

Quantitative Population Epigenetics a Catalyst for Sustainable Agriculture

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IMPLICATION

Ecological intensification of agricultural practices, can be a minimum input agriculture (maximization of 1-h²) with a maximum utilization of the epigenetic potential for a maximum output:

- low input with high output and
- utilization of the genetic potential (inherited characteristics) and the environmental potential or environmental inheritance (acquired characteristics).

EXAMPLE

Linking Nature-Oriented Forestry to Economic Gains in Germany:

The concept of "Nature-Oriented Forestry" for the 5,000 ha of temperate forest in the city of Lübeck

[\[http://www.dbu.de/projekt_25243/db_1036.html\]](http://www.dbu.de/projekt_25243/db_1036.html)



Foto: H. Ellenberg

DISCUSSION

This approach offers earning opportunities (market segments or business cases) for the existing players in the high-input agriculture in terms of win-win), especially in utilization of genotype-environment interactions, such as

- nutritional deficiencies and for example use of a genotype-low-nitrogen interaction (low input/high output-varieties, breeding companies),
- bioactive "additives" (regulator-active compounds) to switch on yield genes of nitrogen deficiency (chemical industry, fertilizer industry) and
- drought/seed treatment with anti-apoptotic substances (chemical industry, fertilizer industry, breeding companies, agricultural engineering companies).

The cultural sustainability (values, appreciation, ethics, customs, agriCulture, ...) as unifying element for the environmental, economic and social pillar is the (positive) stress (maximization of 1-h²) for a paradigm shift in the behavior of stakeholders:

- credibility and awareness, life style issues,
- Corporate Social Responsibility,
- low-input with high-output of food and, for example clean water, biodiversity, landscape, agriCulture, ..., and
- win-win situation for the actors of today's intensive agriculture.