

# Quantitative Population Epigenetics in Screening and Development of Regulator-Active Factors of the Farming System

Reinhold Stauß

Ritzebeker Weg 13, 24222 Schwentinal district Klausdorf, Germany

Reinhold.Stauss@web.de

## INTRODUCTION

Quantitative Population Epigenetics describes the variability observed in characters due to factors in the environment -- induced primarily by factors of the farming system (e.g., fertilizer and pesticide use, application of manure, nature and landscape management).

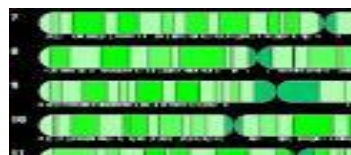
Optimal screening efficiency of regulator-active factors is obtained with

1. high environmental variability,
2. low heritability (characters for which the genotype sets a wide 'norm of reaction' on environmental influences),
3. high correlation between characters under indirect selection and
4. intensity of selection is shown.

## DISCUSSION

- In initial screening a 'random' subpopulation of genotypes should manifest moderate expression of a target character -- resulting in low heritability.
- In testing for quantitative character enhancement, initial screening should be conducted under stress-environment conditions -- in order to obtain an optimum differentiation of farming factors (low heritability).
- To judge constancy in performance, testing should employ a random sampling of genotypes and non-stress environments -- which afford assessment of the interactions: a) factor-genotype, b) factor-environment and c) factor-genotype-environment.
- It must be possible to identify specific genotype-environment constellations from which issue 'amplifier' interactions that intensify differentiation suitability.

**Vision** in screening factors . . .



[http://flaver.com/img/features/chromo\\_SNP.jpg](http://flaver.com/img/features/chromo_SNP.jpg)

Single Nucleotide Polymorphism (SNP)  
**Epigenotype Analysis and Screening of**  
biologically active factors of the farming system  
with **SNP-Chips**



[http://www.columbiassourian.com/media/multimedia/2009/04/29/media/Archive\\_\\_\\_\\_\\_/pages/progress\\_research.html](http://www.columbiassourian.com/media/multimedia/2009/04/29/media/Archive_____/pages/progress_research.html), VALERIE MOSLEY/Missourian