
Results from the 1st ISTA GMO Proficiency Test

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On May 24, 2002, the International Seed Testing Association (ISTA) started its first international proficiency test on GMO testing. According to a test design established by the ISTA GMO Task Force, the ISTA Secretariat prepared and distributed seed samples of maize to 44 laboratories all over the world including both private companies and governmental laboratories.

1. Aim

The aim of this proficiency test was to check the ability of the participating laboratories to detect the presence of GM seeds in samples of conventional seed of *Zea mays* L.

2. Experimental Design

Three different maize seed lots were provided: a non GM seed lot, a T25 GM seed lot and a Mon810 GM seed lot. The material was kindly provided by KWS Saat AG, Germany. The genetic purity had been checked before the profi-

ciency test started.

In order to test the performance of the laboratories in their daily work, the design of this proficiency test allowed laboratories to use their standard methods for GMO testing in maize. 30 samples were sent to every participant and only qualitative test results were requested.

Twelve samples were negative (no GM seeds added) and 18 samples were positive. 6 out of the 18 samples were positive due to Mon810, 6 samples due to T25 and 6 samples due to both (1 seed from Mon810 and 2 seeds from T25). Samples in each set received a random number so that, for example, positive samples due to T25 sent to laboratory 1 could have the same or a different number as compared to those sent to lab 2. Each sample contained about 300 seeds (determined by weight). Based on the testing of the negative seed lot, the potential contamination of negative

samples is below 0.01% with 95% confidence and the expected value for the GMO content in the positive samples is about 1% (3 positive seeds in 300). To avoid cross contamination, the negative samples were prepared first and after sealing all negative bags, the positive samples were prepared. The samples were packed in plastic bags to avoid any cross contamination during sample handling and shipment.

The acceptance of results for the evaluation was closed on August 31st, 2002.

3. Descriptive Statistics of the Results

41 laboratories that reported evaluable data performed in total 43 test series since two laboratories applied two different methods. For simplification, the test series are called "laboratories" in this report. The identity of the individual laboratories is confidential.

Each laboratory reported for the individual sample whether this is a negative sample or a positive sample. So for a given sample the result reported by the laboratory can be either correct or false.

Out of the 43 laboratories:

Correct results:

- 30 laboratories reported results without any false results, all 30 tested samples were classified correctly.
- This is 69.8% of the laboratories.

False results:

- In total, 13 laboratories reported false results.
- 2 laboratories reported both, false positive results and false negative results.
- 8 laboratories reported only false negatives
- 3 laboratories reported only false positives.

False positive results:

- 5 laboratories reported false positive results (between 1 out of the 12 negative samples and 3/12) with a total number of 9 out of 516 negative samples tested.
- This is 11.6% of the laboratories and 1.7% of the negative samples.

False negative results of each event:

- 8 laboratories reported false negative results with the six T25 positive samples.
- Between 1/6 and 6/6 samples were classified falsely as negative with a total number of 24 samples out of the 258 T25 positive samples.

- This is 18.6% of the laboratories and 9.3% of the T25 positive samples.

- 5 laboratories reported false negative results with the Mon810 positive samples.

- Between 1/6 and 6/6 samples were classified falsely as negative with a total number of 13 samples out of the 258 Mon810 positive samples.

- This is 11.6% of the laboratories and 5.0% of the Mon810 positive samples.

- 5 laboratories reported false negative results with the T25+Mon810 positive samples. Between 1/6 and 6/6 samples were classified falsely as negative with a total number of 13 samples out of the 258 T25+Mon810 positive samples.

- This is 11.6% of the laboratories and 5.0% of the T25+Mon810 positive samples.

Summary of false negative results:

- In total, 10 laboratories reported false negative results with positive samples.

- Between 1/18 and 18/18 samples were classified falsely as negative with a total number of 50 samples out of the 774 positive samples.

- This is 23.3% of the laboratories and 6.5% of the positive samples.

- 4 out of the 10 laboratories reported false negative results for both, T25 and Mon810, 4 laboratories only for T25 and 1 laboratory only for Mon810.


- One laboratory reported all positive samples as (false) negatives.

4. Preliminary Conclusions

The results of this proficiency test showed that about 70% of the participants were able to identify all 30 maize samples correctly. This is a clear indication of the high performance of the majority of the participants to perform both accurate GMO tests for the events T25 and Mon810 with a contamination level of 1% and accurate tests for negative samples.

The remaining 30% showed the whole range from minor up to severe problems with GMO testing. This clearly indicates the need for further training and standardisation efforts in these laboratories.

Thus, in summary, the results provide a first estimate for great potential of the performance based approach in the field of GMO testing as developed by ISTA in the GMO Position Paper.



**Announcement
of the
2nd ISTA
Proficiency Test
on
GMO Testing**

The aim of the second ISTA Proficiency Test on GMO Testing is to check the ability of individual laboratories to detect the presence of genetic modified seeds.

The 2nd proficiency test will start in December 2003. Laboratories interested in participating should please contact the ISTA Secretariat for more information.

Application forms are also available:
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