

Eco-Efficiency of the nitrification inhibitor DMPP

P. Saling¹, G. Pasda², W. Zerulla², A. H. Wissemeier²

¹BASF Competence Center for Eco-Efficiency, D- 67056 Ludwigshafen, Germany

²BASF Agricultural Center Limburgerhof, D- 67114 Limburgerhof, Germany

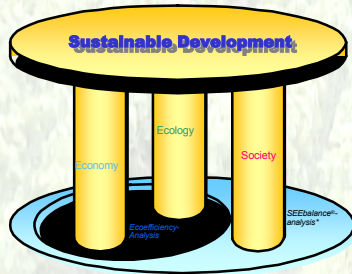
Email: peter.saling@basf-ag.de

Eco-Efficiency Analysis



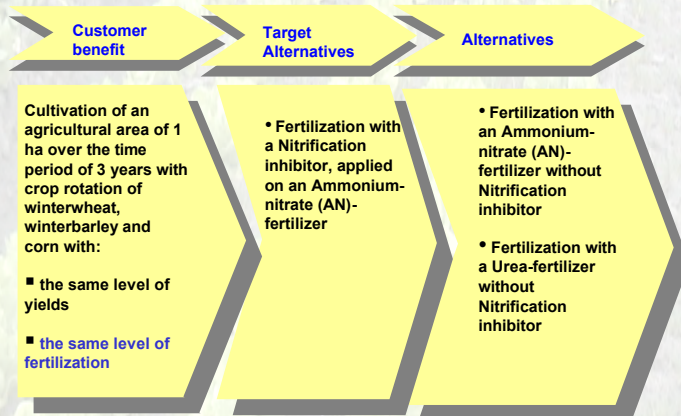
What is Eco-Efficiency?

The purpose of Eco-Efficiency Analysis is to harmonize economy and ecology. BASF Aktiengesellschaft in Ludwigshafen, Germany, is one of the first chemical companies to develop this method for use in its business activities.



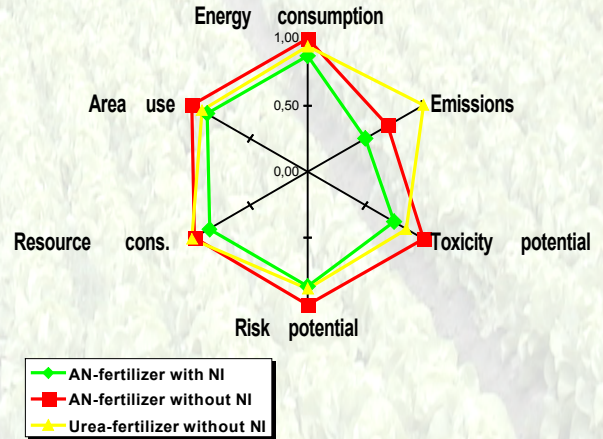
Sustainable Development is based on 3 pillars: Economy, ecology and social aspects. Only through balanced consideration of all 3 pillars, can a company carry out sustainable production or develop sustainable products and processes.

For details see: P. Saling, A. Kicherer et al, Int. J. LCA 7 (4), 203-218, (2002); R. Landsiedel, P. Saling, Int. J. LCA 7 (5), 261-268, (2002)



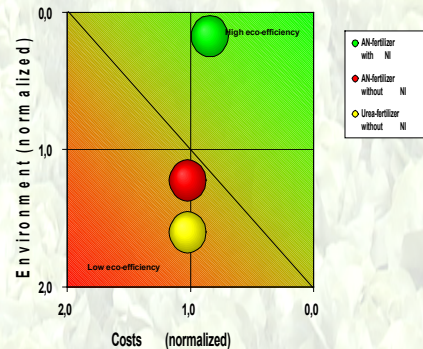
The first step of eco-efficiency analysis is to define not only the customer benefit (functional unit) but also the possible alternatives. As many as possible of the alternatives represented in the marketplace should be included, bearing in mind that small market shares may also be disregarded, depending on the problem posed.

Ecological Fingerprint



Following normalization or normalization and weighting with regard to emissions, the corresponding arithmetic values are summarized in a special plot, the **Environmental Fingerprint** by BASF. This plot represents a graphic depiction of the relative ecological pros and cons of the alternatives under consideration. The outermost alternative, bearing a value of 1, is the least favorable alternative in the compartment in question in that the further inward an alternative is located the better it is.

Eco-Efficiency Portfolio



The calculation of total costs and the calculation of the environmental fingerprint are independent calculations of the economic and ecological aspects of a total system featuring different alternatives. Alternatives having the same product of economic and ecological assessment are deemed equally eco-efficient. To illustrate the results of an eco-efficiency analysis, BASF has developed the **Eco-Efficiency Portfolio**. To calculate the input values for this portfolio, a normalizing step is initially carried out in the environmental assessment for each category.

Conclusion

- Fertilization with a Nitrification inhibitor, applied on an Ammonium-nitrate (AN)-fertilizer is the most eco-efficient alternative.
- The other alternatives are much less eco-efficient, mainly due to their worse environmental position.
- A lot of scenarios showed potentials for further development and optimization of the system.
- The Eco-Efficiency Analysis supports R&D, marketing and customers in defining the most sustainable alternative for the fertilization.

Results (Examples)

