

Call for Paper for a Thematic Issue of Cahiers Agricultures

Reducing the use of agricultural pesticides in Southern countries: socio-technical barriers and levers

Coordinators : L. Temple (Cirad), N. Jas (Inrae), F. Le Bellec (Cirad), JN Aubertot (Inrae), O. Dangles (Ird), JP. Deguine (Cirad), C. Abadie, (Cirad), E. Compaore Sawadogo (Inera, Burkina Faso), F. Cote (Cirad).

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Mail to: ludovic.temple@cirad.fr	

Summary

Demographic transitions, the demands of international markets for agricultural and food commodities, and even bioeconomics, are leading to increasing the intensification of pesticide use in tropical agriculture (understood as ‘chemical products used to control animal or plant pests’). These intensifications are sometimes supported by policies accompanying green revolutions (Andrianarison et al., 2022, Wilson and Tisdell, 2001). The knowledge of the hidden costs related to these increasing uses in terms of health for users and consumers of products, but also in terms of impacts on biodiversity in agro-ecosystems and ecosystems, water, soil and air pollution, and the ecological dysfunction of agro-ecosystems, imply transformations of this intensification trajectory. The conceptualisation of the notion of ‘One Health’ centrally reinforces the need for a technological and organisational paradigm shift in agriculture. This leads to questioning the knowledge of technological, organisational and institutional locks and levers (Bureau-Point and Temple, 2022) that document different alternatives (agroecological, organic, etc.) to reduce or eliminate the use of pesticides.

If, in Northern countries, public or industrial support plans (Guichard et al., 2017) and research inform the deployment of these alternatives (Jacquet et al., 2022), this is not, or is only rarely, the case in tropical agriculture in Southern countries (Maggi et al., 2021). These contexts benefit, for example, from less investment in public research. Knowledge of pesticide use trends, of the conditions for their regulation, of the barriers to agronomic alternatives to these uses is poorly documented, fragmented and poorly synthesised. This incompleteness is all the more problematic as these contexts in the South are structuring a rapid growth of the pesticide market, and thus of investments by agri-supply companies.

The objective of this double thematic issue, initiated within the framework of the PRETAG (Pesticide Reduction for Tropical Agricultures) initiative, and contextualised to work explicitly on tropical agriculture in Southern countries, is to characterise the macroeconomic variables (evolution of relative prices of pesticides and agricultural and food products), institutional variables (public and private norms, social norms), and political and agronomic variables, which constitute barriers and/or levers for pesticide use reduction. Contributions to this thematic issue on the following topics will be welcome:

- the characterisation of the consequences of agricultural policy instruments (programs, projects, intervention or support agencies), on the reduction of pesticide use: agroecology (Cote et al 2019, Deguine et al., 2023); organic agriculture; biopesticides (Goulet, 2021), taxes, quality control, vendor accreditation;
- the functionality of institutions (regulations and standards): regional, national and international public regulations (Jas, 2014), private standards (CSR, quality), labels and standards (Lemeilleur et al., 2020), technical standards on uses, pesticide residue standards in water, on products for export, social standards (Houngnihin et al. 2021);
- the sensitivity of pesticide uses to changes in relative prices (Carpentier et al., 2018) between pesticides, fertiliser (Meynard et al. 2003), labour and agricultural products;
- the role of research and innovation policies (national and international) that organise and accompany (Labarthe, 2010) the emergence, experimentation, implementation, evaluation and dissemination of alternatives that make the challenges of intensification and the objectives of reducing pesticide use compatible;
- agronomic approaches to the design and implementation of agroecological crop protection practices (Deguine et al., 2023): support, redesign of cropping systems, technology transfer for agroecological transition;
- the performance of substitution levers for pesticide use in tropical agriculture: agronomy, bio-inputs, new varieties, small-scale mechanisation, digital technology;
- the sectoral specificities of the sectors (agricultural, food, livestock) in the blocking or the levers of reduction and the role of the private sector in the globalised firms of agri-supply, agri-food, distribution circuits and sale of pesticides.

References

- Andrianarison, F., Kamdem, C. B. & Che Kameni, B. (2022). Factors enhancing agricultural productivity under innovation technology: Insights from Cameroon. African Journal of Science, Technology, Innovation and Development, 14 (5), 1173-1183.
- Bureau-Point, E., Temple, L., (2022). La recherche en sciences humaines et sociales sur l'objet pesticide dans le cadre académique français : état des lieux et perspectives. Vertigo 22 (2).
- Carpentier, A. & Reboud, X. (2018). Why farmers consider pesticides the ultimate in crop protection: economic and behavioral insights. International Association of Agricultural Economists (IAAE) Conference, July 28-August 2, 2018, Vancouver, British Columbia.

Cote, F. X., Poirier-Magona, E., Perret, S., Roudier, P., Rapidel, B., & Thirion, M. C. (2019). La transition agro-écologique des agricultures du Sud, 368 p. Versailles : Quae.

Coulibaly, O., Mbila, D., Sonwa, D. J., Adesina, A., & Bakala, J. (2002). Responding to economic crisis in sub-Saharan Africa: New farmer-developed pest management strategies in cocoa-based plantations in Southern Cameroon. *Integrated Pest Management Reviews*, 7 (3), 165-172.

Deguine, J. P., Aubertot, J. N., Bellon, S., Côte, F. X., Lauri, P. E. P. E., Lescourret, F., ... & Lamichhane, J. R. (2023). Agroecological crop protection for sustainable agriculture. *Advances in Agronomy*, 178.

Flor, R. J., Maat, H., Hadi, B. A. R., Kumar, V., & Castilla, N. (2019). Do field-level practices of Cambodian farmers prompt a pesticide lock-in? *Field Crops Research*, 235:68-78.

Goulet, F. 2021, Characterizing alignments in socio-technical transitions. Lessons from agricultural bio-inputs in Brazil, *Technology in society*, 65.

Guichard, L., Dedieu, F., Jeuffroy, M. H., Meynard, J. M., Reau, R., & Savini, I. (2017). Le plan Ecophyto de réduction d'usage des pesticides en France: décryptage d'un échec et raisons d'espérer. *Cahiers Agricultures*, 26 (1), 1-12.

Houngnihin, R. H., Gbégan P., M., & Doudou T., D. (2021). Au-delà de l'État. La vie sociale des pesticides dans le secteur maraîcher au Bénin. *Vertigo*, 21(3), en ligne <https://doi.org/10.4000/vertigo.34111>.

Hu, Z. (2020). What socio-economic and political factors lead to global pesticide dependence? A critical review from a social science perspective. *International Journal of Environmental Research and Public Health*, 17 (21): 8119.

Jacquet, F., Jeuffroy, M. H., Jouan, J., Le Cadre, E., Malausa, T., Reboud, X., & Huyghe, C. (2022). Zéro pesticide : un nouveau paradigme de recherche pour une agriculture durable. Versailles : Quae.

Jas, N. (2014). Gouverner les substances chimiques dangereuses dans les espaces internationaux. In: Pestre, D. (dir.), *Le gouvernement des technosciences. Gouverner le progrès et ses dégâts depuis 1945*. Paris : La Découverte, 31-63.

Labarthe, P. (2010). Services immatériels et verrouillage technologique. Le cas du conseil technique aux agriculteurs. *Économies et sociétés*, 44 (2), 173-96.

Lamine, C. C., Meynard, J. M. J., Bui, S., & Messeen, A. A. (2010). Réductions d'intrants: des changements techniques, et après ? Effets de verrouillage et voies d'évolution à l'échelle du système agri-alimentaire. *Innovations agronomiques* 8 : 121-134.

Lemeilleur, S., Subervie, J., Presoto, A. E., Piao, R. S., & Saes, M. S. M. (2020). Coffee farmers' incentives to comply with sustainability standards. *Journal of Agribusiness in Developing and Emerging Economies* 10 (4): 365-383.

Maggi, F., Tang, F. H., Black, A. J., Marks, G. B., & McBratney, A. (2021). The pesticide health risk index-An application to the world's countries. *Science of The Total Environment* 801:149731.

Meynard, J. M., Charrier, F., Le Bail, M., Magrini, M. B., Charlier, A., & Messéan, A. (2018). Socio-technical lock-in hinders crop diversification in France. *Agronomy for Sustainable Development*, 38 (5), 1-13.

Meynard, J.-M., Doré, T. & Lucas, P. (2003). Agronomic approach: cropping systems and plant diseases. *C. R. Biol.* 326, 37-46.

Möhring, N., Ingold, K., Kudsk, P., Martin-Laurent, F., Niggli, U., Siegrist, M., ... & Finger, R. (2020). Pathways for advancing pesticide policies. *Nature food*, 1 (9), 535-540.

Wilson, C. & Tisdell, C. (2001). Why farmers continue to use pesticides despite environmental, health and sustainability costs. *Ecological Economics* 39 (3): 449-462.