



GMO analysis regional meeting Sofia, 2008

GMO analysis IN SERBIA

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Belgrade**



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**Laboratory for Plant Molecular Biology
Institute of Molecular Genetics and Genetic Engineering, Belgrade**

- **2001-authorized by Ministry of Agriculture and Waterpower Engineering of Republic of Serbia as an official institution for GMO testing**
- **1997-GMO control requested by "Sojaprotein" - the company for soybean production and processing**



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Law on GMO

1998 - Expert group for making Draft law was formed

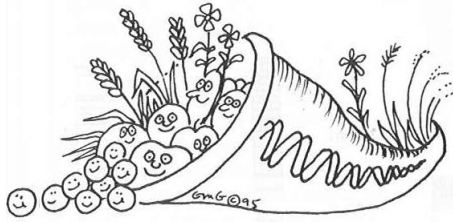
- Directive 219/90/EC of the EU Parliament
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January 2001 - Draft law was put in the procedure

May 2001 - The law was approved of in Federal Parliament

- The Rule books concerning deliberate release of *GMO* into environment and placing feedstuff on the market harmonized with Directive 2001/18/EC

2008 The upgraded law harmonized with EU standards is in the process of approval



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The main actors of Biosafety Network

- **National Council for Biological Safety**

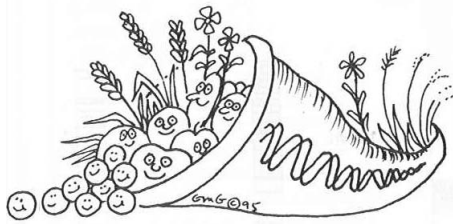
Consists of representatives of scientific institutions engaged in the fields of agricultural, ecological, medical, biological and microbiological sciences

- **Inspection Service**

Competent federal agency- risk management, post-release monitoring

- **Authorized Laboratories**

Capable of performing control by its experts, equipment and facilities

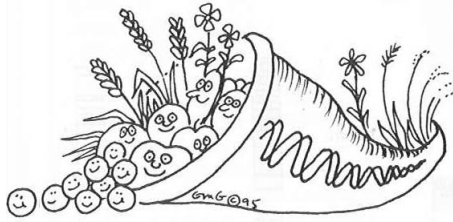


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AUTHORIZED LABORATORIES

Laboratory for Plant Molecular Biology
Institute of Molecular Genetics and Genetic Engineering, Belgrade
JRC courses
ISTA proficiency testing 2002

National Laboratory for Seed Research, Novi Sad
SP laboratory Becej



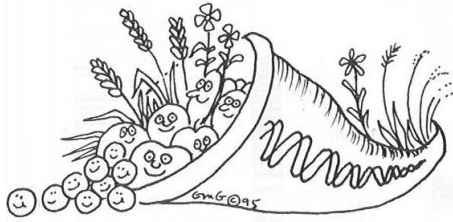
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Quality control

ISTA Proficiency Test on GMO 2002 *Zea mays* (T25, MON810)

43 laboratories from the whole Europe participated

Laboratory for Plant Molecular Biology the only one representative from Serbia and Montenegro successfully participated as one of the 30 laboratories which reported results without any false results



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Steps of analysis

- DNA isolation

Isolation methods: CTAB or SDS/KingFischer Purification Kit

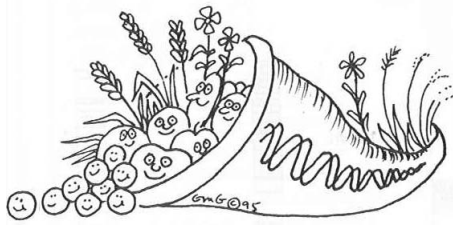
Quality and quantity control: agarose gel electrophoresis/PCR with plant specific primers

- PCR specific for target sequence

Controls - GMO Reference Material IRMM (Fluka)

- DNA-free

- Analysis of PCR products by agarose gel electrophoresis



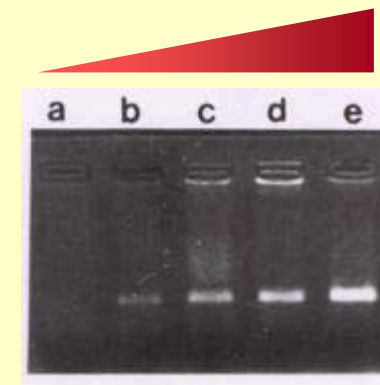
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General GMO screening

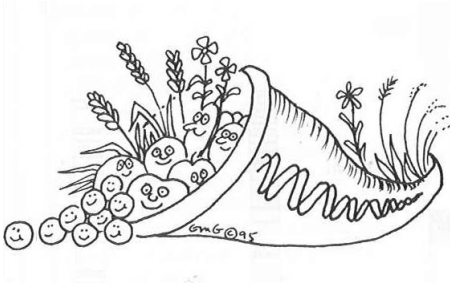
Identification of **CaMV 35S promoter**
NOS terminator

Sensitivity: 0.01% *GMO* (1pg DNA)

Problem: interlaboratory harmonization

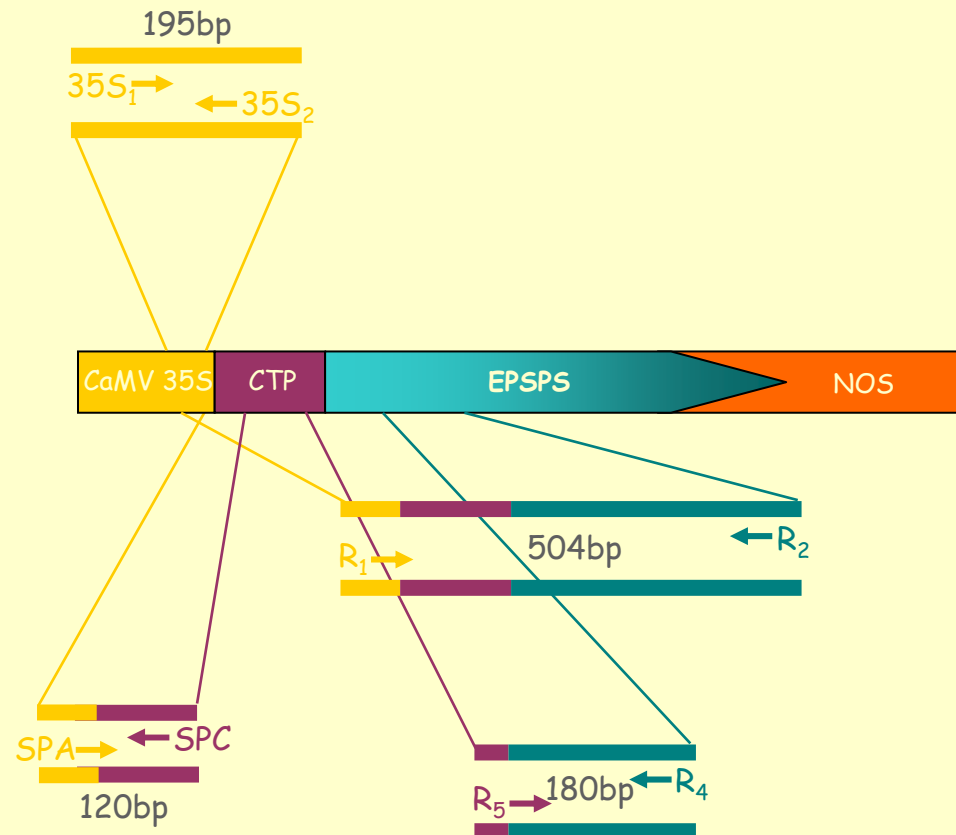


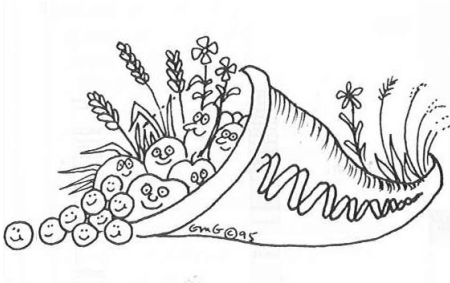
- a) 0% *GMO*;
- b) 0.01% *GMO*
- c) 0.1% *GMO*
- d) 1% *GMO*
- e) 5% *GMO*



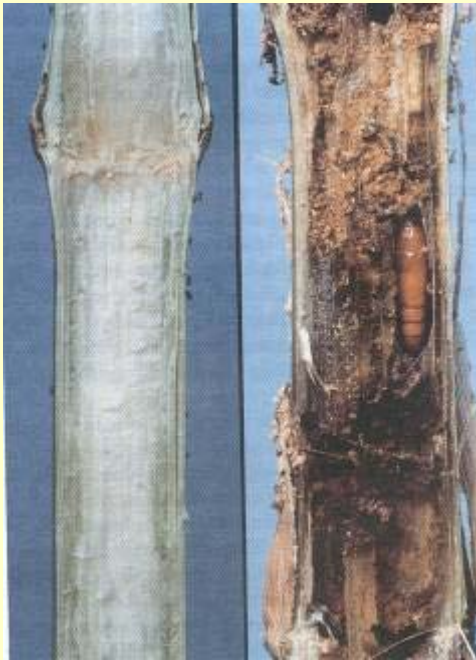
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RoundUp Ready soybean

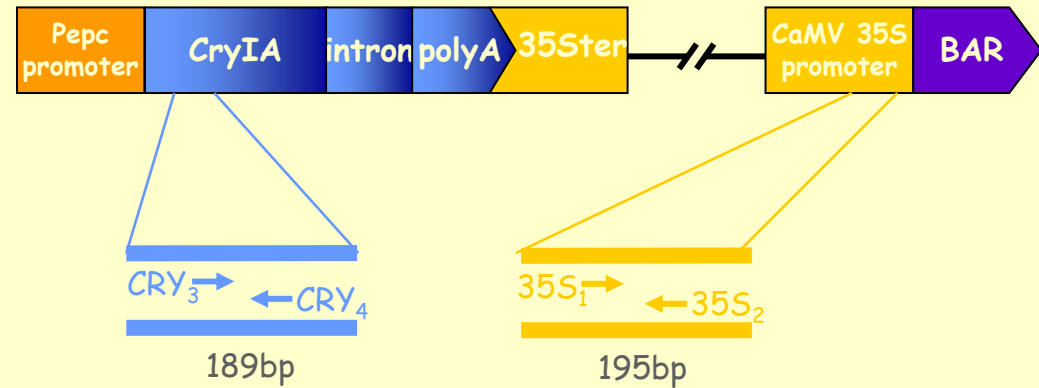




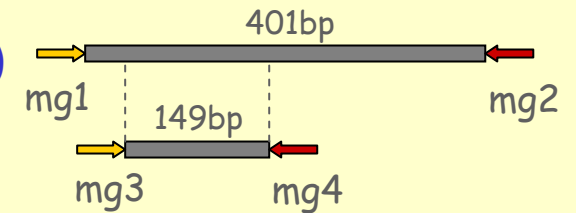
Insect resistant maize



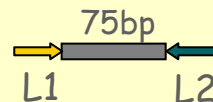
➤ Bt-176/Bt-11

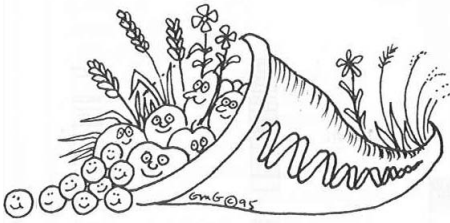


➤ MON810 (YieldGuard)

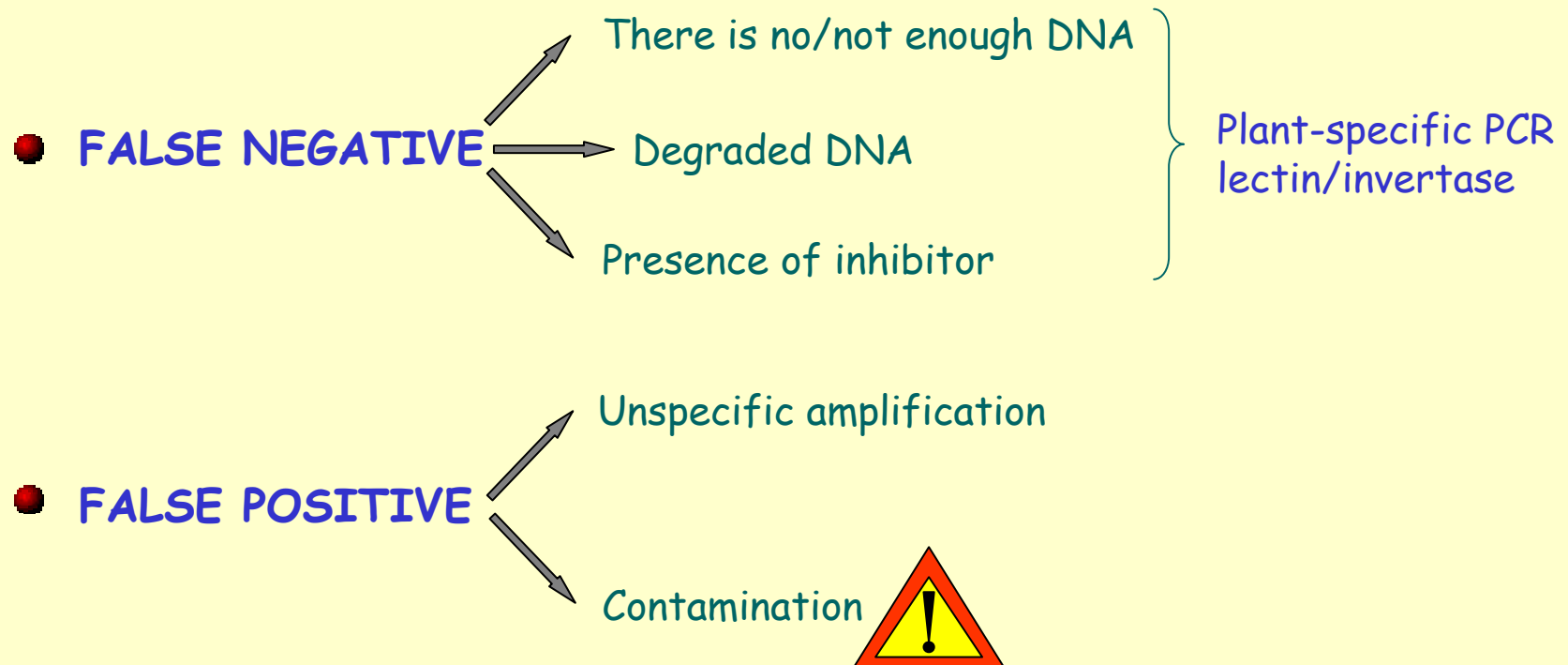


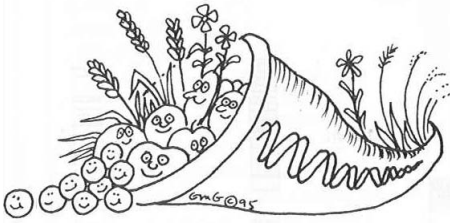
Herbicide tolerant maize - T25 (LibertyLink)



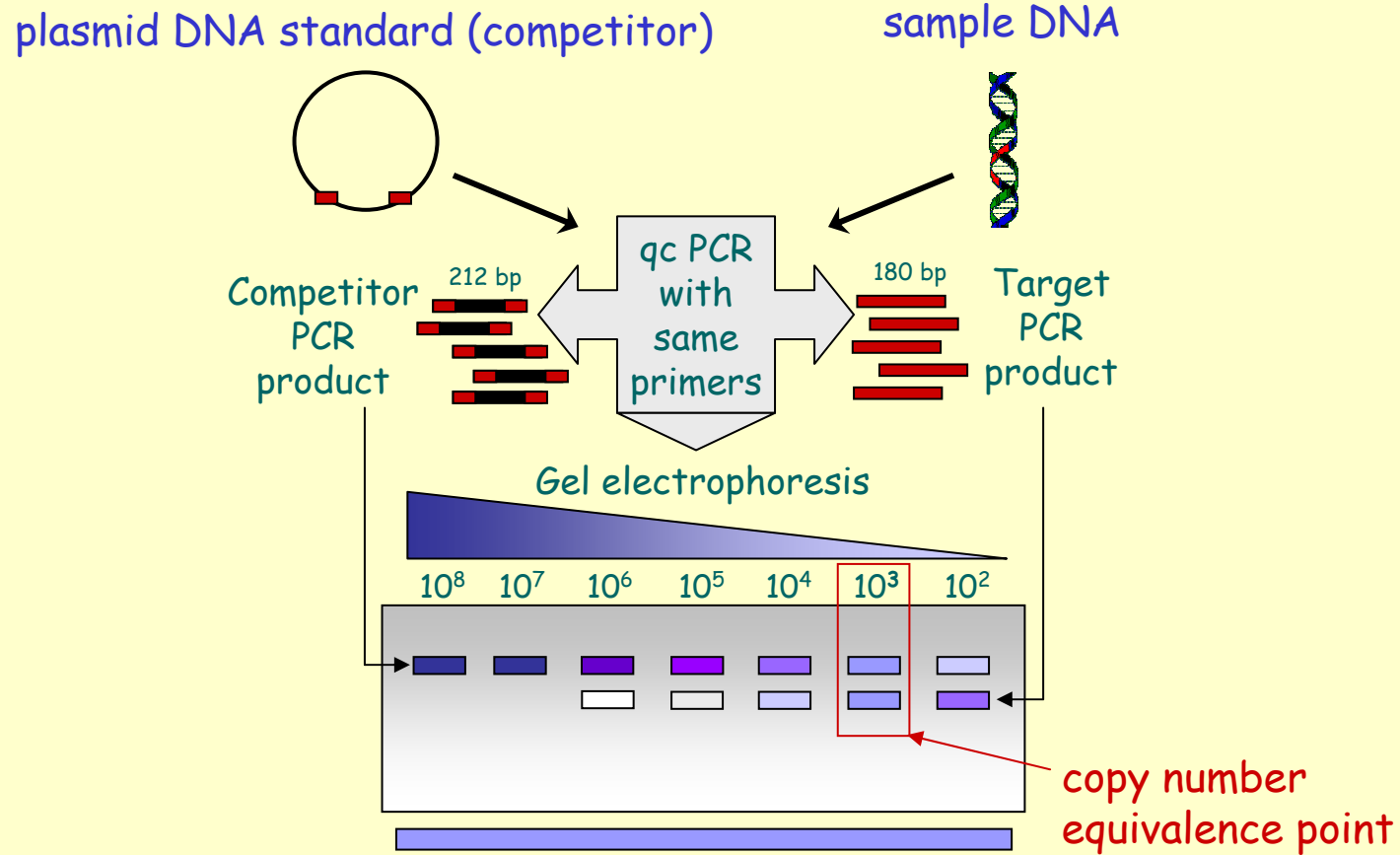


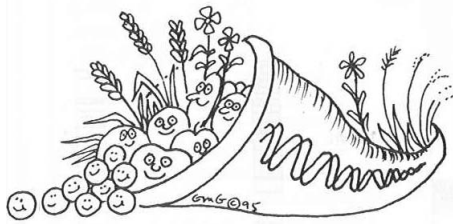
Problems in qualitative PCR





qcPCR method for quantification of GMO





PCR

QUALITATIVE
since 1998

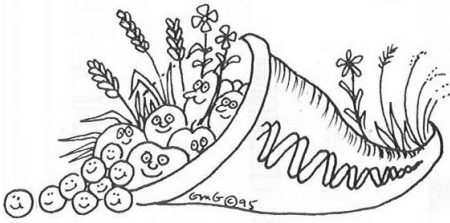
CaMV 35S promoter
Nos terminator
RoundUp Ready construct
Bt 176/11 construct
MON 810

AND

QUANTITATIVE
qcPCR
since 2001



Real Time PCR
since 2005 ABI PRISM 7500
CaMV 35S promoter
RoundUp Ready
Mon 810



GMO labeling and traceability of food & feed products

What is the message to the consumers?



This product contains GMO = smoking is dangerous for your health

0.9% GMO threshold level-does it make sense?

