

African Regional Training of Trainers workshop on the Identification and Documentation of LMOs

Item 6: SAMPLING AND DETECTION OF LMOs

Gerda M Marx

GM Testing Facility, Department of Biotechnology and Cell Biology
UNIVERSITY OF THE FREE STATE • UNIVERSITEIT VAN DIE VRYSTAAT • YUNIBESITHI YA FREISTATA
Tel (051) 400 3388 • E-mail: biotech@ufrs.ac.za • www.ufrs.ac.za



African Regional Training of Trainers workshop on the Identification and Documentation of LMOs

Introduction And Overview GM DETECTION

GM Testing Facility, Department of Biotechnology and Cell Biology
UNIVERSITY OF THE FREE STATE • UNIVERSITEIT VAN DIE VRYSTAAT • YUNIBESITHI YA FREISTATA
Tel (051) 400 3388 • E-mail: biotech@ufrs.ac.za • www.ufrs.ac.za

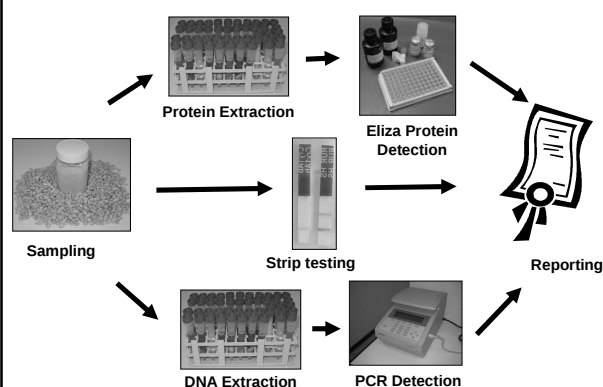


When to do GMO/LMO detection?

- All food crops known to be GM
- Mixed grain/seed with a known LMO
- IF no GM exists in a specific crop type
– no need to test – unless sample is mixed



Principle Steps in GMO Detection



**African Regional Training of Trainers
workshop on the Identification and
Documentation of LMOs**

**Introduction And Overview
SAMPLING**



GMO Training Facility, Department of Biotechnology and Cell Biology
UNIVERSITY OF THE FREE STATE • UNIVERSITEIT VAN DIE VRYSTAAT • YUNIBESITHI YA FREESTATA
Tel: (051) 405 1181 • E-mail: biotech@uovs.ac.za • www.uovs.ac.za

GMO Sampling

DRAFT INTERNATIONAL STANDARD ISO/DIS 21568
© International Organization for Standardization, 2003

INTERNATIONAL ORGANIZATION FOR
STANDARDIZATION • ORGANISATION
INTERNATIONALE DE NORMALISATION
ISO/TC 34

**Foodstuffs — Methods of analysis for the detection of
genetically
modified organisms and derived products — Sampling**
*Produits alimentaires — Méthodes d'analyse pour la
détection des organismes génétiquement modifiés
et des produits dérivés — Échantillonnage*

GMO Sampling

Contents

- Apparatus and equipment
- Sampling of processed and non-processed agricultural commodities
- Sampling of final food products
- Limitations
- Packaging and labelling of samples
- Dispatch of samples
- Preparation of the test portion
- Sampling report



GMO Sampling

Steps:

1. combination of sufficient numbers of increments forming the bulk sample;
 2. reduction of the bulk sample to the laboratory sample;
 3. homogenisation and reduction of the particle size by appropriate means to form the analytical sample
- Representative of the lots from which they are taken.
 - The composition of a lot is seldom uniform
 - a sufficient number of increments
 - mixed
 - Ensure that all sampling apparatus is clean and dry
 - Avoid cross-contamination during the sampling procedure between different lots.



GMO Sampling

- Lots of a maximum of 500 t - recommended
- The bulk sample shall be at least 20 times the size of the laboratory sample (ISO 542:1990).
- In case of processed agricultural commodities at least the representative of the equivalent amount of material

GMO Sampling

Increments

- Taken from as much of the cross section of the flowing material as possible, that every part of the lot has an equal opportunity of entering the sampling device.
- Using a continuous sampling approach a small proportion shall be taken constantly throughout the lot. at predetermined time intervals

Size of increments

Nature of product	Increment kg
Medium-size and large grains	0,5
Small grains	0,2

Sampling from bags

- Relevant for bags of up to 50 kg

Number of bags to be sampled

Number of bags in consignment	Number of bags to be sampled
Up to 10	Each bag
10 to 100	10, taken at random
More than 100	Square root (approximately) of total number

Sampling from rail or road wagons, lorries, barges or ships

up to 15 t
5 sampling points



from 15 t to 30 t
8 sampling points

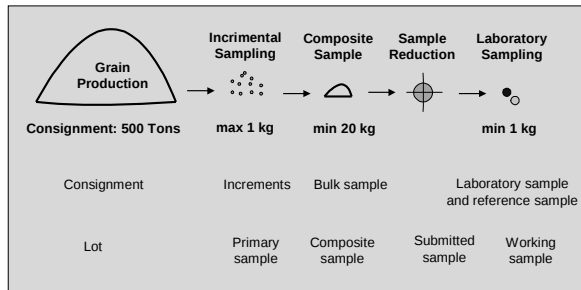


from 30 t to 500 t
11 sampling points



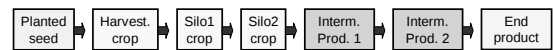
Increments shall be taken throughout the whole depth of the lot.

GMO Sampling



Sample Homogeneity

Increasing homogeneity / representation



High sampling and sub-sampling effort

Potentially decreasing analytical sensitivity due to DNA removal