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KENMERK CGM/260928-01
ONDERWERP Advice Information requirements and environmental risk assessment for NGT plants

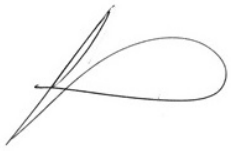
Geachte mevrouw Bertram,

Naar aanleiding van een adviesvraag over de gedelegeerde- en uitvoeringshandelingen van de NGT-wetgeving (Verordening (EU) 2026/1388) van het Ministerie van Infrastructuur en Waterstaat (IenW), deelt de COGEM u het volgende mee. Op verzoek van het ministerie is het advies in het Engels opgesteld.

Samenvatting:
COGEM is gevraagd om te adviseren over de uitwerking van de nieuwe Europese regels voor planten ontwikkeld met nieuwe genomische technieken (NGT's). De NGT-verordening onderscheidt twee categorieën: NGT1-planten, die worden vrijgesteld van ggo-wetgeving, en NGT2-planten, waarvoor een aangepaste milieurisicobeoordeling nodig is.
In dit advies wordt beschreven welke informatie nodig is om aan te tonen dat een plant een NGT-plant is en welke informatie nodig is voor de risicoanalyse van NGT2-planten. Voor alle NGT's moet er worden onderbouwd dat deze uitsluitend door middel van gerichte mutagenese en/of cisgenese zijn geproduceerd, dat geen restanten van vreemd genetisch materiaal aanwezig zijn, en dat bij toepassingen van cisgenese de gebruikte sequenties binnen de conventionele genenpool vallen.
De COGEM adviseert dat voor NGT1-planten in het geval van gerichte mutagenese de gewijzigde en mogelijke off-targetregio's worden gesequenced, dat bij cisgenese de flankerende sequenties worden bepaald, en dat wordt onderbouwd dat geen herbicidetolerantie of insectenresistentie is beoogd.
Voor NGT2-planten adviseert COGEM een casusgerichte beoordeling door een deskundigenpanel, dat op basis van een vooraanmelding bepaalt welke gegevens nodig zijn voor een proportionele milieurisicobeoordeling.

De door de COGEM gehanteerde overwegingen en het hieruit voortvloeiende advies treft u hierbij aan als bijlage.

Hoogachtend,



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Advice on Information requirements and environmental risk assessment for New Genomic Technique (NGT) plants

COGEM advice CGM/260928-01

1. Introduction

COGEM was requested by the Ministry of Infrastructure and Water Management to provide input on the European Commission's (EC) initiative concerning the delegated and implementing acts under Regulation (EU) 2026/1388 on New Genomic Techniques (NGTs).[1] The delegated act concerns the information requirements for demonstrating that a plant qualifies as an NGT plant in general, and as an NGT1 plant in particular. The implementing act concerns the environmental risk assessment and the adapted food and feed safety assessment for NGT2 plants.

In this advice, COGEM sets out which information is required to demonstrate NGT and NGT1 status, and which elements should be included in the environmental risk assessment of NGT2 plants.

2. Background

In April 2026, Regulation (EU) 2026/1388 was adopted,[1] allowing the deliberate release into the environment or placing on the market of NGT plants within the European Union (EU). The techniques that fall within the scope of NGTs comprise targeted mutagenesis and cisgenesis. The Regulation distinguishes between two categories of NGT plants.

First, NGT category 1 plants are limited to modifications that result in changes comparable to those achievable through conventional breeding methods. The limits for this category are defined in Annex I of the Regulation.[1] Any plants that fulfil these criteria are exempt from the obligations of the GMO legislation.[2] Furthermore, plants that are the progeny of NGT1 plants are also considered NGT1 plants.

Second, NGT category 2 refers to plants with genetic modifications that go beyond what is possible through conventional breeding techniques. These plants are modified using targeted mutagenesis and/or cisgenesis but do not fulfil the criteria laid down in Annex I. In addition, any modification that results in herbicide tolerance or the production of insecticidal substances will cause the plant to be categorised as NGT2. The NGT Regulation states that an adapted risk assessment is required for these plants but does not specify in detail which elements should be included in this assessment. The Regulation and its Annex III already provide an outline of the information to be supplied in an NGT2 notification. This includes a tailored risk assessment and the possibility of waiving post-market environmental monitoring.

3. Previous COGEM advice

Over the past few years, COGEM has repeatedly pointed out that the GMO legislation for genetically modified (GM) plants is outdated, and no longer reflects scientific and technological developments, and that changes to the legislation were therefore necessary.[3] COGEM has recommended exempting plants produced through targeted mutagenesis and cisgenesis — but not intragenesis — from the

GMO legislation, because their risk profile is comparable to that of conventionally bred crops.[3,4,5,6] It has also been noted by the COGEM that enforcement of GMO legislation was becoming increasingly difficult as these new techniques are more widely applied. Some genetic modifications can only be detected if they are known in advance and cannot be distinguished from natural mutations.[7,8]

COGEM has previously advised four times on the NGT proposal. In 2023, COGEM observed that the EC proposal was in line with COGEM's earlier recommendations, but that the criteria in Annex I, which aim to distinguish between plants that are and are not comparable to conventionally bred plants[a], required clarification and revision.[9] Later that year, COGEM submitted concrete drafting proposals to improve Annex I.[10] In 2025, COGEM advised on the differences between the positions of the European Parliament and the Council regarding Annex I and on how these relate to COGEM's position. It was noted that both the Parliament text and the Council text would benefit from further clarification.[11] Lastly the COGEM has advised on the compromise text of Annex 1.[12] Again, COGEM noted that the text could benefit from further clarification, but that the risks of NGT1 plants as described in Annex I are comparable to those of conventionally bred plants.

4. Considerations

4.1 Information required to demonstrate that a plant is an NGT plant

In Regulation 2026/1388 an NGT is defined as:

- "'*NGT plant' means a genetically modified plant obtained by targeted mutagenesis or cisgenesis, or a combination thereof, and not containing any genetic material originating from outside the gene pool for conventional breeding purposes that might have been temporarily inserted during the development of that plant.*"

The first requirement concerns the technique used. According to the COGEM, when cisgenesis is used, it is sufficient to demonstrate that the resulting plant contains exclusively sequences that occur within the existing gene pool. Alternatively, an overview can be provided of the methods used to introduce the modification into the plant in enough detail to assess whether the method meets the criteria for cisgenesis. The COGEM suggests that in the case of targeted mutagenesis, an overview of the methods used to introduce the modification should be required.

The definitions of both techniques are provided in the Regulation:

- "'*cisgenesis' means techniques of genetic modification resulting in the insertion, into the genome of an organism, of genetic material already present in the gene pool for conventional breeding purposes;*"
- "'*targeted mutagenesis' means mutagenesis techniques resulting in one or more modifications of the DNA sequence at targeted locations in the genome of an organism;*"

To avoid possible misunderstanding, COGEM advises further clarifying the definition of targeted mutagenesis as follows:

- 'targeted mutagenesis' means mutagenesis techniques resulting in one or more modifications of the DNA sequence at <u>specific</u> targeted <u>sequences</u> in the genome of an organism;

[a] For context: conventional breeding techniques include methods such as in vitro fertilisation, induction of polyploidy, bridge crossing, alongside natural processes.

This clarification ensures that specific sequences must be targeted, rather than broader genomic regions, which may be possible with current or future techniques. One example could be the targeting of DNA that is in a particular chromatin state. Such an approach would "target" part of the genome, but not "target a sequence".

The second requirement concerns the absence of any genetic material originating from outside the gene pool. During transformation, in addition to the intended sequences, unintended sequences can sometimes be integrated, such as fragments of the vectors used. COGEM notes that these potential unintended inserts must therefore be checked for, for example by PCR, to demonstrate that no unintended genetic material is present that would exclude NGT status. In particular, sequences resulting from Agrobacterium-mediated transformation, as well as integrated sequences encoding Cas9 and sgRNA, should be checked for.

Furthermore, where cisgenesis is used, it must be shown that the inserted sequence is present in the gene pool. According to COGEM, the sequence of the insert should be provided, and it should be justified that this sequence is already present in the gene pool. This justification should include literature references describing the successful crossing. COGEM considers it important that the use of sequences from wild relatives within the same genus remains possible, even in the absence of evidence of crossing, provided it is plausible that the species concerned could cross. In the absence of any references to a successful crossing, phylogenetic relatedness can be used as a substitute by showing that both the NGT plant and the wild relative are part of the same (sub)genus. COGEM is of the opinion that this can be shown, either by showing their position in a phylogenetic tree, by referencing any publication classifying them in the same (sub)genus, or by providing evidence of any known possible intermediate crosses.

4.2 Information requirements NGT1 plants

When submitting a plant for verification of NGT1 status, in addition to the information required to demonstrate NGT status, the following information should be supplied according to the COGEM:

- *Any regions modified by targeted mutagenesis must be sequenced and analysed.*

  This confirms the presence of the modification and verifies that any insertions or substitutions do not exceed 20 base pairs in length. Only the region that has been modified has to be sequenced. This also confirms the location of the modification, thereby ensuring that no more than three modifications are present within a single coding sequence.

- *Likely off-targets regions associated with targeted mutagenesis techniques must be sequenced*

  Targeted mutagenesis techniques have the potential to affect off-target regions. In most cases, such regions can be predicted and assigned a likelihood of being affected based on the level of homology. Where likely off-target regions can be identified, sequencing these regions helps to ensure that no additional modifications are present beyond those intended, particularly because such unintended modifications could cause the plant to exceed the limit of twenty modifications for NGT1 plants.

- *In the case of cisgenesis, the flanking regions must be sequenced to confirm the location of the insert.*

This ensures that no endogenous genes have been disrupted by the insertion and that no unintended insertions have occurred elsewhere in the genome that might cause the plant to exceed the limit of twenty modification for NGT1 plants.

- *A description must be provided that no genes known to be involved in herbicide tolerance or in the production of insecticidal compounds are intended to be affected by the modification.*

4.3 Information requirements NGT2 plants

When a notification is submitted for an NGT2 plant, a risk assessment must be carried out. The Regulation outlines the general requirements. However, the specific methodology and information requirements for the environmental risk assessment (ERA) are to be laid down in the implementing act. COGEM makes the following observations:

4.3.1 Application procedure

As stated in the Regulation, applications are to be assessed on a case-by-case basis. COGEM notes that it is unlikely that a fixed list of information requirements will make it possible to carry out a proportionate risk assessment for different NGT2 plants. COGEM therefore suggests that applications should first be reviewed by an expert panel, which would determine, on the basis of preliminary information on the NGT2 plant, which specific information is required for the full risk assessment.

To ensure consistency and proportionality, the expert panel could make use of a guidance document containing information requirements based on the characteristics of the NGT2 plant concerned. This would streamline application requirements as far as possible while preserving the case-by-case nature of the assessment. Annex III, part 1(a-f) lists the information necessary for such a pre-application:

"(a) The characteristics of the category 2 NGT plant, in particular the traits introduced, the function of the modified or inserted genomic sequences and the function of any gene disrupted by the insertion of a cisgene or parts thereof;
(B) prior experience with the consumption of plants of the same species or of a species exhibiting similar traits or in which similar genomic sequences have been modified, inserted or disrupted, or their products;
(C) prior experience with the cultivation of plants of the same species or of a species exhibiting similar traits or in which similar genomic sequences have been modified, inserted or disrupted;
(D) the scale and conditions of the release;
(E) the intended conditions of use of the category 2 NGT plant concerned;
(F) the potential receiving environment."

4.3.2 Technical dossier

In addition to the information required to verify NGT status (section 4.1) and the information required in the pre-application (4.3.1) the following text specifies what information could be supplied in the technical dossier under which conditions.

Cisgenese

When cisgenesis is used, only sequences that are already present in the plant, or that could be introduced through conventional breeding, can be inserted.
Where only parts of a gene from the available gene pool are inserted, or when endogenous genes are disrupted, this is referred to as intragenesis. Where an untargeted insertion method is used, it cannot

be excluded that endogenous genes are disrupted in a way that results in intragenesis. In both cases, the possibility of creating unwanted open reading frames is increased. Therefore, it is important that both the insert and the flanking sequences should be checked for open reading frames encoding harmful proteins, such as allergens or toxins. In addition, where insertion is untargeted, the number of insertions and their genomic locations should be determined. This can be done on the basis of the flanking sequence information.

Targeted mutagenesis

The applications of targeted mutagenesis can vary considerably. In particular, where the limits laid down in Annex I concerning the number of modifications in the genome and the number of modifications per coding sequence do not apply, the effects of multiple nearby insertions or sequence alterations may be difficult to predict. Therefore, the expert panel can determine on a case-by-case basis what type of molecular risk assessment is required in order to evaluate any potential risks.

Monitoring plan

The Regulation requires the inclusion of a monitoring plan for any NGT2 plant. This monitoring plan may be waived if duly justified. COGEM notes that a monitoring plan is not necessary when the plant cannot establish populations or cross with plants anywhere in the European Union. Also, if the NGT2 plant cannot reproduce, either sexually or vegetatively without human intervention a monitoring plan is superfluous.

4.3.3 Environmental risk assessment

The Regulation specifies that the ERA should consist of several elements. Since only point (a), "hazard identification and characterisation", explicitly states that the information requirements may vary depending on the NGT2 plant concerned, this advice focuses primarily on that element.

The specific information required for hazard identification and characterisation is set out in Annex III, Part 2. This advice addresses environmental risks only and not risks relating to food or feed. Annex III, Part 2, point 8, and Annex III, Part 3, are therefore not discussed here.

Point (1) and (2): Comparative analysis

The information referred to in Annex III, Part 2, points 1 and 2 — namely the analysis of agronomic, phenotypic and compositional characteristics, and the assessment of persistence and invasiveness — should be assessed by means of a comparative analysis against the conventional counterpart and relevant reference varieties.

For the environmental risk assessment, the need for a comparative analysis depends on whether the plant in question can grow, establish populations, or cross with plants anywhere in the European Union. If this is the case, a comparative analysis is necessary unless the modification is expected to substantially reduce competitiveness.

Unexpected side effects are more likely to occur in the case of untargeted cisgenesis. Therefore, points 1 and 2 of Annex III, Part 2, should in such cases be addressed by means of a comparative analysis to assess possible unintended effects.

Finally, a comparative analysis is also advisable in case the parent plant cannot grow, establish populations, or cross with plants in the European Union, but the modified plant has been altered in such a way that its potential distribution area may increase. Traits most likely to expand the distribution area are those conferring tolerance to abiotic stress, in particular enhanced drought, cold or heat tolerance, as these may allow plants to grow and establish populations in additional regions, potentially within the European Union. In addition to testing under growth conditions that are typical for the plant species, where the modification may enable an expanded distribution area, the comparative analysis should also include the environmental conditions to which the modified plant is better adapted.

Point (4) and (5) interaction of NGT2 plant with target and non-target organisms.
If the modification is intended to confer tolerance or resistance to diseases or pests and that modification does not fulfil the criteria set out in Annex I, the hazard characterisation should include the effects of the modified plant on target and non-target organisms.

Point (7) Effects on biogeochemical processes
In line with the premise of a case-by-case, proportionate risk assessment, effects on biogeochemical processes should be included in the hazard characterisation only where there is an indication that the modification may affect the soil of the field concerned or the surrounding soil.

History of safe use
If the modified plant has a history of safe use in a region with an ecology similar to that of the receiving environment, hazard identification and characterisation is not needed.

5. Conclusion
COGEM welcomes the opportunity to give input on the initiative set out by the European Commission. COGEM supports the effort to further specify the information required from operators to demonstrate that a plant is an NGT or NGT1 and what the risk assessment of NGT2 should entail. And COGEM has the following suggestions to further enable a targeted and proportionate regulatory framework for NGT plants:

To demonstrate that a plant is an NGT plant, COGEM considers it necessary that:
- information showing that, for cisgenesis, only sequences from the existing gene pool are present in the plant, or sufficient methodological information to verify that only targeted mutagenesis and/or cisgenesis have been used;
- In the case of cisgenesis, a justification must be provided to demonstrate that the genetic material is already present in the gene pool available for conventional breeding purposes;
- It is demonstrated that no unintended genetic material is integrated in the plant genome from outside the conventional breeding gene pool (for example by testing for residual vector or plasmid DNA).

For NGT1 plants COGEM proposes the following requirements:
- All regions modified by targeted mutagenesis must be sequenced;
- Likely off targets regions associated with targeted mutagenesis techniques must be sequenced;

- In the case of cisgenesis, the flanking regions must be sequenced to confirm the location of the insert;
- A description must be provided that no genes known to be involved in herbicide tolerance or in the production of insecticidal compounds are affected by the modification.

For NGT2 plants, COGEM proposes that an expert panel will determine which information is needed to carry out a risk assessment on a case-by-case basis with the use of preliminary information and the use of a guidance document. The guidance document could include the following information requirements:

- Information on the modification as specified in Annex III, part 1(a-f);
- A monitoring plan, if the plant can form populations or cross with plants anywhere in the European Union.

When using intragenesis or untargeted cisgenesis:

- Bio-informatic analysis of open reading frames of insert and flanking sites for similarities to known allergens and toxins;
- Copy numbers and size of all detectable inserts.

For the hazard identification and characterisation information requirements specified in Annex III, Part 2, the following information requirements should be included, depending on the characteristics of the NGT2 plant and the potential environmental risks:

- A comparative analysis (point 1 and 2), if the plant can form a population or cross with plants anywhere in the European Union;
- An analysis of potential effects on target and non-target organisms (point 4 and 5), if the modification confers tolerance or resistance to diseases or insect pests;
- Analysis of potential effects on biogeochemical processes (point 7), if there is an indication that the modification may affect the soil of the field concerned or the surrounding soil.

References

1. Regulation (EU) 2026/1388 of the European Parliament and of the Council of 17 June 2026 on plants obtained by certain new genomic techniques and their products, and amending Regulation (EU) 2017/625
2. Directive 2001/18/EC of the European Parliament and of the Council of 12 March 2001 on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC
3. COGEM (2019). Voorstel voor aanpassing van de vrijstelling in de ggo-regelgeving: aanvullende criteria voor het vrijstellen van gg-planten. CGM/190321-02 [in Dutch]
4. COGEM (2009). Adviserende brief onderzoeksrapport 'nieuwe veredelingstechnieken'. COGEM-advies CGM/091222-01 [in Dutch]
5. COGEM (2017). Advies CRISPR-Cas en gerichte mutagenese bij planten. COGEM-advies CGM/170308-01 [in Dutch]
6. COGEM (2020). Signalerende aanbiedingsbrief bij onderzoeksrapport Natuurlijke genoomvariatie. COGEM signalerende brief CGM/200731-01 [in Dutch]
7. COGEM (2009). Geen roos zonder doornen. Implicaties van een product-georiënteerde regelgeving voor gg-gewassen in Europa. COGEM-signalering CGM/191010-01 [in Dutch]
8. COGEM & Gezondheidsraad (2023). Trendanalyse biotechnologie 2023. Tijd voor een integrale visie. Trendanalyse CGM/230321-02 [in Dutch]
9. COGEM (2023). Voorstel Europese Commissie voor nieuwe wetgeving voor planten verkregen met gerichte mutagenese, cisgenese en intragenese. COGEM-advies CGM/230710-01 [in Dutch]

10. COGEM (2023). Advies over aanpassing van de Annex I in het NGT-voorstel van de EC. COGEM-advies CGM/231124-01 [in Dutch]
11. COGEM (2025). Advice Differences in EU positions regarding Annex I of the NGT-legislation. COGEM-advies CGM/250516-01
12. COGEM (2026). Advies Equivalentiecriteria uit Bijlage I van het compromis NGT-voorstel. COGEM-advies CGM/260611-01 [in Dutch]