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RENURE: Impact on surplus and deficit regions, experiences from the Netherlands

Stakeholder meeting

Rotenberg 5 October 2026

Dr. Ir. Laura van Schöll - NMI

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Overview presentation

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English

- Background Nitrate Directive and ReNure
- Renure criteria and conditions
- Implementation in Netherlands

Deutsch

- Hintergrund-Nitratdirektive und ReNure
- Ernährungskriterien und Bedingungen
- Umsetzung in den Niederlanden

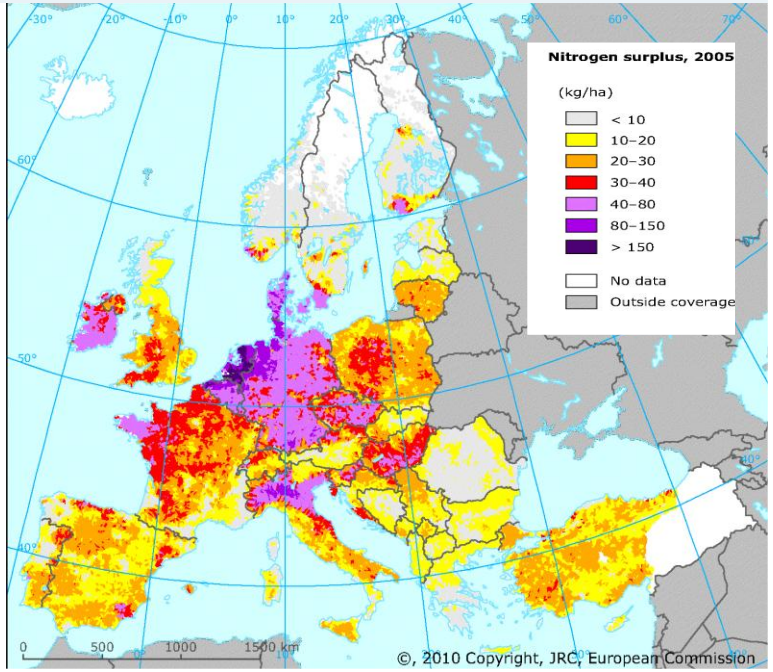
Nitrate directive - Nitrat-Richtlinie

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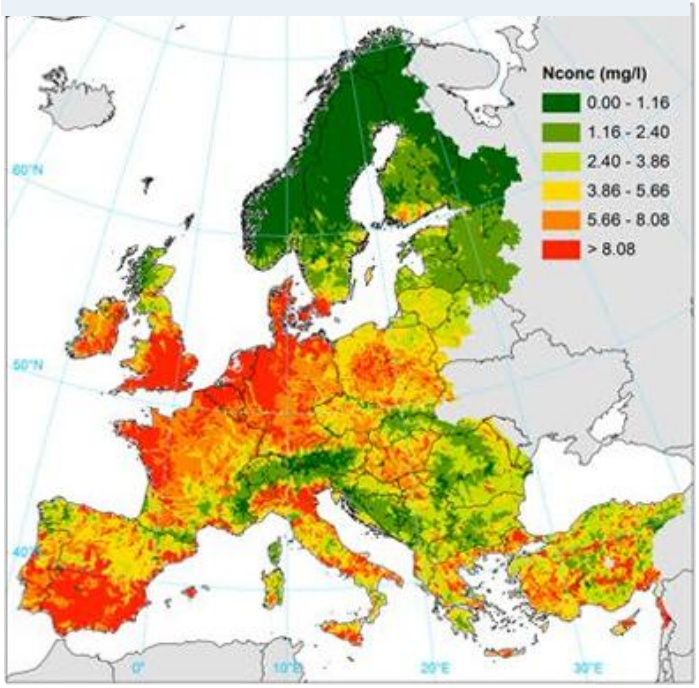
To **prevent and reduce water pollution** caused **by nitrates from agriculture** to protect human health and the environment.

Ziel ist **Nitrat aus der Landwirtschaft verursachte Wasserverschmutzung zu verhindern und zu verringern,** um die menschliche Gesundheit und die Umwelt zu schützen.

N surplus kg N / ha



N concentration EU rivers



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Important measures

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Nitrate Vulnerable Zones Nitratgefährdete Zonen

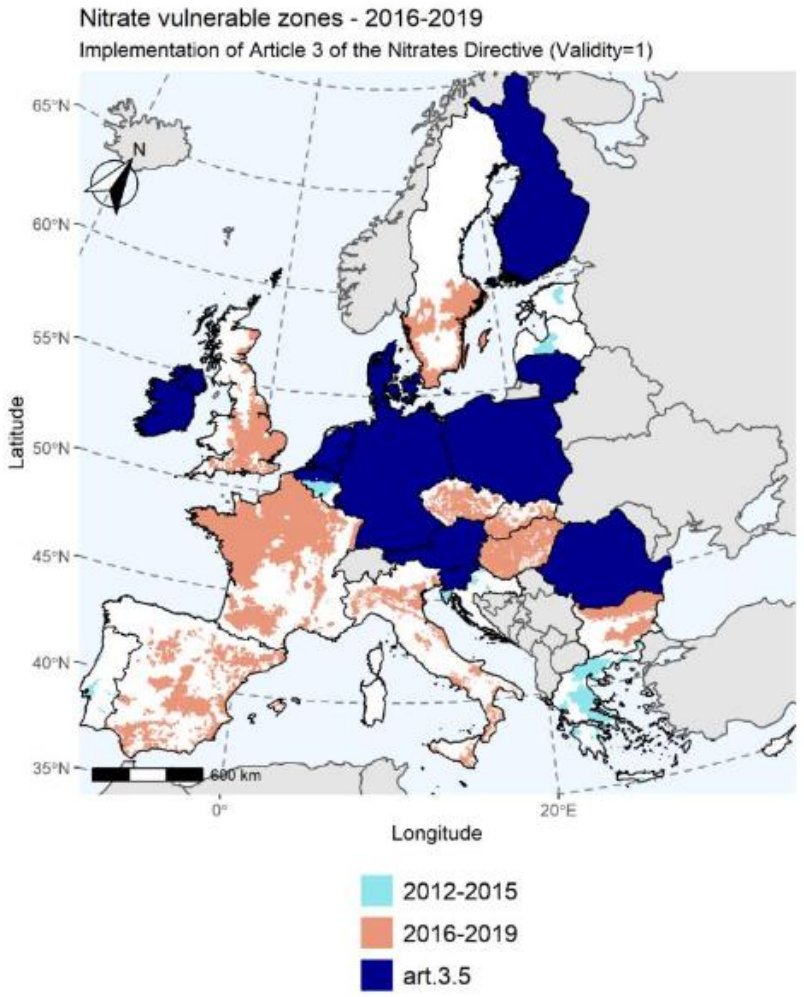
Areas of land which drain into waters that are or could be affected by nitrate pollution if no action were taken, and which contribute to pollution.

Landflächen, die in Gewässer abfließen, die von Nitratverschmutzung betroffen sind oder sein könntenwenn keine Maßnahmen ergriffen wurden, und die zur Verschmutzung beitragen

170 kg N

The amount of N that may be applied to land in the form of manure in Nitrate Vulnerable zones: **high risk of leaching**

Die Menge an N, die in Form von Dung auf Land in Nitratgefährdeten Zonen aufgetragen werden kann: **hohes Auslaugungsrisiko**

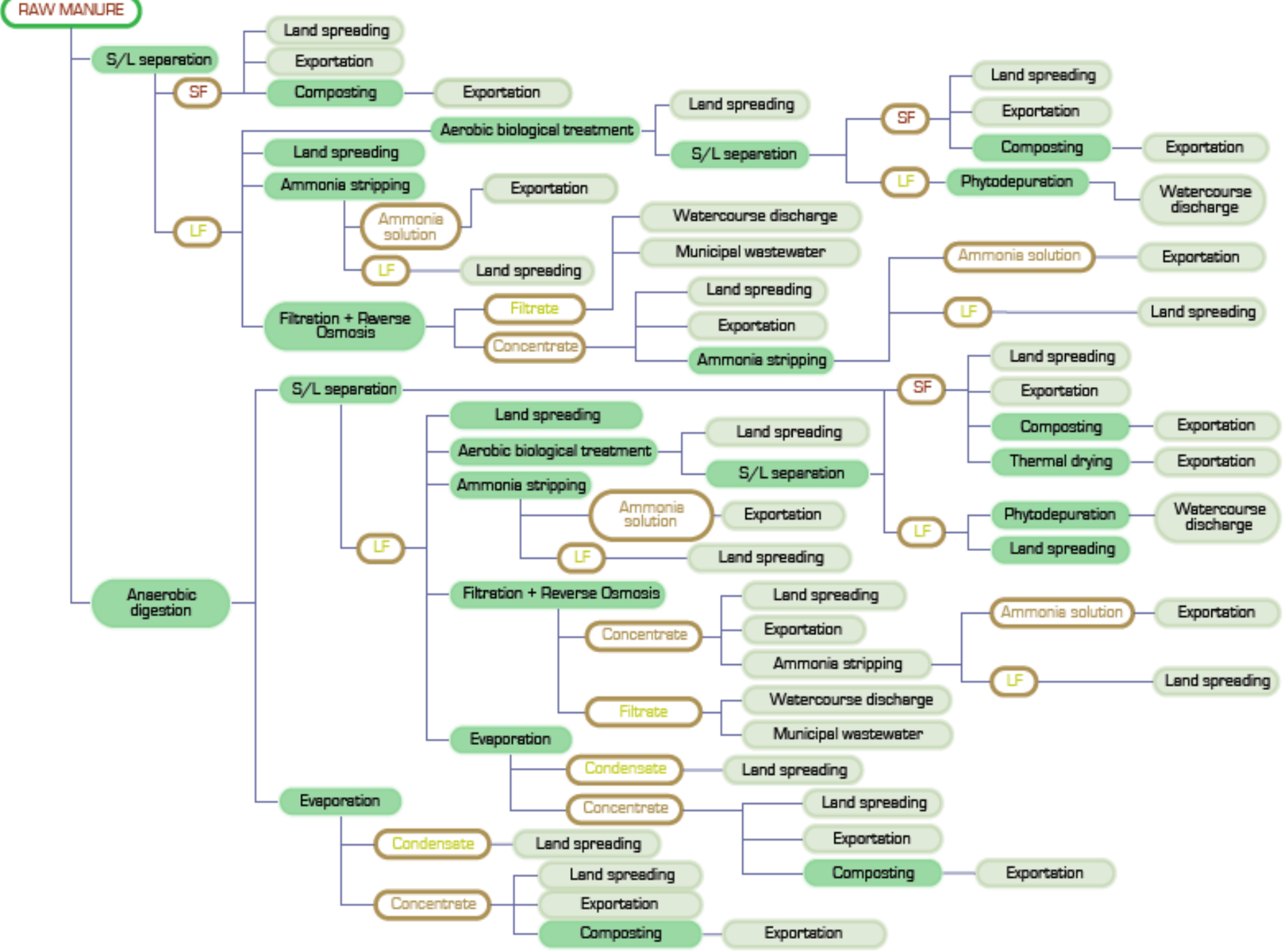


Effects Nitrate Directive

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- **Improved water quality**
- Manure applications in NVZ **decrease**
- ➢ In areas high livestock density
  → **Manure surplus**
  → **Low or negative price** of manure
- **Export** from surplus to demand regions
  → **high transport cost**
- **Complex and detailed set of rules**

- **Verbesserte Wasserqualität**
- Düngungsanwendungen in NVZ **nehmen ab**
- In Gebieten mit hoher Viehdichte
  → **Dungüberschuss**
  → **Niedriger oder negativer Dungpreis**
- **Export** aus Überschuss- zu Nachfrageregionen
  → **Hohe Transportkosten**
- **Komplexes und detailliertes Regelwerk**

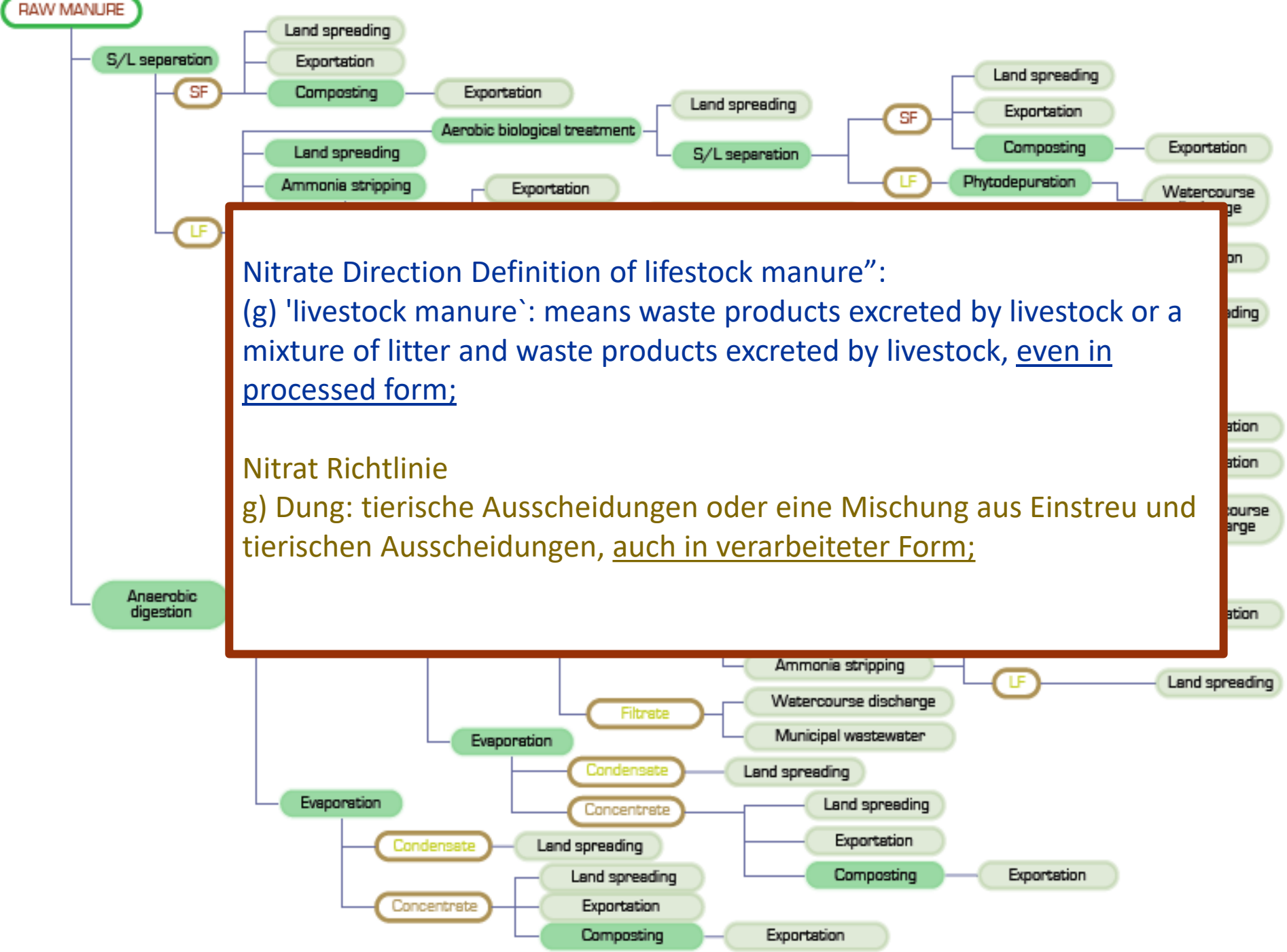


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Manure treatment

Non-exhaustive overview of possible and most commonly applied routes for the treatment of manure and nitrogen recovery for livestock manure, with candidate RENURE materials indicated in brown boxes in the graph (adopted from Bernal et al. (2015) - ©Bernal et al., 2015).

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Nitrate Direction Definition of lifestock manure":
(g) 'livestock manure`: means waste products excreted by livestock or a mixture of litter and waste products excreted by livestock, even in processed form;

Nitrat Richtlinie
g) Dung: tierische Ausscheidungen oder eine Mischung aus Einstreu und tierischen Ausscheidungen, auch in verarbeiteter Form;

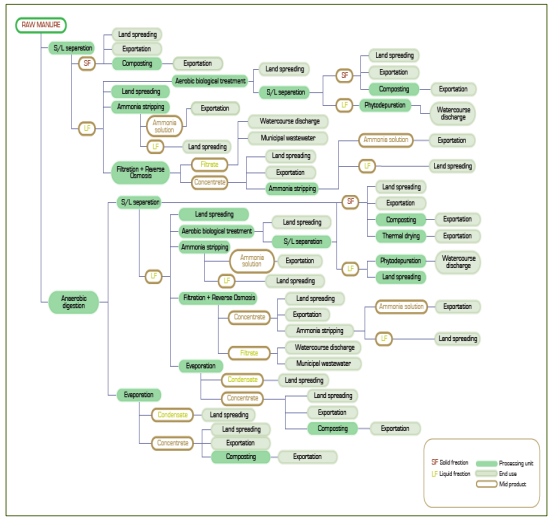
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Manure treatment

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Solid fractions → export

Feste fraktions → export

Liquid N fractions

"synthetic N fertilizer replacement"

- Mineral concentrates
- Ammonium salts
- Liquid fraction
- Filtrate
- Condensate

Flüssige N-Fraktionen

- *"Ersatz für synthetischen N-Dünger"*
- Mineralkonzentrate
- Ammoniumsalze
- Flüssigfraktion
- Filtrat
- Kondensat

170 kg N

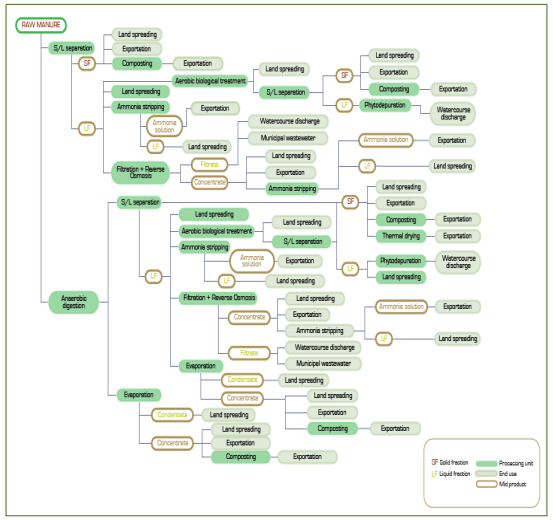
170 kg N

- **No market** in surplus areas
  Kein Markt in Überschussgebieten
- Transport **cost still high**
  Die Transportkosten **immer noch hoch**

End-of manure status needed
End-of-Dung-Status benötigt

Manure treatment

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170 kg N

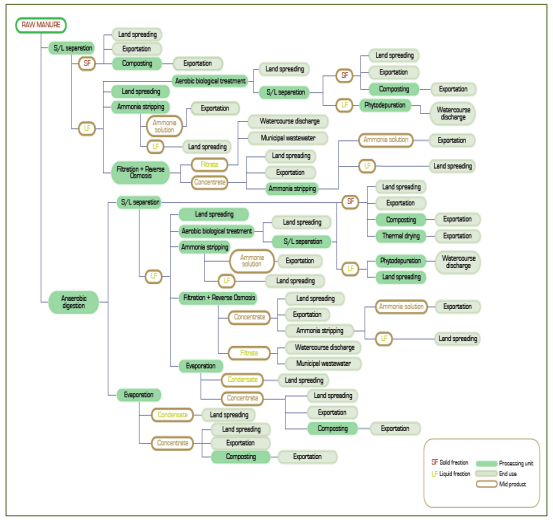
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End-of Manure

Flüssige N-Fraktionen

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-
- sat

Ende Dung

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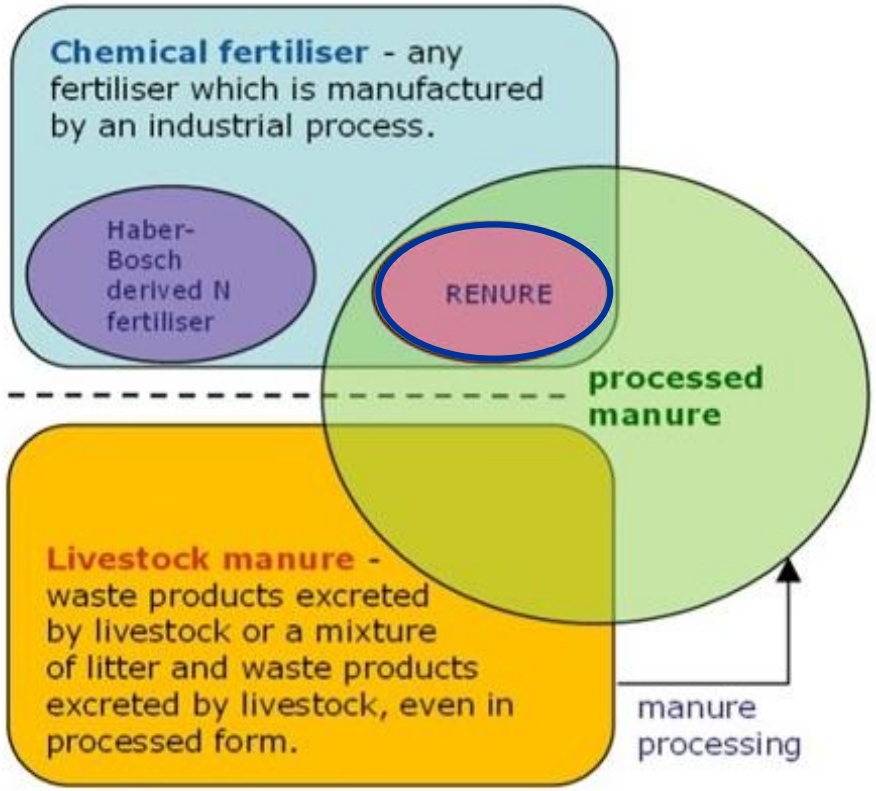
JRC study SAFEMANURE / RENURE

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REcovered **N**itrogen from man**URE**

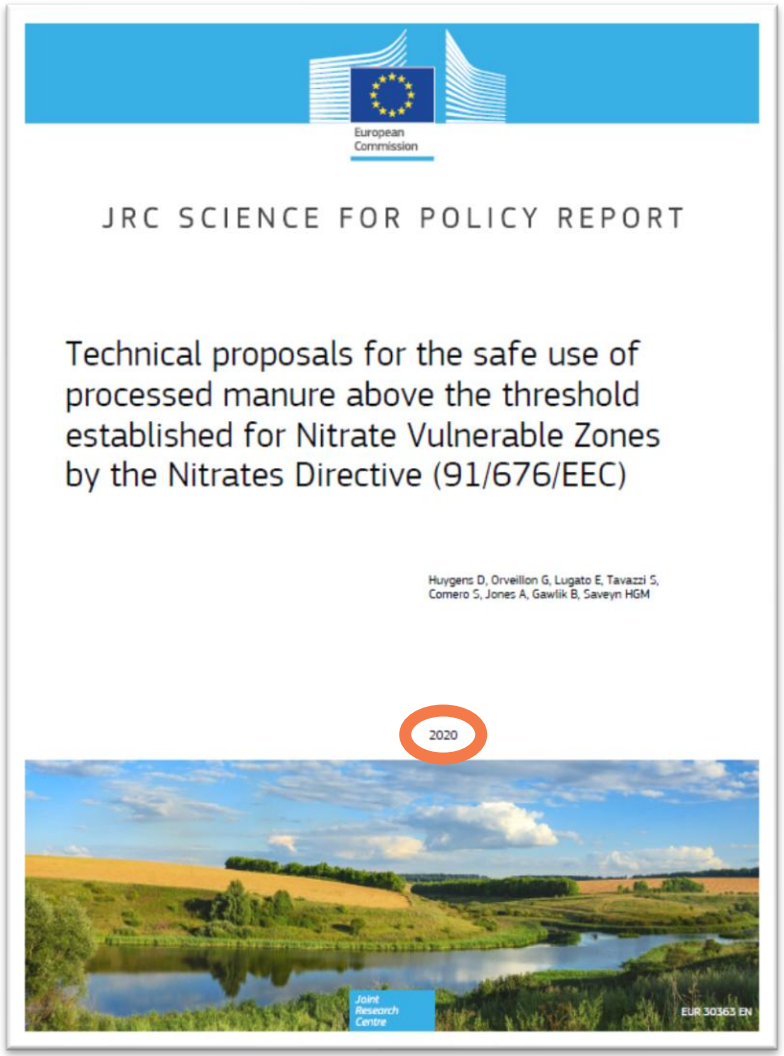
High quality N-fertilisers, derived from manure treatment, that have a **similar nitrogen leaching potential** and **agronomic efficiency** to **chemical fertilisers**

Hochwertige N-Düngemittel, die aus der Mistbehandlung gewonnen werden und ein **ähnliches Stickstoffauswaschungspotenzial** und eine **agronomische Effizienz** wie **chemische Düngemittel** aufweisen



ReNure amendment

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European Commission

JRC SCIENCE FOR POLICY REPORT

Technical proposals for the safe use of processed manure above the threshold established for Nitrate Vulnerable Zones by the Nitrates Directive (91/676/EEC)

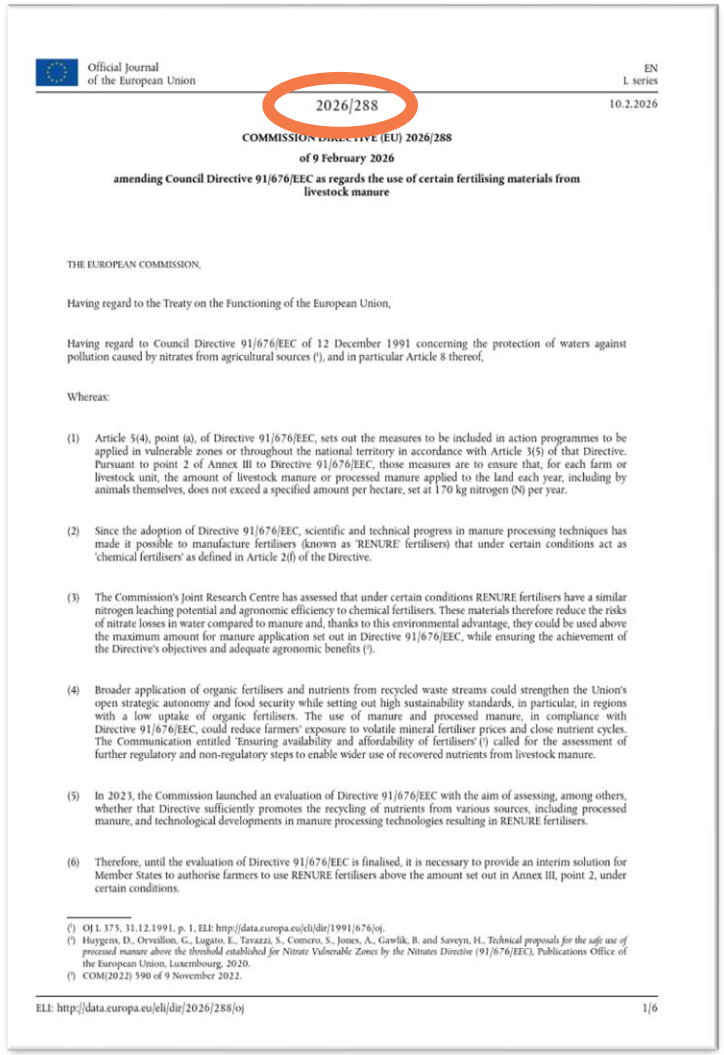
Huygens D, Orveillon G, Lugato E, Tavazzi S, Comero S, Jones A, Gawlik B, Saveyn HGM

2020

Joint Research Centre

EUR 30363 EN

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10.2.2026

COMMISSION DIRECTIVE (EU) 2026/288

of 9 February 2026

amending Council Directive 91/676/EEC as regards the use of certain fertilising materials from livestock manure

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (1), and in particular Article 8 thereof,

Whereas:

(1) Article 5(4), point (a), of Directive 91/676/EEC, sets out the measures to be included in action programmes to be applied in vulnerable zones or throughout the national territory in accordance with Article 3(5) of that Directive. Pursuant to point 2 of Annex III to Directive 91/676/EEC, those measures are to ensure that, for each farm or livestock unit, the amount of livestock manure or processed manure applied to the land each year, including by animals themselves, does not exceed a specified amount per hectare, set at 170 kg nitrogen (N) per year.

(2) Since the adoption of Directive 91/676/EEC, scientific and technical progress in manure processing techniques has made it possible to manufacture fertilisers (known as 'RENURE' fertilisers) that under certain conditions act as 'chemical fertilisers' as defined in Article 2(f) of the Directive.

(3) The Commission's Joint Research Centre has assessed that under certain conditions RENURE fertilisers have a similar nitrogen leaching potential and agronomic efficiency to chemical fertilisers. These materials therefore reduce the risks of nitrate losses in water compared to manure and, thanks to this environmental advantage, they could be used above the maximum amount for manure application set out in Directive 91/676/EEC, while ensuring the achievement of the Directive's objectives and adequate agronomic benefits (2).

(4) Broader application of organic fertilisers and nutrients from recycled waste streams could strengthen the Union's open strategic autonomy and food security while setting out high sustainability standards, in particular, in regions with a low uptake of organic fertilisers. The use of manure and processed manure, in compliance with Directive 91/676/EEC, could reduce farmers' exposure to volatile mineral fertiliser prices and close nutrient cycles. The Communication entitled 'Ensuring availability and affordability of fertilisers' (3) called for the assessment of further regulatory and non-regulatory steps to enable wider use of recovered nutrients from livestock manure.

(5) In 2023, the Commission launched an evaluation of Directive 91/676/EEC with the aim of assessing, among others, whether that Directive sufficiently promotes the recycling of nutrients from various sources, including processed manure, and technological developments in manure processing technologies resulting in RENURE fertilisers.

(6) Therefore, until the evaluation of Directive 91/676/EEC is finalised, it is necessary to provide an interim solution for Member States to authorise farmers to use RENURE fertilisers above the amount set out in Annex III, point 2, under certain conditions.

(1) OJ L 375, 31.12.1991, p. 1, ELI: http://data.europa.eu/eli/dir/1991/676/oj.
(2) Huygens, D., Orveillon, G., Lugato, E., Tavazzi, S., Comero, S., Jones, A., Gawlik, B. and Saveyn, H., *Technical proposals for the safe use of processed manure above the threshold established for Nitrate Vulnerable Zones by the Nitrates Directive (91/676/EEC)*, Publications Office of the European Union, Luxembourg, 2020.
(3) COM(2022) 590 of 9 November 2022.

ELI: http://data.europa.eu/eli/dir/2026/288/oj

1/6

RENURE materials

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Certain materials from livestock manure that have undergone **processing** that **increases mineral N** content,

1. an **ammonium salt** (**scrubbing salt**), stemming from a gas purification or emission control process designed to remove ammonia from off-gases;
2. a **mineral concentrate** obtained through reverse osmosis;
3. a nitrogen-rich phosphate salt (**struvite**), precipitated out of livestock manure;

Bestimmte Materialien aus Dung, die **verarbeitet** wurden, mit dem die Konzentration von **mineralischer Stickstoff erhöht** vorausgesetzt,

1. **Ammoniumsalz** aus einem Gasreinigungs- oder Emissionsminderungsverfahren zur Entfernung von Ammoniak aus Abgasen;
2. durch Umkehrosmose gewonnenes **Mineralkonzentrat**;
3. ein stickstoffreiches Phosphatsalz (**Struvit),** das aus Dung ausgefällt wurde;

RENURE Criteria

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- **Consistent quality**
- Ratio **Nmin:Ntotal >90%** or **Corg:Ntotal <3**
- upper limits:
  - copper **(Cu): 300** mg kg-1 dry matter,
  - zinc **(Zn): 800** mg kg-1 dry matter
- If Corg >1% : **pathogens** (*Salmonella spp. E. coli or enterococci*) limits

- **Konsistente Qualität**
- Verhältnis **Nmin:N total >90 %** oder **Corg:Ntotal <3**
- oberen Grenzen:
  - Kupfer **(Cu): 300** mg kg-1 Trockensubstanz,
  - Zink **(Zn): 800** mg kg-1 Trockensubstanz
- Wenn Corg >1 % : **Krankheitserreger** (*Salmonella spp. E. coli oder Entericocci*) Grenzen

Renure Application & Storage

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- **Renure** application **limit of 80 kg N** (on top of 170 kg N manure)
- **Precaution for ammonium losses**: injection, immediate incorporation of surface applied material, or equivalent.
- Maintenance of **permanent land cover or equivalence methods** where Renure applied.
- Appropriate **storage conditions and requirements** to prevent emissions.
- **Fertiliser rates must be sharpened** to account for *increased risk of N loss in water and air*

- **Renure-Anwendungsgrenze von 80 kg N** (zusätzlich zu 170 kg N Mist)
- **Forsichtsmaßnahmen bei Ammoniumverlusten**: Injektion, sofortiges Einbringen von oberflächenaufgelegtem Material oder Äquivalent.
- **Aufrechterhaltung dauerhafter Landbedeckung oder Äquivalenzmethoden**, wo Renure angewendet wurde.
- Geeignete **Lagerbedingungen und Anforderungen** zur Vermeidung von Emissionen.
- Die **Düngungsraten müssen geschärft** werden, um dem erhöhten *Risiko eines N-Verlusts in Wasser und Luft Rechnung* zu tragen.

National requirements

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- **Limits on livestock numbers and manure** production (75% of area 170 kgN)
- **Measures to prevent adverse effects in and around Natura 2000 areas**, and in the vicinity of **drinking water extraction points**.
- Objectives of the Nitrates Directive, Habitat Directive, Water Framework Directive, National Emission Directive and the Drinking Water Directive **not compromised**
- Member states **notify the EC and report on implementation**

- **Begrenzungen bei der Viehzahl und der Güllingsproduktion** (75 % der Fläche 170 kgN)
- **Maßnahmen zur Vermeidung negativer Auswirkungen in und um Natura-2000-Gebieten** sowie in der Nähe von **Trinkwasserentnahmepunkten.**
- Erreichung der Ziele Nitratrichtlinie, Lebensraumrichtlinie, Wasserrahmenrichtlinie, Nationale Emissionsrichtlinie und die Trinkwasserrichtlinie **nicht kompromittiert**
- Die Mitgliedstaaten **benachrichtigen die EG und berichten über die Umsetzung**

Implementation in the Netherlands

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- Netherlands has a national **limit for manure N and P** production
- Netherland has **elaborate set of detailed protection measures** for Natura 2000 areas and drinking water, Action programme
- **Detailed system for control and monitoring of animal manure** (registration, transport notifications, GPS tracking…)
- In addition: Quality system **ReNuGarant** implemented
- **High logistic and administrative burden** on farmers

- Die Niederlande haben eine Quote für die Produktion von **Dung N und P**
- Niederlande verfügen über **umfangreiche detaillierte Schutzmaßnahmen** für Natura-2000-Gebiete und Trinkwasser, Aktionsprogramm
- **Detailliertes System zur Kontrolle und Überwachung von Dung** (Registrierung, Transportbenachrichtigungen, GPS-Tracking …)
- Weiterhin: Qualitätssystem **ReNuGarant** implementiert
- **Hohe logistische und administrative Belastung** für die Landwirte

In Germany // Deutchland

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- ReNure not implemented
- Feasibility: depends on market situation:
  - Pricing and cost of manure
  - Manure treatment systems require investments
  - Quality system has to be developed and implemented
- Can learn from Dutch innovations and experiences
- ReNure implementation has several consequences

- ReNure nicht implementiert
- Machbarkeit: hängt von der Marktsituation ab:
  - Preisgestaltung und Kosten des Mistes
  - Mistbehandlungssysteme erfordern Investitionen
  - Qualitätssysteme müssen entwickelt und implementiert werden
- Man kann von niederländischen Innovationen und Erfahrungen lernen
- Die Implementierung von ReNure hat mehrere Folgen

In Germany // Deutchland

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- Is the system for the control and monitoring of animal manure implemented under the Nitrate Directive and Animal by-product regulation as advanced as in the Netherlands? (registration, transport notificafions, gps tracking, etc)
- What does this mean for the growth of the lifestock sector regionally and nationally
- Measures to prevent adverse effects in and around Natura 2000 areas, and in the vicinity of drinking water abstraction points.

- Ist das System zur Kontrolle und Überwachung von Tiermist, das unter der Nitratrichtlinie und der Regulierung von Tiernebenprodukten umgesetzt wurde, so fortschrittlich wie in den Niederlanden? (Registrierung, Transportbenachrichtigungen, GPS-Tracking usw.)
- Was bedeutet das für das regionale und nationale Wachstum des Nutztiersektors.
- Maßnahmen zur Verhinderung negativer Auswirkungen in und um Natura-2000-Gebieten sowie in der Nähe von Trinkwasserentnahmepunkten.

ReNu2Ccyle & ReNu2Farm

ESNI Policy Feedback

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Joint Position of European Projects

On the need for an unambiguous definition by the European Commission regarding the waste/manure status of ammonium salts derived from off-gas cleaning associated to treatment of manure or manure-derived products

https://www.nmi-agro.nl/wp-content/uploads/2019/09/Joint-position-on-status-of-AS-and-implementation-of-ReNure_FINAL.pdf

Joint Position of European Projects

On the need for an unambiguous definition by the European Commission regarding the waste/manure status of ammonium salts derived from off-gas cleaning associated to treatment of manure or manure-derived products

https://renu2cycle.nweurope.eu/project-results

Legal status of ammonium salts

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To be manure or not to be manure…

- Ammonium salts are very pure chemicals, cannot be distinguished from synthetic ammonium salts.
- Ammonium salts from stripping-scrubbing manure treatment **under scope FPR as CMC 15** (DG-GROW) very pure material (not manure!)
- Considered as emissions and as such **not ABP nor manure under scope ABP-R** (DG-Sante).

However:

- ➢ Ammonium salts from stripping manure and scrubbing of the off-gasses are interpretated as 'manure in processes form' under Nitrate directive (DG ENV).
- ➢ **Harmonisation of definition and interpretation in different pieces of EU legislation needed.**

Dung sein oder nicht Dung sein…

- Ammoniumsalze sind sehr reine Chemikalien und können nicht von synthetischen Ammoniumsalzen unterschieden werden.
- Ammoniumsalze aus der Entfernungs- und Schrubbung-Düngerbehandlung im Rahmen des Scope-FPR als CMC 15 (DG-GROW) sind sehr reines Material (kein Düng).
- Sie werden als Emissionen betrachtet und somit weder ABP noch Mist im Rahmen des ABP-R (DG-Sante).

Allerdings:

- ➢ **Ammoniumsalze** aus dem Entfernen von Mist und dem Schrubben der Abgase werden gemäß der Nitratrichtlinie (DG ENV) als **„Dung in Prozessform" interpretiert.**
- ➢ Harmonisierung von Definition und Auslegung in **verschiedenen EU-Gesetzgebungen ist notwendig.**

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Q&A

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