

THE FAILURE OF INTEGRATED PEST MANAGEMENT (IPM) IN THE EUROPEAN UNION



WHY IS THIS IMPORTANT?

The European Commission sees Integrated Pest Management (IPM) as one of the main instruments to achieve a significant pesticide reduction. In the Q&A about the proposed “Sustainable Use Regulation” it says (...) *“chemical pesticides should be used only as a last resort. This is*

*the key principle of Integrated Pest Management which will be better implemented by this proposal.”*¹

This paper evaluates what the proposed regulation demands in detail and whether it meets its intended objective of only using pesticides as a last resort.

¹ https://ec.europa.eu/commission/presscorner/detail/en/qanda_22_3694

BACKGROUND

There has been no reduction in pesticide use in the European Union over the last three decades. Compared to the 1990s, pesticide use was much higher between 2011 and 2019 (see Section 3 in the foodwatch report “[Locked-in pesticides](#)”). Only in Denmark, where a pesticide tax is in place, there is a reduction in the pesticide load and amounts sold.

Integrated Pest Management (IPM) – a decades old concept – which hypothetically could reduce pesticide use to a strict minimum, or even to zero, was made obligatory throughout the European Union in 2014.

It has not resulted in any visible pesticide reduction on national/EU level.

The reasons for this failure are outlined in detail in the foodwatch report “[Locked-in pesticides](#)”. They can be summarised as follows:

1. Conventional agriculture is technologically and socio-economically locked into pesticides: this means farmers are forced to use pesticides;
2. Governmental institutions are also locked into certain belief systems - they show apathetic behaviour and little will to induce necessary changes (institutional lock-in);
3. Specific interest groups responsible for a “race to the bottom” (higher production at lower costs), and benefiting from the current pesticide-dependent system have managed to block progress.

The implementation of IPM on a large scale seems to be unrealistic, **without accompanying strong incentives** (see p. 7 “How to make IPM a truly successful tool for reducing pesticide use”).

Freier & Burth (2006) already concluded: “(...) despite tremendous research and efforts to introduce resistant cereal varieties, forecasting systems and thresholds, and natural pest regulation by beneficial insects. It had to be assumed that an area-wide implementation of integrated pest management was unrealistic in arable farming for economic and advisory reasons.”

The last years have proven the truth of this analysis: although mandatory, IPM has failed to reduce pesticide use in the European Union. Nevertheless, the European Commission sees IPM as the main tool towards pesticide reduction. The failed reduction efforts in the past have led to zero insight on what will work in the future.

In **France**, crop specific IPM guidelines for the majority of crops were made public in **2012**. Before that, the demonstration farm network DEPHY including 3000 farms (0.6% of the French farms²) was established in order to test and identify systems to reduce pesticide use. The DEPHY network was funded with €14 million each year. The 2015-2017 average showed a decrease of pesticide treatments by 14% in arable agriculture, 38% in vegetable production, 17% in viticulture and 43% in horticulture on DEPHY farms (EC 2019). Arable crops and viticulture account probably for 70-90% of all pesticide use in France. A reduction of 14% and 17% of **treatments** reduces the number of treatments not even by 1% in arable agriculture and from about 16% to 13% in viticulture³. As the French pesticide sales data show, the minor reductions in arable agriculture and viticulture on some demonstration farms did not translate into a significant pesticide reduction at a national level.

² Around 490,000 farms existed in 2012 in France.

³ Assuming a TFI of 5 over all arable crops (see Figure 8 on page 26 in “[Locked in Pesticides](#)”)

The introduction of crop specific IPM guidelines in France achieved no measurable pesticide reduction. More pesticides doses were sold, and the national Toxic Load increased until 2018 (see Figure 6 in “Locked-in pesticides”).

In the **Netherlands**, the government stated that by “2014, all professional users will be applying the principles of Integrated Pest Management.” Dutch Farmers are already required - as the draft SUR demands in Article 14 - to record all IPM measures such as crop rotation, use of resistant varieties, biological, physical and nonchemical methods, selection of pesticides based on risks for environment and humans, monitoring of harmful organisms, use of warning and forecasting systems and resistance management (Helepciuc & Todor 2021). **The analysis of pesticide use in the Netherlands** (see chapter 2.1. of the report “Locked-in pesticides”) shows **no substantial decrease in pesticide use.**

WHAT DOES THE PROPOSED SUSTAINABLE USE REGULATION (SUR) DEMAND?

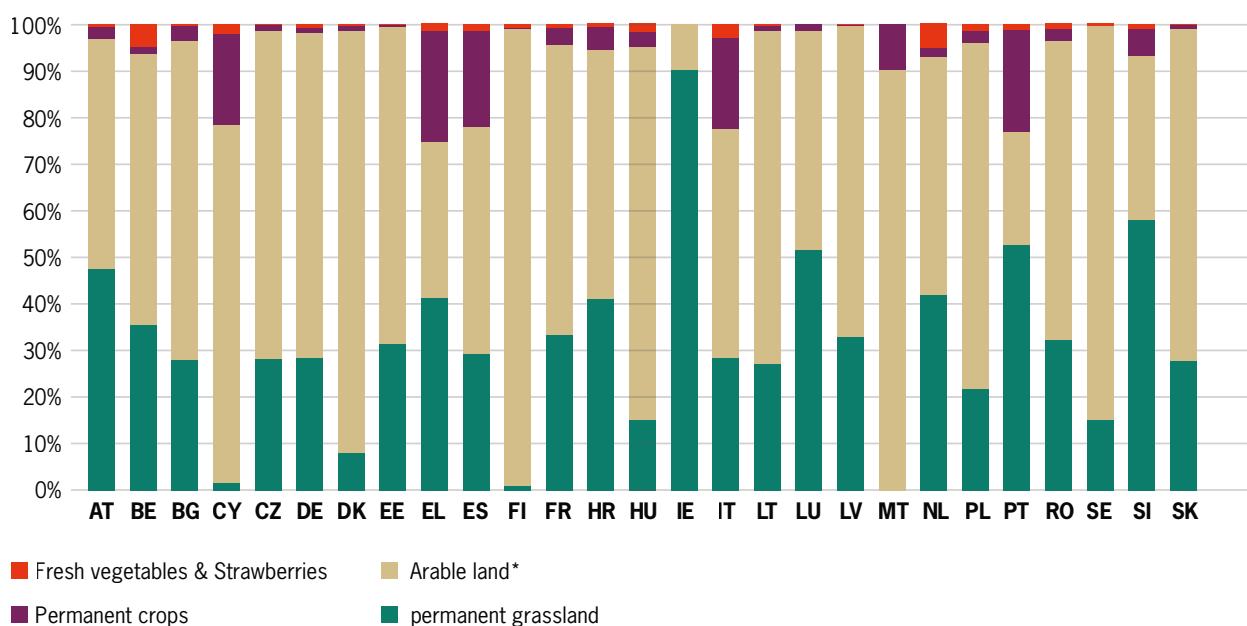
In Article 15 of the SUR proposal, it says: “each Member State shall have in place effective and enforceable crop-specific rules, for crops covering an area that accounts for at least 90 % of its utilised agricultural area (excluding kitchen gardens).” All farmers will also be required to document their decisions.

It may sound ambitious, that specific IPM rules are required for crops on 90% of the utilised agricultural area (UAA) but UAA includes per definition⁴ permanent grassland (meadows, pastures). The following figure shows the distribution of the UAA⁵ by crop type in all Member States. The data show that crops with a high pesticide use intensity (shown in red in the chart below) are under 10% of the UAA in most EU Member States.

⁴ [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Utilised_agricultural_area\(UAA\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Utilised_agricultural_area(UAA))

⁵ Data are available here: <https://ec.europa.eu/eurostat/web/agriculture/data/main-tables>

Figure 1:
DISTRIBUTION OF UTILISED AGRICULTURAL AREA (UAA) IN THE EU MEMBER STATES (2018)



*area for fresh vegetable & strawberries excluded

When Member States strictly implement the proposed regulation, no Member State would be legally required to develop crop-specific IPM rules for vegetables and strawberries. Only five Member State (CY, EL; ES, IT, PT) would need to develop crop-specific IPM rules for some permanent crops such as grapes, olives, citrus and apples. While these crops (fruits, vegetables, strawberries, grapes etc.) cover only a small crop area, the intensity of pesticide use is very high (see foodwatch report “Locked in pesticides” – pages 16-32). Pesticide users, by-standers⁶ and the local environment are exposed to a large number of different pesticides with a particularly high use frequency. Permanent grassland on the other hand is rarely sprayed, and with regulation text as it is Member States can simply define “meadow IPM” to meet the demand by the regulation.

The trick to include the total utilised agricultural area (UAA) as reference area also affects the national pesticide reduction targets in the SUR, because Member States can reduce their target, if their pesticide use intensity is lower compared to the EU average⁷. Intensity means **amounts sold divided by the total UAA** (incl. permanent grassland). Member States with a high share of permanent grassland (meadows, pastures) can therefore probably significantly lower their reduction targets.

However, **fully-fledged** Integrated Pest Management which **requires all measures preventing the development of pest, weed and disease populations** (see Chapter 5.1 in “Locked-in pesticides”), respects the damage threshold before treatments, has indeed the potential to reduce pesticide use by 80-100% (see Deguine et al. 2021, Pretty et al. 2006).

The communication by the European Commission (EC 2022/0196) promised **new** IPM rules:

*“Under the environmentally friendly Integrated Pest Management made mandatory by the **new rules**, prevention and sustainable alternatives must be used before turning to **chemical pesticides only as a last resort**. (...) This is the **key principle of Integrated Pest Management which will be better implemented by this proposal.**”*

However, the definition of Integrated Pest Management in Article 3 of the SUR is not sufficient and is neither effective nor enforceable as demanded in Article 15 of the draft SUR. It is also not “new”!⁸:

“IPM means careful consideration of all available means that discourage the development of populations of harmful organisms, while keeping the use of chemical plant protection products to levels that are economically and ecologically justified and minimise risks to human health and the environment.”⁹

“Careful consideration” is a meaningless, legally undefined, and thus not enforceable term. A much older EU IPM definition asked at least for “*application*” of cultural and biological measures and to limit pesticide use to a strict minimum, while the current definition allows the priority of pesticide use over all other means as long it is economically justified.

The older EU IPM definition in Directive 91/414 from 1991 was much more precise:

“Integrated control: the rational application of a combination of biological, biotechnical, chemical, cultural or plant breeding measures whereby the use of chemical plant protection products is limited to the strict minimum necessary to maintain the pest population at levels below those causing economically unacceptable damage or loss.”

The two definitions above show the main problem with IPM: it is arbitrary.

There are countless IPM definitions (see Deguine et al. 2021 for review), from very ambitious to very meaningless (see Figure 2).

⁶ By-standers are people not directly involved in pesticide spraying. The definition includes people living, being nearby.

⁷ See Article 5 of the SUR proposal from June 2022.

⁸ It is the UN FAO definition (<https://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/ipm/en/>) and very similar to the one in the “old” SUD.

⁹ Article 3, SUR proposal from June 2022.



Figure 2:

WORDBUBBLE WITH IPM

adapted by foodwatch (used with permission from Deguine et al. 2021)

The arbitrary meaning of IPM makes it easy to hide non-action. **Governmental institutions, the pesticide industry and grower associations can basically develop whatever management rules they find suitable and call it IPM** (see below).

WHAT ABOUT THE SUBSIDIES (CAP) HELPING WITH IPM IMPLEMENTATION?

The European Commission announced that pesticide reduction through IPM could be supported by subsidies. This direct support would be legally questionable. Generally, it is not legal to subsidise measures, which are mandatory – and IPM already is mandatory.

In theory, the CAP could support specific risk reduction measure (e.g. use of pheromones in orchards, horticulture). Or more elegantly by making certain preventative plant protection measures a condition for receiving subsidies (see PAN Europe 2021).

The previous “crop rotation” rules were such an attempt, but these rules were badly designed¹⁰ and did not achieve the desired effect.

It seems the new CAP is not more ambitious. A new report by BirdLife Europe and the European Environmental Bureau with the title: Pesticides in the new CAP: *business as usual puts nature and human health at risk*¹¹ concludes:

“Member States’ CAP strategic plans will neither contribute to the uptake of IPM principles nor propose strong enough measures to seriously reducing pesticide use dependency, (...). Overall, the assessed plans demonstrate very low ambition to use CAP funding for interventions related to pesticides use reduction.”

¹⁰ Similar crops, like triticale, wheat, barley and rye were considered as as several crops, but rotating them has no positive effect on preventative plant protection – they are all sensitive to Fusarium spp. and other diseases and support the development of weed problems with grasses like black-grass or wild oat. In general, a crop rotation should not include more than 50% cereals.

¹¹ <https://eeb.org/wp-content/uploads/2022/07/EEB-BirdLife-Briefing-Pesticides-July-2022.pdf>

IPM AND THE INSTITUTIONAL LOCK-IN IN GERMANY

The institutional lock-in becomes fully obvious when looking at the German IPM rules. The concept of IPM exists for about 60 years (Deguine et al. 2021). German institutes have published guidelines and articles on IPM since the 1980s, and in 1992 an Institute for Integrated Pest Control was founded. It was later not only renamed, but also re-functioned.

IPM was made the official production guideline in Germany in 1996 (Freier & Burth 2007). Specific minimum requirements for Integrated Pest Management in arable crops (in Burth et al. 1994) and more specifically for winter wheat were already published in 1995 by Freier et al. (1995).

Nonetheless, the German authorities needed almost 10 years after the "Sustainable Use Directive" came into force to officially publish legally binding crop-specific IPM rules for all major crops.

The first crop specific IPM rules became legally binding in 2018, the last in 2021 (cereals). In the case of sugar beet, IPM guidelines were available already in 2011, but it took seven years to make them legally binding.

Despite expertise and experience, the German government outsourced the development of crops specific IPM rules to private associations, including the German pesticide industry association.

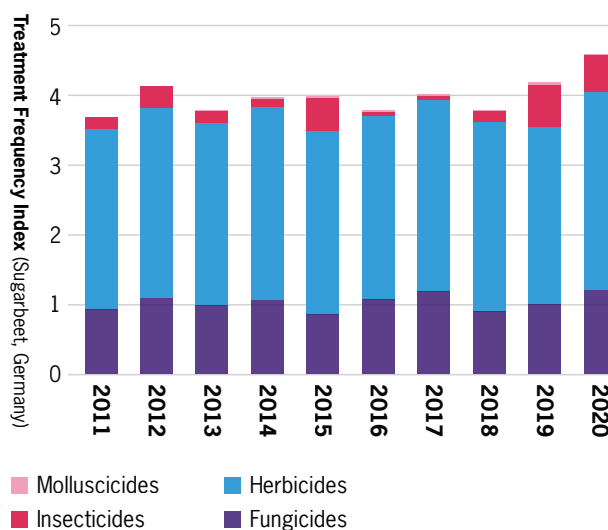
All (except the one for hops¹²) German crop-specific IPM guidelines were published by grower associations of the particular crops¹³, and then made legally binding by the government.

The crop specific IPM rules developed by private associations neither meaningfully restrict pesticide use nor impose conditions on preventative measures. Almost all pest and weed problems in cereals are caused by narrow (non-diverse) crop rotations including a large share of cereals (see DBV 2021). Nevertheless, the crop specific IPM rules developed by the farming lobby group Deutsche Bauernverband (DBV) only say that narrow crop rotation *should be avoided*.

While the IPM rules for winter wheat by Freier et al. (1995) prohibited the use of pyrethroids, the DBV rules do not restrict any pesticide use.

Figure 3:

TREATMENT FREQUENCY INDEX FOR SUGARBEET IN GERMANY. IPM RULES BECAME OBLIGATORY IN 2018



The publication of IPM rules in 2018 has not resulted in any pesticide reduction in sugar beet.

¹² For hops the Bavarian authorities and the hops grower association are the publishers.

¹³ See https://www.nap-pflanzenschutz.de/fileadmin/SITE_MASTER/content/IPS/Integrierter_Pflanzenschutz/Leitlinien_IPS/210428_NAP_Anhang_1_TabelleLL.pdf

HOW TO MAKE IPM A TRULY SUCCESSFUL TOOL FOR REDUCING PESTICIDE USE

If designed properly, ecologically based, preventive IPM **can** successfully reduce pesticide use to a strict minimum or even zero. However, it must address the main driver of pesticides: a lack of diversity on different levels (genetic, spatial, biological, temporal).

The measures which are suitable to achieve a higher diversity are described in Chapter 5.1 in the foodwatch report *“Locked-in pesticides”*. Some of these measures are easy to implement (e.g. relay/strip cropping, mixing of cultivars, flower strips, crop diversification). These measures can increase yields (Jungers et al. 2021; Magrath et al. 2021) and they must be included in IPM rules.

However, IPM will only be a successful pesticides reduction tool, when accompanied by effective incentives e.g. taxation, (legislative) restrictions and funding (subsidies). Simply publishing mandatory IPM guidelines and hoping that this will reduce pesticide use has not worked in the past. Hope is not a strategy.

The next three examples illustrate what a coherent approach between IPM rules, authorisation and subsidies could look like:

1. When the use of certain pesticides e.g. pyrethroids in cereals, violates obligatory IPM rules, these uses should not be authorised (**legal restriction**).
2. Growers will integrate flower strips¹⁴ or other ecological infrastructure attracting beneficial organisms, when it is (partly) **funded via the CAP**.
3. Growers are less likely to spray the area of a field populated by a pest/pathogen above the economic damage threshold, when pesticides are **significantly more expensive because of a tax/levy**. As long as pesticides are as cheap as they are, farmers will not conduct a monitoring of pests, weeds, diseases, and the presence of natural enemies. It is still common practise to spray 100% of the field, although only a small part of the field is infested, or to spray even without a monitoring (calendar spraying). It is also very common to apply tank mixes of various pesticides against several organisms because the treatment is conducted anyways. All these *“better safe, than sorry”* spraying practices violate the principle of IPM, pose high risks and are most probably largely responsible for many pests becoming resistant against pesticides.

It is therefore necessary to embed crop specific IPM guidelines into a greater pesticide reduction plan. Such a plan is outlined in the foodwatch report *“Locked-in pesticides”* (see next figure).

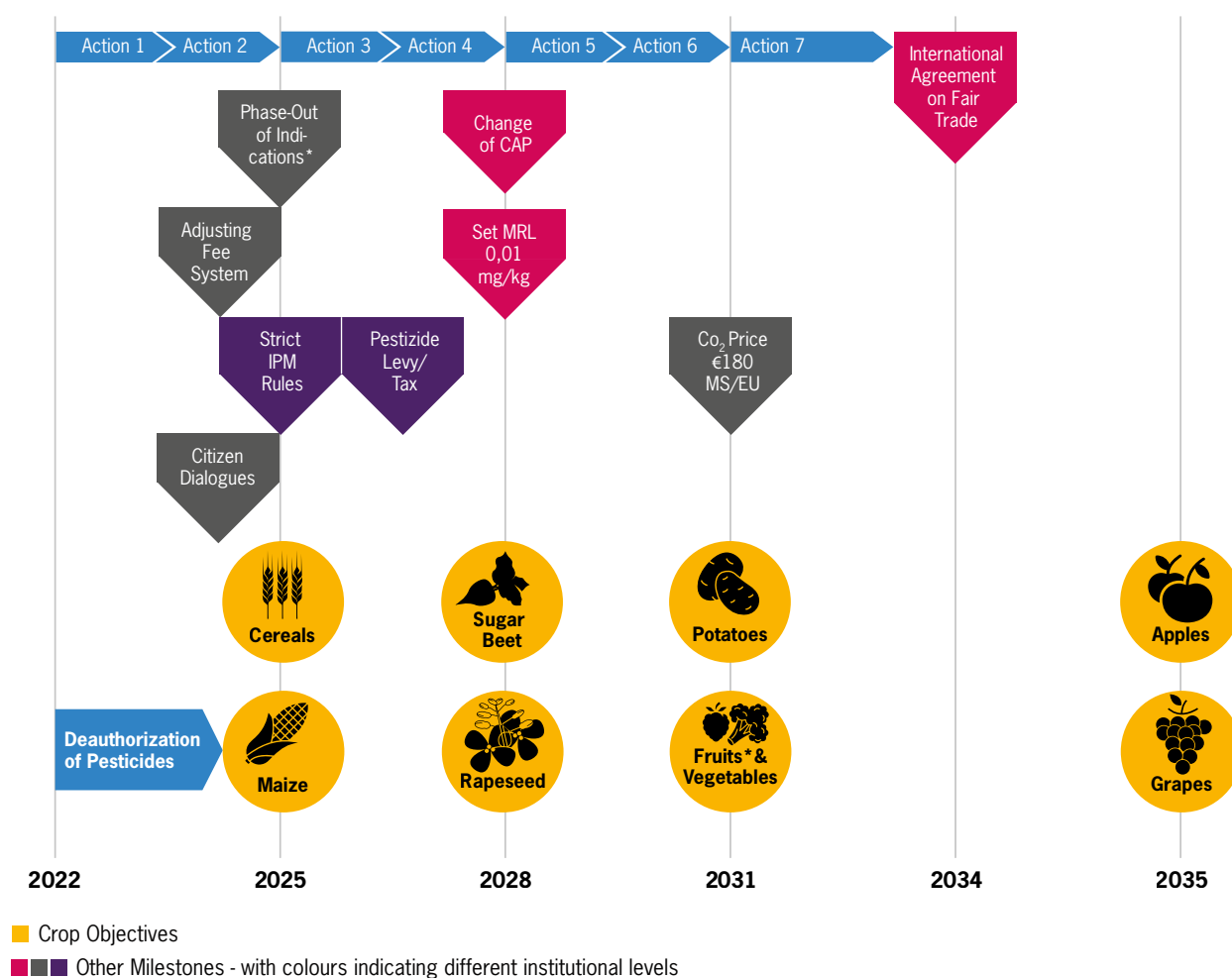
¹⁴ Flower strips or other ecological infrastructure in defined spacing could be also a requirement within a IPM.

IPM rules for the specific crops must aim at a step-by-step phase-out of pesticide use. IPM rules can certainly prohibit pesticide use, if appropriately designed. IP Suisse – the IPM concept of Switzerland – is an excellent example. In most crops, IP Suisse

prohibits the use of fungicides, plant growth regulators and insecticides. IP Suisse recently introduced a pesticide free IP system for wheat¹⁵.

¹⁵ See <https://www.ipsuisse.ch/produzenten/pflanzenbau/#top> (in German and French)

Figure 4:
MODEL OF A PESTICIDE-REDUCTION PLAN WITH CROP OBJECTIVES



CONCLUSIONS – BIG TALK NO ACTION

In their speeches and communications, the European Commission appears ambitious and confident. In 1993, they promised a development “Towards Sustainability” (EC 1993) including pesticide reduction, and more recently, in December 2019, a “Green Deal”¹⁶ including (again) pesticide reduction.

Maybe the European Commission counts on citizens and media with a short memory? Organisations will not read the implementing regulations in details, but spread the message of hope about “*the change to come*”?

In June 2020, the European Commission communicated:

“Integrated Pest Management made mandatory by the new rules, prevention and sustainable alternatives must be used before turning to chemical pesticides only as a last resort.”

The “Sustainable Use Regulation” however offers nothing new. It gives - just as before - pesticides use the priority over pest/weed/disease prevention, because in the current production system, pesticide use is always economically justified.

There is no lack of knowledge about preventative pest control and alternative methods. The European Union can produce more than enough healthy food without regular pesticide use. It just needs to be legally required and incentivised.

However, the financial interest and the massive influence of the pesticide industry, the agricultural lobby including the commodity trade on decision makers have prevailed virtually unchanged¹⁷. Preventing pest/weed/diseases is not a business model for the agro-industry.

As a result, Integrated Pest Management as planned by the European Commission is just another example of how a theoretically tempting concept is ruined by industry compliant politicians and shameless lobbying.

If the “Sustainable Use Regulation” is not substantially changed, another decade may pass in which “Integrated Pest Management” will remain a useless instrument, and continue to profit the current beneficiaries of industrial agriculture, with all its negative externalities.

The EU “Farm to Fork Strategy” for a fair, healthy and environmentally-friendly food system needs to look beyond the farm level. The producers cannot escape the “pesticide lock-in” alone, the entire food system needs a transformation, including international trade agreements on production standards and promotion of a more plant based diets.

Building sustainable agroecosystems requires more than ecological and scientific–technological knowledge such as (properly designed and consequently enforced) Integrated Pest Management. Food production systems are a combination of nature and society. The public, decision-makers, and agricultural producers must be engaged to become part of the necessary changes. Important barriers such as the pesticide lock-in must be identified and addressed.

With relative ease we could solve several crises caused by agriculture (see foodwatch report “Locked-in pesticides”). However, this would require a shift of power away from corporations to the EU citizen.

¹⁶ https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

¹⁷ See A loud lobby for a silent spring. The pesticide industry's toxic lobbying tactics against Farm to Fork <https://corporateeurope.org/en/2022/03/loud-lobby-silent-spring>

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EDITOR

Jörg Rohwedder

foodwatch e.V.

Brunnenstraße 181
10119 Berlin, Germany

Tel. +49 (0) 30 / 24 04 76 - 0

Fax +49 (0) 30 / 24 04 76 - 26

Email info@foodwatch.org

www.foodwatch.org

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The foodwatch report „Locked-in pesticides” provides comprehensive information on pesticide use in the EU, its economic causes and impacts. It presents a crop-by-crop plan how to create a pesticide free European Union by 2035.

DOWNLOAD HERE:

<https://www.foodwatch.org/en/news/2022/europes-fatal-dependency-on-pesticides/>