

EASAC Report: Ecosystem services, agriculture and neonicotinoids

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Ecosystem services, agriculture and neonicotinoids



EASAC policy report 26

April 2015

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This report can be found at
www.easac.eu

building science into EU policy

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NATURE | CORRESPONDENCE

Ecosystem services: Academies review insecticide harm

Peter Neumann

Nature **520**, 157 (09 April 2015) | doi:10.1038/520157a

Published online 08 April 2015



Citation



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Article metrics

The European Academies Science Advisory Council (EASAC) will next week release its report

- EUに加盟している29の国の
各国立科学アカデミーのメンバーから構成される

Collective voice of the National Academies of Science of the EU member states

- 政策意思決定者にむけての科学的分析・助言を行う独立組織

Source of independent scientific analysis and advice for policy-makers

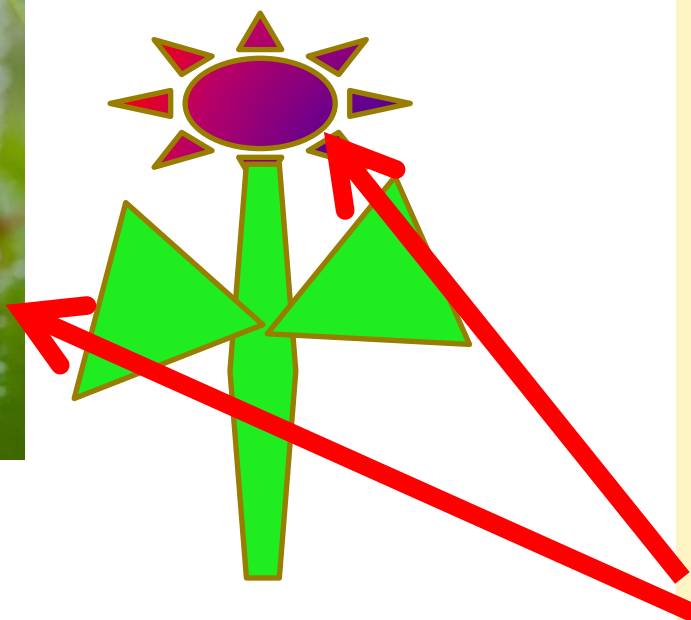
—独立性 Independence

—科学的信頼性 scientific excellence

—透明のあるプロセス transparent processes



Why this study by EASAC?



穀物の種子コーティングに使用

Seeds are treated

植物は殺虫剤を含んで成長する

Plants grow and contain pesticide no need to spray

殺虫剤は蜜や花粉、排水にも含まれる

Pesticides also in nectar, pollen and... guttation water

標的でない他の生物へも影響する可能性

Chances for non-target effects



Why this study by EASAC?



ネコニコチノイドとは＝欧州で広く使われている、新しい殺虫剤

Neonicotinoids : new generation of systemic pesticides

Widely used in agricultural practices in Europe

2013年にEUで規制が開始されてから、科学的調査も進んでいるが、
いまだ議論が続いている

Since EU restrictions were introduced in 2013, results continue, but disputes between stakeholders continue over their interpretation

EASACは、持続可能な農業を行う上で特に重要な生態系サービスを生み出してくれる生態系・生物への影響に注目して詳細なレビュー・研究を行うことを決めた。

EASAC decided to conduct a detailed review and to study effects on organisms providing ecosystem services critical to sustainable agriculture

EASACは、エキスパートグループ(専門家集団)として13人の専門家を選出した

EASAC nominated 13 leading experts to form an Expert Group

The report

Ecosystem services, agriculture and neonicotinoids



EASAC policy report 26

April 2015

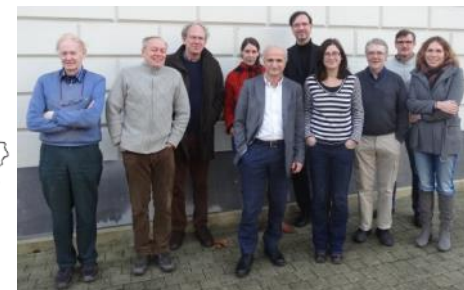
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building science into EU policy

ネオニコチノイドと 生態系サービス、農業に注目

- ・さまざまな専門家
- ・70ページ
- ・300に及ぶ参考文献

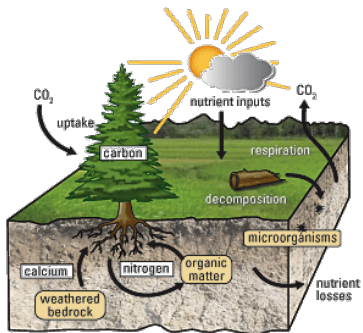


Ecosystem services 生態系サービス

人間が生態系からもらっている便益

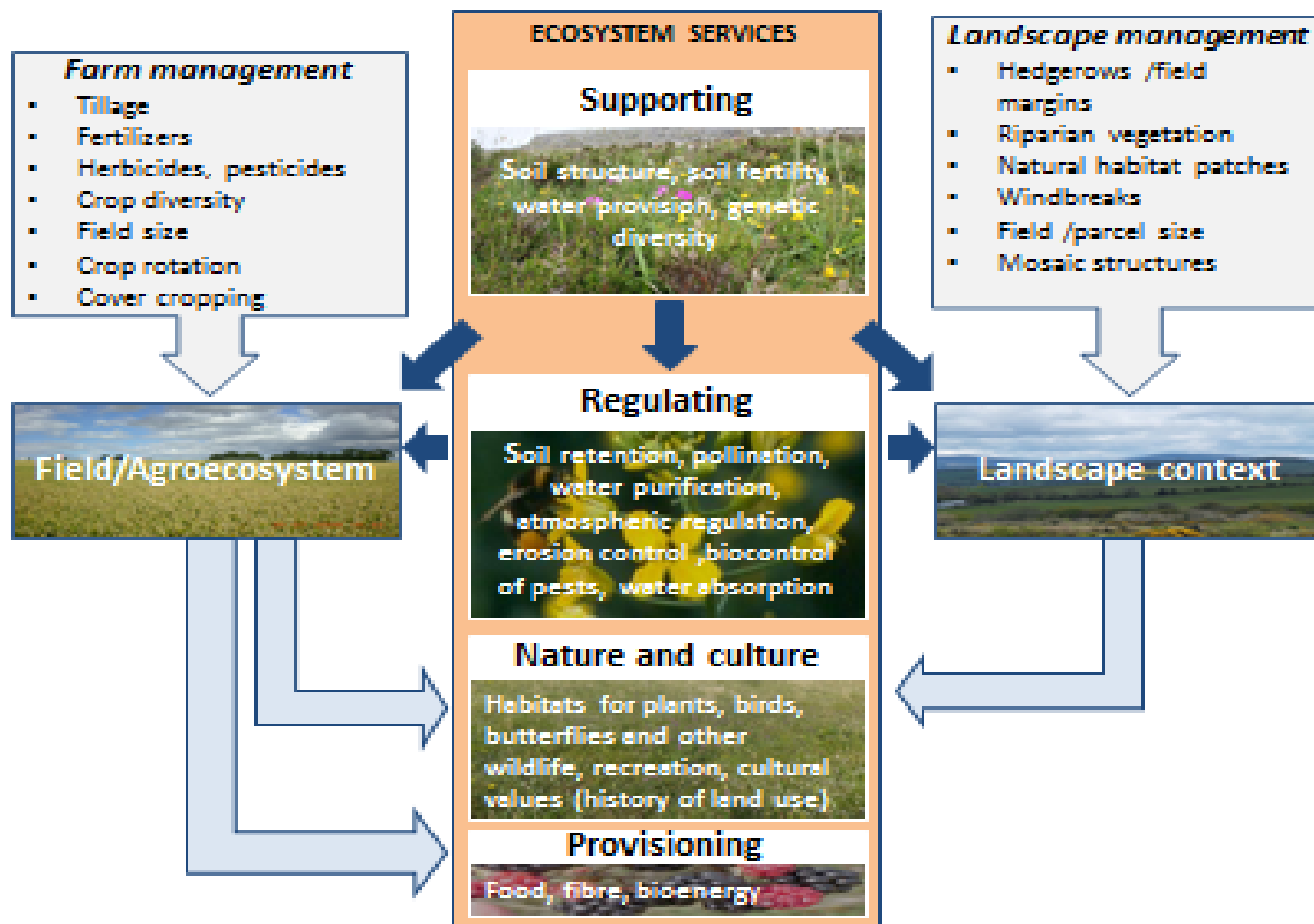
Benefits people obtain from ecosystems:

- 支援サービス Supporting services
- 供給サービス Provisioning services
- 調整サービス Regulating services
- 文化サービス Cultural services



Ecosystem services and agriculture

生態系サービスと農業



Ecosystem services and agriculture

天然の害虫防除システム

Natural pest control



土壌形成

Soil organisms



花粉の送粉(そうふん)

pollination



生物多様性の豊かさは、
これらの生態系サービスの供給力に深く結びついている
Biodiversity is positively interlinked with supply of these ecosystem services

Honey bee colony losses

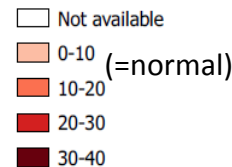
ミツバチの巣の崩壊増加
(1年で10%以上増)

Data show elevated losses of honey bee colonies (>10%)

→経済的な要因が
巣の数を左右している

Socio-economics main drivers of
managed colony numbers

Winter mortality 2011/2012 (%)



ミツバチだけが特別なのか？

Are honey bees in general special?

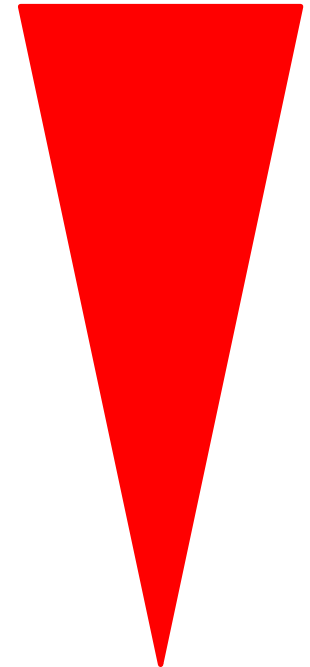
The focus on honey bees

European Academies



Science Advisory Council

環境変化への頑丈さ



ミツバチ Honey bees
社会性があり、
大きなコロニーを形成し越冬する
Eusocial, large colonies, overwinters



マルハナバチ Bumblebees
ミツバチよりコロニーは小さく、冬には
崩壊し、次の年の女王蜂のみが越冬する
Colonies smaller, only future queens hibernate



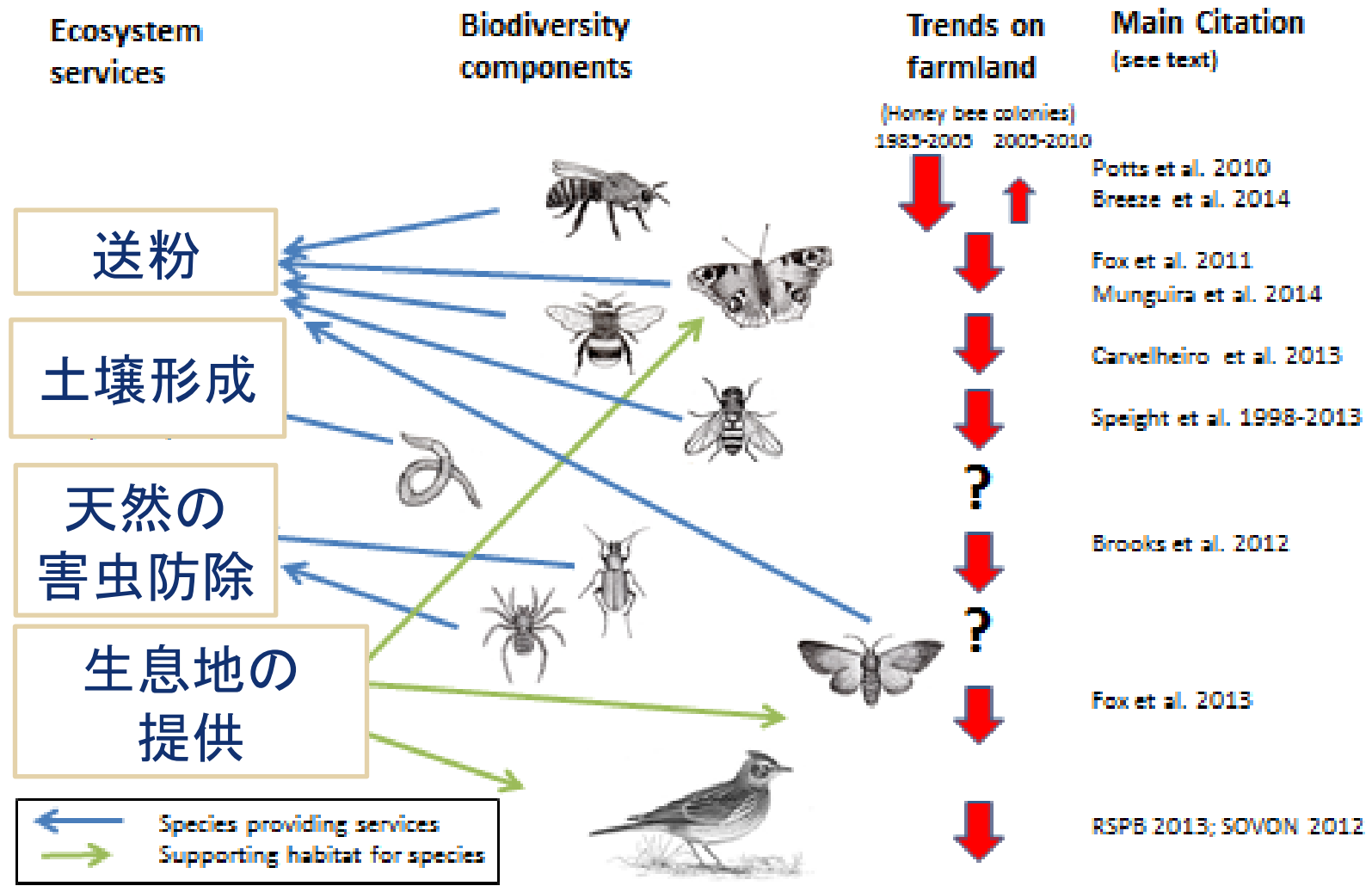
単独性バチ類やその他の送粉昆虫
Solitary bees and other pollinators

全体的な傾向について評価した結果 What are the overall trends?

生態系サービスを保全するには、ミツバチの保護だけでは不十分である

Protection of managed honey bees is not sufficient to
protect pollination or other ecosystem services

Ecosystem Services and biodiversity



商業管理されているミツバチのコロニーの減少は確かに生じていたが、
欧州での最近の傾向については最終的な結論が出ていない

Clear evidence for losses of managed honey bee colonies,
but no final conclusions on recent trends in Europe

一方で、自然の生態系サービスに関わる昆虫たちは
すべて大幅に近年減少していた。

Wild ecosystem service providers all show major declines

生物多様性の保全は、EU全体はもちろんのこと
世界全体でも合意されるべき目標である。

Biodiversity = objective under both global and EU international agreements

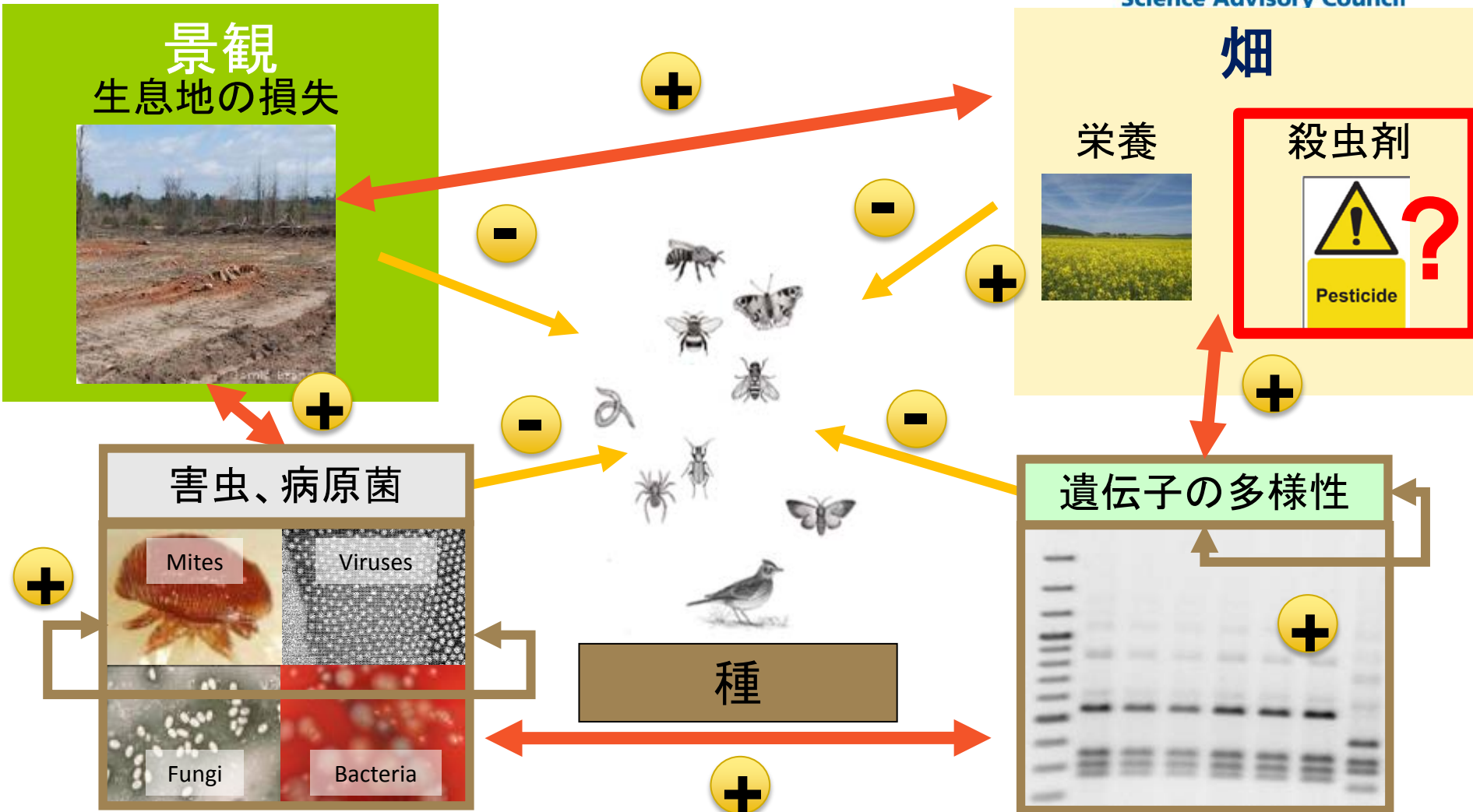
農地の生物多様性を回復し維持することが、EU政策の必要な目的である。

Restoring and maintaining biodiversity in farmland is a particular challenge for EU policy

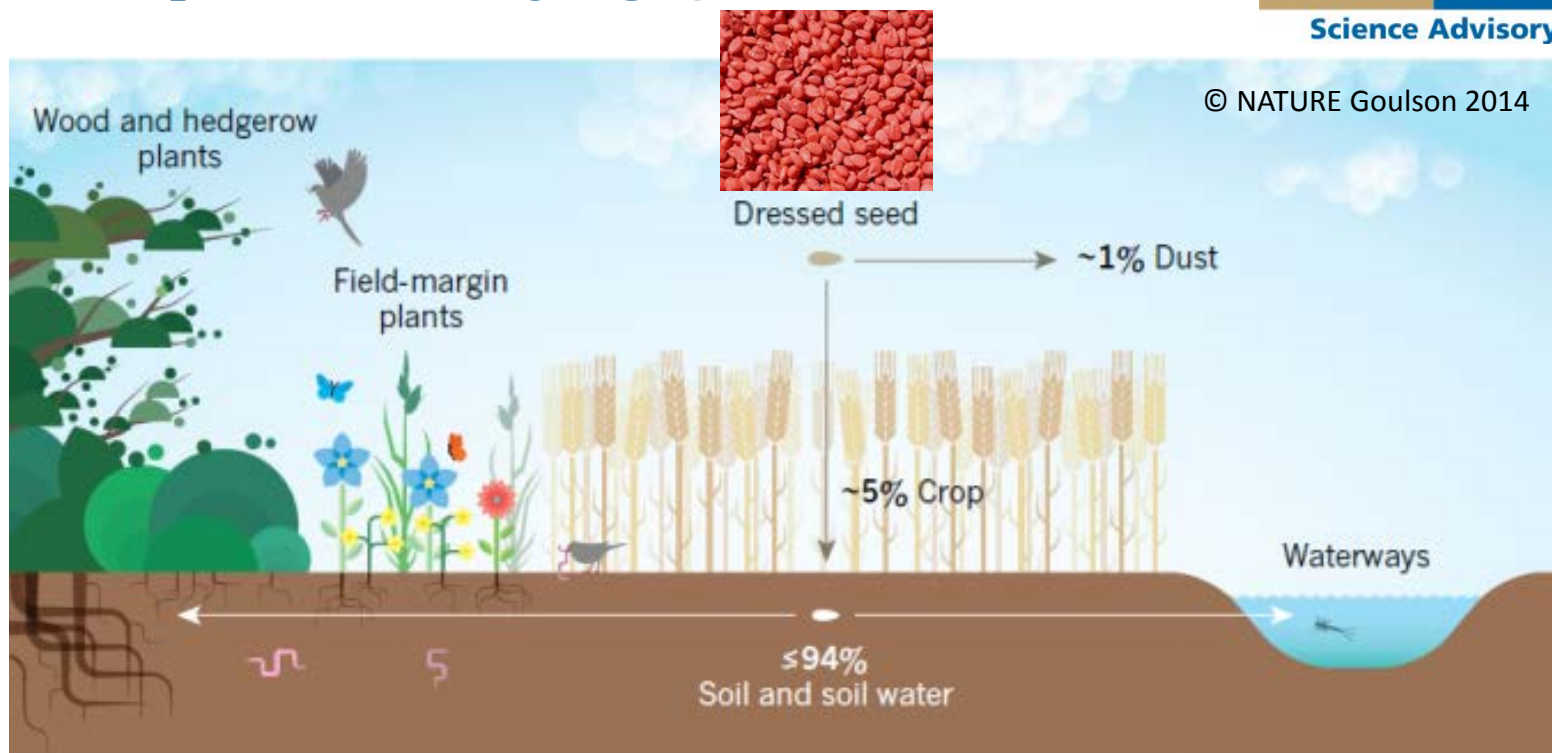
では生物多様性の損失を招いてきた原因は何なのか？

What are the drivers?

Drivers of biodiversity decline 種の多様性減少の原因の複雑さ



What role for Neonicotinoids? ネオニコのふるまいは？



一部が花粉や蜜にとどまるが、大半は土壌や水に浸透する

Besides residues in pollen/nectar, the goes into the soil and water

他の生態系、生態系サービスに広範に影響するおそれ

Potential for effects on other ecosystem services

Evidence reviewed どの証拠？

査読付きの学術論文300本をメタ解析したデータ

Our meta analysis: >300 peer-reviewed references
(incl. reviews, focus on 2012+)

様々なデータソースから得た様々なアプローチの研究データ

Multiple sources of data from different approaches



Research methods 研究方法— strengths and weaknesses 長所、短所

	メリット	デメリット
研究室	実験環境が管理できる	外的影響を判断しにくい
温室など	変数が少ない 現実の環境の再現度が高い	完璧には再現できない
野外調査	現実的な結果	環境の変動性が高い

Conclusions on research methods

研究方法の結論

すべての研究手法には、長所と短所が必ず存在する

All scientific approaches face strengths and weaknesses

それぞれの研究は単独で評価される。

短所のみが強調され、ステークホルダーが批判的になることがある。

Studies are often assessed in isolation, weaknesses will be emphasized given that stakeholders disagree with the results

結論として全体でどういったことがいえるのかこそ評価されるべきで、ある研究結果が、他の手法から得られた結論を

どの程度支持しているか、もしくは一致しているのか

こそ検討されるべきである

The totality of the evidence has to be considered and how far results from one approach are supported or consistent with evidence from other approaches

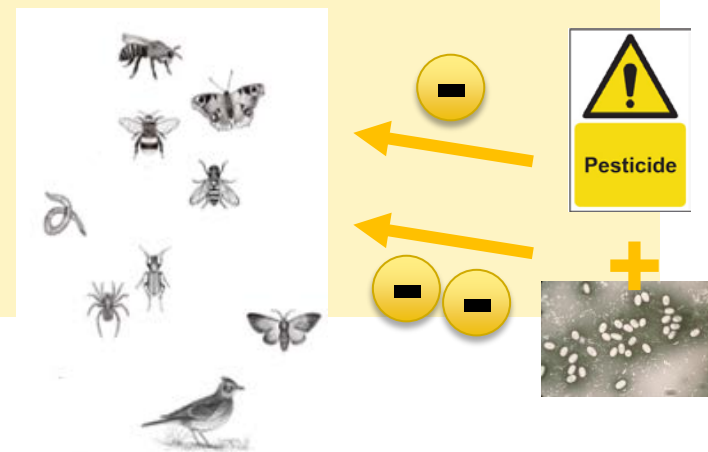
Results 結論その1

予防薬として幅広く使用されているネオニコチノイドが、本来標的ではない生き物にも、重大な悪影響を及ぼしているという証拠が多く集まりつつある。

Increasing body of evidence that the widespread prophylactic use of neonicotinoids has severe negative effects on non-target organisms, which provide ecosystem services, incl. pollination and natural pest control

ネオニコ単独の影響はもちろんのこと、他の要因とかけ合わさったときの影響も検討すべきである。

Effects alone and/or in combination with other factors, e.g. pathogens and/or food stress



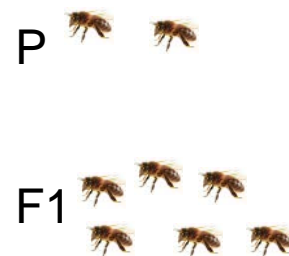
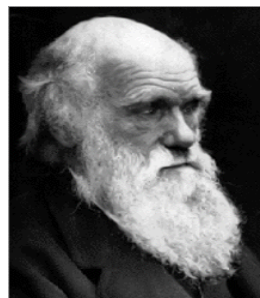
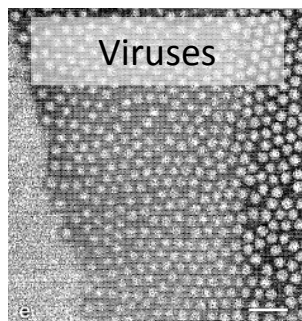
Results 結論その2

「致死量には達しないまでも、悪影響が出る」という
ネオニコの影響が存在することは明確である。

Clear evidence for sublethal effects of neonicotinoids

非常に低い濃度でも、深刻な影響をもたらす場合もある
(例: 抵抗力の低下による潜伏性ウイルスの活性化など)

Very low levels can have severe effects, e.g. activating latent viruses



Results 結論その3

従来考えられてきたネオニコの利益とリスクのバランスは変わりつつあり、今こそ改めて再評価すべきである。

Balance between risks and benefits for neonicotinoids appears to have shifted and requires reassessment

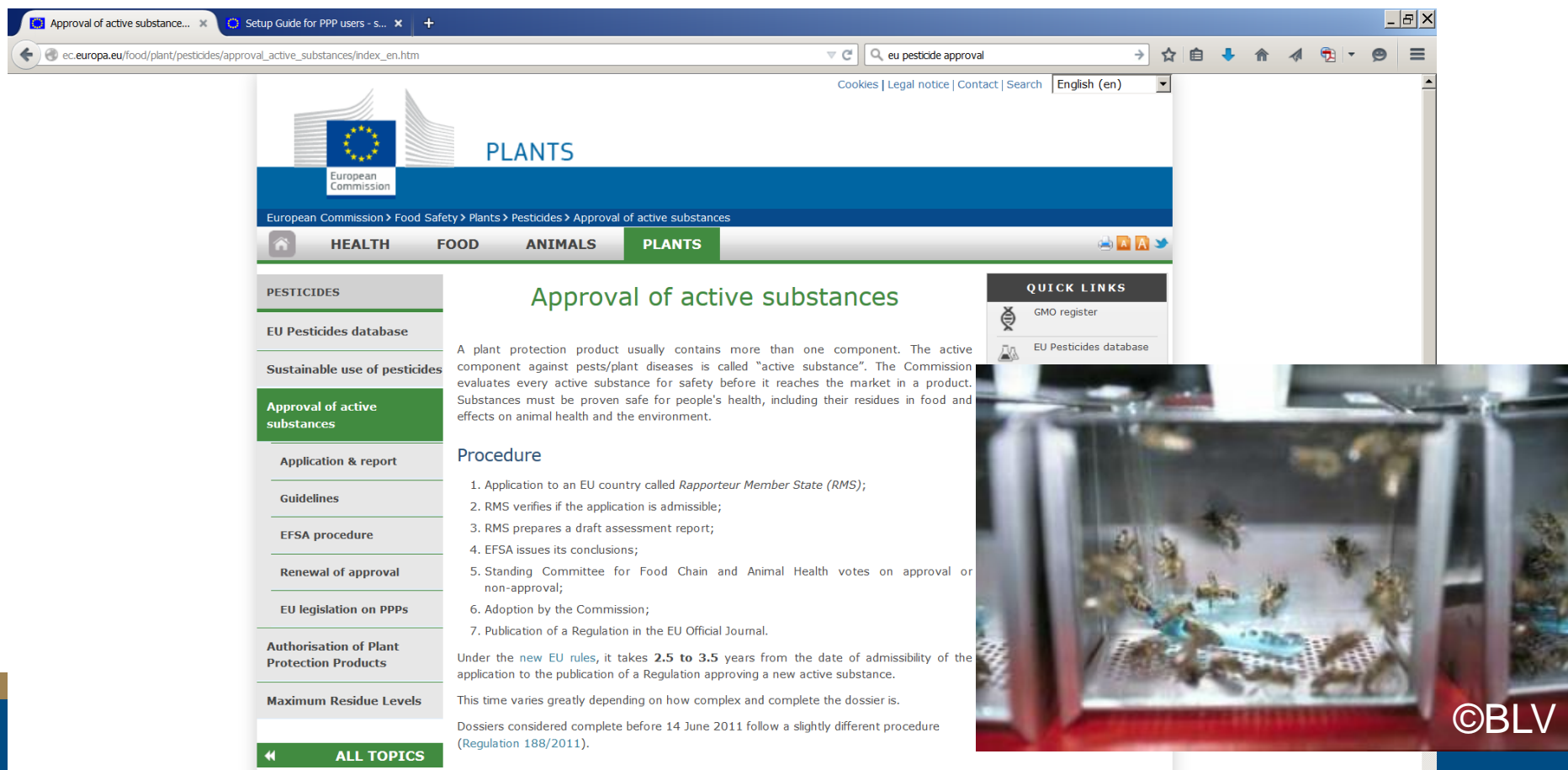
短期間しか発生しない害虫や「主な標的ではない害虫」に対して予防的防除を目的に大規模に使うことの是非は？再検討すべきではないか。

Large scale preventive pesticide usage against occasional or secondary pests targeted?

Wider aspects of EU Policy

現在のEUの承認手続きの中では、ネオニコチノイドによる、「死亡しないが悪影響」については十分に調査されていない

Sublethal effects of neonicotinoids are not sufficiently addressed in the present EU approval procedures



The screenshot displays the European Commission's website for the approval of active substances. The page is titled "Approval of active substances" and is part of the "PLANTS" section. The left sidebar contains a navigation menu with the following items: PESTICIDES, EU Pesticides database, Sustainable use of pesticides, Approval of active substances (highlighted), Application & report, Guidelines, EFSA procedure, Renewal of approval, EU legislation on PPPs, Authorisation of Plant Protection Products, and Maximum Residue Levels. The main content area includes a "QUICK LINKS" section with links to the GMO register and the EU Pesticides database. The "Procedure" section lists seven steps: 1. Application to an EU country called Rapporteur Member State (RMS); 2. RMS verifies if the application is admissible; 3. RMS prepares a draft assessment report; 4. EFSA issues its conclusions; 5. Standing Committee for Food Chain and Animal Health votes on approval or non-approval; 6. Adoption by the Commission; 7. Publication of a Regulation in the EU Official Journal. Below the procedure, it states that under the new EU rules, it takes 2.5 to 3.5 years from the date of admissibility of the application to the publication of a Regulation approving a new active substance. A video on the right shows bees in a cage, with the copyright notice "©BLV" in the bottom right corner.

Approval of active substances

A plant protection product usually contains more than one component. The active component against pests/plant diseases is called "active substance". The Commission evaluates every active substance for safety before it reaches the market in a product. Substances must be proven safe for people's health, including their residues in food and effects on animal health and the environment.

Procedure

1. Application to an EU country called *Rapporteur Member State (RMS)*;
2. RMS verifies if the application is admissible;
3. RMS prepares a draft assessment report;
4. EFSA issues its conclusions;
5. Standing Committee for Food Chain and Animal Health votes on approval or non-approval;
6. Adoption by the Commission;
7. Publication of a Regulation in the EU Official Journal.

Under the new EU rules, it takes **2.5 to 3.5** years from the date of admissibility of the application to the publication of a Regulation approving a new active substance.

This time varies greatly depending on how complex and complete the dossier is.

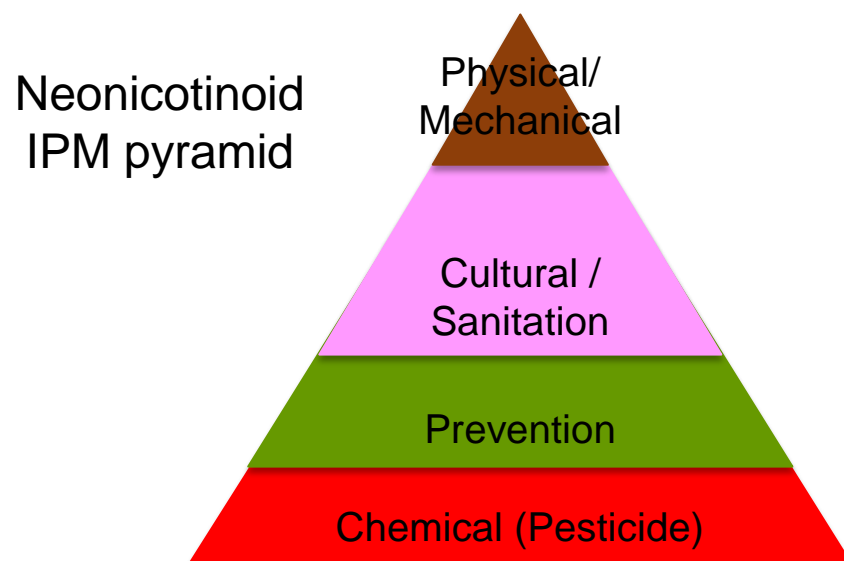
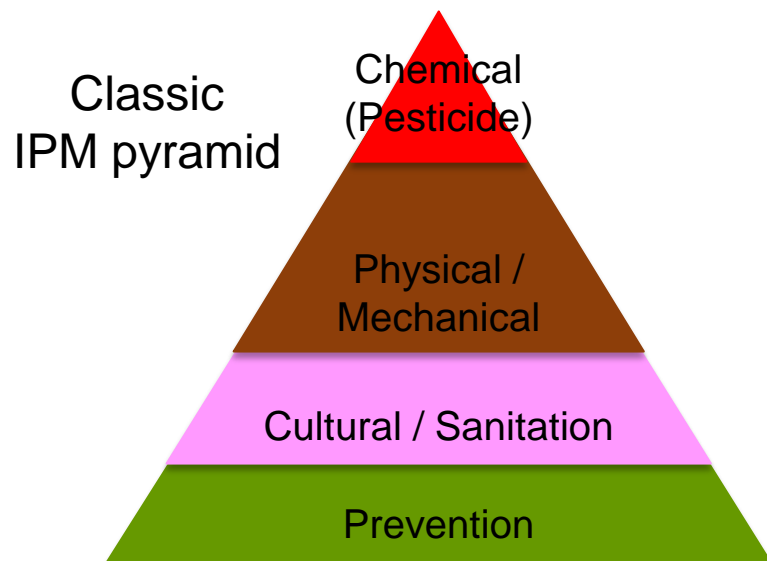
Dossiers considered complete before 14 June 2011 follow a slightly different procedure (Regulation 188/2011).

©BLV

Wider aspects of EU Policy

必要性以上に「とりあえず農薬を使う」という近年のやりかたは、EU指令(2009年/128/EC)の「IPM(総合的病害虫管理)の原則」に反している

Prophylactic usage of neonicotinoids inconsistent with basic principles of Integrated Pest Management as expressed in the EU's Sustainable Pesticides Directive (2009/128/EC)



Policy questions and stakeholder involvement 政策とステークホルダー

今後のネオニコの規制について

Future regulatory status of neonicotinoids?

農業政策との関係は？

Interactions with agricultural policy?

生物多様性政策との関係は？

Interactions with Biodiversity Policy

短期的な経済事情や食料安全保障

VS 拡大する環境リスクと農業の長期的持続可能性については？

Implications for short-term economy and for food security

vs. wider risks to the environment & long-term sustainability of agriculture?

ステークホルダー(産業界、消費者を含む)は持続可能な解決案への取り組み？

Joint efforts of all stakeholders to reach sustainable solutions (incl. industry and consumers).

Policy questions and stakeholder involvement 政策とステークホルダー



Media Response

<https://storify.com/EASACnews/easac-study-on-neonicotinoids>

- 世界中の主なメディアが反応した [Major media coverage across the world](#)
- 主要全国紙 例: New York Times [Major national press – e.g. New York Times](#)





Farm leaders in backlash over EU report on neonicotinoids - Farmers Weekly

The argument surrounding the use of neonicotinoids has intensified following the publication of a new report that claims this class of

pesticides is impact

 PHILIP CASE



Mounting Evidence for Neonicotinoid Environmental Impact

EU - Evidence for the negative impact of neonicotinoid pesticides on the environment is rapidly increasing, according to a joint report from the European Academies of Science to the European Commission.

 THE CROP SITE



Stinging verdict on bee-killers

Not surprisingly all this has provoked an angry reaction, with agrochemical firms even taking legal action against the EC. The industry and its supporters allege that the science behind the ban is "weak" and has been marshalled by pressure groups bringing together

researchers to "create studies" on "a campaigning basis".

 GEOFFREY LEAN



Lifting pesticide ban could harm pollinating insects | The Times

Pesticides temporarily banned because of fears that they kill honeybees could also damage populations of bumble bees, hoverflies, butterflies and moths, scientists claim. Neonicotinoid pesticides are subject to a two-year European Union ban that could be lifted in December. However, they could have "severe effects" on pollinating insects and overall biodiversity if reintroduced widely, a report says.

 THE TIMES

Pesticides could lead to shortage of crop pollinators - EU report

EU restriction on neonicotinoids to be reviewed this year. * Value of pollination in Europe seen at 14.6 bln euros. By Barbara Lewis. BRUSSELS, April 8 (Reuters) - Evidence is mounting that widely-used pesticides harm moths, butterflies and birds as ...

 REUTERS UK

sogenannten Neonicotinoiden gesammelt werden, teilte die EU-Kommission in Brüssel am Freitag auf Anfrage mit.

 VON APA/DPA



Alarmierende EU-Pestizid-Studie zu Bienensterben: SPÖ fordert mehr Rücksicht durch Agrarwirtschaft

„Ohne Bienen geht es nicht - auch nicht für die Landwirtschaft.

Deshalb muss es ein gemeinsames Interesse aller Beteiligten sein, die

Ursachen des massiven Bienensterbens schonungslos aufzuarbeiten. Unabhängige Erkenntnisse wie die jüngste EU-Studie von EASAC zu den Auswirkungen von Neonicotinoid-Giftstoffen müssen Handlungsanleitung für die nachhaltige Bodenbewirtschaftung werden", fordert SPÖ-Klubvorsitzender Christian Makor.

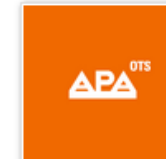
 SPÖ OBERÖSTERREICH

Thumbnail for Bienensterben: Studie bestätigt Ursachen Pestizide

Bienensterben: Studie bestätigt Ursache Pestizide

Initiative für unbefristetes Verbot von Neonicotinoiden bei der Landesumweltreferentenkonferenz im Mai.

 DIE GRÜNEN OBERÖSTERREICH



Kadenbach: EU-Studie bestätigt Bienensterben durch Pestizide

Wien (OTS/SK) - "In der gestern veröffentlichten Studie des europäischen Wissenschaftsnetzwerks EASAC wird einmal mehr bestätigt, dass Neonicotinoide für das Bienensterben mitverantwortlich sind", so SPÖ-EU-Abgeordnete Karin Kadenbach.

Sie warnt seit langem vor den Bienengiften. "Das vor zwei Jahren in Kraft getretene Verbot besonders gefährlicher Insektizide muss ausgeweitet werden", fordert die Abgeordnete am Donnerstag gegenüber dem SPÖ-Pressedienst.

 OTS



EU: Bienen sterben an Pestiziden - Wiener Zeitung Online

Brüssel. Wissenschaftler in der Europäischen Union machen den Einsatz bestimmter Pestizide für das Bienensterben verantwortlich. Es gebe zunehmende Beweise für die negativen Auswirkungen auf andere Organismen durch Neonicotinoid-Insektizide, hieß es in einer am Mittwoch veröffentlichten Studie des

EU-Wissenschaftsnetzwerkes Easac. In dem Bericht werden die Befunde einer Expertengruppe von 13 Forschern zusammengefasst.

 NATUR - WIENER ZEITUNG ONLINE

Regulatory Response

規制者の反応

- Three neonicotinoids (**clothianidin, imidacloprid and thiamethoxam**) already restricted since 2013. Decision on future policy- currently science review underway.
- Will extend from just honey bees to all bees (bumble and solitary)

The screenshot shows the EFSA (European Food Safety Authority) website. The header includes the EFSA logo and the text "European Food Safety Authority Committed to ensuring that Europe's food is safe". A navigation bar contains links: ABOUT EFSA, NEWS & EVENTS, TOPICS, PUBLICATIONS, PANELS & UNITS, COOPERATION, APPLICATIONS HELPDESK, and CALLS & CONSULTATIONS (highlighted). Below the navigation bar, a breadcrumb trail reads: Home > Calls & consultations > Calls for data > Closed calls > Call for new scientific information as reg... A sidebar on the left lists: Procurement, Article 36 grants, Calls for data, Closed calls (highlighted), and Public consultations. The main content area features a blue box with the title "Call for new scientific information as regards the risk to bees from the use of the three neonicotinoid pesticide active substances clothianidin, imidacloprid and thiamethoxam applied as seed treatments and granules in the EU". Below this, it states "Deadline: 30 September 2015". A document icon is shown with the text "Document (252.75 KB)". A "Background" section follows, mentioning "Commission Implementing Regulation (EU) No 485/2013 amended the conditions for approvals of the active substances clothianidin, imidacloprid and thiamethoxam for use in plant protection products, all belonging to the group of neonicotinoids. The specific provisions of the approval were amended to restrict the uses of clothianidin, thiamethoxam". A "See also" box on the right points to "Pesticides".

ご清聴ありがとうございます

Thank you for your attention

<http://www.easac.eu>