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Survey of European Crop Diversification Experiences - First Results of the DiverIMPACTS Project

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Abstract: The DiverIMPACTS EU Horizon 2020 project aims to promote crop diversification by demonstrating its benefits along the value chain, and by providing innovations that can remove existing barriers to practical diffusion. As a first step, DiverIMPACTS explored the existing crop diversification experiences (CDEs) across Europe. An online survey was conducted for experts and professionals reporting on specific crop diversification experiences. The survey focused on identifying factors that contributed to the success or failure of initiatives, and on describing CDE dynamics over time. We received 129 valid responses from 15 European countries – the project countries Belgium, France, Germany, Hungary, Italy, the Netherlands, Poland, Romania, Sweden, Switzerland, and UK, as well as Denmark, Finland, Luxemburg and Spain. The survey was conducted in the online survey tool LimeSurvey from which the data was exported into SPSS Version 22 for statistical analyses.

The starting point for most diversification initiatives was an existing crop rotation, but on some fields multicropping or intercropping was already implemented (ca.15% of responses). Only a smaller share of the initiatives reported that no type of diversification had occurred before the reported initiative (typically maize monoculture or pasture). The diversification initiatives most frequently included new crops to the rotation cycle, but the number of multicropping and intercropping cultivation systems also doubled due to CDEs. In several cases, different forms of diversification – rotation, multicropping and intercropping – were combined in one cultivation system. A wide variety of crops were introduced. The most common crops were cover crops, legumes, cereals, root crops and vegetables, but fibre crops, such as hemp, were also mentioned. Most initiatives were arable cropping systems (86%) and about 25% were vegetable cropping systems. The share of initiatives on non-organic and on certified organic land was almost even (40-40%, the rest being reported as non-certified but without synthetic inputs, respectively as involving both organic and non-organic systems).

Two thirds of the reported diversification initiatives were evaluated as successful or very successful overall, while one third was considered as somewhat successful, and only one initiative was rated as not at all successful. The three most frequently mentioned targeted outcomes were improved environmental preservation, improved crop production stability and higher income. For a large majority of initiatives, all three of these were deemed to be achieved. While the most important failure factors were economic (e.g. market conditions and amount of financial resources), the most important success factors were related to human resources (e.g. professional expertise and commitment of actors). The survey provides important indications about which aspects and factors should be paid special attention when planning future diversification initiatives.

Keywords: DiverImpacts, Crop Diversification Experiences, European Survey

PoS2-52

Impacts of Inter-Row Grass Cover on Soil Biological Fertility in Tomato Crop in Martinique

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Abstract: The Hemiptera *Bemisia tabaci* (Gennadius) species is one of the main tomato pest in Martinique, due to its role in the transmission of a variety of plant viruses (Urbino et al., 2003). One of the most effective ways to regulate its infestation in agroecology is to keep grassed inter-rows in tomato crops (Bezerra et al., 2004). This practice may have benefits for soil health such as promotion of biological activity. However, it may in some case reduce yields due to resource competition with the main crop (Singh et al., 2015). Our objective was thus to determine whether having grassed inter-rows would improve soil biological fertility in tomato crop. To do so, we monitored the biological activity in bare and grassed tomato inter-rows (spontaneous vegetation, dominated by graminoids) between plantation and flowering stage (March to May 2017) in an experimental site in Le Lamentin (Martinique, France). We used two indicators of biological fertility: lamina-bait decomposition of a labile (bean) and recalcitrant (acacia) substrate to assess soil biological activity, and bioassay to assess nutrient cycling.

In line with our expectations, our results evidenced lower *Bemisia tabaci* densities in tomato crops with grassed than bare inter-rows (P-value = 0.04). In addition, soil biological activity was higher in grassed than bare inter-rows, with a mean increase of 23 and 68% for bean and acacia lamina-baits decomposition, respectively, for all sampling dates. Nonetheless, the biomass produced in bioassay was 31% inferior in soil from grassed than bare inter-rows, which was well reflected by crop yield differences between the two intercropping modalities. These results suggest that while grassed inter-rows may improve soil biological activity and reduce *Bemisia tabaci* spreading in tomato crop, the resulting soil community may have higher nutritional needs that probably led to competition with tomato growth. We conclude that good biological activity and pest control do not necessarily translate in increased yield in high inputs systems as tomato crops, at least on the short-term.

Keywords: Tomato Crop, Inter-Rows Management, Soil Biological Activity, *Bemisia Tabaci*



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ABSTRACT BOOK



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