

The European Commission sets the objectives of reducing the sales of the most dangerous PPP by 50% by 2030, and to totally eliminate the use of hazardous pesticides by 2050. The European agricultural market is subject to harmonized EC regulation 1107/2009 that specifies the conditions for placing PPPs on the European market. Nevertheless, with the disposal of emergency derogations, PPP may be authorized in one Member State (MS) and prohibited in another. Focusing on neonicotinoids, we test the hypothesis this works against the objective of reducing the use of PPPs in Europe, using the prisoner's dilemma.

❖ **Prisoner's dilemma: The possibility of waiving the ban encourages the generalization of waiver requests.**

In the absence of a pest attack, MS have an interest in cooperative behavior: not to derogate from the ban on the use of PPP.

In the event of a pest attack, each MS is encouraged to apply for a derogation to limit the losses and remain on the market, despite the very significant damage to human health and ecosystems.

Total, private and (societal) gains per year with pest attack :

MS B \ MS A	doesn't use banned PPP	uses banned PPP
doesn't use banned PPP	-5 \ -5	-5 \ 4+2+(-6)=0
uses banned PPP	4+2+(-6)=0 \ -5	4+(-6)=-2 \ 4+(-6)=-2

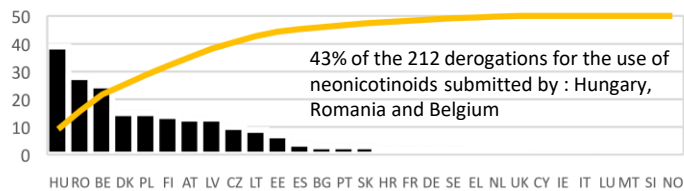
❖ **Derogations for prohibited PPP, requested and used, 2016-2021:**

✓ By year:

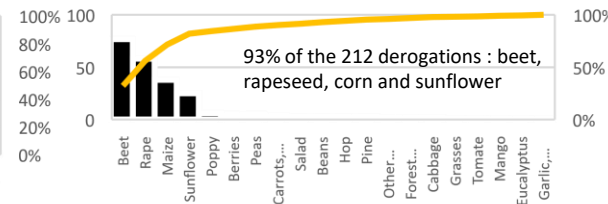
	2016	2017	2018	2019	2020	2021
All banned PPP	275	598	673	598	638	357
Neonicotinoids	11	48	35	49	34	35

Sources : Authors from EU-pesticides-database

✓ By MS :



✓ By crops:



Is the incentive for a MS to apply for an exemption greater:  
 . if private gains associated to the crop are high?  
 . if other MS have applied for a derogation themselves?

❖ **Model on annual data**

A first regression shows that a MS is more likely to request a derogation for the use of a neonicotinoid substance if it has a large area under maize and is specialized in maize or beet production relative to other EU countries.

The rest of the analysis is focused on the requests for derogations that specifically target the protection of beet, maize and rape/sunflowers.

- $Surf_{ij}$  : Area cultivated in crop  $j$  of MS  $i$
- The measure of the economic importance of a crop for a Member State shall be twofold:
- Share of MS  $i$  in the cultivated area in  $j$  in the EU:  $Share_{ij} = Surf_{ij} / Surf_{UE}$
- Specialization coefficient of MS  $i$  in  $j$ :  $Spec_{ij} = Share_{ij} / (Surf_{ij} / Surf_{UE})$

Variables	beet	maize	rape/sunflower	beet	maize	rape/sunflower
Constant	-2.650***	-2.951***	-2.241***	-2.707***	-4.371***	-3.369***
$Share_{ij}$	5.799**	18.007***	5.083			
$Spec_{ij}$				0.288**	1.557***	0.978***
Nb of derogations requested by other MS	0.176***	-0.294	0.133*	0.176***	-0.284	0.158**
LR Test Khi <sup>2</sup>	19.75	26.84	4.84	19.57	36.15	13.31
Nb Observations	139	139	134	139	139	134

- For maize and beet, country specialization has a positive and significant effect on the probability of a MS requesting a waiver
- The model is of better quality if the specialization coefficient is used rather than the surface share.
- For rape/sunflower, the MS specialization coefficient has a significant and positive effect on the probability of the MS requesting a derogation.
- The role of derogations requested by other MS seems positive and significant in the case of beet and rape/sunflowers (only 4 countries have requested derogations for the use of neonicotinoids for maize).

❖ **Conclusion**

Our results confirm that the risk of suffering a loss for an attacked sector leads a MS to request a derogation to protect the crop. This incentive is clear in the case of neonicotinoids which protect important sectors for several MS, in particular beet and maize.

Relying on the existing regulatory system alone to ensure the withdrawal of PPPs is ineffective when exemptions to the bans are possible.

Our results are consistent with the assumption that the fear of suffering a distortion of competition leads to a generalization at the Community level of the derogatory use of the dangerous PPPs, which are normally prohibited.

This would need to be confirmed by looking at the timing and duration of exemptions on a finer scale than the year.