

USDA/GIPSA Proficiency Program
Testing for the Presence of Biotechnology Events in Corn and Soybeans
April 2005 Sample Distribution Results

Purpose of USDA/GIPSA Proficiency Program

Through the USDA/GIPSA Proficiency Program, USDA seeks to improve the overall performance of testing for biotechnology-derived grains and oil seeds. The USDA/GIPSA Proficiency Program helps organizations identify areas of concern and take corrective actions to improve testing accuracy, capability and reliability.

Program Description

In February 2003, USDA/GIPSA's Technical Services Division expanded the program to offer samples for qualitative or quantitative analysis. Participants could request samples for qualitative analysis or quantitative analysis. In this round of the USDA/GIPSA Proficiency Program one set of samples was used for both qualitative and quantitative analyses. The samples were fortified with various combinations and concentrations of transgenic events, and participants had the choice of providing qualitative and/or quantitative results. Scoring of the participant's results was done by computing the "percentage of correctly reported transgenic events" in the samples. Two biotechnology corn events commercialized in the U.S. in 2003 continue to be included in the sample rounds: MON863 (Monsanto event) and Herculex-TC1507 (Dow AgroScience/Pioneer Dupont event)

Sample Composition

The corn samples contained various combinations and concentrations of the following transgenic events: T25, CBH351, MON810, GA21, E176, Bt11, NK603, Herculex, and MON863; or, no events (i.e., negative corn sample). The various transgenic concentration levels were produced on a percentage weight-weight basis (%w/w). A calculated amount of ground transgenic corn was mixed with a calculated amount of non-transgenic corn to produce concentrations of anywhere from 0.1 % to 5.0 % of the event. The soybean samples were either non-transgenic soybeans, or fortified soybeans samples containing 0.1 %, 1.5 %, or 3.0% of the transgenic glyphosate-tolerant soybeans (RoundUp Ready®). Each participant received six corn samples and three soybean samples. Each sample contained approximately 20 grams of ground material.

Program Participants

Participants included organizations from Africa, Asia, Europe, North America, and South America. Each participant received a study description and a data report form by electronic mail, and with the samples. Participants submitted results by electronic mail, FAX, or regular mail. No analytical methodologies were specified, and organizations used both DNA- and protein-based testing technologies. Sixty organizations participated in the April 2005 round of proficiency testing.

- Twenty-five participants submitted **qualitative** results only,
- Twelve participants submitted **quantitative** results only, and
- Twenty-three participants submitted a combination of **qualitative** and **quantitative** results.

In this report, participating organizations are identified by a confidential "Participant Identification Number." Appendix I identifies those organizations who gave GIPSA permission to list them as participants in the USDA/GIPSA Proficiency Program.

Data Summary Results

Data submitted by the participants are summarized in this report primarily in tables and figures. Participants reported their results on a qualitative basis, quantitative basis, or a combination of both qualitative and quantitative bases. Qualitative results were reported as the presence or absence of a particular event in each sample. Quantitative results were reported as the concentration of a particular event in the sample. Due to the complexity of the data, this report summarizes the data as follows:

Qualitative Data Summaries. This section summarizes qualitative sample analysis data:

- Table 1: Qualitative results for corn fortified with 35S for all participants (DNA-based assays).
- Table 2: Percentage of correct results in qualitative reports for 35S for all participants.
- Table 3: Qualitative results for corn fortified with NOS for all participants (DNA-based assays).
- Table 4: Percentage of correct results in qualitative reports for NOS for all participants.
- Table 5: Qualitative results for corn fortified with T25 for all participants (DNA-based assays).
- Table 6: Percentage of correct results in qualitative reports for T25 for all participants.
- Table 7: Qualitative results for corn fortified with CBH351 for all participants (DNA-based assays).
- Table 8: Percentage of correct results in qualitative reports for CBH351 for all participants.
- Table 9: Qualitative results for corn fortified with MON810 for all participants (DNA-based assays).
- Table 10: Percentage of correct results in qualitative reports for MON810 for all participants.
- Table 11: Qualitative results for corn fortified with GA21 for all participants (DNA-based assays).
- Table 12: Percentage of correct results in qualitative reports for GA21 for all participants.
- Table 13: Qualitative results for corn fortified with E176 for all participants (DNA-based assays).
- Table 14: Percentage of correct results in qualitative reports for E176 for all participants.

- Table 15: Qualitative results for corn fortified with Bt11 for all participants (DNA-based assays).
- Table 16: Percentage of correct results in qualitative reports for Bt11 for all participants.
- Table 17: Qualitative results for corn fortified with NK603 for all participants. (DNA-based assays).
- Table 18: Percentage of correct results in qualitative reports for NK603 for all participants.
- Table 19: Qualitative results for corn fortified with Herculex for all participants (DNA-based assays).
- Table 20: Percentage of correct results in qualitative reports for Herculex for all participants.
- Table 21: Qualitative results for corn fortified with MON863 for all participants (DNA-based assays).
- Table 22: Percentage of correct results in qualitative reports for MON863 for all participants.
- Table 23: Qualitative results for soybeans fortified with CP4 EPSPS (Roundup Ready) for all participants (DNA-based assays).
- Table 24: Percentage of correct results in qualitative reports for CP4 EPSPS for all participants.
- Table 25: Percentage of correct results in qualitative reports for each transgenic event for all participants (DNA-based assays).
- Figure 1: Summary data of all participants for each event combined with the number of results submitted for that particular event (DNA-based assays).
- Table 26: Qualitative results for corn fortified with T25 for all participants using Lateral Flow Strip (LFS) Testing (Protein-based testing).
- Table 27: Percentage of correct results in qualitative reports for T25 for all participants using Lateral Flow Strip (LFS) Testing (Protein-based testing).
- Table 28: Qualitative results for corn fortified with CBH351 for all participants using Lateral Flow Strip (LFS) Testing (Protein-based testing).
- Table 29: Percentage of correct results in qualitative reports for CBH351 for all participants using Lateral Flow Strip (LFS) Testing (Protein-based testing).
- Table 30: Qualitative results for corn fortified with NK603 for all participants using Lateral Flow Strip (LFS) Testing (Protein-based testing).

- Table 31: Percentage of correct results in qualitative reports for NK603 for all participants using Lateral Flow Strip (LFS) Testing (Protein-based testing).
- Table 32: Qualitative results for corn fortified with Herculex for all participants using Lateral Flow Strip (LFS) Testing (Protein-based testing).
- Table 33: Percentage of correct results in qualitative reports for Herculex for all participants using Lateral Flow Strip (LFS) Testing (Protein-based testing).
- Table 34: Qualitative results for corn fortified with MON863 for all participants using Lateral Flow Strip (LFS) Testing (Protein-based testing).
- Table 35: Percentage of correct results in qualitative reports for MON863 for all participants using Lateral Flow Strip (LFS) Testing (Protein-based testing).
- Table 36: Qualitative results for corn fortified with CBH351 for all participants using Enzyme-Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing).
- Table 37: Percentage of correct results in qualitative reports for CBH351 for all participants using Enzyme-Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing).
- Table 38: Qualitative results for corn fortified with NK603 for all participants using Enzyme-Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing).
- Table 39: Percentage of correct results in qualitative reports for NK603 for all participants using Enzyme-Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing).
- Table 40: Qualitative results for corn fortified with Herculex for all participants using Enzyme-Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing).
- Table 41: Percentage of correct results in qualitative reports for Herculex for all participants using Enzyme-Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing).
- Table 42: Qualitative results for corn fortified with MON863 for all participants using Enzyme-Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing).
- Table 43: Percentage of correct results in qualitative reports for MON863 for all participants using Enzyme-Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing).
- Table 44: Qualitative results for corn fortified with Cry1Ab for all participants using Lateral Flow Strip (LFS) Testing and Enzyme-Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing).

Quantitative Data Summaries. This section summarizes quantitative sample analysis data:

- Table 45: Quantitative results and z-scores for corn fortified with T25 for all participants (DNA-based assays).

- Table 46: Quantitative results and z-scores for corn fortified with E176 for all participants (DNA-based assays).
- Table 47: Quantitative results and z-scores for corn fortified with Herculex for all participants (DNA-based assays).
- Table 48: Quantitative results and z-scores for corn fortified with MON810 for all participants (DNA-based assays).
- Table 49: Quantitative results and z-scores for corn fortified with MON863 for all participants (DNA-based assays).
- Table 50: Quantitative results and z-scores for corn fortified with Bt11 for all participants (DNA-based assays).
-
- Table 51: Quantitative results and z-scores for corn fortified with NK603 for all participants (DNA-based assays).
- Table 52: Quantitative results and z-scores for corn fortified with GA21 for all participants (DNA-based assays).
- Table 53: Quantitative results and z-scores for corn fortified with CBH351 for all participants (DNA-based assays).
- Table 54: Quantitative results and z-scores for soybeans fortified with CP4 EPSPS for all participants (DNA-based assays).
- Table 55: Descriptive statistics for participant's reported quantifications relative to GIPSA fortification levels using DNA-based assays.

Table 1: Qualitative results for corn fortified with 35S for all participants (DNA-based assays). (N=negative, P=positive)

35S	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	N	P	P	P	P	P
1750	N	P	P	P	P	P
1754	N	P	P	P	P	P
1755	N	P	P	P	P	P
1761	N	P	P	P	P	P
1763	N	P	P	P	P	P
1770	N	P	P	P	P	P
1773	N	P	P	P	P	P
1778	N	P	P	P	P	P
1781	N	P	P	P	P	P
1785	N	P	P	P	P	P
1787	N	P	P	P	P	P
1788	N	P	P	P	P	P
1844	N	P	P	P	P	P
1848	N	P	P	P	P	P
1849	N	P	P	P	P	P
1853	N	P	P	P	P	P
1868	N	P	P	P	P	P
1891	N	P	P	P	P	P
1892	N	P	P	P	P	P
1893	P	P	P	P	P	P
2004	N	P	P	P	P	P
2006	N	P	P	P	P	P
2031	N	P	P	P	P	P
2032	N	P	P	P	P	P
2033	P	P	P	P	P	P
2034	N	P	P	P	P	P
2036	N	P	P	P	P	P
2039	N	P	P	P	P	P
2043	N	P	P	P	P	P
2045	N	P	P	P	P	P
2050	N	P	P	P	P	P
2057	N	P	P	P	P	P
2058	P	P	P	P	P	P
2075	N	P	P	P	P	P
2095	N	P	P	P	P	P
2100	N	P	P	P	P	P
2108	N	P	P	N	N	P
2113	N	P	P	P	P	P
2119	N	P	P	P	P	P
2122	N	P	P	P	P	P
2126	N	P	P	P	P	P
2132	N	P	P	P	P	P

Number of Results	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
# Negative	39	0	0	1	1	0
# Positive	3	42	42	41	41	41
% Correct	92.9%	100.0%	100.0%	97.6%	97.6%	100.0%
% False	7.1%	0.0%	0.0%	2.4%	2.4%	0.0%

Table 2: Percentage of correct results in qualitative reports for 35S for all participants. Table 2 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	251
# Reported Incorrect	5
% Correct	98.0%
# of Provided Positives (P)	210
# of False Negatives	2
%False Negative	0.9%
# of Provided Negatives (N)	41
# of False Positives	3
%False Positive	6.8%

Table 3: Qualitative results for corn fortified with NOS for all participants (DNA-based assays). (N=negative, P=positive)

NOS	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	N	P	P	P	P	P
1750	N	P	P	P	P	P
1754	N	P	P	P	P	P
1755	N	P	P	P	P	P
1761	N	P	P	P	P	P
1763	N	P	P	P	P	P
1770	N	P	P	P	P	P
1773	N	P	P	P	P	P
1778	N	P	P	P	P	P
1781	N	P	P	P	P	P
1785	N	P	P	P	P	P
1788	N	P	P	P	P	P
1844	N	P	P	P	P	P
1848	N	P	P	P	P	P
1849	N	P	P	P	P	P
1853	N	P	P	P	P	P
1858	N	P	P	P	P	P
1868	N					
1891	N	P	P	P	P	
1892	N	P	P	P	P	P
1893	P	P	P	P	P	P
2004	N	P	P	P	P	P
2006	N	P	P	P	P	P
2031	N	P	P	P	P	P
2032	N	P	P	P	P	P
2033	N	P	P	P	N	P
2034	N	P	P	P	P	P
2036	N	P	P	P	P	P
2039	N	P	P	P	P	P
2043	N	P	P	P	P	P
2050	N	P	P	P	P	P
2057	N	P	P	P	P	P
2058	N	P	N	P	P	P
2095	N	P	P	P	P	P
2098	N	P	P	P	P	P
2108	N	N	P	N	N	P
2113	N	P	P	P	P	P
2122	N	P	P	P	P	P
2126	N	P	P	P	P	P
2132	N	P	P	P	P	P

Number of Results	39	38	38	38	38	37
# Negative	38	1	1	1	2	0
# Positive	1	37	37	37	36	37
% Correct	97.4%	97.4%	97.4%	97.4%	94.7%	100.0%
% False	2.6%	2.6%	2.6%	2.6%	5.3%	0.0%

Table 4: Percentage of correct results in qualitative reports for NOS for all participants. Table 4 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	228
# Reported Incorrect	6
% Correct	97.4%
# of Provided Positives (P)	185
# of False Negatives	5
%False Negative	2.6%
# of Provided Negatives (N)	43
# of False Positives	1
%False Positive	2.3%

Table 5: Qualitative results for corn fortified with T25 for all participants (DNA-based assays). (N=negative, P=positive)

T25	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.0%	0.1%	0.5%	0.4%	5.0%
1750	N	N	P	P	P	P
1773	N	N	P	P	P	P
1778	N	N	P	P	P	P
1785	N	N		P		P
1787	N	N	P	P	P	P
1788	N	N	P	P	P	P
1844	N	N	P	P	P	P
1853	N	N	P	P	P	P
1859	N	N	P	P	P	P
1868		N	P	P	P	P
1892	N	N	P	P	P	P
2004	N	N	P	P	P	P
2031	N	P	P	P	P	P
2034	N	N	P	P	P	P
2039	N	N	P	P	P	P
2043		N	P	P	P	P
2058	N	N	P	P	P	P
2060	N	N	P	P	P	P
2075	N	N	P	P	N	P
2095	N	N	N	N	N	P
2098	N	N				
2113	N	N	P	P	P	P
2126	N	N	P	P	P	P
2132	N	N	P	P	P	P

Number of Results	22	24	22	24	22	24
# Negative	22	23	1	1	2	0
# Positive	0	1	21	22	20	24
% Correct	100.0%	95.8%	91.3%	95.7%	90.9%	100.0%

Table 6: Percentage of correct results in qualitative reports for T25 for all participants.
Table 6 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	136
# Reported Incorrect	5
% Correct	96.3%
# of Provided Positives (P)	87
# of False Negatives	4
%False Negative	4.4%
# of Provided Negatives (N)	49
# of False Positives	1
%False Positive	2.0%

Table 7: Qualitative results for corn fortified with CBH351 for all participants (DNA-based assays). (N=negative, P=positive)

CBH351	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.1%	0.1%	0.1%	0.4%	1.5%
1770	N	P	P	P	P	P
1773	N	P	P	P	P	P
1778	N	P	P	P	P	P
1785	N	P	P	P	P	P
1788	N	N	N	P	P	P
1844	N	P	P	P	P	P
1859	N	P	P	P	P	P
1868		N	P	P	P	P
1892	N	P	P	P	P	P
1893	N	P	P	P	P	P
2004	N	P	P	P	P	P
2031	N	P	P	P	P	P
2034	N	N	P	N	P	P
2036	N	P	P	P	P	P
2039	N	P	P	P	P	P
2043		P	P	P	P	P
2060	N	P	P	P	P	P
2075	N	P	P	P	P	P
2098	N	P	P	P	P	P
2113	N	P	P	P	P	P

Number of Results	18	20	20	20	20	20
# Negative	18	3	1	1	0	0
# Positive	0	17	19	19	20	20
% Correct	100.0%	85.0%	95.0%	95.0%	100.0%	100.0%

Table 8: Percentage of correct results in qualitative reports for CBH351 for all participants. Table 8 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	118
# Reported Incorrect	5
% Correct	95.8%
# of Provided Positives (P)	95
# of False Negatives	0
%False Negative	0.0%
# of Provided Negatives (N)	23
# of False Positives	5
%False Positive	17.9%

Table 9: Qualitative results for corn fortified with MON810 for all participants (DNA-based assays). (N=negative, P=positive)

MON810	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.1%	0.0%	0.0%	0.8%	0.5%
1750	N	P	N	N	P	P
1773	N	P	N	N	P	P
1778	N	P	N	N	P	P
1785	N	P	N	P	P	P
1788	N	P	N	N	P	P
1844	N	P	N	N	P	P
1859	N	P	N	N	P	P
1868		P	N	N	P	P
1892	N	P	N	N	P	P
2004	N	P	N	N	P	P
2031	N	N	N	N	P	P
2034	N	P	N	N	P	N
2036	N	P	N	N	P	P
2039	N	P	N	N	P	P
2043		P	N	N	P	P
2058	N	P	N	N	P	P
2075	N	P	P	P	P	P
2089	N	P	N	N	P	P
2095	N	P	N	N	P	P
2098			N			
2113	N	N	N	N	P	P
2126	N	P	N	N	P	P
2132	N	N	N	N	P	P

Number of Results	20	22	23	22	22	22
# Negative	20	3	22	20	0	1
# Positive	0	19	1	2	22	21
% Correct	100.0%	86.4%	95.7%	90.9%	100.0%	95.5%

Table 10: Percentage of correct results in qualitative reports for MON810 for all participants. Table 10 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	131
# Reported Incorrect	7
% Correct	94.7%
# of Provided Positives (P)	65
# of False Negatives	4
%False Negative	5.8%
# of Provided Negatives (N)	66
# of False Positives	3
%False Positive	4.3%

Table 11: Qualitative results for corn fortified with GA21 for all participants (DNA-based assays). (N=negative, P=positive)

GA21	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.1%	0.1%	3.0%	0.4%	0.1%
1750	N	P	P	P	P	N
1773	N	P	P	P	P	P
1778	N	P	P	P	P	P
1785	N	P	P	P	P	P
1788	N	P	P	P	P	P
1844	N	P	P	P	P	P
1859	N	P	P	P	P	P
1868		P	P	P	P	P
1892	N	P	P	P	P	P
2004	N	P	P	P	P	P
2031	N	P	P	P	P	P
2034	N	P	P	P	P	N
2039	N	P	P	P	P	P
2043		P	P	P	P	P
2075	N	P	P	P	P	P
2089	N	P	P	P	P	P
2095	N	P	P	P	N	P
2098	N	P	P	P	P	P
2113	N	N	N	P	P	N
2119	N	P	P	P	P	P
2126	N	P	P	P	P	P

Number of Results	19	21	21	21	21	21
# Negative	19	1	1	0	1	3
# Positive	0	20	20	21	20	18
% Correct	100.0%	95.2%	95.2%	100.0%	95.2%	85.7%

Table 12: Percentage of correct results in qualitative reports for GA21 for all participants. Table 12 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	124
# Reported Incorrect	6
% Correct	95.2%
# of Provided Positives (P)	99
# of False Negatives	0
%False Negative	0.0%
# of Provided Negatives (N)	25
# of False Positives	6
%False Positive	19.4%

Table 13: Qualitative results for corn fortified with E176 for all participants (DNA-based assays). (N=negative, P=positive)

E176	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.1%	0.0%	1.5%	0.4%	0.0%
1750	N	P	N	P	P	N
1773	N	P	N	P	P	N
1778	N	P	N	P	P	N
1785	N	P	N	P	P	N
1788	N	P	N	P	P	N
1844	N	P	N	P	P	N
1858	N	P	N	P	P	N
1859	N	P	N	P	P	N
1868		P	N	P	P	N
1892	N	P	N	P	P	N
2004	N	P	N	P	P	N
2031	N	P	N	P	P	N
2034	N	P	N	P	P	N
2036	N	P	N	P	P	N
2039	N	P	N	P	P	N
2043		P	N	P	P	N
2058	N	P	N	P	P	N
2075	N	P	N	P	P	N
2095	N	P	N	P	N	N
2098			N			N
2113	P	P	N	P	P	N
2126	N	P	P	P	P	P
2132	N	P	N	P	P	N

Number of Results	20	22	23	22	22	23
# Negative	19	0	22	0	1	22
# Positive	1	22	1	22	21	1
% Correct	95.0%	100.0%	95.7%	100.0%	95.5%	95.7%

Table 14: Percentage of correct results in qualitative reports for E176 for all participants. Table 14 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	132
# Reported Incorrect	4
% Correct	97.0%
# of Provided Positives (P)	68
# of False Negatives	3
%False Negative	4.2%
# of Provided Negatives (N)	64
# of False Positives	1
%False Positive	1.5%

Table 15: Qualitative results for corn fortified with Bt11 for all participants (DNA-based assays). (N=negative, P=positive)

Bt11	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.1%	0.1%	3.0%	0.4%	0.0%
1750	N	P	P	P	P	N
1773	N	P	P	P	P	N
1778	N	P	P	P	P	N
1785	N	P	P	P	P	N
1787	N	P	P	P	P	N
1788	N	P	P	P	P	N
1844	N	P	P	P	P	N
1848	N	P	P	P	P	P
1858	N	P	P	P		N
1859	N	P	P	P	P	N
1868		N	N	P	P	N
1892	N	P	P	P	P	N
1893	N	P	P	P	P	N
2004	N	P	P	P	P	N
2031	N	P	P	P	P	N
2034	N	P	P	P	P	N
2036	N	P	P	P	P	N
2039	N	P	P	P	P	N
2043		P	P	P	P	N
2075	N	P	P	P	P	N
2095	N	P	P	P	P	N
2098						N
2113	N	P	P	P	P	N
2132	N	N	N	P	N	N

Number of Results	21	23	23	23	22	24
# Negative	21	2	2	0	1	23
# Positive	0	21	21	23	21	1
% Correct	100.0%	91.3%	91.3%	100.0%	95.5%	95.8%

Table 16: Percentage of correct results in qualitative reports for Bt11 for all participants. Table 16 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	136
# Reported Incorrect	6
% Correct	95.6%
# of Provided Positives (P)	87
# of False Negatives	5
%False Negative	5.4%
# of Provided Negatives (N)	49
# of False Positives	1
%False Positive	2.0%

Table 17: Qualitative results for corn fortified with NK603 for all participants (DNA-based assays).

NK603	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.1%	0.4%	1.5%	0.8%	5.0%
1750	N	N	P	P	P	P
1761	N	P	P	P	P	P
1773	N	P	P	P	P	P
1778	N	P	P	P	P	P
1785	N	P	P	P	P	P
1788	N	P	P	P	P	P
1844	N	P	P	P	P	P
1859	N	P	P	P	P	P
1868		P	P	P	P	P
1893	N	P	P	P	P	P
2004	N	P	P	P	P	P
2031	N	P	P	P	P	P
2034	N	P	P	P	P	P
2039	N	P	P	P	P	P
2043		P	P	P	P	P
2075	N	P	P	P	P	P
2089	N	P	P	P	P	P
2095	N	P	P	P	P	P
2113	N	P	P	P	P	P
2126	N	P	P	P	P	P
2132	P	P	P	P	P	P

Number of Results	20	22	22	22	22	22
# Negative	19	1	0	0	0	0
# Positive	1	21	22	22	22	22
% Correct	95.0%	95.5%	100.0%	100.0%	100.0%	100.0%

Table 18: Percentage of correct results in qualitative reports for NK603 for all participants. Table 18 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	130
# Reported Incorrect	2
% Correct	98.5%
# of Provided Positives (P)	110
# of False Negatives	1
%False Negative	0.9%
# of Provided Negatives (N)	20
# of False Positives	1
%False Positive	4.8%

Table 19: Qualitative results for corn fortified with Herculex for all participants (DNA-based assays). (N=negative, P=positive)

Herculex	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.0%	0.4%	0.0%	0.8%	0.0%
1755	N	N	P	N	P	N
1773	N	N	P	N	P	N
1778	N	N	P	N	P	N
1785	N	N	P	N	P	N
1844	N	N	P	N	P	N
1859	N	N	P	N	P	N
1868	N	N	P	N	P	N
1891		N	P	N	P	
1893	N	N	P	N	P	N
2004	N	N	P	N	P	N
2006	N	N	P	N	P	N
2039	N	N	P	N	P	N
2043		N	P	N	P	N
2089	N	N	P	N	P	N
2098	N	N	P	N	P	N

Number of Results	13	15	15	15	15	14
# Negative	13	15	0	15	0	14
# Positive	0	0	16	0	16	0
% Correct	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 20: Percentage of correct results in qualitative reports for Herculex for all participants. Table 20 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	87
# Reported Incorrect	0
% Correct	100.0%
# of Provided Positives (P)	30
# of False Negatives	0
%False Negative	0.0%
# of Provided Negatives (N)	57
# of False Positives	0
%False Positive	0.0%

Table 21: Qualitative results for corn fortified with MON863 for all participants (DNA-based assays). (N=negative, P=positive)

MON863	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.1%	0.4%	0.0%	0.8%	0.0%
1750	N	P	P	N	P	N
1755	N	P	P	N	P	N
1773	N	P	P	N	P	N
1778	N	P	P	N	P	N
1785	N	P	P	N	P	N
1788	N	P	P	N	P	N
1844	N	P	P	N	P	N
1859	N	P	P	N	P	N
1868		P	P	N	P	N
1893	N	P	P	N	P	N
2004	N	P	P	N	P	N
2006	N	P	P	N	P	N
2031	N	N	P	N	P	N
2033	N	P	P	P	P	P
2039	N	P	P	N	P	N
2043		P	P	N	P	N
2075	N	P	P	N	P	N
2089	N	P	P	N	P	N
2095	N	P	P	N	P	N
2098	N	P	P	N	P	N
2113	N	P	P	N	P	N
2126	N	P	P	N	P	N

Number of Results	20	22	22	22	22	22
# Negative	20	1	0	21	0	21
# Positive	0	21	22	1	22	1
% Correct	100.0%	95.5%	100.0%	95.5%	100.0%	95.5%

Table 22: Percentage of correct results in qualitative reports for MON863 for all participants. Table 22 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	130
# Reported Incorrect	3
% Correct	97.7%
# of Provided Positives (P)	67
# of False Negatives	1
%False Negative	1.5%
# of Provided Negatives (N)	63
# of False Positives	2
%False Positive	3.1%

Table 23: Qualitative results for soybeans fortified with CP4 EPSPS for all participants (DNA-based assays). (N=negative, P=positive)

CP4 EPSPS	Sample 1	Sample 2	Sample 3	Sample 4
	0.00	0.10	1.50	3.00
1750	N	P		
		P		
1778	N	P	P	
1785	N	P		
		P		
1787	N	P		
	N			
1844	N			P
	N			
1848		P	P	
		P		
1849	N		P	
			P	
1859	N		P	P
2004		P	P	P
2036	N		P	
	N			
2043		P	P	P
2058	N		P	P
2100	N		P	P
2113				
2108		P		N
				P
2119		P		
		P		
		P		
2122	N		P	P
2132				P
				P
				P

Number of Results	14	14	11	12
# Negative	14	0	0	1
# Positive	0	14	11	11
% Correct	100%	100%	100%	92%

Table 24: Percentage of correct results in qualitative reports for CP4 EPSPS for all participants. Table 24 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	51
# Reported Incorrect	1
% Correct	98.0%
# of Provided Positives (P)	36
# of False Negatives	1
%False Negative	2.8%
# of Provided Negatives (N)	14
# of False Positives	0
%False Positive	0.0%

Table 25. Percentage of correct results in Qualitative reports for each transgenic event for all participants. N = number of results submitted. Table 2 includes information for the provided positive (+) and negative (-) results and the corresponding % false positive and % false negative results for each event. [(incorrectly reported result /Number (+) or (-)) x 100]

Event	35S	NOS	T25	CBH351	MON810	GA21	E176	Bt11	NK603	Herculex	MON863	RUR
N	251	228	136	118	131	124	132	136	124	87	130	51
Reported Incorrect	5	6	5	5	7	6	4	6	2	0	3	1
% Correct	98.0%	97.4%	96.3%	95.8%	94.7%	95.2%	97.0%	95.6%	98.4%	100.0%	97.7%	98.0%
Provided (+)	210	185	87	95	68	99	68	87	105	30	67	36
False Negatives	2	5	4	0	4	0	3	5	1	0	1	1
%False Negative	0.9%	2.6%	4.4%	0.0%	5.8%	0.0%	4.2%	5.4%	0.9%	0.0%	1.5%	2.8%
Provided (-)	41	44	49	23	66	25	64	49	19	57	36	14
False Positives	3	1	1	5	3	6	1	1	1	0	2	0
%False Positive	6.8%	2.3%	2.0%	17.9%	4.3%	19.4%	1.5%	2.0%	5.0%	0.0%	3.1%	0.0%

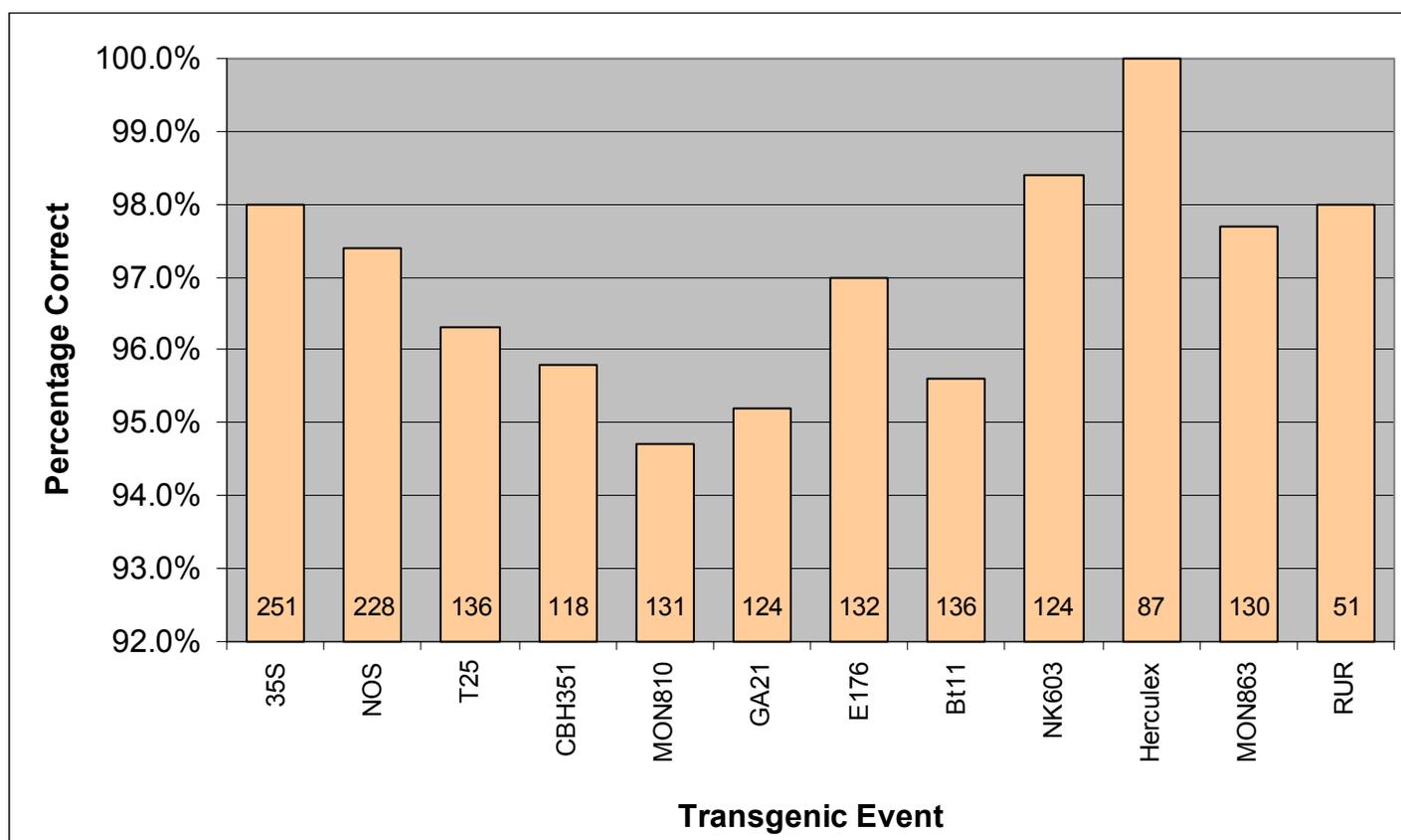


Figure 1. Group average of percentage correct for Qualitative reports on each event combined with the total number of results reported using DNA-based testing. Events labeled as 35S through MON863 were assayed in corn samples. The soybean samples contained the glyphosate tolerant event (RoundUp Ready/RUR) producing the CP4 EPSPS protein. Numbers embedded in the histogram represent the total number of reported results for that event. Data are shown on a composite basis (i.e., all participants results combined)

Table 26. Qualitative results for corn fortified with T25 - Lateral Flow Strip (LFS) Testing (Protein-based testing). (N=negative, P=positive)

T25	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.0	0.1	0.5	0.4	5.0
1782	N	P	P	P	P	P
1898	N	P	P	P	P	P
2058	P	P	P	P	P	P

Number of Results	3	3	3	3	3	3
# Negative	2	0	0	0	0	0
# Positive	1	3	3	3	3	3
% Correct	33.3%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 27: Percentage of correct results in qualitative reports for T25 for all participants. (LFS) Table 27 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	18
Reported Incorrect	1
% Correct	94.4%
# of Provided Positive (P) Results	16
# of False Negatives	1
% False Negative	5.9%
# of Provided Negatives (N) Results	2
# of False Positives	1
% False Positive	33.3%

Table 28. Qualitative results for corn fortified with CBH351 - Lateral Flow Strip (LFS) Testing (Protein-based testing). (N=negative, P=positive)

CBH351	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.1	0.1	0.1	0.4	1.5
1762	N	P	P	P	P	P
1782	N	P	P	P	P	P
1898	N	P	N	P	P	P
2058	N	P	P	P	P	P

Number of Results	4	4	4	4	4	4
# Negative	4	0	1	0	0	0
# Positive	0	4	3	4	4	4
% Correct	100.0%	100.0%	75.0%	100.0%	100.0%	100.0%

Table 29: Percentage of correct results in qualitative reports for CBH351 for all participants. (LFS) Table 29 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	24
Reported Incorrect	1
% Correct	95.8%
# of Provided Positives (P)	19
# of False Negatives	1
% False Negative	5.0%
# of Provided Negatives (N)	5
# of False Positives	0
% False Positive	0.0%

Table 30. Qualitative results for corn fortified with NK603 - Lateral Flow Strip (LFS) Testing (Protein-based testing). (N=negative, P=positive)

NK603	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.1	0.4	1.5	0.8	5.0
1762	N	P	P	P	P	P
1898	N	P	P	P	P	P
2058	N	P	P	P	P	P

Number of Results	3	3	3	3	3	3
# Negative	3	0	0	0	0	0
# Positive	0	3	3	3	3	3
% Correct	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 31: Percentage of correct results in qualitative reports for NK603 for all participants. (LFS) Table 31 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	18
Reported Incorrect	0
% Correct	100.0%
# of Provided Positives (P)	15
# of False Negatives	0
% False Negative	0.0%
# of Provided Negatives (N)	3
# of False Positives	0
% False Positive	0.0%

Table 32. Qualitative results for corn fortified with Herculex - Lateral Flow Strip (LFS) Testing (Protein-based testing). (N=negative, P=positive)

Herculex	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.0	0.4	0.0	0.8	0.0
2058	N	N	P	N	P	N

Number of Results	1	1	1	1	1	1
# Negative	1	1	0	1	0	1
# Positive	0	0	1	0	1	0
% Correct	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%

Table 338: Percentage of correct results in qualitative reports for Herculex for all participants. (LFS) Table 33 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	6
Reported Incorrect	0
% Correct	100.0%
# of Provided Positives (P)	2
# of False Negatives	0
% False Negative	0.0%
# of Provided Negatives (N)	4
# of False Positives	0
% False Positive	0.0%

Table 34. Qualitative results for corn fortified with MON863 - Lateral Flow Strip (LFS) Testing (Protein-based testing). (N=negative, P=positive)

Mon863	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.1	0.4	0.0	0.8	0.0
2058	N	P	P	N	P	N

Number of Results	1	1	1	1	1	1
# Negative	1	0	0	1	0	1
# Positive	0	1	1	0	1	0
% Correct	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%

Table 35: Percentage of correct results in qualitative reports for MON863 for all participants. (LFS) Table 35 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	6
Reported Incorrect	1
% Correct	83.3%
# of Provided Positives (P)	3
# of False Negatives	0
% False Negative	0.0%
# of Provided Negatives (N)	3
# of False Positives	1
% False Positive	25.0%

Table 36. Qualitative results for corn fortified with CBH351 - Enzyme -Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing) (N=negative, P=positive)

CBH351	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.1	0.1	0.1	0.4	1.5
1843	N	P	P	P	P	P

Number of Results	1	1	1	1	1	1
# Negative	1	0	0	0	0	0
# Positive	0	1	1	1	1	1
% Correct	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 37: Percentage of correct results in qualitative reports for CBH351 for all participants. (ELISA) Table 37 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	6
Reported Incorrect	0
% Correct	100.0%
# of Provided Positives (P)	5
# of False Negatives	0
% False Negative	0.0%
# of Provided Negatives (N)	1
# of False Positives	0
% False Positive	0.0%

Table 38. Qualitative results for corn fortified with NK603 - Enzyme -Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing) (N=negative, P=positive)

NK603	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.1	0.4	1.5	0.8	5.0
2133	N	P	P	P	P	P

Number of Results	1	1	1	1	1	1
# Negative	1	0	0	0	0	0
# Positive	0	1	1	1	1	1
% Correct	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 39: Percentage of correct results in qualitative reports for NK603 for all participants. (ELISA) Table 39 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	6
Reported Incorrect	0
% Correct	100.0%
# of Provided Positives (P)	5
# of False Negatives	0
% False Negative	0.0%
# of Provided Negatives (N)	1
# of False Positives	0
% False Positive	0.0%

Table 40. Qualitative results for corn fortified with Herculex - Enzyme -Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing) (N=negative, P=positive)

Herculex		Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.0	0.4	0.0	0.8	0.0
2058	N	N	P	N	P	N

Number of Results	1	1	1	1	1	1
# Negative	1	1	0	1	0	1
# Positive	0	0	1	0	1	0
% Correct	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%

Table 41: Percentage of correct results in qualitative reports for Herculex for all participants. (ELISA) Table 41 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	6
Reported Incorrect	0
% Correct	100.0%
# of Provided Positives (P)	2
# of False Negatives	0
% False Negative	0.0%
# of Provided Negatives (N)	4
# of False Positives	0
% False Positive	0.0%

Table 42. Qualitative results for corn fortified with MON863 - Enzyme -Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing) (N=negative, P=positive)

Mon863	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0	0.1	0.4	0.0	0.8	0.0
1843	N	P	P	N	P	N
Number of Results	1	1	1	1	1	1
# Negative	1	0	0	1	0	1
# Positive	0	1	1	0	1	0
% Correct	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%

Table 43: Percentage of correct results in qualitative reports for MON863 for all participants. (ELISA) Table 43 also includes % False Positive and % False Negative for this event.

Total # of Reported Results	6
Reported Incorrect	1
% Correct	83.3%
# of Provided Positives (P)	3
# of False Negatives	0
% False Negative	0.0%
# of Provided Negatives (N)	3
# of False Positives	1
% False Positive	25.0%

Table 44: Qualitative results for corn fortified with Cry1Ab protien - Lateral Flow Strip (LFS) Testing and Enzyme -Linked Immunosorbent Assay (ELISA) Testing (Protein-based testing) (N=negative, P=positive)

Cry1Ab	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant #	0.0					
1782 LFS	N	N	N	P	P	N
2058 LFS	N	N	N	P	P	N
1843 Plate	N	P	P	P	P	P
Number of Results	3	3	3	3	3	3
# Negative	0	1	1	3	3	1
# Positive	3	2	2	0	0	2

Cry1Ab contains Bt11 (high-expressing in kernels, MON810 (medium-expressing in kernels), and Event 176 (low-expressing in kernels).

Sample 1: contained no Bt11, no MON810, and no Event 176;
 Sample 2: contained 0.1% Bt11, 0.1% MON810, and 0.1% Event 176;
 Sample 3: contained 0.1% Bt11, no MON810, and no Event 176;
 Sample 4: contained 3.0% Bt11, no MON810, and 1.5% Event 176;
 Sample 5: contained 0.4% Bt11, 0.8% MON810, and 0.4% Event 176;
 Sample 6: contained no Bt11, 0.5% MON810, and no Event 176.

Table 45. Quantitative Results and z-Scores for Corn Fortified with T25 using DNA-based Assays

Event: T25								
Fortification Level (w/w%)	Fortified @ 0.10 (w/w%)		Fortified @ 0.40 (w/w%)		Fortified @ 0.50 (w/w%)		Fortified @ 5.0 (w/w%)	
Participant Number	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score
1754	0.1	0.00	0.6	0.40	0.6	0.38	6.9	0.92
1755	0.6	1.79	2.1	3.36	0.6	0.38	4.8	-0.10
1761	1.1	3.58	1.5	2.18	0.5	0.00	5.7	0.34
1770	0.5	1.43	0.6	0.40	0.3	-0.76	3.4	-0.78
1771	0.1	0.00	0.8	0.79	0.1	-1.51	1.5	-1.70
1780	0.10	0.00	0.40	0.00	0.40	-0.38	4.92	-0.04
1781	0.4	1.08	0.7	0.59	0.8	1.14	3.7	-0.63
1870	0.3	0.72	1.0	1.19	0.1	-1.51	5.0	0.00
1891	0.30	0.72	0.60	0.40	0.30	-0.76		
2006	0.64	1.94	1.20	1.58	0.44	-0.23	5.84	0.41
2032	0.1	0.00	0.2	-0.40	0.4	-0.38	3.0	-0.97
2033	0.0	-0.36	0.4	0.00	0.4	-0.38	0.4	-2.24
2050	0.3	0.72	1.2	1.58	0.5	0.00	1.5	-1.70
2057	0.15	0.18	0.40	0.00	0.60	0.38	5.00	0.00
2098	0.4	1.18	1.0	1.23	0.8	1.17	4.9	-0.07
2198	0.25	0.54	1.42	2.02	1.13	2.39	7.82	1.37

Table 46. Quantitative Results and z-Scores for Corn Fortified with E176 using DNA-based Assays

Event: E176							
Fortification Level (w/w%)	Fortified @ 0.10 (w/w%)		Fortified @ 0.40 (w/w%)		Fortified @ 1.5 (w/w%)		
Participant Number	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	
1754	0.1	0.00	0.3	-0.38	0.8	-1.49	
1755	0.1	0.00	0.3	-0.38	1.0	-1.07	
1761	0.1	0.00	0.4	0.00	1.1	-0.85	
1770	0.1	0.00	0.4	0.00	1.0	-1.07	
1771	0.1	0.00	0.4	0.00	0.8	-1.49	
1780	0.11	0.02	0.35	-0.19	0.86	-1.36	
1781	0.0	-0.17	0.6	0.76	1.8	0.64	
1788	0.11	0.02	0.25	-0.57	1.7	0.43	
1853	0.1	0.00	0.3	-0.38	0.7	-1.70	
1870	0.1	0.00	0.8	1.52	1.4	-0.21	
1891	0.10	0.00	0.40	0.00	1.40	-0.21	
1892	0.5	0.66	1.2	3.03	1.6	0.21	
1893	0.0	-0.17	0.2	-0.76	0.5	-2.13	
2006	0.22	0.20	0.68	1.06	2.34	1.79	
2032	0.2	0.17	0.4	0.00	1.5	0.00	
2033	0.2	0.17	0.4	0.00	0.4	-2.34	
2050	*2.9	4.65	1.0	2.27	1.0	-1.07	
2057	0.07	-0.05	0.40	0.00	1.20	-0.64	
2060	0.0	-0.17	0.23	-0.64	1.00	-1.07	
2098	0.1	-0.08	0.2	-0.91	0.5	-2.07	
2128	0.13	0.05	0.23	-0.64	0.95	-1.17	
2131	0.08	-0.03	0.3	-0.38	1.0	-1.07	

(Note: z-scores outside the satisfactory range, i.e. $z > 2$, are shown in **bold**.)

* This result was determined to be an outlier and will not be included in the statistical analysis of the data.

Table 47. Quantitative Results and z-Scores for Corn Fortified with Herculex using DNA-based Assays

Event: Herculex				
Fortification Level (w/w%)	Fortified @ 0.40 (w/w%)		Fortified @ 0.80 (w/w%)	
Participant Number	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score
1754	0.3	-0.60	0.6	-0.79
1770	0.3	-0.60	0.7	-0.40
1780	0.42	0.12	0.75	-0.20
1781	0.1	-1.80	0.3	-1.99
1853	0.1	-1.80	0.2	-2.38
1870	0.5	0.60	0.8	0.00
2032	0.4	0.00	0.8	0.00
2033	0.0	-2.41	0.4	-1.59
2050	0.2	-1.20	0.5	-1.19
2057	0.27	-0.78	0.45	-1.39
2128	0.37	-0.18	0.65	-0.60

Table 48. Quantitative Results and z-Scores for Corn Fortified with MON810 using DNA-based Assays

Event: MON810						
Fortification Level (w/w%)	Fortified @ 0.10 (w/w%)		Fortified @ 0.50 (w/w%)		Fortified @ 0.80 (w/w%)	
Participant Number	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score
1754	0.1	0.00	0.2	-0.19	0.6	-0.54
1755	0.2	1.80	4.8	2.77	1.6	2.14
1761	0.1	0.00	0.3	-0.13	0.6	-0.54
1763	0.0	-1.80	0.31	-0.12	0.28	-1.39
1770	0.1	0.00	0.3	-0.13	0.8	0.00
1771	0.1	0.00	0.8	0.19	0.8	0.00
1780	0.10	0.00	0.40	-0.06	0.80	0.00
1781	0.1	0.00	0.3	-0.13	0.4	-1.07
1788	0.00	-1.80	0.27	-0.15	0.40	-1.07
1853	0.1	0.00	0.3	-0.13	0.7	-0.27
1870	0.1	0.00	0.3	-0.13	0.5	-0.80
1891	0.00	-1.80			0.40	-1.07
1892	0.1	0.00	0.5	0.00	0.5	-0.80
1893	0.0	-1.80	0.4	-0.06	0.9	0.27
2006	0.06	-0.72	0.26	-0.15	0.82	0.05
2032	0.1	0.00	0.8	0.19	1.2	1.07
2033	0.2	1.80	0.2	-0.19	0.0	-2.14
2050	0.1	0.00	0.3	-0.13	0.9	0.27
2057	0.09	-0.18	0.90	0.26	0.35	-1.20
2060	0.0	-1.80	5.80	3.42	1.38	1.55
2098	0.1	0.18	3.2	1.76	0.9	0.24
2128	0.05	-0.90	0.15	-0.23	0.31	-1.31
2131	0.10	0.00	0.30	-0.13	0.4	-1.07

(Note: z-scores outside the satisfactory range, i.e. $z > 2$, are shown in **bold**.)

Table 49. Quantitative Results and z-Scores for Corn Fortified with MON 863 using DNA-based Assays

Event: MON863						
Fortification Level (w/w%)	Fortified @ 0.10 (w/w%)		Fortified @ 0.40 (w/w%)		Fortified @ 0.80 (w/w%)	
Participant Number	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score
1754	0.1	0.00	0.4	0.00	0.7	-0.36
1770	0.2	2.04	0.7	1.32	1.1	1.08
1780	0.12	0.41	0.80	1.76	1.12	1.16
1781	0.1	0.00	0.3	-0.44	1.0	0.72
1870	0.1	0.00	0.4	0.00	1.0	0.72
1891	0.00	-2.04	0.24	-0.71	0.50	-1.08
2032	0.1	0.00	0.4	0.00	0.8	0.00
2050	0.1	0.00	0.0	-1.76	1.2	1.44
2057	0.06	-0.82	0.35	-0.22	0.51	-1.05
2128	0.05	-1.02	0.27	-0.57	0.40	-1.44
2131	0.10	0.00			0.8	0.00

Table 50. Quantitative Results and z-Scores for Corn Fortified with Bt11 using DNA-based Assays

Event: Bt11								
Fortification Level (w/w%)	Fortified @ 0.10 (w/w%)		Fortified @ 0.10 (w/w%)		Fortified @ 0.40 (w/w%)		Fortified @ 3.0 (w/w%)	
Participant Number	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score
1754	0.1	0.00	0.1	0.00	0.4	0.00	2.4	-0.64
1755	0.1	0.00	0.2	1.34	0.4	0.00	3.3	0.32
1761	0.2	1.52	0.3	2.67	0.6	1.44	2.9	-0.11
1770	0.1	0.00	0.2	1.34	0.6	1.44	3.5	0.53
1771	0.1	0.00	0.1	0.00	0.5	0.72	1.5	-1.59
1780	0.10	0.00	0.14	0.53	0.48	0.58	2.90	-0.11
1781	0.0	-1.52	0.0	-1.34	0.4	0.00	2.2	-0.85
1788	0.13	0.46	0.13	0.40	0.61	1.51	3.9	0.96
1853	0.2	1.52	0.1	0.00	0.3	-0.72	2.0	-1.06
1870	0.1	0.00	0.1	0.00	0.4	0.00	2.7	-0.32
1891	0.13	0.46	0.10	0.00	0.60	1.44	3.00	0.00
2006	0.22	1.83	0.16	0.80	0.60	1.44	3.00	0.00
2032	0.3	3.05	0.2	1.34	0.4	0.00	2.0	-1.06
2033	0.2	1.52	0.0	-1.34	0.4	0.00	0.4	-2.76
2050	0.1	0.00	0.0	-1.34	0.6	1.44	2.0	-1.06
2057	0.10	0.00	0.10	0.00	0.15	-1.80	1.80	-1.27
2060	0.09	-0.15	0.08	-0.27	0.24	-1.15	2.29	-0.75
2098	0.1	0.61	0.1	0.13	0.3	-0.86	2.9	-0.06
2128	0.15	0.76	0.11	0.13	0.52	0.86	4.67	1.77

(Note: z-scores outside the satisfactory range, i.e. $z > 2$, are shown in **bold**.)

Table 51. Quantitative Results and z-Scores for Corn Fortified with NK603 using DNA-based Assays

Event: NK603										
Fortification Level (w/w%)	Fortified @ 0.10 (w/w%)		Fortified @ 0.40 (w/w%)		Fortified @ 0.80 (w/w%)		Fortified @ 1.5 (w/w%)		Fortified @ 5.0 (w/w%)	
Participant Number	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score
1754	0.1	0.00	0.3	-0.21	0.7	-0.09	0.8	-0.40	3.4	-0.17
1755	0.1	0.00	0.7	0.62	0.9	0.09	1.1	-0.23	4.7	-0.03
1770	0.1	0.00	0.7	0.62	0.6	-0.17	0.8	-0.40	4.1	-0.10
1780	0.11	0.04	0.63	0.48	0.84	0.03	1.04	-0.26	5.28	0.03
1781	0.0	-0.42	0.2	-0.41	0.5	-0.26	0.8	-0.40	3.0	-0.22
1853	0.1	0.00	0.0	-0.83	0.6	-0.17	2.0	0.28	4.0	-0.11
1870	0.1	0.00	0.5	0.21	0.8	0.00	1.2	-0.17	4.4	-0.07
1891	0.10	0.00	0.36	-0.08	0.80	0.00	1.10	-0.23		
2006	0.10	0.00	0.64	0.50	1.24	0.38	1.18	-0.18	6.02	0.11
2032	1.0	3.75	0.4	0.00	0.8	0.00	1.0	-0.28	3.0	-0.22
2033	0.0	-0.42	0.2	-0.41	0.4	-0.34	0.4	-0.63	0.8	-0.46
2050	0.0	-0.42	0.5	0.21	1.4	0.51	1.3	-0.11	4.0	-0.11
2057	0.06	-0.17	0.30	-0.21	0.40	-0.34	0.50	-0.57	1.00	-0.44
2060	0.34	1.00	*2.11	3.55	*5.33	3.88	*7.90	3.65	*39.00	3.70
2098	0.1	-0.17	0.4	-0.08	0.8	0.01	1.1	-0.23	5.8	0.09
2131	0.10	0.00			0.9	0.09	1.1	-0.23	5.00	0.00

Table 52. Quantitative Results and z-Scores for Corn Fortified with GA21 using DNA-based Assays

Event: GA21										
Fortification Level (w/w%)	Fortified @ 0.10 (w/w%)		Fortified @ 0.10 (w/w%)		Fortified @ 0.10 (w/w%)		Fortified @ 0.40 (w/w%)		Fortified @ 3.0 (w/w%)	
Participant Number	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score
1754	0.2	1.34	0.2	1.41	0.1	0.00	0.5	0.53	3.3	0.18
1755	0.1	0.00	0.1	0.00	0.1	0.00	0.3	-0.53	2.7	-0.18
1761	0.1	0.00	0.1	0.00	0.1	0.00	0.3	-0.53	2.2	-0.48
1770	0.1	0.00	0.1	0.00	0.1	0.00	0.4	0.00	1.7	-0.78
1771	0.1	0.00	0.1	0.00	0.1	0.00	0.4	0.00	3.0	0.00
1773	0.1	0.00	0.1	0.00	0.1	0.00	0.3	-0.53	1.8	-0.72
1780	0.10	0.00	0.10	0.00	0.10	0.00	0.39	-0.05	2.16	-0.50
1781	0.0	-1.34	0.0	-1.41	0.1	0.00	0.4	0.00	2.8	-0.12
1853	0.3	2.67	0.2	1.41	0.1	0.00	0.5	0.53	3.0	0.00
1870	0.1	0.00	0.2	1.41	0.15	0.28	0.1	-1.58	4.1	0.66
1891	0.00	-1.34	0.00	-1.41			0.38	-0.11	2.00	-0.60
1893	0.0	-1.34	0.0	-1.41	0.0	-0.56	0.2	-1.05	1.9	-0.66
2006	0.12	0.27	0.20	1.41	0.12	0.11	0.50	0.53	2.32	-0.41
2032	0.1	0.00	0.1	0.00	0.1	0.00	0.4	0.00	2.0	-0.60
2033	0.0	-1.34	0.2	1.41	*0.8	3.94	0.4	0.00	0.4	-1.55
2050	0.0	-1.34	0.0	-1.41	0.4	1.69	0.4	0.00	2.0	-0.60
2057	0.10	0.00	0.10	0.00	0.04	-0.34	0.40	0.00	0.60	-1.43
2060	0.2	0.67	0.14	0.56	0.14	0.23	*0.95	2.90	*8.50	3.28
2128	0.06	-0.53	0.09	-0.14	0.07	-0.17	0.72	1.68	2.23	-0.46
2131	0.03	-0.93			0.02	-0.45	0.1	-1.58	0.8	-1.31

(Note: z-scores outside the satisfactory range, i.e. $z > 2$, are shown in **bold**.)

* This result was determined to be an outlier and will not be included in the statistical analysis of the data.

Table 53. Quantitative Results and z-Scores for Corn Fortified with CBH351 using DNA-based Assays

Event: CBH351										
Fortification Level (w/w%)	Fortified @ 0.10 (w/w%)		Fortified @ 0.10 (w/w%)		Fortified @ 0.10 (w/w%)		Fortified @ 0.40 (w/w%)		Fortified @ 1.5 (w/w%)	
Participant Number	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score
1754	0.1	0.00	0.1	0.00	0.1	0.00	0.4	0.00	1.5	0.00
1755	0.0	-0.97	0.1	0.00	0.1	0.00	0.2	-0.72	0.8	-1.25
1781	0.3	1.95	0.8	2.62	0.5	2.80	0.5	0.36	1.6	0.18
1853	0.3	1.95	0.6	1.87	0.2	0.70	*1.1	2.51		
1870	0.1	0.00	0.3	0.75	0.1	0.00	0.5	0.36	1.5	0.00
2006	0.06	-0.39	0.12	0.07	0.00	-0.70	0.28	-0.43	1.34	-0.29
2032	0.1	0.00	0.1	0.00	0.1	0.00	0.2	-0.72	1.5	0.00
2033	0.1	0.00	0.0	-0.37	0.0	-0.70	0.1	-1.08	0.4	-1.97
2057	0.07	-0.29	0.07	-0.11	0.20	0.70	0.40	0.00	2.40	1.61
2128	0.03	-0.68	0.05	-0.19	0.10	0.00	0.32	-0.29	1.12	-0.68

Table 54. Quantitative Results and z-Scores for Soybeans Fortified with RUR using DNA-based Assays

Event: RUR						
Fortification Level (w/w%)	Fortified @ 0.10 (w/w%)		Fortified @ 1.50 (w/w%)		Fortified @3.00 (w/w%)	
Participant Number	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score	Reported Result (w/w%)	z-Score
1754			1.50	0.00	3.00	0.00
1755	0.10	0.00			2.60	-0.25
1761			1.50	0.00		
1763	0.19	1.50			7.10	2.55
1770	0.20	1.67	3.10	1.50		
1771	0.10	0.00	1.6	0.09		
1773	0.10	0.00				
1780	0.16	1.00			3.51	0.32
1781	0.14	0.67	4.10	2.44	6.30	2.05
					5.40	1.49
1788			1.8	0.28		
			1.3	-0.19		
			1.5	0.00		
1853	0.20	1.67	2.00	0.47		
1858			1.70	0.19		
			1.25	-0.24		
1862	0.20	1.67			3.20	0.12
1868	0.20	1.67	1.30	-0.19	2.90	-0.06
1870					3.0	0.00
			1.8	0.28	3.6	0.37
1891	0.16	1.00				
	0.19	1.50	2.70	1.13		
1892					3.40	0.25
			2.00	0.47	3.40	0.25
1893	0.10	0.00	2.00	0.47		
2006			3.80	2.16	6.10	1.93
					5.50	1.55
2031					5.00	1.24
2032	0.10	0.00	1.80	0.28	3.20	0.12
2033	0.10	0.00	0.30	-1.13		
2034					1.40	-0.99
2039	0.18	1.33	2.34	0.79		
2050	0.20	1.67				
	*0.30	3.33	3.70	2.07		
2057	0.09	-0.17			3.00	0.00
2060	0.10	0.00	1.80	0.28	3.10	0.06
2075			2.20	0.66		
2095	0.10	0.00				
	0.10	0.00			2.10	-0.56
2098	0.10	0.00			4.76	1.09
2126	0.10	0.00	0.30	-1.13		
2128	0.07	-0.50			0.72	-1.42
2131			1.50	0.00		

(Note: z-scores outside the satisfactory range, i.e. $z > 2$, are shown in **bold**.)

* This result was determined to be an outlier and will not be included in the statistical analysis of the data.

Table 55. Descriptive statistics for participant's reported quantifications relative to GIPSA fortification levels using DNA-based assays. N = total number of quantitative results reported; Reported Mean = average of all reported quantitations; Standard Deviation of all reported quantitations; %Relative Standard Deviation = [standard deviation/mean value x 100%] for the reported means; %R.E. = percentage relative error between the fortified and reported levels [reported value – fortification value / fortification value x 100]. Outliers were determined and eliminated from final results.

Event	N - Results	Fortification (%w/w)	Reported Mean (%w/w)	Standard Deviation	% Relative Standard Deviation	% Relative Error	Range of Reported Results
T25	16	0.10	0.34	0.28	83%	236%	0.0-1.1
T25	16	0.40	0.88	0.51	57%	121%	0.0-1.13
T25	16	0.50	0.50	0.26	53%	0%	0.2-2.1
T25	15	5.0	4.29	2.06	48%	14%	0.4-7.82
CBH351	30	0.10	0.16	0.17	103%	60%	0.0-0.8
CBH351	9	0.40	0.32	0.14	43%	19%	0.1-1.1
CBH351	9	1.5	1.35	0.56	41%	10%	0.4-2.40
MON810	23	0.10	0.08	0.06	67%	17%	0.0-0.2
MON810	22	0.50	0.96	1.55	161%	92%	0.15-5.80
MON810	23	0.80	0.68	0.37	55%	16%	0.0-1.6
GA21	57	0.10	0.10	0.07	76%	9%	0.0-0.8
GA21	19	0.40	0.37	0.14	38%	7%	0.1-0.95
GA21	19	3.0	2.16	0.92	42%	28%	0.4-8.50
E176	21	0.10	0.12	0.11	90%	18%	0.0-2.9
E176	22	0.40	0.44	0.26	60%	10%	0.16-1.2
E176	22	1.5	1.12	0.47	42%	26%	0.4-2.34
Bt11	38	0.10	0.13	0.07	57%	26%	0.0-0.3
Bt11	19	0.40	0.45	0.14	31%	12%	0.15-0.61
Bt11	19	3.0	2.60	0.94	36%	13%	0.4-4.67
NK603	15	0.10	0.09	0.08	88%	9%	0.0-1.0
NK603	14	0.40	0.41	0.21	51%	3%	0.0-2.11
NK603	15	0.80	0.78	0.28	35%	3%	0.4-5.33
NK603	15	1.5	1.03	0.37	36%	32%	0.4-7.90
NK603	15	5.0	3.89	1.57	40%	22%	0.8-39.00
Herculex	12	0.40	0.25	0.17	67%	38%	0.0-0.5
Herculex	12	0.80	0.51	0.25	49%	36%	0.2-0.8
MON863	11	0.10	0.09	0.05	52%	6%	0.0-0.2
MON863	10	0.40	0.39	0.23	59%	4%	0.0-0.80
MON863	11	0.80	0.83	0.28	33%	4%	0.0-1.2
RUR	26	0.10	0.13	0.05	34%	34%	0.07-0.20
RUR	25	1.50	1.96	0.94	48%	30%	0.30-4.10
RUR	22	3.00	3.74	1.61	43%	25%	0.72-7.10

Summary of Findings

Qualitative Sample Analysis

- 1) As evidenced by the “percentage correct scores” in Table 25 and Figure 1, participants were able to correctly identify most of the transgenic events in the corn test samples with greater than 94% to 100% accuracy through the use of conventional PCR. The best performance was observed in the detection of Herculex and the least accurate detection was observed for MON810.
- 2) Detecting the presence or absence of the protein product of the various transgenes was done through the use of either lateral flow strips (LFS) or ELISA (Tables 26 through 44). Detection by lateral flow strips displayed good overall accuracy. In most cases, a correct determination was made on four of the six corn test samples (note that most of the performance scores were greater than 83% correct). However, in the three soybean test samples all participants were able to detect the gene product of the RoundUp Ready insert with 100% accuracy. When ELISA was used, the performance results were variable for the Cry1Ab corn test samples, but were uniformly accurate for detecting the other transgenic corn events and detecting transgenic soybeans.
- 3) The transgenic events that proved difficult to detect were MON810 and Bt11 as evidenced by these events having greater than 5 percent false negatives (Table25). There were two events that displayed a noticeable tendency towards being falsely positive in this round of test samples, CBH351 at 17.2% false positive and GA21 at 18.8% false positive results.

Quantitative Sample Analysis

Since the discovery of the polymerase chain reaction in 1985, analytical methods for the detection of nucleic acids have advanced rapidly. Real-time PCR continues to be the method of choice for the analyses of transgenic events in grains. The USDA/GIPSA proficiency program is designed to allow participating laboratories the ability to assess their individual methods for the detection and quantification of transgenic events and to compare the values of their measurements with peer laboratories. The analysis of proficiency test samples also enables laboratories to develop and validate new methods, and participation in a proficiency program is mandatory for ISO17025 certification. Overall, the performance of the participants testing for transgenic events in corn and soy was very good. GIPSA collected data for the April 2005 distribution and performed statistical analysis including a mean, standard deviation, % coefficient of variation, range, % relative error, and z-scores. Outliers were identified and not used for calculation of z-scores. Laboratories with z-scores above + 2 or below -2 are advised to carefully review their procedures. Participants are encouraged to seek confidential advice from the GIPSA staff to assist with this review. There was a characteristic inverse relationship between precision (% RSD) of reported quantifications and event fortification level for most of the fortified samples. Reported quantifications were highly variable at the lowest fortification level (0.1%) while being less variable at higher fortification levels. The Mon810 event fortified at 0.5% was an obvious exception to this observed trend, and is attributable to the highly variable range of reported results for this particular event. RUR soybeans also did not show an inverse relationship between % RSD and fortification level. This observation is inconsistent when compared with results from past distributions.

For the assessment of residue analytical methods in crops, food, feed and environmental samples, it is recommended that an analytical method have a % RSD below 20%. It should be noted however, that the % RSD for all transgenic events in this study was greater than

20%, and this high level of inter-laboratory variability is consistent with observations from previous studies. The lack of internationally recognized reference material for all events, genetics, matrix effects and lack of standardized methods may be contributing factors to this observed variability. Monitoring and improving the performance of laboratories that use PCR for the detection of transgenic events in grains will improve marketing and reliability of this commodity. The USDA/GIPSA proficiency testing program should be a complement to other quality assurance tools used by laboratories as they monitor their performances and improve their analytical capabilities.

Note: It is important to understand that there are no internationally recognized standard reference materials for all transgenic events. The transgenic seed or grain used to prepare these samples was made available to GIPSA by the Life Science Organizations. Care was taken to ensure the transgenic material was either essentially 100% positive for the event, or adjusted accordingly. The fortified samples were prepared using a process that has been verified to produce homogenous mixes, and representative samples were analyzed to ensure proper fortification and homogeneity.

To obtain additional information on the USDA/GIPSA Proficiency Program, contact Mrs. Ganga Murthy, USDA/GIPSA Proficiency Program Manager, at US 816-891-0469, or by e-mail at Ganga.Murthy@usda.gov.

Appendix I. . List of organizations who wished to be identified as a participant in the April GIPSA 2005 Proficiency Program.

A. Bio. C – Molecular Biology Division

Route de Samadet
64410 ARZACQ
France

Contact Dr. F. Bois
Telephone 33 5 59 04 49 20
Fax 33 5 59 04 49 30
E-mail bio.moleculaire@labo-abioc.fr

AINIA (Instituto Tecnológico Agroalimentario)

Benjamin Franklin 5-11
Parque Tecnológico
46980 Paterna
Valencia
Spain

Contact David Tomas
Telephone +34961366090
Fax +34961318008
E-mail dtomas@ainia.es

Applied Genetics

1900 17th Avenue S.
Brookings, SD 57006

Contact Weiping Zhang
Telephone 605-697-7484/605-691-9388
Fax 605-697-7484-11
E-mail appliedgene@brookings.net

Biolytix AG

Benkenstrasse 254
CH-4108 Witterswil
Switzerland

Contact Peter Brodmann
Telephone 41 (0)61 723 20 70
Fax 41 (0)61 723 20 71
E-mail peter.brodmann@biolytix.ch

Bolsa de Comercio de Rosario

Córdoba 1402- 2ºPiso
Rosario S2000AWV – Santa Fe
Argentina

Contact Juan J. Giorda
Telephone 54-341-4211000
Fax 54-341-4213471 ext 2211
E-mail jjgiorda@bcr.com.ar
Participant Number: 1862

Bureau of Food and Drug Analysis (BFDA), DOH, Taiwan

161-2, Kuen Yang Street

Nankang

Taipei, Taiwan

Contact Dr. Lih-Ching Chiueh

Telephone 02-26531273

Fax 02-26531268

E-mail clc1025@nfd.gov.tw

Bureau of Quality and Safety of Food

Department of Medical Sciences

88/7 Tiwanon Rd.

Amphur Muang

Nonthaburi 11000

Thailand

Contact Ms Nittaya Phunbua

Telephone 66 (662) – 9510000. Ext 99514-5

Fax 66 (662) – 9511021

E-mail npyuki@hotmail.com

Canadian Food Inspection Agency

Ottawa Lab Fallowfield - MATU

3851 Fallowfield Road

Ottawa, Ontario

K2H 8P9

Canada

Contact Cheryl Dollard

Phone 613 228-6698, ext 5960

Fax 613-228-6669

E-mail dollardc@inspection.gc.ca

Chemisches und Veterinäruntersuchungsamt Freiburg (CVUA)

(State Institute of Chemical and Veterinarian Analysis)

Bissierstrasse 5

79114 Freiburg

GERMANY

Contact Hans-Ulrich Waiblinger/Dr. Pietsch

Telephone ++49 761 8855151

Fax ++49 761 8855100

E-mail hans-ulrich.waiblinger@cvuaf.bwl.de

Participant Number: 1891

CNTA-Laboratorio del Ebro

Ctra N-134 km 50

31570 San Adrian

Navarra

Spain

Contact Blanca Jauregui, Ph.D.

Telephone 34 948 670159

Fax 34 948 696127

E-mail bjaregui@cnta.es

CONGEN Biotechnology GmbH

Robert Roessle Str. 10
13125 Berlin, Germany
Contact Dr. Lutz Grohmann
Telephone Fon +49-(0)30-9489 3506
Fax +49-(0)30-9489 3510
E-Mail l.grohmann@congen.de
Participant Number: 2039

Environmental Protection Agency

Office of Pesticide Program
701 Mapes Rd.
Ft. Meade, MD 20755
Contact Marcus B. Rindal
Telephone 410-305-2977
Fax 410-305-3094
E-Mail rindal.marc@epamail.epa.gov
Participant Number: 2045

FASMAC CO., LTD

5-1-3 Midorigaoka, Atsugi-shi
Kanagawa 243-0041
JAPAN
Contact Dr. Satoshi Futo
Telephone +81 46-295-8787
Fax +81 46-294-3738
E-mail sfuto@fasmac.co.jp

Federal University of Santa Catarina\CAL\CCA

Laboratory of Mycotoxicology
P.O. Box 476, Itacorubi
Florianopolis, SC, CEP 88.034-001
BRAZIL
Contact Vildes M. Scussel, Ph.D.
Telephone +55 (048)331.5386
Fax +55 (048)331.9943
E-Mail vildes@cca.ufsc.br
Participant Number 1898

Food Industry Research and Development Institute (FIRDI)

No. 331 Shih-Pin Road
Hsinchu, 30099
Taiwan
Contact Wen-Shen Chu
Telephone 886-3-5223191, ext 541
Fax 886-3-5214016
E-mail cws@firdi.org.tw
Participant Number: 1771

GeneScan Analytics GmbH, Freiburg

Engesserstr. 4
79108 Freiburg i. Br.
Germany

Contact Dr. Castor Menendez
Telephone +49-(0)761-5038
Fax +49-(0)761-5038-111
E-mail gmoanalytics@genescan.com

GeneScan do Brasil Ltda

Gerente de Qualidade
Avenida Antonia Gazzola, 1001
3 andar
13.301-245 ITU - SP - Brazil

Contact Flavia Machado
Telephone +55 11 4023 0522
Fax +55 11 4023 0625
E-mail f.machado@genescan.com.br

Genetic ID NA

501 Dimick Drive
Fairfield, Iowa 52557

Contact Jane Pappin/Bernd Schoel
Telephone 641-472-9979, ext 124
Fax 641-472-9198
E-mail jpappin@genetic-id.com/bshoel@genetic-id.com

JenaGen GmbH

JenaGen Diagnostik-Gentechnik-Biotechnologie
Loebstedter Str. 78
D-07749 Jena
Germany

Contact Dr. Reinhard Baier
Telephone: +49(0)3641-464913
Fax: +49(0)3641-464991
E-mail: r.baier@jenagen.de
Participant Number: 2031

Kantonaales Labor Basel-Stadt

Kannenfeldstrasse 2
Postfach
CH-4012 Basel
Switzerland

Contact Philipp Huebner, Ph.D.
Telephone +41 61 385 25 27
Fax +41 61 385 25 09
E-mail philipp.huebner@kl.bs.ch

Laboratorio CHMICO CCIAA TORINO

Via Vettimiglia 165

10127 Turin, Italy

Contact Filippo Odasso

Telephone 390116700111

Fax 390116700100

E-mail filippo.odasso@lab-to.camecom.it

Laboratorio COOP ITALIA

Via del Lavoro 6/8

40033 Casalecchio di Reno

Bologna, Italy

Contact Dr. Martino Barbanera/ Dr. Sonia Scaramagli

Telephone 0039-051-596172

Fax 0039-051596170

E-mail martino.barbanera@coopitalia.coop.it/sonia.scaramagli@coopitalia.coop.it

Laboratorio de Analises Geneticas – AgroGenetica

Olívia de Castro Road, 273

Clélia Bernardes

City Viçosa, Minas Gerais

CEP:36570-000

Contact Francismar Corrêa Marcelino

Telephone 31-3899 2947

Fax 31-3899 2864

E-mail franagrogenetica@agrogenetica.com.br

LAV Sachsen-Anhalt

Freiimfelder Str. 66/68

D-061112 Halle

Germany

Contact Dr. Dietrich Maede

Telephone +49 345 5643 222

Fax +49 345 5643 439

E-mail dietch.maede@hal.lav.ms.lsa-net.de

Participant Number: 1870

LUFA Augustenberg

D 76227 Karlsruhe

Nesslerstr. 23

Germany

Contact Dr. Brigitte Roth

Telephone 49 721 9468 225

Fax 49 721 9468 387

E-mail Brigitte.roth@lufa.bwl.de

Participant Number: 2098

Monsanto Company

QA-Seed Services
460 E. Adams Street
Waterman, IL 60556
USA

Telephone 815-264-8142
Fax 815-264-7940
E-mail jean.h.tolliver@monsanto.com
Participant Number: 2133

Monsanto Company (Creve Coure)

Genetic Purity Lab.
800 North Lindbergh Blvd
St. Louis, MO 63167

Contact John C. Jackson
Phone (314) 694-5895
Fax (314) 694-7560
E-mail john.c.jackson@monsanto.com
Participant Number: 2089

Monsanto SAS -France

BP-21-Croix de Pardies
40305 Peyrehorade cedex
France

Contact Bruno Zaccomer
Phone +33 558 73 60 99
Fax +33 558 73 09 20
E-mail bruno.zaccomer@monsanto.com

Niedersächsisches Landesamt für Verbraucherschutz und Lebensmittelsicherheit

Lebensmittelinstitut Braunschweig
Dresdenstrasse 2 + 6
38124 Braunschweig
Germany

Contact Manuela Schulze, Ph.D.
Telephone 0531/6804 205
Fax 0531/6804 201
E-mail Manuela.Schulze@LAVES.niedersachsen.de

Nippon Yuryo Kentei Kyokai Yokohama Laboratory

(Japan Oil Stuff Inspectors Corporation)
Bankokubashi Bldg 5-26-1
Kaigan-dori Naka-ku
231-0002, Yokohama
Japan

Contact Ms Kumi Goto
Telephone 045-641-1037
Fax 045-641-1038
E-mail goto@nykk.or.jp
Participant Number: 1782

Ocimum Biosolutions, LLC

8765 Guion Road, Suite #G

Indianapolis, IN 46268

Contact Sujata Pammi, Ph.D.

Telephone: 317-228-0600

Fax: 317-228-0700

E-mail: sujata@ocimumbio.com

OMIC USA Inc.

3344 NW Industrial Street

Portland, OR 97210

Contact Dr. Farin Hajar

Telephone 503-223-1497

Fax 503-223-9436

E-mail dna.us@omicnet.com
h.iwaya@omicnet.com

Oregon Department of Agriculture

Export Service Center/Laboratory Services

1207 NW Naito Parkway, Suite 204

Portland, OR 97209

Contact Jim Madden

Telephone (503) 872-6632

Fax (503) 872-6615

E-mail jmadden@oda.state.or.us

Participant Number: 2043

Q Laboratories, Inc.

1400 Harrison Avenue

Cincinnati, Ohio 45214

Contact Dave Goins

Telephone 513-471-1300

Fax 513-471-5600

E-mail dgoins@qlaboratories.com

Participant Number: 1762

Reading Scientific Services Ltd.

The Lord Zuckerman Research Centre

Whiteknights

Reading RG66LA

United Kingdom

Contact Andrew P Tingey, PhD.

Telephone +44 (0)118 986 8541

Fax +44 (0)118 986 8932

E-mail andrew.p.tingey@rssl.com

Participant Number: 1788

ScanBi Diagnostics AB

Vaxtskyddsvagen 1
Box 166, SE 230 53 Alnarp
Sweden
Telephone +4640415321
Fax +4640415545
E-Mail anders.dahlqvist@scanbi.se

Shanghai Academy of Agricultural Sciences

Agri-Biotech Center
Shanghai JiaoTong University
Beidi Rd 2901
Shanghai 201106 P.R.China
Contact Dabing Zhang
Telephone 0086-21-62208750
Fax 0086-21-34201073
E-mail zhangdb@sjtu.edu.cn
Participant Number: 2113

Silliker, Inc.

405 8th Ave SE
Cedar Rapids, IA 52401
Contact Dr. Daniel Wetsch
Telephone 319-366-3570
Fax 319-366-4018
E-mail daniel.wetsch@silliker.com

Superinspect Ltda.

Rua do Comercio, 83
11010-141 Centro
Santos - Sa~o Paulo
Brazil
Contact Dr. Carolina Fernandes Ribas
Telephone 55 13 3219 4000
Fax 55 13 3219 1108
Email santos@superinspect.com.br
Participant Number: 2100

Syngenta Seeds Ltda

BR 452 Km 142
Uberlandia-MG
Brazil
38405-232
Contact Cristhiane Abegg Bothona
Phone 55-34-32334510
FAX 55-34-32166537
E-mail cristhiane.bothona@syngenta.com

TECAM

Rua Fabia, 59

Sao Paulo – SP – CEP: 05051-030

Brazil

Contact Dr. Janete Moura or Renata do Val

Telephone 55 11 3873 2553

Fax 55 11 3862 8954

E-mail janete.moura@tecam.com.br microbiol@tecam.com.br