Call for papers - Special issue
Environmental Science & Policy

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Removing pesticides. Competing alternatives for changing agriculture

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1. Scope and contribution

Key-words : Agriculture ; pesticides ; alternatives ; politics ; technology ; science ; policy; industry; competition

Reducing the consumption of pesticides is one of the main challenges facing the transition towards more sustainable agrifood systems (Carvalho, 2006). Their negative impacts have been highlighted repeatedly, affecting human health (Evangelakaki, Karelakis and Galanopoulos 2020; Dereumeaux et al. 2020; Bajwa et Sandhu, 2014), biodiversity (Seibold et al., 2019) and natural resources (Pelosi et al., 2021). Scientific controversies regarding pesticides (McHenry, 2018), collective movements in rural areas (Arancibia 2013), as well as the growing reporting of pesticides related issues by the media, have increased the visibility of these problems during the last decade.

Removing pesticides have proved to be quite problematic however, as they are a crucial component of contemporary agricultural systems (Shattuck, 2021). An important bulk of literature has documented the various lock-in mechanisms that tend to impede pesticides to be challenged (Cowan and Gumby, 1996; Wilson and Tisdell, 2001; Vanloqueren and Baret, 2007). Despite these mechanisms, attempts and solutions targeted at removing pesticides or reducing their use do exist. Some authors analyze how farmers, activists, bureaucrats and scientists engage in organic agriculture, which per definition excludes the use of synthetic chemical inputs (Padel, 2001; Lamine, 2011; Fouilleux and Loconto, 2018). Other authors have focused on the development of integrated pest management as a dissenting scientific project (Kogan 1998; Lamine 2011). Other works explore the emergence of new 'nature-based' substitution products, often derived from biotechnologies (Goulet, 2021) - on the market of agricultural inputs (Kvakkestad et al. 2020), or the adoption of new technologies for precision spraying (Wachenheim et al., 2021). All of these works show that pesticides removal is an objective that can be attained through radically different levers and that these do not target the same lock-in points. Said differently, different technologies (Arthur, 1989) and/or niches (Kemp et al., 2001) may compete for offering solutions to remove pesticides while ensuring crop protection.

With this special issue, we aim to approach the various types of solutions proposed to reduce agricultural dependency on pesticides as *plural* and *competing* alternatives. Our core hypothesis is that pesticides reduction/removal initiatives are embedding contrasted visions regarding the future of agriculture, along with specific representations, values, imaginaries but also material cultures. Our goal is thus to explore the politics and sociotechnical processes that underlie such plurality and competition. These solutions can be at odds with each other, but for different reasons actors often hybridize them in their discourses and/or in their technical and social practices. Through this special issue, our goal is to explore and understand this diversity of solutions, the actors, networks and coalitions they involve, and the way they are justified, legitimized or challenged. Our goal is also to assess the changes resulting from these various processes.

We expect papers either analyzing the emergence of one specific type of solution for pesticide use reduction/removal and its implementation, or exploring the competition at stake among different types of options for pesticide reduction/removal. Such processes may take place in different fields (or at the crossroads among them), which might be studied individually or in interaction:

- **Pesticides as public problems:** the social construction of public problems is itself a competitive process that participates to the identification and promotion of policy solutions, or to their dissimulation/occultation. The way pesticide use is constructed as a problem in various contexts may play an important role in the selection of pesticide reduction/removal levers. Many questions arise. How do different actors problematize pesticides to promote their favorite options and/or to hinder other ones? What specific

role does the media play in exploring the different types of alternatives and on the competition among them? What types of power games do these controversies involve? In particular, how do the actors threatened by potential changes in policy and practices for pesticide reduction/removal react?

- **Public policies and policy instruments**: Developing alternatives to pesticide use often involves major investments by the state (Goulet and Hubert 2020). Many countries and regional groups are implementing public policies aimed at reducing pesticide consumption, with varying degrees of success (Barzman and Dachbrodt-Saaydeh, 2011; Möhring et al., 2020). These policies can rely on very different instruments, from taxation of pesticides, ban of incriminated substances, promotion of substitution products, labels, organic subsidies, or specific food procurement rules for example. How are these policies' instruments identified and implemented? How does the competition among options reflect into public policies? How do these policies and the instruments they rely on reshape (or solidify) farming and agrarian models?
- **Agricultural knowledge and innovation systems** (AKIS): Pesticide reduction/removal options can involve dramatically different changes in farms, from simple input substitution (Rosset and Altieri, 1997) to the complete redesign of crop systems (Chantre et al., 2015). The range of these changes implies the mobilization of heterogeneous knowledge and disparate visions of the role of extension actors (Coquil et al. 2018). Pesticide reduction often requires reshaping the work of public research actors and their relations to policy makers (Aulagnier and Goulet 2017) as well as the practices of all the actors engaged in the diffusion of agricultural knowledge (Compagnone and Simon 2018). What epistemic and organizational transformations do various attempts to decrease pesticides involve? How do competing alternatives reconfigure –or not- relations between scientists, extension actors and farmers?
- **Firms' strategies and technologies**: Developing and promoting alternative technologies to pesticide is a matter of growing importance for actors of the private sector. Agrochemical or biotechnology companies invest in specific technologies and solutions (Schwindenhammer 2020). But works have shown that such innovations – often based on biological processes – require radical changes in the modes of homologation, transport, sale or use of inputs. Developing and selling alternatives to pesticides reshape agro-industry practices and market agencements. What are the sociotechnical mechanisms that accompany the production of these innovations, from their conception to their marketing? How are firms' practices affected by pesticides removal/reduction injunctions? How do these actors participate to the selection or disqualification of different options?

Contributions exploring other aspects of the transformations related to the reduction of pesticide use in agriculture or their removal are also welcome.

Critical dates:

- Full papers submission: 15th January 2022
- Publication of the special issue: September 2022

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2. About *Environmental Science & Policy* journal

Environmental Science & Policy advances research in the intersections between environmental science, policy and society. The journal invites scholarship within this broad thematic that fits with one or more of the following four focal areas: 1) Studies of the relationship between the production and use of knowledge in decision making; 2) Studies of the relation between science and other forms of environmental knowledge, including practical, local and indigenous knowledge; 3) Analyses of decision making practices in government, civil society, and businesses and the ways that they engage environmental knowledge; or 4) Research that presents environmental research with a clear perspective on pathways towards policy action and impact. Research can address a wide number of environmental issues, such as climate change, food systems, biodiversity loss, human and ecological well-being, resource use- and extraction, land use change, and sustainability more generally. The journal aspires to achieve an appropriate balance between perspectives from the global North as well as the global South and welcomes discussions of (environmental) justice, equity and inclusion. The journal is particularly interested in cutting edge developments in inter- and transdisciplinary work on co-production; arts-based research; integrated nexus and landscape approaches; the trade-offs and synergies between environmental issues and policies; innovations in integrated assessment, monitoring and evaluation; and transitions and transformative change.

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