som et hele** (dvs den genetiske sammensætning af en organisme).
- **Forædlerundtagelsen (Breeder's Exemption) tillader** tredjeparter at bruge en beskyttet sort til videreudvikling – af feks nye sorter.
- **Beskyttelsen gælder kun den eksakte sort (og/eller forældre ved hybrider).**

UPOV definerer hvad der gøres krav på (er beskyttet) = formeringsmateriale (ex frø)



PVR – et (rimelig) simpelt system



g	Afsnit	g	Typografier
<i>DUS Protocol; please mark or state the expression which corresponds best)</i>			
Egenskab Characteristics	Stadie Stage	Udtryk Expression	Eksempel sorter Example Varieties
4.1 (28) Dyrkningsform Seasonal type		Vinterform / Winter type Alternativ / Alternative Vårform / Spring type	Taget;- Noveta;- -; Alexis
4.2 (3) Blad (nedre): Bladskedebehåring Lowest leaves: hairiness of leaf sheaths	25-20	Uden / Absent Med / Present	Marylin; Alexis Pastoral; Ceres
4.3 (7) Aks: Skridning (første synlige småaks på 50% af aks, anfør skridningsdagen for kandidaten og to velkendte sorter) Time of ear emergence (first spikelet visible on 50% of ears; quote mean date of heading of variety as well as of two well known comparable varieties)	50-52	Kandidatsort: Kendt sort: Kendt sort:	Dato for Skridning Time of Ear Emergence
4.4 (8) Stak: pigment Awns: intensity of anthocyanin coloration of tips	60-65	Uden eller er meget svag / absent or very weak Weak / svag Medium / medium Stærk / strong Meget stærk / very strong	Monika;- Rebelle; Berenice Fedora; Alexis Susj; Atem Frolic; Beate
4.5 Plante: højde (strå og aks incl. ...)	80-92		Plantehøjde, cm

4. februar 2022 / February 4th 2022



„I rette vedkommende

Hermed bekræftes, at vinterbyg SJ 168270 (Aros) anm. nr. 33329, er godkendt af Plantenyhedsnævnet for så vidt angår VP og SES, og at navnet er i godkendelsesproces.

Såfremt vi ikke får indsigelser på navnet, vil SJ 168270(Aros) anm. nr. 33329 blive optaget på sortlisten pr. 1. april 2022.

To whom it may concern

Hereby confirmation that winter barley SJ 168270 (Aros) our ref. 33329 has been approved by the Danish Plant Novelty Board regarding DUS and VCU.

The name proposal "Aros" was published in the Danish Gazette in January, and will be approved April 1st if we do not receive objections before this date. At the same time Aros will be added to the Danish National List.

Med venlig hilsen/Kind regards

Kristian Knudsen
Kristian Knudsen
HR- og økonomikordinator / Head of Administration
TystofteFonden



CERTIFICATE ON THE GRANT OF COMMUNITY PLANT VARIETY RIGHTS

THE COMMUNITY PLANT VARIETY OFFICE HEREBY ACKNOWLEDGES THE GRANT OF COMMUNITY PLANT VARIETY RIGHT BY ITS DECISION N° EU 62527 OF 17 OCTOBER 2022 TAKEN IN ACCORDANCE WITH COUNCIL REGULATION (EC) N° 2100/94 ON COMMUNITY PLANT VARIETY RIGHTS, WITH EFFECT FROM THE DATE OF THE DECISION REFERRED TO ABOVE, FOR

Sejet Planteforædling I/S

BEING DOMICILED OR HAVING HIS SEAT OR ESTABLISHMENT IN

**Nørremarksvej 67
DK - 8700 Horsens**

AS HOLDER OF THIS RIGHT, IN RESPECT OF THE VARIETY OF *Hordeum vulgare* L. BEARING THE DESIGNATED DENOMINATION:

'Aros'

FOR A PERIOD EXPIRING ON **31 DECEMBER 2047** AT THE LATEST.

THE COMMUNITY PLANT VARIETY RIGHT HAS UNIFORM EFFECT WITHIN THE TERRITORY OF THE EUROPEAN COMMUNITY AND MAY NOT BE TRANSFERRED IN RESPECT OF THIS TERRITORY OTHERWISE THAN ON SUCH UNIFORM BASIS. IT CAN BE EXERCISED AND ENJOYED BY THE HOLDER IN ACCORDANCE WITH COUNCIL REGULATION N° 2100/94 ON COMMUNITY PLANT VARIETY RIGHTS.

THIS ACKNOWLEDGEMENT DOES NOT AFFECT THE REQUIREMENT OF THE HOLDER TO PAY THE FEES DUE FOR EACH YEAR OF DURATION OF THE COMMUNITY PLANT VARIETY RIGHT.



Patenter – lidt mere kompleks godkendelse

- Ansøgningsproces mere usikker mht til tidsramme grundet flere muligheder for indsigelser fra tredjepart.
 - MEN – beskyttelse starter fra ansøgningstidspunktet.
- Dvs er bagudrettet hvis patentet udstedes!



(12) EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent: **15.06.2022** Bulletin 2022/24

(51) International Patent Classification (IPC):
A01H 1/04 (2006.01) C12Q 1/68 (2018.01)
C12N 9/14 (2006.01) C12N 15/82 (2006.01)

(21) Application number: 18169122.1

(52) Cooperative Patent Classification (CPC):
C12N 15/8255; A01H 1/04; C12N 9/0071;
C12N 15/8216; C12Q 1/6895; C12Y 114/13088;
C12Q 2600/156

(22) Date of filing: **24.04.2018**

(54) **PLANTS WITH IMPROVED DIGESTIBILITY AND MARKER HAPLOTYPES**
PFLANZEN MIT VERBESSERTER VERDAULICHKEIT UND MARKERHAPLOTYPEN
PLANTES À DIGESTIBILITÉ AMÉLIORÉE ET HAPLOTYPES MARQUEURS

4 years from application to grant



(12) EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent: **03.01.2018** Bulletin 2018/01

(51) Int Cl.:
C12N 15/82 (2006.01) C12N 9/02 (2006.01)
A01H 5/08 (2018.01)

(21) Application number: 12155889.4

(22) Date of filing: **30.01.2008**

10 years from application to grant

(54) **Disease resistant plants**
Krankheitsresistente Pflanzen
Plantes résistantes aux maladies



UPOV

UPOV MISSION STATEMENT

“To provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society”

CONDITIONS FOR GRANTING A BREEDER'S RIGHT

Criteria to be satisfied

- NOVELTY
- DISTINCTNESS
- UNIFORMITY
- STABILITY
- VARIETY DENOMINATION
- FORMALITIES
- PAYMENT OF FEES

Authorization of breeder required for:

- Production or reproduction (multiplication)
- Conditioning for the purpose of propagation
- Offering for sale
- Selling or marketing
- Exporting
- Importing
- Stocking for any of the above purposes

.... for any protected variety

EXCEPTIONS TO THE BREEDER'S RIGHT

Compulsory

Acts done:

- privately and for non-commercial purposes
- for experimental purposes
- breeding other varieties (breeder's exemption")

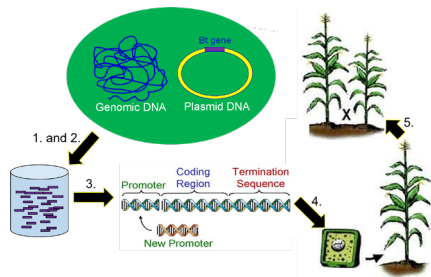
Optional

Farm-saved seed



Forskellige former for patenter;

Men – patenterbare opfindelser skal være *man-made* og tekniske.



I en **transgen plante** er det kodende DNA designet og lavet udenfor Organismen og indsat af et menneske – **resultatet er derfor patenterbart.** den “begrænsede forædlerundtagelse” (limited breeders exemption) giver ret til krydsning og selection men ikke markedsføring.



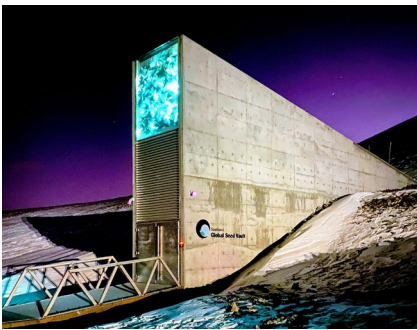
I en **mutateret plante** hvor mutationen er frembragt ved menneskelig handling – feks ved brug af EMS, radioaktive stråler, Crispr osv – er **resultatet derfor patenterbart.**

den “begrænsede forædlerundtagelse” (limited breeders exemption) giver ret til krydsning og selection men ikke markedsføring.



Forskellige former for patenter;

Men – patenterbare opfindelser skal være *man-made* og tekniske.



Hvad så med **genetiske ressourcer** (feks genbanken og arboretetet)?

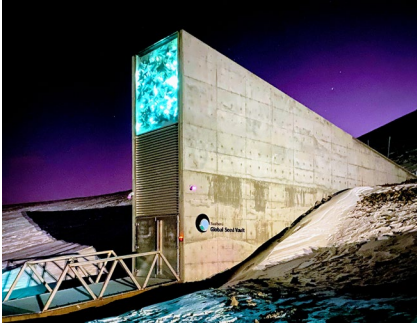
Ifølge regel 28 I EPC "(2) Under Article 53(b), European patents shall not be granted in respect of plants or animals exclusively obtained by means of an essentially biological process (EBP)."
(hvis ansøgningen er indsendt efter 1 juli 2017!)

Non-EBP = "...is the result of a technical process exceeding mere crossing and selection." (EPO guidelines, p. 754).

Betyder det så at **genetiske ressourcer** er "sikre"? At de er ikke-patenterbare?



”Product by process” / procespatenter



NEJ – for en (teknisk) proces kan patenteres, og derefter kan der gøres krav på det produkt der er et resultat af processen!

“The technical method of production of the plant or animal may be included in the claims, in the form of product-by-process claims” (EPO guidelines, p. 756)

“Processes for selecting plants or animals using genetic molecular markers without crossing the plants or animals are not excluded from patentability. Technical means, such as genetic molecular markers, used in such processes are not excluded, either.” (EPO guidelines, p. 758).

“Plant products that are not propagation material, such as flour, sugars or fatty acids, have to be considered on the basis of their chemical properties only. Thus provided the general patentability requirements are fulfilled, it will not be relevant whether the subject-matter (e.g. a sugar molecule) is isolated from a product (e.g. a living plant) of an essentially biological process or is produced in a laboratory.” (EPO guidelines, p. 756)



”Product by process”- i praksis...

(19)



(11)

EP 3 560 330 A1

(12)

EUROPEAN PATENT APPLICATION

(43)

Date of publication:
30.10.2019 Bulletin 2019/44

(51) Int Cl.:

A01H 1/04 ^(2006.01) *C12Q 1/68* ^(2018.01)
C12N 9/14 ^(2006.01) *C12N 15/82* ^(2006.01)

(21)

Application number: **18169122.1**

(22)

Date of filing: **24.04.2018**

(84)

Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB

(72) Inventors:

KLOPPER, MATZ, Moritz

FIELD OF THE INVENTION

- 5 **[0001]** The invention relates to quantitative trait loci (QTL) and associated markers involved in and/or associated with improved digestibility of plants and plant parts, such as maize. The invention further relates to uses of such QTL or markers for identification and/or selection purposes, as well as transgenic or non-transgenic plants.

37574 Einbeck (DE)

37574 Einbeck (DE)

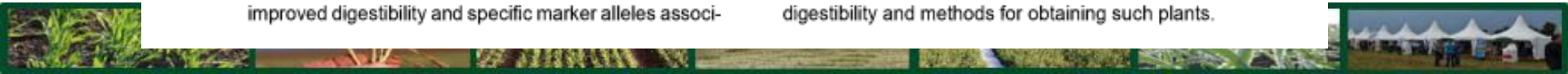
(54)

PLANTS WITH IMPROVED DIGESTIBILITY AND MARKER HAPLOTYPES

(57)

The present invention relates to plants, such as maize, sorghum or sugar cane, having improved digestibility, in particular improved stover digestibility. The present invention relates to a QTL allele associated with improved digestibility and specific marker alleles associ-

ated with the QTL allele. The present invention further relates to such plants, wherein the F35H gene is mutated or wherein F35H expression is altered. The invention also relates to methods for identifying plants having improved digestibility and methods for obtaining such plants.



”Product by process”- i praksis...

EP3560330B1 PLANTS WITH IMPROVED DIGESTIBILITY AND MARKER HAPLOTYPES

1. A method for identifying a maize plant or plant part from maize having improved digestibility comprising
 - a) screening for the presence of a QTL allele, such as a QTL allele associated with improved digestibility, said QTL allele comprising a nucleotide sequence of a gene encoding a cytochrome P450 flavonoid 3',5'-hydroxylase (F35H), having a mutation leading to reduced or absent expression of the mRNA of the gene and/or the F35H

Dvs der gøres ikke krav på selve (majs) planten med forbedret fordøjelighed
- der gøres krav på **processen** til at **identificere** denne plante, med øget fordøjelighed på grund af favorabelt allel/QTL af F35H, i nævnte position.



”Product by process”- i praksis...

2. The method according to claim 1, wherein the method comprising screening for the presence of the molecular marker allele of ma61134xxx and/or one or more molecular marker alleles located in a chromosomal interval on chromosome 9 flanked by marker alleles ma61070s01 and ma30168s02, preferably by marker alleles ma50827s01 and ma16983s02, more preferably by marker alleles ma17117s01 and ma61125s01;

Dvs der gøres krav på planter der er fundet ved af hjælp DNA markører i intervallet fra og med ma61070s01 til og med ma30168s02

ma61070s01 = pos 121588825 bp

ma30168s02 = pos. 139452428 bp

= > 17.863.603 bp = ca 10% kromosom 9!



”Product by process”- i praksis...

3. A maize plant or plant part from maize having improved digestibility comprising
- a) a QTL allele associated with improved digestibility, said QTL allele comprising a nucleotide sequence of a gene encoding a cytochrome P450 flavonoid 3',5'-hydroxylase (F35H), having a mutation leading to reduced or absent expression of the mRNA of the gene and/or the F35H protein, or a mutation leading to a non-functional F35H protein or an F35H protein having reduced enzymatic activity upon translation; or
 - b)

wherein the unmutated F35H is selected from the group consisting of:

- (i) a nucleotide sequence comprising the sequence of SEQ ID NO: 1;

Krav gældende mere direkte på planter der er muterede i det beskrevne gen –
I tilfælde af nogen valgte at mutere genet eller fandt plante hvor kobling mellem
markør og egenskab var brudt.



”Product by process” - i praksis...

3. A maize plant or plant part from maize having improved digestibility comprising

a) a QTL allele associated with improved digestibility, said QTL allele comprising a nucleotide sequence of a gene encoding a cytochrome P450 flavonoid 3',5'-hydroxylase (F35H), having a mutation leading to reduced or absent expression of the mRNA of the gene and/or the F35H protein, or a mutation leading to a non-functional F35H protein or an F35H protein having reduced enzymatic activity upon translation; or

b)

wherein the unmutated F35H is selected from the group consisting of:

(i) a nucleotide sequence comprising the sequence of SEQ ID NO: 1;

(ii)

wherein the maize plant or plant part from maize is not exclusively obtained by means of an essentially biological process .

Krav gældende direkte på planter der er muterede i det beskrevne gen
– og som er frembragt uafhængigt/parallelt til opfindelsen (disclaimeren)
... hvis man kan bevise at frembringelse/identifikation af planten er sket uden brug (dvs kendskab) til patentet!



”Product by process”- i praksis...

6. A method for improving digestibility of a maize plant or plant part from maize, comprising **introducing through stable or transient integration by means of transformation, insertion using gene editing technology or modification using random or targeted mutagenesis** into the genome of the plant or plant part

(a) a nucleotide sequence of a gene encoding a cytochrome P450 flavonoid 3',5'-hydroxylase (F35H), having a mutation leading to reduced or absent expression of the mRNA of the gene and/or the F35H protein, or a mutation leading to a non-functional F35H protein or an F35H protein having reduced enzymatic activity upon translation, or said method comprising

Krav gældende på selv at mutere det beskrevne gen eller frembringe det vha transgenese .



”Product by process”- i praksis...

13. A method for producing an ensilaged plant material or animal feed having improved digestibility, comprising
- (a) growing the plant according to any one of claims 3 to 5 and 9, or a plant identified or identifiable by the method of claims 1 or 2, or a progeny thereof having the improved digestibility as defined in claim 1,
 - (b) harvesting the plant or a part thereof, and
 - (c) ensiling the plant or a part thereof of (b).
14. The method according to claim 13, wherein the part in step (b) and (c) is stover.
15. An ensilaged plant material or animal feed produced by the method of claim 13 or 14

...og kravene gør sig gældende helt ud i landmandens ensilagestak...



Patenter er dyrere end PVR men;

★- de gælder fra ansøgningstidspunktet,

★- der kan gøres krav gennem hele værdikæden,

⊘- man definerer selv det man gør krav på,

⊘- man kan nøjes med en beskrivelse (modsat PVR der kræver fysisk produkt),

⊘- man kan blokere konkurrenters udvikling på området.



Opformering før godkendelse = ingen rettigheder!?

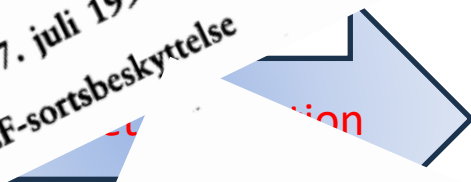


TystofteFonden



SES godkendelse 2+ år

RÅDETS FORORDNING (EF) Nr. 2100/94
af 27. juli 1994
om EF-sortsbeskyttelse



Artikel 95

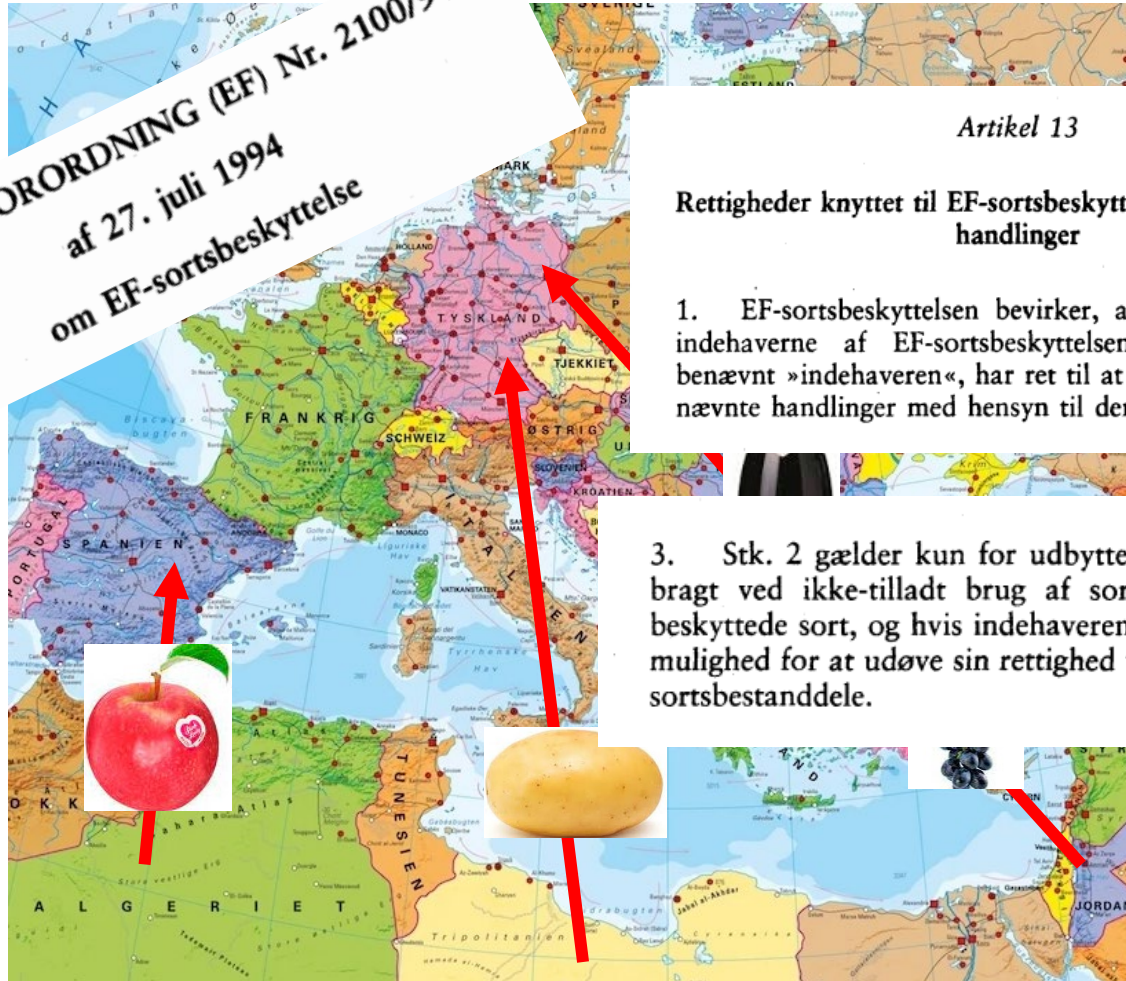
Handlinger inden meddelelse af EF-sortsbeskyttelse
Indehaveren kan kræve en rimelig godtgørelse af enhver, der i perioden fra offentliggørelsen af ansøgningen om EF-sortsbeskyttelse og meddelelsen heraf har foretaget en handling, som efter denne periode ville være forbudt som følge af EF-sortsbeskyttelsen.

sejet
planteforædling



Høst og import fra uautoriseret dyrkning = ingen rettigheder!?

RÅDETS FORORDNING (EF) Nr. 2100/94
af 27. juli 1994
om EF-sortsbeskyttelse



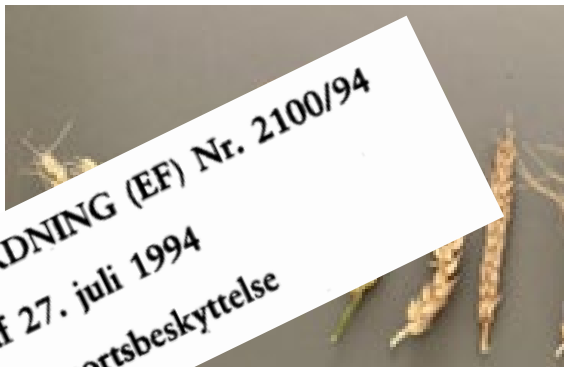
Artikel 13

Rettigheder knyttet til EF-sortsbeskyttelsen samt forbudte handlinger

1. EF-sortsbeskyttelsen bevirker, at indehaveren eller indehaverne af EF-sortsbeskyttelsen, i det følgende benævnt »indehaveren«, har ret til at foretage de i stk. 2 nævnte handlinger med hensyn til den pågældende sort.
3. Stk. 2 gælder kun for udbytte, hvis dette er tilvejebragt ved ikke-tilladt brug af sortsbestanddele af den beskyttede sort, og hvis indehaveren ikke har haft rimelig mulighed for at udøve sin rettighed vedrørende de nævnte sortsbestanddele.

Mutagenese/NGT = planteforædling = sortsrettigheder!?

RÅDETS FORORDNING (EF) Nr. 2100/94
af 27. juli 1994
om EF-sortsbeskyttelse



Artikel 13

Rettigheder knyttet til EF-sortsbeskyttelsen samt forbudte handlinger

1. EF-sortsbeskyttelsen bevirker, at indehaveren eller indehaverne af EF-sortsbeskyttelsen, i det følgende benævnt »indehaveren«, har ret til at foretage de i stk. 2 nævnte handlinger med hensyn til den pågældende sort.

6. Ved anvendelsen af stk. 5, litra a), kræves en sort for i det væsentlige at være afledt af en anden sort, i det følgende benævnt »den oprindelige sort«, når

- a) den i overvejende grad er afledt af den oprindelige sort eller af en sort, som selv i overvejende grad er afledt af den oprindelige sort
- b) den i henhold til artikel 7 er selvstændig i forhold til den oprindelige sort, og
- c) den bortset fra forskelle, som skyldes afledningsprocessen, i det væsentlige er i overensstemmelse med den oprindelige sort med hensyn til forekomsten af de kendetegn, der skyldes den oprindelige sorts genotype eller kombination af genotyper.



1 - Poseidon



3 - Adoniscus
ble Pink



158 - Gaia



PVR billigere og mere simpelt IP:

- transparent IP system (klart hvad der beskyttes),
 - billig ansøgning – for nogen afgrøder,
- fleksibel konvention, mulighed for undtagelser (feks. Artikel 14 om FSS på udvalgte arter, og dir. 2021/1873 om forlænget beskyttelse for visse arter)

... men behov for opdateret i implementering i EU!:

- midlertidig beskyttelse fra ansøgningstidspunkt
 - krav på høst fra uautoriseret brug af formeringsmateriale.
 - forbedret håndhævelse.
 - klar EDV definition.



Planteforædling behøver Beskyttelse og IP (af sorter og formeringsmateriale)

Ikke monopoler
(på egenskaber, gener og metoder)

Tak for opmærksomheden
Rasmus L. Hjortshøj,