

GMO en gewasbescherming: waar trekken we de grens?



**KNPV-najaarsvergadering
in samenwerking met de
COGEM:
discussiemiddag met lezingen**

13 december 2007

Forum-gebouw Wageningen Universiteit
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Global Impact of Biotech Crops: Socio-Economic and Environmental Effects in the First Ten Years of Commercial Use

Graham Brookes and Peter Barfoot

PG Economics Ltd., Dorchester, UK

Genetically modified (GM) crops have now been grown commercially on a substantial scale for ten years. This paper assesses the impact this technology is having on global agriculture from both economic and environmental perspectives. It examines specific global economic impacts on farm income and environmental impacts of the technology with respect to pesti-

CORRESPONDENCE

screened for unwanted changes in a similar way as plants derived from mutagenesis are screened and selected. Mutation breeding has led over the past 70 years worldwide to more than 2,250 plant varieties, derived either as direct mutants or from their progenies¹. Mutagenesis has led to undirected mutations and translocations. Release of mutation-derived varieties does not require molecular characterization of the mutations involved. Although these numerous mutation-derived plant varieties have been produced and used for food, feed or as ornamentals in more than 30 countries for several decennia¹, we are not aware of indications that the underlying but unknown mutations, after selection of the variety, have caused damage to the environment or have caused adverse effects on consumers or livestock². This provides circumstantial evidence that the phenotypic screening and selection, which are the rule in plant breeding programs, in combination with other conventional selection procedures before introduction of varieties onto the market, have been sufficient to reduce risks of unknown mutations in plants to an acceptable low level. The same process of screening and selection will be the rule for development of cisgenic varieties.

Considering the equivalence of products resulting from cisgenesis and traditional breeding including mutation breeding, we propose that cisgenic plants should be excluded from GMO regulations. Cisgenic plants should in our view be handled at the regulatory level like traditionally bred plants (that is, those created via long-standing cross breeding, *in vitro* fertilization, polyploidy induction, protoplast fusion between crossable species and mutagenesis with chemicals or irradiation). Given that an increasing number of functional genes from crops and their crossable wild relatives are being isolated and can readily be used to create cisgenic plants, the time to act is now.

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1. Aklonis, B.S., Maluszynski, M. & Nichterlein, K. *Euphytica* 135, 187-204 (2004).

2. Harton, A.W. *Mutation Breeding: Theory and Practical Applications*. (Cambridge University Press, Cambridge, UK, 1998).

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viewpoint

Cisgenic plants are similar to traditionally bred plants

International regulations for genetically modified organisms should be altered to exempt cisgenesis

Henk J. Schouten, Frans A. Krens & Evert Jacobsen

Do cisgenic plants warrant less stringent oversight?

To the editor:

While the debate continues on the appropriate level of regulatory oversight for transgenic plants, we believe there are strong reasons for legislators to differentiate cisgenic from transgenic plants. A cisgenic plant is a crop plant that has been genetically modified with one or more genes (containing introns and flanking regions such as native promoter and terminator regions in a sense orientation) isolated from a crossable donor plant. In contrast, transgenic plants contain foreign genes (e.g., a selection marker gene originating from a microorganism) from noncrossable organisms, synthetic genes or artificial combinations of a coding gene with regulatory sequences, such as a promoter, from another gene.

To date, the majority of established genetically modified organism (GMO) regulations worldwide has not discriminated cisgenic from transgenic plants. This may be because until now cisgenic plants have been almost absent in applications for approval of deliberate release of transgenic plants into the environment. Only in Canada, which has a product-based regulation rather than a process-based regulation, might cisgenic

plants be treated less stringently than transgenic plants.

In our view, cisgenic plants are fundamentally different from transgenic plants. In the case of cisgenesis, a foreign gene is introduced into a plant. A transgenic plant may have a phenotypic trait that did not occur before in that species and its crossable relatives. Such a novel trait can affect fitness in ways new to the species. Gene flow to wild relatives could potentially extend this fitness effect. This may lead to increased invasiveness of the transgenic crop or its relatives.

In contrast, for cisgenesis, the introduced gene of interest with its native promoter has already been present in the species or in crossable relatives for centuries. Therefore, cisgenesis does not add an extra trait. It does not invoke a fitness change that could not also occur through traditional breeding or in nature. The same holds true for other environmental risks, such as effects on nontarget organisms or soil ecosystems, and for usage in food or feed. As a result, deliberate release of cisgenic plants into the environment is as safe as the deliberate release of traditionally bred plants.

As the process of genetic modification itself may lead to mutations and rearrangements, cisgenic plants should be

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1. 'Cisgenic' as a product designation

David Schubert, David Williams

CONTEXT: ...in the July issue (Nat. Biotechnol. 24, 753, 2006) and a publication in EMBO Reports in August, Henk **Schouten**, Frans Krens and Evert Jacobsen discuss a new category of genetically engineered (GE) crop plants known as cisgenics. A...

Nature Biotechnology 24, 1327 - 1329 (01 Nov 2006) Correspondence

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2. 'Cisgenic' as a product designation

Tjard de Cock Buning, Edith T Lammerts van Bueren, Michel A Haring, Huib C de Vriend, Paul C Struik

CONTEXT: ...genes used to genetically modify the plant are different. This difference has been exploited in two articles by **Schouten** et al. to suggest that cisgenic plants pose fewer environmental risks, evoke less moral objection and should...

Nature Biotechnology 24, 1329 - 1331 (01 Nov 2006) Correspondence

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3. 'Cisgenic' as a product designation

L. Val Giddings

CONTEXT: To the editor: In their recent articles in July issue (Nat. Biotechnol. 24, 753, 2006) and EMBO Reports, **Schouten** et al. propose a rationale for a new subcategory of genetically modified (GM) plants. This new category should, in their...

Nature Biotechnology 24, 1329 - 1329 (01 Nov 2006) Correspondence

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4. Reply to 'Cisgenic' as a product designation

CONTEXT: **Schouten** and colleagues respond: Schubert and Williams contend that genetic engineering is a highly mutagenic and imprecise process, an argument that they have previously touted in a correspondence to this journal relating to an article...

Nature Biotechnology 24, 1331 - 1333 (01 Nov 2006) Correspondence

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5. Do cisgenic plants warrant less stringent oversight?

Henk J. Schouten, Frans A. Krens, Evert Jacobsen

Nature Biotechnology 24, 753 - 753 (01 Jul 2006)

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Geen herhaling!
De aflevering 'Onderzoek op de grens van de dood' wordt zaterdagochtend 27 oktober niet herhaald.

Leven met Alzheimer
Leven met dementie in beeld gebracht. Verschijnt in januari. dvd
€ 14,95

netwerk

Het Elfde Uur live meemaken?
Meld je nu aan!

Gentech, gaat nooit meer weg
dinsdag 16 oktober 2007 om 22:57



Jarenlang zijn we bang gemaakt met de komst van 'Frankenstein-voedsel', waarin genetisch gemanipuleerde ingrediënten zaten. Inmiddels zijn we heel wat jaren verder en staan producten met genetisch gemodificeerde ingrediënten opvallend in de supermarktschappen. Hoe ver is de wetenschap in het veilig genetisch modificeren? Stichting Greenpeace huijvert bij de gedachte aan alle initiatieven op het gebied van gentechnologisch voedsel. Genetische modificatie is volgens Greenpeace oncontroleerbaar, onvoorspelbaar en onomkeerbaar. Presentator Reinier van den Berg duikt in de wereld van de genetisch ontworpen appel. Hij probeert in deze aflevering antwoord te krijgen op de vraag 'Is de weg van genetische modificatie nou alleen goed voor commerciële doeleinden? Of hebben we er als mens ook echt baat bij?'

video

1 reacties

Reacties

Nienke, 30 oktober 2007 18:26 uur
In de uitzending op tv.. was er ook als laatst een stuk waar ze medicijnen uitmaakte.. maar op dat filmpje zie dat niet

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Wetenschap

Nieuw zaad past niet in oude wetten

Gepubliceerd: 28 november 2006 00:00 | Gewijzigd: 30 november 2006 16:08

Door onze redacteur **Sander Voormolen**.

Utrecht, 28 nov. Bij nieuwe veredelingstechnieken in de landbouw wordt soms genetische manipulatie gebruikt, maar is het zaaizaad dat eruit voortkomt (en de plant) niet of niet aantoonbaar genetisch gemanipuleerd.

Tijdens een drukbezochte workshop 'Nieuwe veredelingstechnieken en genetische modificatie' gisteren in Utrecht uitten gewasveredelaars hun zorgen over hoe de wetgever omgaat met nieuwe technieken in de gewasveredeling. Het ministerie van VROM organiseerde de bijeenkomst om te leren van de telerspraktijk.

Overzicht - Meer wetenschapsnieuws

De grote vraag is of deze technieken moeten vallen onder de wetgeving die geldt voor genetisch gemanipuleerde organismen (ggo). Europese wetgeving daarover stamt uit 2001. De wet houdt geen rekening met

Staatscourant nr. 228: interview over biotechnologie,

Genetische modificatie van gewassen heeft alles te maken met ethiek

Staatscourant: Gebruik van gebetisch gemodificeerd veevoer heeft nie

Volgens drs. Henk Jan Ormel, namens het CDA woordvoerder biotechn versoepelen. Zo niet, dan is de consequentie van het huidige nultolera 'We moeten in de discussie over genetische modificatie de ethiek losk

- Ronde tafelgesprek met 2e kamerleden en experts op het gebied van Biotech op uitnodiging van VROM over Biotech ter voorbereiding op algemeen overleg 2e kamer – 1 november 2007
- Algemeen overleg van de 2e kamer met ministers van VROM, LNV en VWS over Biotech, waaronder cisgenese, op 15 november 2007
- Algemeen overleg van de 2e kamer over nieuwe technieken in de plantenveredeling op 5 februari 2008



Programma:

13.00 Start inschrijving, koffie en thee

13.30 Dr. Ir. G.H.J. Kema

Opening

13.40 Dr. Ir. F. van der Wilk

Wat is de trend rond GMO's in NL en EU?

14.10 Dr. Ir. G.A. Kleter

Welke effecten hebben GMO's op bestrijdingsmiddelengebruik?

14.40 Prof. Dr. Ir. E. Jacobsen

Onderzoek: Cisgenese rond aardappelziekte en appelschurft

15.10 Pauze

15.30 Dr. Ir B.A. Uijtewaal

Cimbaa als project voor de bestrijding van de *diamondback moth*

16.00 Prof. Dr. Ir. E.T. Lammerts
van Bueren

Co-existentie biologische sector en GG-gewassen mogelijk?

16.30 Ir. J. Buurma

Discussie

17.30 Afsluitende borrel