

EBIC POSITION PAPER

Which quality claims are appropriate for biostimulant products?

EXECUTIVE SUMMARY

- Quality is a broad term that can mean many things, and many different types of crop input can have direct or indirect effects on quality.
- When biostimulant producers place products on the market, they should articulate specific product claims and be able to demonstrate that those claims are justified in verifiable ways. (This paper provides examples.)
- Biostimulants are not the only crop inputs to make quality claims. Fertilisers and crop protection products, among others, also contribute to quality in various ways. Researchers have devised ways to demonstrate that quality effects result from the use of biostimulants and not from other crop inputs that may also be applied to a given crop.
- While biostimulants do not have a monopoly on positively affecting crop quality, there are some aspects of “quality” that fall outside of what are acceptable biostimulant claims. Notably, any claims related to plant protection (i.e. protecting quality from attack by pathogens, etc.) are clearly outside the definition of biostimulants. Therefore, quality claims should not be used to circumvent rules for obtaining authorisation for plant protection products.

Keywords: product quality, verifiable, fertilisers, plant protection

I. INTRODUCTION

- Quality is a broad term that can mean many things, and many different types of crop input can have direct or indirect effects on quality.
- When biostimulant producers place products on the market, they should articulate specific product claims and be able to demonstrate that those claims are justified.
- This paper discusses the importance of quality claims to the biostimulant industry’s positioning and outlines the specific types of claims that could be justified as a biostimulant effect.

II. SCIENCE SUPPORTS ENHANCED QUALITY AS A RESULT OF GOOD FERTILISATION

Most biostimulant claims are similar to claims made for various nutrient fertilisers. However, the contribution of fertilisers has become so obvious that their nutrient content is often used as short-hand for the likely benefits. The North Carolina (USA) Department of Agriculture lists the following as some of the effects of key fertiliser nutrients:

- N helps plants with rapid growth, increasing seed and fruit production and improving the quality of leaf and forage crops
- P fosters maturation, stress tolerance, rapid growth, blooming and root growth
- K improves fruit quality
- Ca counteracts the effect of alkali salts and organic acids
- S improves root growth, seed production, plant vigor and resistance to cold.

Many of these claims are similar to claims made for biostimulants and there are several explicit references to quality.

We also see the importance of plant nutrition in enhancing quality in the International Fertilizer Industry Association's (IFA) definition of a fertiliser: "any solid, liquid or gaseous substances containing one or more plant nutrients in known amount, that is applied to the soil, directly on the plant (foliage) or added to aqueous solutions (as in fertigation) to maintain soil fertility, **improve crop development, yield and/or crop quality.**" [emphasis added]

The examples of scientific literature studying the effect of fertilisers on crop quality are too numerous to list here. Needless to say, the contribution of plant nutrition to crop quality are multiple and well-documented. For example, nitrogen fertilisation is often linked to increased protein content in wheat which contributes to better baking quality of bread, etc.

Other EU regulatory frameworks also give precedents for the contribution of biostimulants to quality enhancement, notably the feed additive definition: "Feed additives are products used in animal nutrition for purposes of **improving the quality of feed and the quality of food from animal origin, or to improve the animals' performance and health.**" [emphasis added] If nutritional enhancement for animals is recognised as contributing to quality and health in ways that are independent from veterinary contributions, there is no reason that a parallel should not be articulated for qualitative benefits of nutritional enhancers for plants.

III. QUALITY IS A KEY PART OF THE ADDED VALUE FARMERS DERIVE FROM BIOSTIMULANTS AS REFLECTED IN THE PROPORTION OF SALES REALTED TO QUALITY TRAITS

In 2014, EBIC conducted a survey among its members to evaluate the importance of quality claims to sales. Although the survey was only open for three days, 31 companies responded. This sample represented at least 365 of the biostimulant-type¹ products currently on the market

According to the data gathered, the economic impact is extensive. Quality was central to claims made for at least 25% of products on the market at that time. Based on previous EBIC estimates of the number of total biostimulant products currently being sold (600-1000), that would mean 150-250 products on the European market and more than 200 products in the R&D pipeline have quality as a central part of the product's claims.

Furthermore, while farmers may appreciate improved nutrient use efficiency and abiotic stress tolerance, it is the resulting quality improvement that motivates them to use biostimulants because the return on their investment is related to the improved quality/yield of their crop and the premium they can earn as a result. Removing quality claims would decrease the attractiveness of biostimulants positioned only to support nutrient use efficiency and/or abiotic stress tolerance. According to the EBIC survey, **that raise the threshold of products for which quality is an essential part of marketing to over 50% of the total.**

¹ We use this term because of the lack of uniform definition and recognition of biostimulants from one EU country to another.

Raw data and interpretations

Survey data indicated that at least 104 biostimulant products currently on the market are sold with claims focused solely on their ability to improve crop quality. In addition, at least 165 products make a quality claim combined with either nutrient use efficiency or abiotic stress tolerance (however, the design of the survey was such that we know this number has been significantly underreported).

One member commented, “Quality is one of the most important parameters needed and expected by farmers when using biostimulants. Quality can be demonstrated by measurable parameters like Brix degree, Caliber, Color, Dry matter, Protein content, Zeleny, making efficacy assessment possible.”

IV. HOW CAN QUALITY BE CONCEPTUALISED TO HELP IDENTIFY A PRODUCT AS A BIOSTIMULANT?

In their responses to the survey, EBIC members commented that quality is not just an outcome of nutrient use efficiency and/or abiotic stress tolerance. Strengthening cell walls, fruit setting and enhanced sugar content are examples. A number of factors (listed below) make it difficult to indicate the specific mode of action of many biostimulant products today, but it is nonetheless possible to demonstrate biostimulant effects:

- Because many (and an increasing number) of biostimulant products are complex, multicomponent products, it is extremely difficult to isolate the various modes of action from one another, but it is possible to observe that they are not related to plant protection actions and to isolate the impact of the plant biostimulant component from, for example, a fertiliser component. (The Consiglio per la Ricerca e la sperimentazione in Agricoltura – ENTECRA – in particular has done useful research into this methodology.)
- Research into modes of action is extremely complicated and costly, creating a barrier to the entry and operation of small and medium enterprises (SMEs).
- Taking the previous points into account, quality improvements provide measureable and objective proxies for demonstrating biostimulant effects, and these pragmatic proxies are much more accessible for SMEs.
- Including an overly specific definition of quality attributes in the definition of biostimulants would, in effect, result in a positive list system, with all of the drawbacks that characterise positive lists.
- Furthermore, overly specific quality attributes in a general category definition fail to take into account the crop-specific aspects of quality. For example, high-quality peas would have high sugar content and low starch content, whereas it would be the opposite for high-quality potatoes.

All of these points underscore the need for two-tier thinking about the concept of quality:

1. The general concept of quality in the definition of a product category and
2. The specific (science-based and justified) claim(s) made by the entity placing the product on the market.

This two-tiered approach can be modelled as indicated below. Biostimulant products can enhance sensory, technical or nutritional quality of the crop. Each type of quality enhancement can be expressed in more specific terms, depending on the product and the crop (see table below).

Examples of how general categories of quality enhancements related to biostimulant use can be expressed in measurable characteristics

Sensory	Nutritional content	Technical
Appearance -- Size -- Form -- Color -- Defects (or lack thereof)	Minimising the presence of unwanted elements such as heavy metals (by inhibiting their uptake)	Inherent tolerance to storage (excluding exogenous factors like fungicidal protection, etc.)
Taste	Protein	Tolerance to handling
Texture	Minerals (including micronutrients)	Persistence of other quality traits through transformation
Smell	Vitamins	
	Nutraceuticals	
	Carbohydrates	

The list above is intended to illustrate that it is possible to translate the general concept of “quality” into specific, measurable and verifiable traits. This list is not exhaustive. As long as they fall within the scope of the regulatory definition of biostimulants, then manufacturers should be able to make any quality claims that are appropriately defined and demonstrated through scientific literature and/or product specific/trial data.

In addition to the fact that biostimulants are not the only inputs to influence the quality traits listed above, some aspects of quality protection and enhancement fall outside the scope of biostimulants effects. These can be categorised as “sanitary” aspects of quality and include the control of and/or tolerance of pathogens (thus diminishing any negative effects on quality attributes) or reducing/eliminating toxicity due to pathogens, microtoxins or natural defenses. The “sanitary” aspects of quality fall within the European Union’s plant protection regulation and require product authorisation under that regulation.

V. THE PROPOSED REGULATORY PROCESS PROVIDES SUFFICIENT CHECKS AND BALANCES TO PREVENT SYSTEMATIC ABUSES OF THE QUALITY CLAIM.

The proposed process for placing biostimulants on the market should prevent widespread abuses of quality claims.

- With regard to quality claims that are outside the defined scope of biostimulants (particularly plant protection claims), the planned conformity assessment provides ample opportunity for the responsible agency to ensure that no inappropriate claims (i.e. related to PPP effects) are made without proper authorisation.
- Sufficient resources should also be made available for market surveillance, particularly with regard to unauthorised verbal claims that may be made at the point of distribution, sale or advice.

VI. DO THE PROPOSED DEFINITIONS OF BIOSTIMULANTS INCLUDE EFFECTS IN THE SOIL (OR OTHER GROWING SUBSTRATE) AND NOT ON PLANTS?

The definition agreed by the Fertilisers Working Group in June 2012 and used by EBIC would accommodate products that do not directly act on plant processes (e.g. microbes that make nutrients more absorbable in the growing environment around the plant) because it states that the products “stimulate natural processes” with the specificity being provided by an explanation of which natural processes rather than by a reference to “plant processes”. This wording was carefully negotiated precisely to include products acting on the soil microbiome under the biostimulants umbrella.