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## On the role of farmers in seed innovations: a brief introduction

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Seed has always been a key input for farmers. During the twentieth century, the technicity related to seed has been increasing at least in the industrialized countries. Originally, seed was saved from the harvest of the previous season, and one major requirement for farmers was to have a sufficient germination rate to guarantee the production for the next season. Seed varieties are now products that cumulate innovations on multiple traits. Farmers have access to different seed products, and one key question for them is to choose the adequate variety knowing the specificity of its field (biotic and abiotic conditions) and the valorization of the output. Related to that, a seed market, a seed regulation, specific intellectual property rights, and a seed sector have progressively emerged during the second half of the century. Currently, the seed sector is research intensive with generally more than 10% of sales invested in R&D. As a result, seed innovation has contributed, to a large extent, to productivity gain in agriculture.<sup>1</sup> More recently, seed has also been considered a key lever for the transition toward agroecology. To mention few examples, disease-resistant traits enable to decrease pesticide use, more nitrogen efficient variety could lead to a decrease of nitrogen leakage in groundwater, and productivity increase for minor crop is often a necessary condition for crop diversification.

This “News and Views” section addresses the role of farmers in this innovation process. In the line of the seminal article by Griliches (1957) on the adoption of hybrid corn in the USA, a large part of the analysis in agricultural economics have analyzed the drivers of the adoption of improved seed varieties by farmers and the impact of this adoption on farm productivity. The two contributions of this section take a quite different perspective, leading to a richer comprehension of the role of farmers in the seed innovation system.

The first article, by Richard Gray, provides a detailed analysis of Farm Save Seed (FSS). When seed innovation is protected by plant breeders’ rights, a farmers’ privilege allows the farmer to use his own harvest as a source of seed for the next year.

<sup>1</sup> See Gate et al. (2013) for field crops in France.

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However, this exemption creates a competition with certified seeds bought by farmers from seed dealers. As a consequence, crop with high percentage of FSS are less profitable for seed companies, leading to smaller incentive for investing in research. Taking the defense of FSS, Richard Gray develops, in a convincing way, why FSS is a source of economic efficiency gain, and how the research incentive problem can be solved by designing differently the way seed companies benefit from their research investment.

The second article, by Fabien Girard and Christine Frison, provides a rich analysis of the emergence of “peasants’ rights” in the history of the biodiversity conservation instruments, from the International Undertaking (IU) on Plant Genetic Resources (1983) to the United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas (2018). They show how the conception of farmers’ rights has been evolving from the sole question of the property of genetic resources to a broader view integrating farmers’ knowledge and the role of local communities in seed governance, conservation, and sustainable use instruments. They analyze the institutional framework, questioning how intellectual property rights impact a larger set of institutions dedicated to rural and agricultural communities (e.g., community-based conservation programs). Fabien Girard and Christine Frison conclude that there is still a need for institutional innovations, in particular for the governance of seed exchanges.

These two contributions are far from exhausting the discussion of the multiple roles of farmers in the seed innovation systems. For example, the recent European directive related to organic agriculture (2018/848) opens a window for the exchange of more heterogeneous seed material, providing more opportunities for farmers to engage in participatory plant breeding. Another issue concerns the tools that can enhance capacity of farmer communities to incentivize the development of some particular varieties or crop to answer to specific need. The invitation to contribute to this “News and Views” is still open!

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