

PAPER PROPOSAL

Meeting: "Agricultural Biotechnology" (Italy, July, 2005)

**9th International Conference on
Agricultural Biotechnology: Ten Years After**

organized by the:

**International Consortium on Agricultural Biotechnology
Research (ICABR)**

and the:

Catholic University of Leuven

CEIS - University of Rome "Tor Vergata"

Centre of Sustainable Resource Development, University of California at Berkeley

Economic Growth Centre, Yale University

Ravello (Italy), July 6-10, 2005

**“Detection of Genetically Modified Crops in real-time
Practice: a State of the Art”**

Content

- Picture of **legal framework on detection of GM crops** on a global basis (regulatory concepts: traceability, labeling, co-existence, monitoring, enforcement control).
- Current status of **GM detection approaches** in different regions (North America, Asia-Pacific, Europe). Focus on the '**European approach**'
- **Real-time technical approach**: a practical example

ABSTRACT

Genetically modified (GM) crops have become a real part of the global food/feed market (James, 2003). The recent increase of commercial GM crops, especially as commodity products, has created a novel global market situation. Importation of GM commodity crops due to the lack of global non-regulated status imposed novel **controlling** strategies at the crop production level. Also, the request for controlled cultivation of crops under different management regimes in so-called '**co-existence**' (segregation of GM, organic or conventional offspring) raises several practical and **enforcement** concerns (Schiemann, 2003).

To accommodate to this novel market situation, in many cases it was decided to set **threshold** levels as to guarantee a **freedom of choice** regarding the methods of

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production, the manufacture and the consumption of food ingredients. The **detection**, the **identification** and the **quantification** of the presence of GMO offspring in certified seed lots and along the food/feed production chain is as such essential to properly fulfill downstream labeling and traceability requirements.

To comply with, streamline and enforce the above requirements on cultivation, import, **traceability**, and **labeling** with regards to GM crops (and GM-derived products), a complex surveillance system will be needed. Any successful effort will largely depend of the effectiveness, robustness and **cost** of the novel paradigm. Analysis enforced by product nature, origin and identification requirements should ideally be limited to a minimum (without losing robustness and accuracy). Appropriate analytical methodology and sampling procedures are key aspects within this respect.

Most methods today are developed based on the physical properties of the introduced **DNA** or of chromosomal rearrangements generated by the transformation itself, applying the "Polymerase Chain reaction"(**PCR**). Next to alterations at the DNA level, the genetic modification also results in changes at the **protein** level (**ELISA, Protein Strip Tests**).

In **Europe**, a concerted effort to develop generally accepted detection methods has been established through the establishment of the '**European Network of GMO Laboratories**' and a '**Central Reference Laboratory**' (JRC-Ispira, Italy). Through the organisation of pre-validation trials and consecutive broader ringtrials, detection methods are being tested, validated and conceptualized as enforcement tools. In parallel, the necessary Reference Materials needed to support the analyses, are being produced and made commercially available.

At the laboratory of the **SBB/ISP, Belgium**, we are currently running both DNA and protein based analysis for the presence of GM-derived materials on the Belgian market. To support these enforcement efforts, the SBB is actively involved in the evaluation, production and validation of **novel technologies** for the detection of GM products. An overview of these activities and obtained results will be given.