« Biostimulants, a new class of functional additives in Agro : formulation challenges and sustainability impact »

C. Vernay, A Wathelet, JC Castaing

The general trend in the agrochemical industry is to minimize off-target impact of active ingredients presenting possibly toxicity or ecotoxicity issues. This has favored the emergence of a new class of inputs, called biostimulants, that help the plants fight biotic or abiotic stresses, reducing the need for “classical” active pesticides.

The use of those new inputs, which can be foliar, soil or seed applied, comes with a number of challenges. Formulation is the first problem to solve. Biostimulants are not usually as “active” as phytopharmaceutical molecules, their use rate can be slightly larger : this has to be managed to be compatible with existing formulations and application tools. A second challenge is to make the proof of their efficacy, as their effect on plant metabolism is most of the time less specific as traditional pesticide treatments. Then, a last challenge is to demonstrate the real environmental benefit of using a biostimulant.

We present here a case study focusing on a biosourced seed applied biostimulant. We review first the specific compatibility and application criteria that the formulation has to fulfill to be used in existing seed treatment plants. We then show the result of multiyear field trials campaigns, comparing the yield of crops such as corn, soybean, rapeseed and sunflower grown in the presence and absence of the biostimulant, considering also conditions of water or nutrient shortage. We conclude with a detailed life cycle analysis to quantify the environmental impact of a biostimulant.