

USDA/GIPSA Proficiency Program
Testing for the Presence of Biotechnology Events in Corn and Soybeans
October 2013 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 precision, capability and reliability.

Program Description and Assessment of Results

The USDA/GIPSA proficiency program report contains inter-laboratory comparisons for the purpose of proficiency testing (i.e. to determine the performance of individual laboratories' ability to detect and/or quantify transgenic traits in corn or soy and to monitor laboratories' continuing performance). The program does not assess the effectiveness of different detection methods for biotechnology-derived traits, nor does it determine the characteristics of fortified samples to a particular degree of accuracy.

In this round of the USDA/GIPSA Proficiency Program sample distribution, one set of samples was used for both qualitative and quantitative analyses. The samples were fortified with various combinations and concentrations of transgenic traits, and participants had the choice of providing qualitative and/or quantitative results. Scoring of the participants' qualitative results was done by computing the "percentage of correctly reported transgenic traits" in the samples (Tables 1 to 51 and Figure 1 for DNA-based analysis, and Tables 52 to 59 for protein-based analysis). The "percentage false positive" and "percentage false negative" were calculated by dividing the number of incorrectly reported results by the number of "provided negatives" or "provided positives" that were distributed to the participants. It should be noted that trait specific, DNA-based testing can discern between different traits that express the same protein, (e.g. Roundup ReadyTM (RUR) and Roundup ReadyTM II (RUR II)), whereas in most instances, construct-specific DNA-based testing or protein-based testing cannot.

Consensus mean values were calculated on the sets of quantitative data shown in Tables 60 to 80, with outliers excluded. Data sets were treated equally with this model, assuming no laboratory effect on outcomes, and are most likely idealistic. To assess accuracy of individual participant's submitted quantitative results for a specified transgenic event, z-scores (based on: (reported value – consensus mean value) / standard deviation) were computed for each reported quantification result (Tables 60 to 80). Tests for outliers and z-scores assume a normal distribution. At the 0.0 or 0.1% fortification levels, and on tables with a limited number of results, the distributions are not likely normal and are probably skewed. A false positive on a 0.0% spike level is considered an outlier. At the 0.1% fortification level, outlier tests will likely identify more outliers than should be declared. Some judgment will be necessary when interpreting data at these low levels. Absolute values for z-scores that are > 2 should be scrutinized by the participating lab. Those that are > 3, or classified as outliers, are clearly suspect and action should be taken by the participating laboratory. Prior to computing the z-scores, outliers in the distribution of values were eliminated by use of the "Grubb's Test for Outliers." To evaluate the performance as a group (i.e., inter-laboratory variation), a summary table (Table 81) was prepared to show the accuracy and precision of compiled quantification results at each fortification level for the various transgenic events.

Sample Preparation and Composition

GIPSA receives 100% genetically-engineered (GE) trait material from life science companies through materials transfer agreements. Specific GE trait materials are characterized at GIPSA and tested for the presence of all other available traits (also used in the program) by event-specific polymerase chain reaction (PCR) testing. Occasionally, stack-traits are identified. Seed purity and zygosity characteristics are not assessed by GIPSA. Commercially available and internationally recognized reference material are purchased through the Institute for Reference Materials and Measurements (IRMM) or the American Oil Chemists Society (AOCS) as finely ground flour, containing a certified percentage weight/weight (%w/w), level. GIPSA uses commercially available reference standards to characterize the composition of proficiency samples prior to disseminating to participants.

Transgene-free, Pioneer Negative Corn (PNC) is provided by Pioneer Hi-Bred International, Inc., and the maize is ground to the consistency of fine flour using a high speed rotor mill, "Pulverisette 14." A 50 gram aliquot of 100% event material (maize or soy) is ground in liquid nitrogen, in a highly controlled environment using a SPEX Certi Prep 6800 Freezer Mill. The 100% event sample is stored at -20 °C until further use. The 100% event material is blended gravimetrically with well characterized non-event PNC to a specified %w/w concentration. The sample sets are then analyzed by real-time PCR using in-house validated methods. GIPSA always characterizes one challenge sample batch that is not fortified with any maize/soy GE trait and this serves as a negative control sample.

The corn samples contained various combinations and concentrations of the following transgenic traits: T25, CBH351 (StarlinkTM), MON810, GA21, Bt176, Bt11, NK603, Herculex[®] (TC1507), MON863, Herculex[®] RW (DAS-59122-7), MIR 604 (Agrisure RW[®]), Event 3272, MON 88017, MON 89034, MIR 162; or, no events (i.e., negative corn sample). The soybean samples contained various combinations and concentrations of the following transgenic traits: the transgenic glyphosate-tolerant soybeans (Roundup ReadyTM), the glufosinate ammonium tolerant soybeans (A2704-12), the transgenic glyphosate-tolerant soybeans (Roundup ReadyTM II); high oleic acid soybeans (DP305423); or, no events (i.e. negative soybean sample). The various transgenic concentration levels were produced on a %w/w basis. A calculated amount of ground transgenic corn or soybeans was blended to homogeneity with a calculated amount of ground non-transgenic corn or soybeans to produce concentrations ranging from 0.1 to 2.0% of a specified event. Each participant received six corn and four soybean samples. Individual samples contained approximately 10 to 15 grams of ground material.

Samples prepared at a particular %w/w fortification should in theory be concordant with consensus values as cited in the report. In many instances, however, the %w/w fortification value did not agree with analytical data generated by PCR when compared to commercially available reference standards using in-house validated methods. The trend of generating lower reported concentrations compared with gravimetric fortified values is possibly due to zygosity differences in the corn and soybean samples compared with commercially available reference materials. For example, GIPSA in-house validated methods yield composite averages for MON810 to be about half the %w/w fortified levels; conversely, Herculex[®] RW composite averages were observed to be higher than the %w/w fortifications. GIPSA data are consistent with historical data generated by GIPSA proficiency program participants. For this reason, consensus means are used for statistical evaluation in lieu of gravimetric fortification values.

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 included with the samples. Participants submitted results by electronic mail. No analytical methodologies were specified, and organizations used both DNA- and protein-based testing technologies. Seventy-eight (78) organizations received samples in the October 2012 round of proficiency testing, and seventy-three (73) organizations submitted results to GIPSA.

- Thirty-one (31) participants submitted **qualitative** results only (of these 31, three (3) participants performed a combination of DNA and protein based testing),
- Three (3) submitted **quantitative** results only,
- Thirty-two (32) participants submitted a combination of **qualitative** and **quantitative** results (of these 32, two (2) participants performed a combination of DNA and protein based testing), and
- Seven (7) participants submitted **protein** based results, using Lateral Flow Strip (LFS) qualitative and/or Enzyme-linked Immunosorbent Assay (ELISA) quantitative analyses.

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; several listed organizations requested that their identity remain anonymous.

Data Summary Results

Data submitted by the participants is 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 (% w/w) 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 of corn fortified with 35S for all participants (DNA-based assays).
- Table 2: Percentages of correct results, false negatives, and false positives in qualitative reports of 35S for all participants.
- Table 3: Qualitative results of corn fortified with NOS for all participants (DNA-based assays).
- Table 4: Percentages of correct results, false negatives, and false positives in qualitative reports of NOS for all participants.
- Table 5: Qualitative results of corn fortified with FMV for all participants (DNA-based assays).
- Table 6: Percentages of correct results, false negatives, and false positives in qualitative reports of FMV for all participants.
- Table 7: Qualitative results of corn fortified with T25 for all participants (DNA-based assays).

- Table 8: Percentages of correct results, false negatives, and false positives in qualitative reports of T25 for all participants.
- Table 9: Qualitative results of corn fortified CBH351 with for all participants (DNA-based assays).
- Table 10: Percentages of correct results, false negatives, and false positives in qualitative reports of CBH351 for all participants.
- Table 11: Qualitative results of corn fortified with MON810 for all participants (DNA-based assays).
- Table 12: Percentages of correct results, false negatives, and false positives in qualitative reports of MON810 for all participants.
- Table 13: Qualitative results of corn fortified with GA21 for all participants (DNA-based assays).
- Table 14: Percentages of correct results, false negatives, and false positives in qualitative reports of GA21 for all participants.
- Table 15: Qualitative results of corn fortified with Bt176 for all participants (DNA-based assays).
- Table 16: Percentages of correct results, false negatives, and false positives in qualitative reports of Bt176 for all participants.
- Table 17: Qualitative results of corn fortified with Bt11 for all participants (DNA-based assays).
- Table 18: Percentages of correct results, false negatives, and false positives in qualitative reports of Bt11 for all participants.
- Table 19: Qualitative results of corn fortified with NK603 for all participants. (DNA-based assays).
- Table 20: Percentages of correct results, false negatives, and false positives in qualitative reports of NK603 for all participants.
- Table 21: Qualitative results of corn fortified with Herculex[®] for all participants (DNA-based assays).
- Table 22: Percentages of correct results, false negatives, and false positives in qualitative reports of Herculex[®] for all participants.
- Table 23: Qualitative results of corn fortified with MON863 for all participants (DNA-based assays).
- Table 24: Percentages of correct results, false negatives, and false positives in qualitative reports of MON863 for all participants.
- Table 25: Qualitative results of corn fortified with Herculex[®] RW for all participants (DNA-based assays).
- Table 26: Percentages of correct results, false negatives, and false positives in qualitative reports of Herculex[®] RW for all participants.
- Table 27: Qualitative results of corn fortified with MIR604 for all participants (DNA-based assays).
- Table 28: Percentages of correct results, false negatives, and false positives in qualitative reports of MIR604 for all participants.
- Table 29: Qualitative results of corn fortified with Event 3272 for all participants (DNA-based assays).
- Table 30: Percentages of correct results, false negatives, and false positives in qualitative reports of Event 3272 for all participants.
- Table 31: Qualitative results of corn fortified with MON 88017 for all participants (DNA-based assays).

- Table 32: Percentages of correct results, false negatives, and false positives in qualitative reports of MON 88017 for all participants.
- Table 33: Qualitative results of corn fortified with MON 89034 for all participants (DNA-based assays).
- Table 34: Percentages of correct results, false negatives, and false positives in qualitative reports of MON 89034 for all participants.
- Table 35: Qualitative results of corn fortified with MIR162 for all participants (DNA-based assays)
- Table 36: Percentages of correct results, false negatives and false positives in qualitative reports of MIR162 for all participants.
- Table 37: Qualitative results of soybeans fortified with CP4 EPSPS (Roundup Ready™) for all participants (DNA-based assays).
- Table 38: Percentages of correct results, false negatives, and false positives in qualitative reports of CP4 EPSPS for all participants.
- Table 39: Qualitative results of soybeans fortified with A2704-12 (Liberty Link®) for all
- Table 40: Percentages of correct results, false negatives, and false positives in qualitative reports of A2704-12 for all participants.
- Table 41: Qualitative results of soybeans fortified with Roundup Ready™ II for all participants (DNA-based assays).
- Table 42: Percentages of correct results, false negatives, and false positives in qualitative reports of Roundup Ready™ II for all participants.
- Table 43: Qualitative results of soybeans fortified with DP305423 for all participants (DNA-based assays).
- Table 44: Percentages of correct results, false negatives, and false positives in qualitative reports of DP305423 for all participants.
- Table 45: Qualitative and quantitative results combined for soybeans fortified with 35S for all participants (DNA-based assays).
- Table 46: Percentages of correct results, false negatives, and false positives in qualitative reports of Soy 35S for all participants.
- Table 47: Qualitative results for soybeans fortified with NOS for all participants (DNA-based assays).
- Table 48: Percentages of correct results, false negatives, and false positives in qualitative reports of Soy NOS for all participants.
- Table 49: Qualitative results of soybeans fortified with FMV for all participants (DNA-based assays).
- Table 50: Percentages of correct results, false negatives, and false positives in qualitative reports of Soy FMV for all participants.
- Table 51: Composite percentages of correct results, false negatives, and false positives in qualitative reports for each transgenic event for all participants (DNA-based assays).
- Figure 1: Group average of percentage correct for Qualitative reports on each event (DNA-based assays).

Protein Based Data Summaries. This section summarizes protein based sample analysis data:

- Table 52: Lateral Flow Strip (LFS) testing (Protein-based testing) results for the detection of transgenic events in corn.
- Table 53: Percentage of correct results, false negatives, and false positives in qualitative reports for transgenic events in corn using Lateral Flow Strip (LFS) testing.
- Table 54: Results for soybeans fortified with CP4EPSPS and A2704-12 for participants using Lateral Flow Strip (LFS) testing.
- Table 55: Percentage of correct results in qualitative reports for CP4EPSPS and A2704-12 for participants using Lateral Flow Strip (LFS) testing.
- Table 56: Results for the detection of transgenic events in corn using Enzyme-Linked Immunosorbent Assay (ELISA) (Protein-based testing).
- Table 57: Percentage of correct results in the detection of transgenic events in corn using Enzyme-Linked Immunosorbent Assay (ELISA) (Protein-based testing).
- Table 58: Results for soybeans fortified with CP4EPSPS using Enzyme-Linked Immunosorbent Assay (ELISA) (Protein-based testing).
- Table 59: Percentage of correct results in qualitative reports for CP4EPSPS using Enzyme-Linked Immunosorbent Assay (ELISA) (Protein-based testing)

Quantitative Data Summaries. This section summarizes DNA based quantitative sample analysis data: z-scores were purposefully left blank on non-fortified (0.0%) samples since a z-score assumes a normal distribution and its interpretation would be distorted.

- Table 60: Quantitative results and z-scores for corn fortified with T25 for all participants (DNA-based assays).
- Table 61: Quantitative results and z-scores for corn fortified with CBH351 for all participants (DNA-based assays).
- Table 62: Quantitative results and z-scores for corn fortified with MON810 for all participants (DNA-based assays).
- Table 63: Quantitative results and z-scores for corn fortified with GA21 for all participants (DNA-based assays).
- Table 64: Quantitative results and z-scores for corn fortified with Bt176 for all participants (DNA-based assays).
- Table 65: Quantitative results and z-scores for corn fortified with Bt11 for all participants (DNA-based assays).
- Table 66: Quantitative results and z-scores for corn fortified with NK603 for all participants (DNA-based assays).
- Table 67: Quantitative results and z-scores for corn fortified with Herculex[®] for all participants (DNA-based assays).
- Table 68: Quantitative results and z-scores for corn fortified with MON863 for all participants (DNA-based assays).
- Table 69: Quantitative results and z-scores for corn fortified with Herculex[®] RW for all participants (DNA-based assays).
- Table 70: Quantitative results and z-scores for corn fortified with MIR604 for all participants (DNA-based assays).
- Table 71: Quantitative results and z-scores for corn fortified with Event 3272 for all participants (DNA-based assays).

- Table 72: Quantitative results and z-scores for corn fortified with MON 88017 for all participants (DNA-based assays).
- Table 73: Quantitative results and z-scores for corn fortified with MON 89034 for all participants (DNA-based assays).
- Table 74: Quantitative results and z-scores for corn fortified with MIR162 for all participants (DNA-based assays).
- Table 75: Quantitative results and z-scores for soybeans fortified with CP4 EPSPS in Roundup Ready™ for all participants (DNA-based assays).
- Table 76: Quantitative results and z-scores for soybeans fortified with A2704-12 for all participants (DNA-based assays).
- Table 77: Quantitative results and z-scores for soybeans fortified with CP4 EPSPS in Roundup Ready™ II for all participants (DNA-based assays).
- Table 78: Quantitative results and z-scores for soybeans fortified with DP305423 for all participants (DNA-based assays).
- Table 79: Quantitative results for 35S, NOS, and FMV in corn (DNA-based assays).
- Table 80: Quantitative results for 35S, NOS, and FMV in soybeans (DNA-based assays).
- Table 81: Descriptive statistics for participants reported quantifications relative to GIPSA fortification levels using DNA-based assays.

- Appendix I: List of organizations who wished to be identified as a participant in the GIPSA October 2013 Proficiency Program.

Table 1: Qualitative results of 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 Number	P	P	N	P	P	N
1752	P	P	N	P	P	P
1754	P	P	N	P	P	N
1764	P	P	N	P	P	P
1773	P	P	N	P	P	N
1788	P	P	N	P	P	P
1844	P	P	N	P	P	N
1847	P	P	N	P	P	N
1854	P	P	N	P	P	P
1855	P	P	N	P	P	N
1858	P	P	N	P	P	N
1859	P	P	N	P	P	N
1862	P	P	N	P	P	N
1865	P	P	N	P	P	N
1870	P	P	N	P	P	N
1875	P	P	N	P	P	N
1892	P	P	N	P	P	N
1895	P	P	N	P	P	N
1897	P	P	N	P	P	N
2034	P	P	N	P	P	N
2057	P	P	N	P	P	N
2076	P	P	N	P	P	N
2112	P	P	N	P	P	N
2123	P	P	N	P	P	N
2126	P	P	N	P	P	N
2716	P	P	N	P	P	N
2720	P	P	N	P	P	N
2721	P	P	N	P	P	N
2822	P	P	N	P	P	P
3095	P	P	N	P	P	N
3927	P	P	N	P	P	N
3928	P	P	N	P	P	N
3929	P	P	N	P	P	N
4504	P	P	P	P	P	P
4932	P	P	N	P	P	N
4933	P	P	N	P	P	N
4935	P	P	N	P	P	N
4937	P	P	N	P	P	N
4939	P	P	N	P	P	P
4942	P	P	N	P	P	N
4945	P	P	N	P	P	N
4951	P	P	N	P	P	N
4952	P	P	N	P	P	N
4954	P	P	N	P	P	N
4956	P	P	N	P	P	N
4957	P	P	N	P	P	N
4966	P	P	N	P	P	N
4971	P	P	N	P	P	N
4973	P	P	N	P	P	N
4974	P	P	N	P	P	N
N, Results	49	49	49	49	49	49
# Negative	0	0	48	0	0	42
# Positive	49	49	1	49	49	7
% Correct	100.0%	100.0%	98.0%	100.0%	100.0%	85.7%
% Incorrect	0.0%	0.0%	2.0%	0.0%	0.0%	14.3%

Table 2: Percentages of correct results, false negatives, and false positives in qualitative reports of 35S for all participants

Total # Reported Results	294
# Incorrect	8
% Correct	97.3%
# Provided Positives	196
# False Negative	0
% False Negative	0.0%
# Provided Negatives	98
# False Positive	8
% False Positive	8.2%

Table 3: Qualitative results of corn fortified with NOS for all participants (DNA-based assays)
(N = negative; P = positive; Incorrect results are shown in boldface).

NOS	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	P	P	N	P	P	P
1752	P	P	N	P	P	P
1754	P	P	N	P	P	P
1764	P	P	N	P	P	P
1773	P	P	N	P	P	P
1788	P	P	N	P	P	P
1844	P	P	N	P	P	P
1847	P	P	N	P	P	P
1854	P	P	N	P	P	P
1855	P	P	N	P	P	P
1858	P	P	N	P	P	P
1859	P	P	N	P	P	P
1862	P	P	N	P	P	P
1865	P	P	N	P	P	P
1870	P	P	N	P	P	P
1875	P	P	N	P	P	P
1892	P	P	N	P	P	P
1895	P	P	N	P	P	P
1897	P	P	N	P	P	P
2034	P	P	N	P	P	P
2057	P	P	N	P	P	P
2076	P	P	N	P	P	P
2112	P	P	N	P	P	P
2123	P	P	N	P	P	P
2126	P	P	N	P	P	P
2716	P	P	N	P	P	P
2720	P	P	N	P	P	P
2721	P	P	N	P	P	P
2822	P	P	N	P	P	P
3095	P	P	N	P	P	P
3927	P	P	N	P	P	P
3928	P	P	N	P	P	P
3929	P	P	N	P	P	P
4504	P	P	N	P	P	P
4932	P	P	N	P	P	P
4933	P	P	N	P	P	P
4935	P	P	N	P	P	P
4936	P	P	N	P	P	P
4937	P	P	N	P	P	P
4939	P	P	N	P	P	P
4942	P	P	N	P	P	P
4945	P	P	N	P	P	P
4947	P	P	N	P	P	P
4951	P	P	N	P	P	P
4952	P	P	N	P	P	P
4954	P	P	N	P	P	P
4956	P	P	N	P	P	P
4957	P	P	N	P	P	P
4962	P	P	N	P	P	P
4966	P	P	N	P	P	P
4971	P	P	N	P	P	P
4973	P	P	N	P	P	P
4974	P	P	N	P	P	P
N, Results	52	52	52	52	52	52
# Negative	0	0	52	0	0	0
# Positive	52	52	0	52	52	52
% Correct	100.0%	100.0%	100%	100.0%	100.0%	100.0%
% Incorrect	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table 4: Percentages of correct results, false negatives, and false positives in qualitative reports of NOS for all participants

Total # Reported Results	312
# Incorrect	0
% Correct	100.0%
# Provided Positives	260
# False Negative	0
% False Negative	0.0%
# Provided Negatives	52
# False Positive	0
% False Positive	0.0%

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

FMV Corn	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	N	N	N	P	P	N
1754	N	N	N	P	P	N
1764	N	N	N	P	P	N
1773	N	N	N	P	P	N
1785	N	N	N	P	P	N
1859	N	N	N	P	P	N
1865	N	N	N	P	P	N
1870	N	N	N	P	P	N
1875	N	N	N	P	P	N
1895	N	N	N	P	P	N
2034	N	N	N	P	P	N
2057	N	N	N	P	P	N
2716	N	N	N	P	P	N
2721	N	N	N	P	P	N
2822	N	N	N	P	P	N
4504	N	N	N	P	P	N
4932	N	N	N	P	P	N
4935	N	N	N	P	P	N
4947	N	N	N	P	P	N
4951	N	N	N	P	P	N
4952	N	N	N	P	P	N
4954	N	N	N	P	P	N
4956	N	N	N	P	P	N
4957	N	N	N	P	P	N
4964	N	N	N	P	P	N
4966	N	N	N	P	P	N
4971	N	N	N	P	P	N
N, Results	26	26	26	26	26	26
# Negative	26	26	26	0	0	26
# Positive	0	0	0	26	26	0
% Correct	100.0%	100.0%	100.0%	100%	100%	100.0%
% Incorrect	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table 6: Percentages of correct results, false negatives, and false positives in qualitative reports of FMV for all participants

Total # Reported Results	156
# Incorrect	0
% Correct	100.0%
# Provided Positives	52
# False Negative	0
% False Negative	0.0%
# Provided Negatives	104
# False Positive	0
% False Positive	0.0%

Table 7: Qualitative results of corn fortified with T25 for all participants (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in boldface).

T25	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	1.5%	0.3%	0.0%	0.1%	0.0%	0.0%
1773	P	P	N	P	N	N
1785	P	P	N	P	N	N
1788	P	N	N	N*	P	N
1844	P	P	N	P	N	N
1854	P	P	N	P	N	N
1859	P	P	N	P	N	N
1862	P	P	N	P	N	N
1865	P	P	N	P	N	N
1892	P	P	N	P	N	N
1895	P	P	N	P	N	N
1897	P	P	N	N*	N	N
2034	P	P	N	P	N	N
2051	P	P	N	P	N	N
2089	P	P	N	P	N	N
2126	P	P	N	P	N	N
2694	P	P	N	P	N	N
2720	P	P	N	P	N	N
2721	P	P	N	P	N	N
2732	P	P	N	P	N	N
2830	P	N	N	N	N	N
3694	P	P	N	P	N	N
3928	P	P	N	P	N	N
3929	P	P	N	P	N	N
4504	N	N	N	N	N	N
4937	P	P	N	P	N	N
4945	P	P	N	P	N	N
4947	P	P	N	P	N	N
4952	P	P	N	P	N	N
4964	P	P	N	P	N	N
4966	P	P	N	P	N	N
4975	P	P	N	NR	NR	N
N, Results	31	31	31	30	30	31
# Negative	1	3	31	4	29	31
# Positive	30	28	0	26	1	0
% Correct	96.8%	90.3%	100.0%	93.3%	96.7%	100.0%
% Incorrect	3.2%	9.7%	0.0%	6.7%	3.3%	0.0%

* - Consensus Mean below Participants' LOD, assessed as Provided Negative; NR- No Result

Table 8: Percentages of correct results, false negatives, and false positives in qualitative reports of T25 for all participants

Total # Reported Results	184
# Incorrect	7
% Correct	96.2%
# Provided Positives	90
# False Negative	6
% False Negative	6.7%
# Provided Negatives	94
# False Positive	1
% False Positive	1.1%

Table 9: Qualitative results of corn fortified with CBH351 for all participants (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in boldface).

CBH351	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
1773	P	N	N	N	N	N
1785	P	N	N	N	N	N
1788	P	N	N	N	N	N
1844	P	N	N	N	N	N
1854	P	N	N	N	P	P
1859	P	N	N	N	N	N
1865	P	N	N	N	N	N
1875	P	N	N	N	N	N
1892	P	N	N	N	N	N
1897	P	N	N	N	N	N
2034	P	N	N	N	N	N
2051	P	N	N	N	N	N
2057	P	N	N	N	N	N
2694	P	N	N	N	N	N
3694	P	N	N	N	N	N
4964	P	N	N	N	N	N
4974	P	N	N	N	N	N
N, Results	17	17	17	17	17	17
# Negative	0	17	17	17	16	16
# Positive	17	0	0	0	1	1
% Correct	100.0%	100.0%	100.0%	100.0%	94.1%	94.1%
% Incorrect	0.0%	0.0%	0.0%	0.0%	5.9%	5.9%

Table 10: Percentages of correct results, false negatives, and false positives in qualitative reports of CBH351 for all participants

Total # Reported Results	102
# Incorrect	2
% Correct	98.0%
# Provided Positives	17
# False Negative	0
% False Negative	0.0%
# Provided Negatives	85
# False Positive	2
% False Positive	2.4%

Table 11: Qualitative results of corn fortified with MON810 for all participants (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in boldface).

MON810	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	1.1%	0.1%	0.0%	0.1%	0.2%	0.0%
1773	P	P	N	P	P	N
1785	P	P	N	P	P	N
1788	P	N*	N	P	P	N
1854	N	P	N	N*	P	N
1858	P	P	N	P	P	N
1859	P	P	N	P	P	N
1862	P	P	N	P	P	N
1865	P	P	N	P	P	N
1892	P	P	N	P	P	N
1895	P	N*	N	N*	P	N
1897	P	P	N	P	P	N
2034	P	P	N	P	P	N
2051	P	P	N	P	P	N
2089	P	P	N	P	P	N
2126	P	N	N	P	P	N
2569	P	P	N	P	P	N
2720	P	P	N	P	P	N
2721	P	P	N	P	P	N
2822	P	P	N	P	P	N
2830	P	N	N	N	N	N
3929	P	P	N	P	P	N
4504	P	N	N	N	P	N
4937	P	P	N	P	P	N
4964	P	P	N	P	P	N
4966	P	N	N	P	P	N
4974	P	N	N	N	P	N
N, Results	26	26	26	26	26	26
# Negative	1	7	26	5	1	26
# Positive	25	19	0	21	25	0
% Correct	96.2%	80.8%	100.0%	88.5%	96.2%	100.0%
% Incorrect	3.8%	19.2%	0.0%	11.5%	3.8%	0.0%

* - Consensus Mean below Participants' LOD, assessed as Provided Negative

Table 12: Percentages of correct results, false negatives, and false positives in qualitative reports of MON810 for all participants

Total # Reported Results	156
# Incorrect	10
% Correct	93.6%
# Provided Positives	100
# False Negative	10
% False Negative	10.0%
# Provided Negatives	56
# False Positive	0
% False Positive	0.0%

Table 13: Qualitative results of 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 Number	0.0%	0.4%	0.0%	0.0%	0.4%	0.8%
1752	N	P	N	N	P	P
1785	N	P	N	N	P	P
1788	N	P	N	N	P	P
1854	N	P	N	N	P	P
1858	N	P	N	N	P	P
1859	N	P	N	N	P	P
1862	N	P	N	N	P	P
1865	N	P	N	N	P	P
1892	N	P	N	N	P	P
1895	N	P	N	N	P	P
1897	N	P	N	N	P	P
2034	N	P	N	N	P	P
2051	N	P	N	N	P	P
2089	N	P	N	N	P	P
2126	N	P	N	P	P	P
2569	N	P	N	N	P	P
2720	N	P	N	N	P	P
2721	N	P	N	N	P	P
2830	N	N	N	N	N	N
3095	NR	P	N	N	P	P
3929	N	P	N	N	P	P
4504	N	N	N	N	N	N
4936	N	P	N	N	P	N
4937	N	P	N	N	P	P
4942	N	P	N	N	P	P
4957	N	P	N	N	P	P
4964	N	P	N	N	P	P
4966	N	P	N	N	P	P
4974	P	N	N	P	N	N
N, Results	28	29	29	29	29	29
# Negative	27	3	29	27	3	4
# Positive	1	26	0	2	26	25
% Correct	96.4%	89.7%	100.0%	93.1%	89.7%	86.2%
% Incorrect	3.6%	10.3%	0.0%	6.9%	10.3%	13.8%

NR- No Result

Table 14: Percentages of correct results, false negatives, and false positives in qualitative reports of GA21 for all participants

Total # Reported Results	173
# Incorrect	13
% Correct	92.5%
# Provided Positives	87
# False Negative	10
% False Negative	11.5%
# Provided Negatives	86
# False Positive	3
% False Positive	3.5%

Table 15: Qualitative results of corn fortified with Bt176 for all participants (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in boldface).

Bt176	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	1.1%	0.1%	0.0%	0.0%	0.0%	0.0%
1752	P	P	N	N	N	N
1773	P	P	N	N	N	N
1785	P	P	N	N	N	N
1788	P	P	N	N	N	N
1844	P	P	N	N	N	N
1854	N	N*	N	N	P	N
1858	P	P	N	N	N	N
1859	P	P	N	N	N	N
1862	P	P	N	N	N	N
1865	P	P	N	N	N	N
1892	P	P	N	N	N	N
1897	P	P	N	N	N	N
2034	P	P	N	N	N	N
2051	P	P	N	N	N	N
2720	P	P	N	N	N	N
2721	P	P	N	N	N	N
2822	P	P	N	N	N	N
3095	P	P	N	N	N	N
3929	P	P	N	N	N	N
4504	P	P	N	N	N	N
4936	P	P	N	N	N	N
4937	P	P	N	N	N	N
4942	P	P	N	N	N	N
4964	P	P	N	N	N	N
4966	P	P	N	N	N	N
4974	P	N	N	N	N	N
N, Results	26	26	26	26	26	26
# Negative	1	2	26	26	25	26
# Positive	25	24	0	0	1	0
% Correct	96.2%	96.2%	100.0%	100.0%	96.2%	100.0%
% Incorrect	3.8%	3.8%	0.0%	0.0%	3.8%	0.0%

* - Consensus Mean below Participants' LOD, assessed as Provided Negative

Table 16: Percentages of correct results, false negatives, and false positives in qualitative reports of Bt176 for all participants

Total # Reported Results	156
# Incorrect	3
% Correct	98.1%
# Provided Positives	51
# False Negative	2
% False Negative	3.9%
# Provided Negatives	105
# False Positive	1
% False Positive	1.0%

Table 17: Qualitative results of corn fortified with Bt11 for all participants (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in boldface.)

Bt11	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	0.1%	1.3%	0.0%	0.0%	0.0%	0.0%
1752	P	P	N	N	N	N
1773	P	P	N	N	N	N
1785	P	P	N	N	N	N
1788	P	P	N	N	N	N
1854	N*	P	N	N	N	P
1858	P	P	N	N	N	N
1859	P	P	N	N	N	N
1862	P	P	N	N	N	N
1865	P	P	N	N	N	N
1892	P	P	N	N	N	N
1897	P	P	N	N	N	N
2034	P	P	N	N	N	N
2051	P	P	N	N	N	N
2089	N	P	N	N	N	N
2126	P	P	N	N	N	N
2569	P	P	N	N	N	N
2721	P	P	N	N	N	N
2822	P	P	N	N	N	N
3095	P	P	N	N	N	N
3929	P	P	N	N	N	N
4504	P	P	N	N	P	N
4936	P	P	N	N	N	N
4937	P	P	N	N	N	N
4952	P	P	N	N	N	N
4957	P	P	N	N	N	N
4964	P	P	N	N	N	N
4966	P	P	N	N	N	N
4974	N	N	P	P	P	P
N, Results	28	28	28	28	28	28
# Negative	3	1	27	27	26	26
# Positive	25	27	1	1	2	2
% Correct	92.9%	96.4%	96.4%	96.4%	92.9%	92.9%
% Incorrect	7.1%	3.6%	3.6%	3.6%	7.1%	7.1%

* - Consensus Mean below Participants' LOD, assessed as Provided Negative

Table 18: Percentages of correct results, false negatives, and false positives in qualitative reports of Bt11 for all participants

Total # Reported Results	168
# Incorrect	9
% Correct	94.6%
# Provided Positives	55
# False Negative	3
% False Negative	5.5%
# Provided Negatives	113
# False Positive	6
% False Positive	5.3%

Table 19: Qualitative results of corn fortified with NK603 for all participants. (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in boldface).

NK603	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	0.5%	0.0%	0.0%	0.0%	0.3%	0.0%
1752	P	N	N	N	P	N
1785	P	N	N	N	P	N
1788	P	P	N	P	N	N
1854	N	P	N	N	P	N
1858	P	N	N	N	P	N
1859	P	N	N	N	P	N
1862	P	N	N	N	P	N
1865	P	N	N	N	P	N
1875	P	N	N	N	P	N
1897	P	N	N	N	P	N
2034	P	P	N	N	P	N
2051	P	N	N	N	P	N
2089	P	N	N	N	P	N
2126	P	N	N	N	P	N
2569	P	N	N	N	P	N
2720	P	N	N	N	P	N
2721	P	N	N	N	P	N
3929	P	N	N	N	P	N
4504	N	N	N	N	N	N
4936	P	N	N	N	P	N
4937	P	N	N	N	P	N
4942	P	N	N	N	P	N
4956	P	N	N	N	P	N
4957	P	N	N	N	P	N
4936	P	N	N	N	P	N
4964	P	N	N	N	P	N
4966	P	N	N	N	P	N
4974	P	N	N	P	N	N
N, Results	28	28	28	28	28	28
# Negative	2	25	28	26	3	28
# Positive	26	3	0	2	25	0
% Correct	92.9%	89.3%	100.0%	92.9%	89.3%	100.0%
% Incorrect	7.1%	10.7%	0.0%	7.1%	10.7%	0.0%

Table 20: Percentages of correct results, false negatives, and false positives in qualitative reports of NK603 for all participants

Total # Reported Results	168
# Incorrect	10
% Correct	94.0%
# Provided Positives	56
# False Negative	5
% False Negative	8.9%
# Provided Negatives	112
# False Positive	5
% False Positive	4.5%

Table 21: Qualitative results of corn fortified with Herculex® for all participants (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in boldface).

Herculex®	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	0.0%	0.5%	0.0%	0.4%	0.0%	0.0%
1752	N	P	N	P	N	N
1773	N	P	N	P	N	N
1785	N	P	N	P	N	N
1854	P	P	N	P	N	N
1859	N	P	N	P	N	N
1862	N	P	N	P	N	N
1865	N	P	N	P	N	N
1895	N	P	N	P	N	N
1897	N	P	N	P	N	N
2034	N	P	N	P	N	N
2051	N	P	N	P	N	N
2089	N	P	N	P	N	N
2126	N	P	N	P	N	N
2569	N	P	N	P	N	N
2721	N	P	N	P	N	N
3929	N	P	N	P	N	N
4504	N	P	N	N	P	P
4936	N	P	N	P	N	N
4937	N	P	N	P	N	N
4942	N	P	N	P	N	N
4952	N	P	N	P	N	N
4957	N	P	N	P	N	N
4964	N	P	N	P	N	N
4966	N	P	N	P	N	N
4973	N	P	N	P	N	N
4974	N	P	N	P	N	N
4975	N	P	N	P	N	N
N, Results	27	27	27	27	27	27
# Negative	26	0	27	1	26	26
# Positive	1	27	0	26	1	1
% Correct	96.3%	100.0%	100.0%	96.3%	96.3%	96.3%
% Incorrect	3.7%	0.0%	0.0%	3.7%	3.7%	3.7%

Table 22: Percentages of correct results, false negatives, and false positives in qualitative reports of Herculex® for all participants

Total # Reported Results	162
# Incorrect	4
% Correct	97.5%
# Provided Positives	54
# False Negative	1
% False Negative	1.9%
# Provided Negatives	108
# False Positive	3
% False Positive	2.8%

Table 23: Qualitative results of corn fortified with MON863 for all participants (DNA-based assays) (N = negative; P = positive; NR = no result; Incorrect results are shown in boldface).

MON863	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	0.0%	0.6%	0.0%	0.0%	0.4%	0.0%
1752	P	P	N	P	P	N
1773	N	P	N	N	P	N
1785	N	P	N	N	P	N
1788	N	P	N	N	P	N
1854	N	P	N	N	P	N
1859	N	P	N	N	P	N
1865	N	P	N	N	P	N
1895	N	P	N	N	P	N
1897	N	P	N	N	P	N
2034	N	P	N	P	P	N
2051	N	P	N	N	P	N
2089	N	P	N	N	P	N
2126	N	P	N	N	P	N
2569	N	P	N	N	P	N
2720	N	P	N	N	P	N
2721	N	P	N	N	P	N
3929	N	P	N	N	P	N
4504	N	N	N	N	N	N
4936	N	P	N	N	P	N
4937	N	P	N	N	P	N
4942	N	P	N	N	P	N
4956	N	P	N	N	P	N
4957	N	P	N	N	P	N
4964	N	P	N	N	P	N
4966	N	P	N	N	P	N
4974	N	P	N	N	P	N
N, Results	26	26	26	26	26	26
# Negative	25	1	26	24	1	26
# Positive	1	25	0	2	25	0
% Correct	96.2%	96.2%	100.0%	92.3%	96.2%	100.0%
% Incorrect	3.8%	3.8%	0.0%	7.7%	3.8%	0.0%

Table 24: Percentages of correct results, false negatives, and false positives in qualitative reports of MON863 for all participants

Total # Reported Results	156
# Incorrect	5
% Correct	96.8%
# Provided Positives	52
# False Negative	2
% False Negative	3.8%
# Provided Negatives	104
# False Positive	3
% False Positive	2.9%

Table 25: Qualitative results of corn fortified with Herculex® RW for all participants (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in bold face).

Herculex® RW	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
1752	N	P	N	N	N	N
1773	N	P	N	N	N	N
1785	N	P	N	N	N	N
1859	N	P	N	N	N	N
1862	N	P	N	N	N	N
1865	N	P	N	N	N	N
1895	N	P	N	N	N	N
2034	N	P	N	N	N	N
2051	N	P	N	N	N	N
2089	N	N	N	N	N	N
2126	N	P	N	N	N	N
2569	N	P	N	N	N	N
2721	N	P	N	N	N	N
3095	N	P	N	N	N	N
3929	N	P	N	N	N	N
4054	N	P	N	P	P	P
4936	N	P	N	N	N	N
4937	N	P	N	N	N	N
4942	N	P	N	N	N	N
4947	N	P	N	N	N	N
4957	N	P	N	N	N	N
4964	N	P	N	N	N	N
4966	N	P	N	N	N	N
4973	N	N*	N	N	N	N
4975	N	P	N	N	N	N
N, Results	25	25	25	25	25	25
# Negative	25	2	25	24	24	24
# Positive	0	23	0	1	1	1
% Correct	100.0%	96.0%	100.0%	96.0%	96.0%	96.0%
% Incorrect	0.0%	4.0%	0.0%	4.0%	4.0%	4.0%

* - Consensus Mean below participants' LOD, assessed as Provided Negative

Table 26: Percentages of correct results, false negatives, and false positives in qualitative reports of Herculex® RW for all participants

Total # Reported Results	150
# Incorrect	4
% Correct	97.3%
# Provided Positives	24
# False Negative	1
% False Negative	4.2%
# Provided Negatives	126
# False Positive	3
% False Positive	2.4%

Table 27: Qualitative results of corn fortified with MIR604 for all participants (DNA-based assays) (N = negative; P = positive; NR = no result; Incorrect results are shown in boldface).

MIR604	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%
1752	N	N	N	N	P	P
1773	N	N	N	N	P	P
1785	N	N	N	N	P	P
1854	N	N	N	N	N*	P
1859	N	N	N	N	P	P
1862	N	N	N	N	P	P
1865	N	N	N	N	P	P
1895	N	N	N	N	P	P
1897	N	N	N	N	P	P
2034	N	N	N	N	P	P
2051	N	N	N	N	P	P
2089	N	N	N	N	P	P
2126	N	N	N	N	P	P
2721	N	N	N	N	P	P
3929	N	N	N	N	P	P
4504	N	N	N	N	N	N
4937	N	N	N	N	P	P
4942	N	N	N	N	P	P
4947	N	N	N	N	P	P
4956	N	N	N	N	P	P
4962	N	N	N	N	P	P
4964	N	N	N	N	P	P
4966	N	N	N	N	P	P
4974	N	N	N	N	P	P
4975	N	N	N	N	P	P
N, Results	25	25	25	25	25	25
# Negative	25	25	25	25	2	1
# Positive	0	0	0	0	23	24
% Correct	100.0%	100.0%	100.0%	100.0%	96.0%	96.0%
% Incorrect	0.0%	0.0%	0.0%	0.0%	4.0%	4.0%

* - Consensus Mean below participants' LOD, assessed as Provided Negative

Table 28: Percentages of correct results, false negatives, and false positives in qualitative reports of MIR604 for all participants

Total # Reported Results	150
# Incorrect	2
% Correct	98.7%
# Provided Positives	49
# False Negative	2
% False Negative	4.1%
# Provided Negatives	101
# False Positive	0
% False Positive	0.0%

Table 29: Qualitative results of corn fortified with Event 3272 for all participants (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in boldface).

Event 3272	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	0.5%	0.7%	0.0%	0.0%	0.0%	0.2%
1773	P	P	N	N	N	P
1785	P	P	N	N	N	P
1844	P	P	N	N	N	P
1854	P	P	N	N	N	P
1859	P	P	N	N	N	P
1865	P	P	N	N	N	P
2034	P	P	N	N	N	P
2051	P	P	N	N	N	P
2126	P	P	N	N	N	P
2694	P	P	N	N	N	P
2716	P	P	N	N	N	P
2721	P	P	N	N	N	P
4504	P	P	N	N	N	P
4937	P	P	N	N	N	P
4942	P	P	N	N	N	P
4952	P	P	N	N	N	P
4964	P	P	N	N	N	P
4966	P	P	N	N	N	P
4974	P	P	N	N	N	P
N, Results	19	19	19	19	19	19
# Negative	0	0	19	19	19	0
# Positive	19	19	0	0	0	19
% Correct	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
% Incorrect	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table 30: Percentages of correct results, false negatives, and false positives in qualitative reports of Event 3272 for all participants

Total # Reported Results	114
# Incorrect	0
% Correct	100.0%
# Provided Positives	57
# False Negative	0
% False Negative	0.0%
# Provided Negatives	57
# False Positive	0
% False Positive	0.0%

Table 31: Qualitative results of Corn fortified with MON88017 for all participants (DNA-based assays) (N = negative; P = positive).

MON 88017	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	0.0%	0.0%	0.0%	0.1%	0.4%	0.0%
1773	N	N	N	P	P	N
1785	N	N	N	P	P	N
1859	N	N	N	P	P	N
1862	N	N	N	P	P	N
1865	N	N	N	P	P	N
1875	N	N	N	P	P	N
1895	N	N	N	N	P	N
1897	N	N	N	P	P	N
2034	N	N	N	P	P	N
2051	N	N	N	P	P	N
2089	N	N	N	P	P	N
2126	N	N	N	N	P	N
2569	N	N	N	N*	P	N
2694	N	N	N	P	P	N
2720	N	N	N	P	P	N
2721	N	N	N	P	P	N
3928	N	N	N	P	P	N
3929	N	N	N	P	P	N
4504	N	N	N	N	N	N
4937	N	N	N	P	P	N
4942	N	N	N	P	P	N
4945	N	N	N	P	P	N
4964	N	N	N	P	P	N
4966	N	N	N	P	P	N
4974	N	N	N	N	P	N
N, Results	25	25	25	25	25	25
# Negative	25	25	25	5	1	25
# Positive	0	0	0	20	24	0
% Correct	100%	100%	100%	84.0%	96.0%	100.0%
% Incorrect	0.0%	0.0%	0.0%	16.0%	4.0%	0.0%

* - Consensus Mean below participants' LOD, assessed as Provided Negative

Table 32: Percentages of correct results, false negatives, and false positives in qualitative reports of MON88017 for all participants

Total # Reported Results	150
# Incorrect	5
% Correct	96.7%
# Provided Positives	49
# False Negative	5
% False Negative	10.2%
# Provided Negatives	101
# False Positive	0
% False Positive	0.0%

Table 33: Qualitative results of corn fortified with MON89034 for all participants (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in bold face).

MON 89034	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	0.0%	0.0%	0.0%	1.3%	0.5%	0.0%
1773	N	N	N	P	P	N
1785	N	N	N	P	P	N
1859	N	N	N	P	P	N
1862	N	N	N	P	P	N
1865	N	N	N	P	P	N
1875	N	N	N	P	P	N
1895	N	N	N	P	P	N
1897	N	N	N	P	P	N
2034	N	N	N	P	P	N
2051	N	N	N	P	P	N
2089	N	N	N	P	P	N
2126	N	N	N	P	P	N
2569	N	N	N	P	P	N
2694	N	N	N	P	P	N
2720	N	N	N	P	P	N
2721	N	N	N	P	P	N
2822	N	N	N	P	P	N
4504	N	P	N	P	P	N
4935	N	N	N	P	P	N
4937	N	N	N	P	P	N
4942	N	N	N	P	P	N
4945	N	N	N	P	P	N
4964	N	N	N	P	P	N
4966	N	N	N	P	P	N
4974	N	N	N	P	P	N
N, Results	25	25	25	25	25	25
# Negative	25	24	25	0	0	25
# Positive	0	1	0	25	25	0
% Correct	100%	4.0%	100%	0%	0%	100%
% Incorrect	0.0%	96.0%	0.0%	100.0%	100.0%	0.0%

Table 34: Percentages of correct results, false negatives, and false positives in qualitative reports of MON89034 for all participants

Total # Reported Results	150
# Incorrect	1
% Correct	99.3%
# Provided Positives	50
# False Negative	0
% False Negative	0.0%
# Provided Negatives	100
# False Positive	1
% False Positive	1.0%

Table 35: Qualitative results of corn fortified with MIR162 for all participants (DNA-based assays) (N = negative; P = positive).

MIR 162	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Participant Number	0.0%	0.0%	0.0%	1.1%	0.0%	0.3%
1773	N	N	N	P	N	P
1785	N	N	N	P	N	P
1859	N	N	N	P	N	P
1862	N	N	N	P	N	P
1865	N	N	N	P	N	P
1895	N	N	N	P	N	P
2034	N	N	N	P	N	P
2051	N	N	N	P	N	P
2089	N	N	N	P	N	P
2126	N	N	N	P	N	P
2694	N	N	N	P	N	P
2716	N	N	N	P	N	P
2720	N	N	N	P	N	P
2721	N	N	N	P	N	P
4504	N	N	N	P	N	N
4936	N	N	N	P	N	N
4937	N	N	N	P	N	P
4942	N	N	N	P	N	P
4952	N	N	N	P	N	P
4957	N	N	N	P	N	P
4964	N	N	N	P	N	P
4974	N	N	N	P	N	P
N, Results	22	22	22	22	22	22
# Negative	22	22	22	0	22	2
# Positive	0	0	0	22	0	20
% Correct	100%	100%	100%	100.0%	100%	90.9%
% Incorrect	0.0%	0.0%	0.0%	0.0%	0.0%	9.1%

Table 36: Percentages of correct results, false negatives, and false positives in qualitative reports of MIR162 for all participants

Total # Reported Results	132
# Incorrect	2
% Correct	98.5%
# Provided Positives	44
# False Negative	2
% False Negative	4.5%
# Provided Negatives	88
# False Positive	0
% False Positive	0.0%

Table 37: Qualitative results of soybeans fortified with CP4 EPSPS (Roundup Ready™) for all participants (DNA-based assays) (N = negative; P = positive).

CP4 EPSPS (RUR I)	Sample 1	Sample 2	Sample 3	Sample 4
Participant Number	0.4%	0.0%	0.7%	0.9%
1752	P	N	P	P
1773	P	N	P	P
1788	P	N	P	P
1847	P	N	P	P
1854	P	N	P	P
1858	P	N	P	P
1859	P	N	P	P
1862	P	N	P	P
1865	P	N	P	P
1892	P	N	P	P
1897	P	N	P	P
2051	P	N	P	P
2569	P	N	P	P
2692	P	N	P	P
2720	P	N	P	P
2721	P	N	P	P
2822	P	N	P	P
2830	N	N	P	P
4937	P	N	P	P
4956	P	N	P	P
4964	P	N	P	P
4966	P	N	P	P
N, Results	22	22	22	22
# Negative	1	22	0	0
# Positive	21	0	22	22
% Correct	95.5%	100.0%	100.0%	100.0%
% Incorrect	4.5%	0.0%	0.0%	0.0%

Table 38: Percentages of correct results, false negatives, and false positives in qualitative reports of CP4 EPSPS (Roundup Ready™) for all participants

Total # Reported Results	88
# Incorrect	1
% Correct	98.9%
# Provided Positives	66
# False Negative	1
% False Negative	1.5%
# Provided Negatives	22
# False Positive	0
% False Positive	0.0%

Table 39: Qualitative results of soybeans fortified with A2704-12 (Liberty Link® Soy) for all participants (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in bold face).

A2704-12	Sample 1	Sample 2	Sample 3	Sample 4
Participant Number	0.1%	0.0%	0.3%	0.0%
1752	P	N	P	N
1844	P	N	P	N
1847	P	N	P	N
1854	P	P	P	P
1855	P	N	P	N
1859	P	N	P	N
1862	P	N	P	N
1865	P	N	P	N
1875	P	N	P	N
1895	P	N	P	N
2034	P	N	P	N
2051	P	N	P	N
2692	P	N	P	N
2716	P	N	P	N
2721	P	N	P	N
4942	P	N	P	N
4945	P	N	P	N
4947	P	N	P	N
4952	P	N	P	N
4956	P	N	P	N
4957	P	N	P	N
4964	P	N	P	N
4966	P	N	P	N
4974	N	N	N	N
N, Results	24	24	24	24
# Negative	1	23	1	23
# Positive	23	1	23	1
% Correct	95.8%	95.8%	95.8%	95.8%
% Incorrect	4.2%	4.2%	4.2%	4.2%

Table 40: Percentages of correct results, false negatives, and false positives in qualitative reports of A2704-12 (Liberty Link® Soy) for all participants

Total # Reported Results	96
# Incorrect	4
% Correct	95.8%
# Provided Positives	48
# False Negative	2
% False Negative	4.2%
# Provided Negatives	48
# False Positive	2
% False Positive	4.2%

Table 41: Qualitative results of soybeans fortified with CP4 EPSPS (Roundup Ready™ II) for all participants (DNA-based assays) (N = negative; P = positive).

RUR II	Sample 1	Sample 2	Sample 3	Sample 4
Participant Number	0.0%	0.0%	0.3%	0.7%
1752	N	N	P	P
1847	N	N	P	P
1859	N	N	P	P
1862	N	N	P	P
1865	N	N	P	P
2034	N	N	P	P
2051	N	N	P	P
2569	N	N	P	P
2692	N	N	P	P
2721	N	N	P	P
2822	N	N	P	P
3095	N	N	P	P
4937	N	N	P	P
4945	N	N	P	P
4960	N	N	P	P
4964	N	N	P	P
4966	N	N	P	P
N, Results	17	17	17	17
# Negative	17	17	0	0
# Positive	0	0	17	17
% Correct	100.0%	100.0%	100.0%	100.0%
% Incorrect	0.0%	0.0%	0.0%	0.0%

Table 42: Percentages of correct results, false negatives, and false positives in qualitative reports of CP4 EPSPS (Roundup Ready™ II) for all participants

Total # Reported Results	68
# Incorrect	0
% Correct	100.0%
# Provided Positives	34
# False Negative	0
% False Negative	0.0%
# Provided Negatives	34
# False Positive	0
% False Positive	0.0%

Table 43: Qualitative results of soybeans fortified with DP305423 for all participants (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in bold face).

DP 305423	Sample 1	Sample 2	Sample 3	Sample 4
Participant Number	0.0%	0.0%	0.1%	0.9%
1773	N	N	P	P
1785	N	N	P	P
1844	N	N	P	P
1847	N	N	P	P
1859	N	N	P	P
1875	N	N	P	P
1897	N	N	P	P
2034	N	N	P	P
2051	N	N	P	P
2692	N	N	P	P
2721	N	N	P	P
4942	N	N	P	P
4956	N	N	P	P
4964	N	N	P	P
4966	N	N	P	P
N, Results	15	15	15	15
# Negative	15	15	0	0
# Positive	0	0	15	15
% Correct	100.0%	100.0%	100.0%	100.0%
% Incorrect	0.0%	0.0%	0.0%	0.0%

Table 44: Percentages of correct results, false negatives, and false positives in qualitative reports of DP305423 for all participants

Total # Reported Results	60
# Incorrect	0
% Correct	100.0%
# Provided Positives	30
# False Negative	0
% False Negative	0.0%
# Provided Negatives	30
# False Positive	0
% False Positive	0.0%

Table 45: Qualitative and quantitative results combined for soybeans fortified with 35S for all participants (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in bold face).

Event: 35S Soy				
Event: 35S Soy	Sample 1	Sample 2	Sample 3	Sample 4
Participant Number	0.5%	0.0%	1.1%	0.8%
1752	P	N	P	P
1754	P	N	P	P
1764	P	N	P	P
1785	P	N	P	P
1844	P	N	P	P
1854	P	N	P	P
1859	P	N	P	P
1865	P	N	P	P
1870	P	N	P	P
1875	P	N	P	P
1892	P	N	P	P
1895	P	N	P	P
1897	P	N	P	P
2034	P	N	P	P
2057	P	N	P	P
2076	P	N	P	P
2123	P	N	P	P
2692	P	N	P	P
2716	P	N	P	P
2721	P	N	P	P
2822	P	N	P	P
2830	P	N	P	P
3927	P	N	P	P
3928	P	N	P	P
4932	P	N	P	P
4933	P	N	P	P
4935	P	N	P	P
4937	P	N	P	P
4939	P	N	P	P
4942	P	N	P	P
4945	P	N	P	P
4947	P	N	P	P
4951	P	N	P	P
4952	P	N	P	P
4954	P	N	P	P
4956	P	N	P	P
4957	P	N	P	P
4964	P	N	P	P
4966	P	N	P	P
4971	P	N	P	P
N, Results	40	40	40	40
# Negative	0	40	0	0
# Positive	40	0	40	40
% Correct	100.0%	100.0%	100.0%	100.0%
% Incorrect	0.0%	0.0%	0.0%	0.0%

Table 46: Percentages of correct results, false negatives, and false positives in qualitative reports of Soy 35S for all participants

Total # Reported Results	160
# Incorrect	0
% Correct	100.0%
# Provided Positives	120
# False Negative	0
% False Negative	0.0%
# Provided Negatives	40
# False Positive	0
% False Positive	0.0%

Table 47: Qualitative results of soybeans fortified with NOS for all participants (DNA-based assays)
(N = negative; P = positive; Incorrect results are shown in bold face).

Event: NOS Soy				
Event: NOS Soy	Sample 1	Sample 2	Sample 3	Sample 4
Participant Number	0.9%	0.0%	1.7%	1.6%
1752	P	N	P	P
1754	P	N	P	P
1764	P	N	P	P
1785	P	N	P	P
1844	P	N	P	P
1854	P	N	P	P
1859	P	N	P	P
1862	P	N	P	P
1865	P	N	P	P
1870	P	N	P	P
1875	P	N	P	P
1892	P	N	P	P
1895	P	N	P	P
1897	P	N	P	P
2034	P	N	P	P
2057	P	N	P	P
2076	P	N	P	P
2123	P	N	P	P
2692	P	N	P	P
2716	P	N	P	P
2721	P	N	P	P
2822	P	N	P	P
3927	P	N	P	P
3928	P	N	P	P
4932	P	N	P	P
4933	P	N	P	P
4935	P	N	P	P
4936	P	N	P	N
4937	P	N	P	P
4939	P	N	P	P
4942	P	N	P	P
4945	P	N	P	P
4947	P	N	P	P
4951	P	N	P	P
4952	P	N	P	P
4954	P	N	P	P
4956	P	N	P	P
4957	P	N	P	P
4962	P	N	P	P
4964	P	N	P	P
4966	P	N	P	P
4971	P	N	P	P
N, Results	42	42	42	42
# Negative	0	42	0	1
# Positive	42	0	42	41
% Correct	100.0%	100.0%	100.0%	97.6%
% Incorrect	0.0%	0.0%	0.0%	2.4%

Note: The NOS trait serves as a terminator in RUR and DP305423 in this list of events.

Table 48: Percentages of correct results, false negatives, and false positives in qualitative reports of Soy NOS for all participants

Total # Reported Results	168
# Incorrect	1
% Correct	99.4%
# Provided Positives	126
# False Negative	1
% False Negative	0.8%
# Provided Negatives	42
# False Positive	0
% False Positive	0.0%

Table 49: Qualitative results of soybeans fortified with FMV for all participants (DNA-based assays) (N = negative; P = positive; Incorrect results are shown in bold face).

Event: FMV Soy				
Event: FMV Soy	Sample 1	Sample 2	Sample 3	Sample 4
Participant Number	0.0%	0.0%	0.3%	0.7%
1754	N	N	P	P
1764	N	N	P	P
1785	N	N	P	P
1859	N	N	P	P
1865	N	N	P	P
1895	N	N	P	P
2034	P	N	P	P
2057	N	N	P	P
2716	N	N	P	P
2822	N	N	P	P
4932	N	N	P	P
4935	N	N	P	P
4947	N	N	P	P
4951	N	N	P	P
4952	N	N	P	P
4954	N	N	P	P
4956	N	N	P	P
4957	N	N	P	P
4960	N	N	P	P
4964	N	N	P	P
4966	N	N	P	P
4971	N	N	P	P
N, Results	22	22	22	22
# Negative	21	22	0	0
# Positive	1	0	22	22
% Correct	95.5%	100.0%	100.0%	100.0%
% Incorrect	4.5%	0.0%	0.0%	0.0%

Note: The FMV trait is a promoter in RURII in this list of events.

Table 50: Percentages of correct results, false negatives, and false positives in qualitative reports of Soy FMV for all participants

Total # Reported Results	88
# Incorrect	1
% Correct	98.9%
# Provided Positives	44
# False Negative	0
% False Negative	0.0%
# Provided Negatives	44
# False Positive	1
% False Positive	2.3%

Table 51: Composite percentages of correct results, false negatives, and false positives in qualitative reports for each transgenic event for all participants (DNA-based assays)

N = total number of results submitted for an event; % False Negative = [# False Negatives / # Provided Positives] x 100; % False Positives = [#False Positives / # Provided Negatives] x100.

Event	35S	NOS	Corn FMV	T25	CBH351	MON810	GA21
N, Results	294	312	156	184	102	156	173
Reported Incorrect	8	0	0	7	2	10	13
% Correct	97.3%	100.0%	100.0%	96.2%	98.0%	93.6%	92.5%
# Provided Positives	196	260	52	90	17	100	87
# False Negative	0	0	0	6	0	10	10
% False Negative	0.0%	0.0%	0.0%	6.7%	0.0%	10.0%	11.5%
# Provided Negatives	98	52	104	94	85	56	86
# False Positive	8	0	0	1	2	0	3
% False Positive	8.2%	0.0%	0.0%	1.1%	2.4%	0.0%	3.5%

Event	Bt176	Bt11	NK603	Herculex®	MON863	Herculex®RW	MIR604
N, Results	156	168	168	162	156	150	150
Reported Incorrect	3	9	10	4	5	4	2
% Correct	98.1%	94.6%	94.0%	97.5%	96.8%	97.3%	98.7%
# Provided Positives	51	55	56	54	52	24	49
# False Negative	2	3	5	1	2	1	2
% False Negative	3.9%	5.5%	8.9%	1.9%	3.8%	4.2%	4.1%
# Provided Negatives	105	113	112	108	104	126	101
# False Positive	1	6	5	3	3	3	0
% False Positive	1.0%	5.3%	4.5%	2.8%	2.9%	2.4%	0.0%

Event	EV3272	MON88017	MON89034	MIR162	RUR	A2704-12	RUR II
N, Results	114	150	150	132	88	96	68
Reported Incorrect	0	5	1	2	1	4	0
% Correct	100.0%	96.7%	99.3%	98.5%	98.9%	95.8%	100.0%
# Provided Positives	57	49	50	44	66	48	34
# False Negative	0	5	0	2	1	2	0
% False Negative	0.0%	10.2%	0.0%	4.5%	1.5%	4.2%	0.0%
# Provided Negatives	57	101	100	88	22	48	34
# False Positive	0	0	1	0	0	2	0
% False Positive	0.0%	0.0%	1.0%	0.0%	0.0%	4.2%	0.0%

Event	DP305423	Soy 35S	Soy NOS	Soy FMV
N, Results	60	160	168	88
Reported Incorrect	0	0	1	1
% Correct	100.0%	100.0%	99.4%	98.9%
# Provided Positives	30	120	126	44
# False Negative	0	0	1	0
% False Negative	0.0%	0.0%	0.8%	0.0%
# Provided Negatives	30	40	42	44
# False Positive	0	0	0	1
% False Positive	0.0%	0.0%	0.0%	2.3%

Figure 1: Group average of percentage correct for Qualitative reports on each event (DNA-based assays).

Embedded numbers represent the total number of reported results for that event. Data are shown on a composite basis (i.e., all participants results combined) extracted from the percentage correct scores in Table 51.

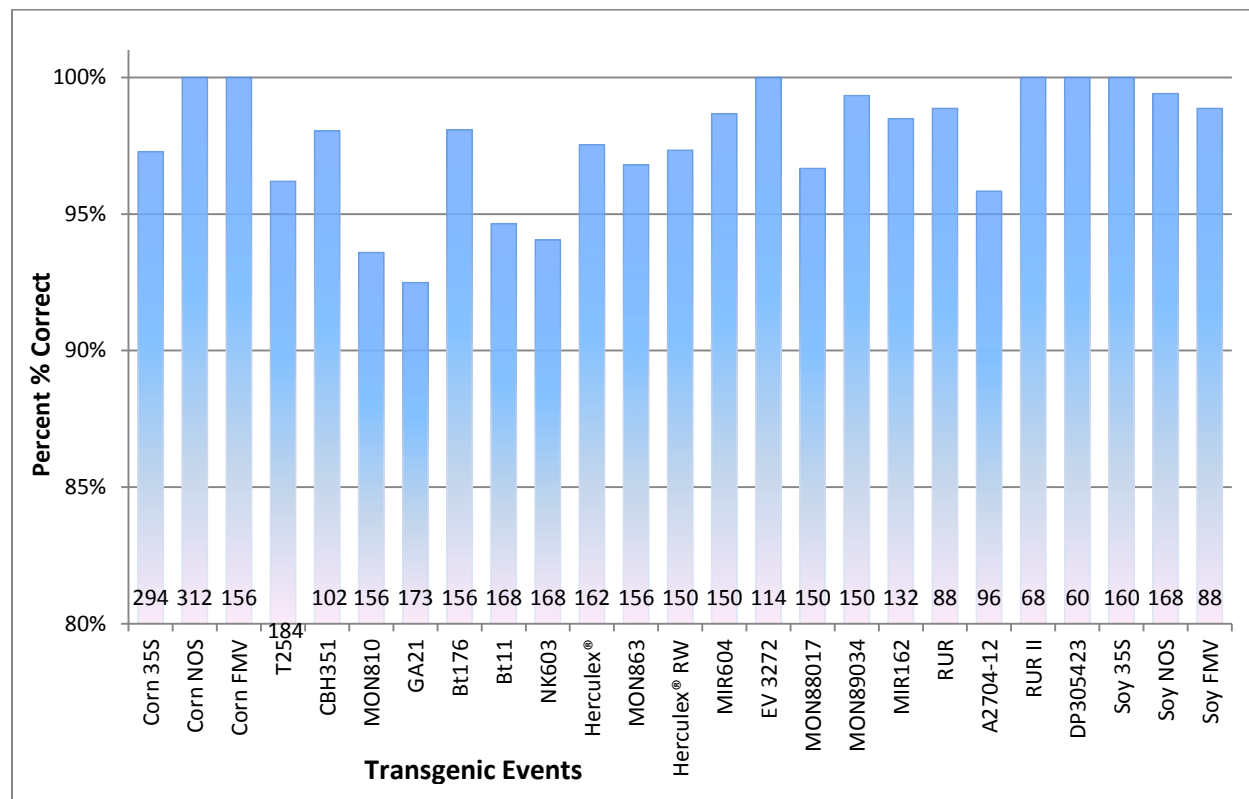


Table 52: Lateral Flow Strip (LFS) Testing (Protein-based testing) results for the detection of transgenic events in corn (N = negative; P = positive; Incorrect results are shown in boldface).

Participant Number	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	LOD
T 25	1.5%	0.3%	0.0%	0.1%	0.0%	0.0%	
1764	P	P	N	P	N	N	0.5%
1843	P	P	N	N*	N	N	0.5%
1895	P	P	N	P	N	N	0.5%
4936	N	P	N	P	P	N	0.5%
EPSPS (NK603/MON88017)	0.5%	0.0%	0.0%	0.1%	0.4%	0.0%	
1764	P	N	N	N*	P	N	0.5%
1843	P	N	N	P	P	N	0.5%
1895	P	N	N	N*	P	N	0.5%
3931	P	N	N	P	P	N	0.5%
4936	P	N	N	P	P	N	0.5%
Cry1Ab (MON810/Bt11/Bt176)	2.3%	1.5%	0.0%	0.1%	0.2%	0.0%	
1764	P	P	N	N*	N*	N	0.8%
1843	N	P	N	N*	N*	N	2.0%
1895	P	P	N	N*	P	N	10.0%
3931	P	P	N	P	P	N	0.8%
4936	P	P	N	P	P	N	0.8%
Herculex	0.0%	1.5%	0.0%	0.8%	0.0%	0.0%	
1764	N	P	N	P	N	N	0.5%
1843	P	P	N	P	N	N	0.5%
1895	N	P	N	P	N	N	Not Provided
3931	P	P	N	P	N	N	0.5%
4936	N	P	N	P	N	N	0.5%
4975	N	P	N	P	N	N	0.17%
Cry3Bb1 (MON863/MON88017)	0.0%	0.6%	0.0%	0.1%	0.8%	0.0%	
1764	N	P	N	N*	P	N	0.5%
1843	N	P	N	N*	P	N	1.0%
1895	N	P	N	N*	P	N	10.0%
4936	N	P	N	P	P	N	0.5%
Hclx RW	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	
1764	N	P	N	N	N	N	0.5%
1843	N	P	N	N	N	N	0.5%
1895	N	P	N	N	N	N	Not Provided
4936	N	N*	N	N	N	N	0.5%
MIR 604	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	
1764	N	N	N	N	P	P	1.0%
1843	N	N	N	N	N*	N*	2.0%
4936	N	N	N	N	N*	N*	1.0%
MON89034	0.0%	0.0%	0.0%	2.0%	1.0%	0.0%	
4975	N	N	N	P	P	N	Not Provided

* - Consensus Mean below participants' LOD, assessed as Provided Negative

Table 43: Percentage of correct results, false negatives, and false positives in reports for transgenic events in corn using Lateral Flow Strip (LFS) Testing

Event	T25	EPSPS	Cry1Ab	Herculex
Total # Reported Results	24	30	30	36
# Incorrect	2	0	1	2
% Correct	91.7%	100.0%	96.7%	94.4%
# Provided Positives	11	13	15	12
# False Negative	1	0	1	2
% False Negative	9.1%	0.0%	6.7%	16.7%
# Provided Negatives	13	17	15	24
# False Positive	1	0	0	0
% False Positive	7.7%	0.0%	0.0%	0.0%

Event	Cry3Bb1	Hclx RW	MIR 604	MON89034
Total # Reported Results	24	24	18	6
# Incorrect	0	0	0	0
% Correct	100.0%	100.0%	100.0%	100.0%
# Provided Positives	9	3	2	2
# False Negative	0	0	0	0
% False Negative	0.0%	0.0%	0.0%	0.0%
# Provided Negatives	15	21	16	4
# False Positives	0	0	0	0
% False Positive	0.0%	0.0%	0.0%	0.0%

Table 54: Results for soybeans fortified with CP4EPSPS (RUR/RURII) and A2704-12 (LL) for all participants using Lateral Flow Strip (LFS) Testing (N = negative; P = positive; Incorrect results are shown in boldface).

CP4 EPSPS (RUR & RURII)	Sample 1	Sample 2	Sample 3	Sample 4	
Participant Number	0.4%	0.0%	0.7%	0.9%	LOD
1764	P	N	P	P	0.1%
1782	0.3	0.0	0.6	1.00	Not Provided
1843	P	N	P	P	0.1%
1895	P	N	P	P	0.25%
2126	P	N	P	P	Not Provided
3931	P	N	P	P	0.1%
4902	P	N	P	P	Not Provided

A2704-12 (Liberty Link)	0.1%	0.0%	0.3%	0.0%	LOD
1764	P	N	P	N	0.5%
1843	P	N	P	N	Not Provided
1895	N*	N	N*	N	0.5%

* - Consensus Mean below participants' LOD, assessed as Provided Negative

Table 55: Percentage of correct results in qualitative reports for CP4EPSPS and A2704-12 for all participants using Lateral Flow Strip (LFS) Testing

Event	RUR	LL
Total # Reported results	28	12
# Incorrect	0	0
% Correct	100.0%	100.0%
# Provided Positives	21	4
# False Negative	0	0
% False Negative	0.0%	0.0%
# Provided Negatives	7	8
# False Positive	0	0
% False Positive	0.0%	0.0%

Table 56: Results for the detection of transgenic events in corn using Enzyme-Linked Immunosorbent Assay (ELISA) (Protein-based testing)

Participant	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	LOD
T 25	1.5%	0.3%	0.0%	0.1%	0.0%	0.0%	
4972	P	P	N	P	N	N	0.50%
4975	P	P	N	P	N	N	0.50%
EPSPS (NK603/MON88017)	0.5%	0.0%	0.0%	0.1%	0.4%	0.0%	
3931	P	N	N	N*	P	N	0.75%
Cry1Ab (MON810/Bt11/Bt176)	2.3%	1.5%	0.0%	0.1%	0.2%	0.0%	
1895	P	P	N	N	P	N	Not Provided
3931	P	P	N	P	P	N	1.85%
4972	P	P	N	P	P	N	0.50%
4975	P	P	N	P	P	N	0.15%
Herculex	0.0%	1.5%	0.0%	0.8%	0.0%	0.0%	
1895	N	P	N	P	N	N	Not Provided
3931	N	P	N	P	N	N	0.75%
4972	N	P	N	P	N	N	0.17%
4975	N	P	N	P	N	N	0.17%
Cry3Bb1 (MON863/MON88017)	0.0%	0.6%	0.0%	0.1%	0.8%	0.0%	
1895	N	P	N	N	P	N	Not Provided
MON89034	0.0%	0.0%	0.0%	2.0%	1.0%	0.0%	
4975	N	N	N	P	P	N	Not Provided

* - Consensus Mean below participants' LOD, assessed as Provided Negative

Table 57: Percentage of correct results in the detection of transgenic events in corn using Enzyme-Linked Immunosorbent Assay (ELISA) (Protein-based testing)

Event	T25	EPSPS	Cry1Ab	Herculex	Cry3Bb1	MON 89034
Total # Reported results	12	6	24	24	6	6
# Incorrect	0	0	1	0	1	0
% Correct	100.0%	100.0%	95.8%	100.0%	83.3%	100.0%
# Provided Positives	6	2	16	8	3	2
# False Negative	0	0	1	0	1	0
% False Negative	0.0%	0.0%	6.3%	0.0%	33.3%	0.0%
# Provided Negatives	6	4	8	16	3	4
# False Positive	0	0	0	0	0	0
% False Positive	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table 58: Results for soybeans fortified with CP4EPSPS and A2704-12 for participants using Enzyme-Linked Immunosorbent Assay (ELISA) (Protein-based testing).

CP4 EPSPS (RUR & RURII)	Sample 1	Sample 2	Sample 3	Sample 4	
Participant Number	0.4%	0.0%	0.7%	0.9%	LOD
1782	P	N	P	P	Not Provided
2126	P	N	P	P	Not Provided
2817	N	N	P	P	0.3%
4961	P	N	P	P	0.3%

A2704-12 (Liberty Link)	0.1%	0.0%	0.3%	0.0%	LOD
4972	P	P	P	P	Not Provided

Table 59: Percentage of correct results in qualitative reports for CP4EPSPS and A2704-12 for participants using Enzyme-Linked Immunosorbent Assay (ELISA) (Protein-based testing)

Event	RUR	LL
Total # Reported results	16	4
# Incorrect	1	2
% Correct	93.8%	50.0%
# Provided Positives	12	2
# False Negative	1	0
% False Negative	8.3%	0.0%
# Provided Negatives	4	2
# False Positive	0	2
% False Positive	0.0%	100.0%

Table 60: Quantitative results and z-scores for corn fortified with T25 for all participants (DNA-based assays). Values highlighted in **yellow** indicate a z-score outside of the expected range, i.e., $z > +2$ or $z < -2$ that is not considered an outlier. Quantifications marked in **red** indicate values determined to be either: (1) an outlier by the “Grubb’s Test for Outliers”; or (2) a negative value for a fortified sample (i.e. a false negative result).

Event: T25									
%w/w Fortification Level	2.0%		0.5%		0.0%	0.1%		0.0%	0.0%
Consensus Mean	1.59%		0.29%		0.0%	0.09%		0.0%	0.0%
Participant Number	Result	z-score	Result	z-score	Result	Result	z-score	Result	Result
1754	2.10	0.47	0.30	0.05	0.00	0.10	0.30	0.00	0.00
1764	1.89	0.28	0.86	2.12	0.00	0.55		0.00	0.00
1870	1.90	0.28	0.40	0.41	0.00	0.10	0.30	0.00	0.00
1875	0.36	-1.11	0.09	-0.73	0.00	0.02	-1.28	0.00	0.00
2057	1.41	-0.16	0.19	-0.36	0.00	0.16	1.48	0.00	0.00
2716	0.10	-1.34	0.10	-0.69	0.00	0.00		0.00	0.00
2723	1.03	-0.50	0.07	-0.81	0.00	0.02	-1.28	0.00	0.00
4932	1.60	0.01	0.22	-0.25	0.00	0.05	-0.69	0.00	0.00
4942	3.88	2.08	0.56	1.01	0.00	0.13	0.89	0.00	0.00
4947	P		0.10	-0.69	0.00	0.10	0.30	0.00	0.00

P- Qualitative data only, see Table #7

Table 61: Quantitative results and z-scores for corn fortified with CBH351 for all participants (DNA-based assays). Note: This data set is too small to be statistically significant.

Event: CBH351							
%w/w Fortification Level	0.1%		0.0%	0.0%	0.0%	0.0%	0.0%
Consensus Mean	0.09%		0.0%	0.0%	0.0%	0.0%	0.0%
Participant Number	Result	z-score	Result	Result	Result	Result	Result
1754	0.10	0.73	0.00	0.00	0.00	0.00	0.00
1870	0.10	0.73	0.00	0.00	0.00	0.00	0.00
2723	0.07	-1.10	0.00	0.00	0.00	0.00	0.00
4932	0.07	-1.10	0.00	0.00	0.00	0.00	0.00
4947	0.10	0.73	0.00	0.00	0.00	0.00	0.00

Table 62: Quantitative results and z-scores for corn fortified with MON810 for all participants (DNA-based assays). Values highlighted in **yellow** indicate a z-score outside of the expected range, i.e., $z > +2$ or $z < -2$ that is not considered an outlier. Quantifications marked in **red** indicate values determined to be a negative value for a fortified sample (i.e. a false negative result).

Event: MON810										
%w/w Fortification Level	2.0%		0.1%		0.0%	0.1%		0.5%		0.0%
Consensus Mean	1.03%		0.05%		0.0%	0.07%		0.24%		0.0%
Participant Number	Result	z-score	Result	z-score	Result	Result	z-score	Result	z-score	Result
1754	1.60	1.00	0.05	-0.06	0.00	0.10	1.03	0.30	0.59	0.00
1764	2.23	2.12	0.05	-0.06	0.00	0.09	0.71	0.48	2.22	0.00
1788	1.40	0.65	0**		0.00	P		0.11	-1.14	0.00
1844	1.21	0.31	0.06	0.28	0.00	0.03	-1.25	0.26	0.22	0.00
1870	0.90	-0.24	0.03	-0.72	0.00	0.06	-0.27	0.20	-0.32	0.00
1875	0.54	-0.88	0.04	-0.39	0.00	0.04	-0.92	0.16	-0.69	0.00
2057	0.29	-1.32	0.02	-1.05	0.00	0.05	-0.60	0.08	-1.41	0.00
2716	0.39	-1.14	0.10	1.61	0.00	0.10	1.03	0.20	-0.32	0.00
2723	1.39	0.63	0.04	-0.39	0.00	0.06	-0.27	0.27	0.31	0.00
3095	0.56	-0.84	NR		0.00	NR		0.21	-0.23	0.00
3927	1.02	-0.03	0.02	-1.05	0.00	0.02	-1.57	0.22	-0.14	0.00
3929	0.92	-0.20	P		0.00	P		0.28	0.40	0.00
4936	0.60	-0.77	0.00		0.00	0.00		0.14	-0.87	0.00
4942	1.69	1.16	0.05	-0.06	0.00	0.08	0.38	0.38	1.31	0.00
4945	1.13	0.17	<0.1		0.00	<0.1		0.12	-1.05	0.00
4947	0.12	-1.62	0.12	2.27	0.00	0.12	1.68	0.12	-1.05	0.00
4952	1.70	1.18	<0.1		0.00	<0.1		0.40	1.49	0.00
4957	0.93	-0.18	0.04	-0.39	0.00	0.07	0.05	0.31	0.68	0.00

P- Qualitative data only, see Table #11,
NR- No Result, **- Consensus Mean below participants' LOD

Table 63: Quantitative results and z-scores for corn fortified with GA21 for all participants (DNA-based assays). Values highlighted in **yellow** indicate z-scores outside of the expected range, i.e., $z > +2$ or $z < -2$. Quantifications marked in **red** indicate values determined to be either: (1) an outlier by the “Grubb’s Test for Outliers”; or (2) a negative value for a fortified sample (i.e. a false negative result).

Event: GA21									
%w/w Fortification Level	0.0%	1.0%		0.0%	0.0%	0.8%		1.0%	
Consensus Mean	0.0%	0.41%		0.0%	0.0%	0.46%		0.60%	
Participant Number	Result	Result	z-score	Result	Result	Result	z-score	Result	z-score
1754	0.00	0.60	1.21	0.00	0.00	0.60	0.87	0.80	1.12
1764	0.00	0.11	-1.93	0.00	0.00	0.16	-1.79	0.18	-2.37
1773	0.00	0.50	0.57	0.00	0.00	0.50	0.26	0.70	0.56
1844	0.00	0.52	0.69	0.00	0.00	0.76	1.83	0.67	0.39
1870	0.00	0.38	-0.20	0.00	0.00	0.45	-0.04	0.60	0.00
1875	0.00	0.43	0.12	0.00	0.00	0.43	-0.16	0.59	-0.06
2057	0.00	0.43	0.12	0.00	0.00	0.38	-0.46	2.21	
2716	0.00	0.52	0.69	0.00	0.00	1.47		2.96	
2723	0.00	0.19	-1.42	0.00	0.00	0.33	-0.76	0.51	-0.51
3927	0.00	0.47	0.37	0.00	0.00	0.53	0.44	0.48	-0.68
3928	0.00	0.56	0.95	0.00	0.00	0.63	1.05	0.88	1.57
4945	0.00	0.18	-1.48	0.00	0.00	0.17	-1.73	0.55	-0.29
4947	0.00	0.50	0.57	0.00	0.00	0.50	0.26	0.70	0.56
4952	0.00	0.45	0.25	0.00	0.00	0.55	0.57	0.00	
4962	0.00	0.24	-1.10	0.00	0.00	0.40	-0.34	0.55	-0.29

Table 64: Quantitative results and z-scores for corn fortified with Bt176 for all participants (DNA-based assays). Values highlighted in **yellow** indicate z-scores outside of the expected range, i.e., $z > +2$ or $z < -2$.

Event: Bt176								
%w/w Fortification Level	1.5%		0.1%		0.0%	0.0%	0.0%	0.0%
Consensus Mean	1.02%		0.09%		0.0%	0.0%	0.0%	0.0%
Participant Number	Result	Z-score	Result	Z-score	Result	Result	Result	Result
1754	1.20	0.43	0.10	0.26	0.00	0.00	0.00	0.00
1764	1.45	1.03	0.13	0.87	0.00	0.00	0.00	0.00
1788	0.83	-0.46	P		0.00	0.00	0.00	0.00
1870	1.60	1.39	0.10	0.26	0.00	0.00	0.00	0.00
1875	0.56	-1.11	0.05	-0.75	0.00	0.00	0.00	0.00
2057	0.55	-1.14	0.02	-1.36	0.00	0.00	0.00	0.00
2716	0.98	-0.10	0.19	2.09	0.00	0.00	0.00	0.00
2723	1.13	0.26	0.04	-0.95	0.00	0.00	0.00	0.00
3928	0.95	-0.18	<0.1		0.00	0.00	0.00	0.00
4935	1.34	0.76	0.08	-0.14	0.00	0.00	0.00	0.00
4945	1.40	0.91	<0.1		0.00	0.00	0.00	0.00
4947	0.10	-2.22	0.10	0.26	0.00	0.00	0.00	0.00
4952	0.90	-0.30	<0.1		0.00	0.00	0.00	0.00
4957	1.33	0.74	0.06	-0.55	0.00	0.00	0.00	0.00

Table 65: Quantitative results and z-scores for corn fortified with Bt11 for all participants (DNA-based assays). Z-scores outside of the expected range, i.e., $z > +2$ or $z < -2$ were not observed in this data set.

Event: Bt11								
%w/w Fortification Level	0.1%		2.0%		0.0%	0.0%	0.0%	0.0%
Consensus Mean	0.11%		1.33%		0.0%	0.0%	0.0%	0.0%
Participant Number	Result	z-score	Result	z-score	Result	Result	Result	Result
1754	0.20	1.75	2.10	1.29	0.00	0.00	0.00	0.00
1764	0.15	0.82	1.23	-0.17	0.00	0.00	0.00	0.00
1788	0.10	-0.11	0.66	-1.13	0.00	0.00	0.00	0.00
1844	0.09	-0.30	2.06	1.23	0.00	0.00	0.00	0.00
1870	0.10	-0.11	1.60	0.45	0.00	0.00	0.00	0.00
1875	0.07	-0.67	1.22	-0.19	0.00	0.00	0.00	0.00
2057	0.03	-1.42	0.52	-1.37	0.00	0.00	0.00	0.00
2716	0.10	-0.11	0.37	-1.62	0.00	0.00	0.00	0.00
2723	0.01	-1.79	0.58	-1.27	0.00	0.00	0.00	0.00
3927	0.17	1.19	1.72	0.65	0.00	0.00	0.00	0.00
3928	0.10	-0.11	1.70	0.62	0.00	0.00	0.00	0.00
4942	0.16	1.00	1.71	0.64	0.00	0.00	0.00	0.00
4945	<0.1		1.29	-0.07	0.00	0.00	0.00	0.00
4947	0.10	-0.11	1.90	0.96	0.00	0.00	0.00	0.00

Table 66: Quantitative results and z-scores for corn fortified with NK603 for all participants (DNA-based assays). Value highlighted in yellow indicates a z-score outside of the expected range, i.e., $z > +2$ or $z < -2$. Quantifications marked in red indicate values determined to be either: (1) a negative value for a fortified sample (i.e. a false negative result); or (2) a positive value for a non-fortified sample (i.e. a false positive result).

Event: NK603								
%w/w Fortification Level	1.0%		0.0%	0.0%	0.0%	0.5%		0.0%
Consensus Mean	0.56%		0.0%	0.0%	0.0%	0.31%		0.0%
Participant Number	Result	z-score	Result	Result	Result	Result	z-score	Result
1754	0.40	-0.56	0.00	0.00	0.00	0.60	1.91	0.00
1764	1.05	1.68	0.00	0.00	0.00	0.49	1.20	0.00
1773	1.10	1.85	0.00	0.00	0.00	0.50	1.26	0.00
1844	0.57	0.02	0.00	0.00	0.00	0.36	0.35	0.00
1870	0.60	0.13	0.00	0.00	0.00	0.20	-0.69	0.00
2057	0.37	-0.66	0.00	0.00	0.00	0.20	-0.69	0.00
2716	0.10	-1.60	0.00	0.00	0.00	0.10	-1.34	0.00
2723	0.51	-0.18	0.00	0.00	0.00	0.27	-0.24	0.00
3927	0.29	-0.94	0.00	0.00	0.00	0.00		0.00
3928	0.72	0.54	0.00	0.00	0.00	0.31	0.03	0.00
4945	0.35	-0.73	0.00	0.00	0.00	0.15	-1.02	0.00
4947	0.90	1.16	0.00	0.00	0.20	0.20	-0.69	0.00
4952	0.40	-0.56	0.00	0.00	0.00	0.20	-0.69	0.00
4960	0.52	-0.15	0.00	0.00	0.00	0.40	0.61	0.00

Table 67: Quantitative results and z-scores for corn fortified with Herculex® for all participants (DNA-based assays). Value highlighted in yellow indicates a z-score outside of the expected range, i.e., $z > +2$ or $z < -2$.

Event: Herculex®								
%w/w Fortification Level	0.0%	1.5%		0.0%	0.8%		0.0%	0.0%
Consensus Mean	0.0%	0.49%		0.0%	0.42%		0.0%	0.0%
Participant Number	Result	Result	z-score	Result	Result	z-score	Result	Result
1754	0.00	0.70	1.51	0.00	0.40	-0.23	0.00	0.00
1764	0.00	0.50	0.07	0.00	0.44	0.21	0.00	0.00
1844	0.00	0.78	2.08	0.00	0.52	1.07	0.00	0.00
1870	0.00	0.60	0.79	0.00	0.50	0.86	0.00	0.00
1875	0.00	0.45	-0.29	0.00	0.36	-0.66	0.00	0.00
2057	0.00	0.31	-1.30	0.00	0.54	1.29	0.00	0.00
2716	0.00	0.51	0.14	0.00	0.47	0.53	0.00	0.00
2723	0.00	0.39	-0.73	0.00	0.36	-0.66	0.00	0.00
3927	0.00	0.38	-0.80	0.00	0.37	-0.55	0.00	0.00
3928	0.00	0.41	-0.58	0.00	0.43	0.10	0.00	0.00
4945	0.00	0.46	-0.22	0.00	0.46	0.42	0.00	0.00
4947	0.00	0.40	-0.65	0.00	0.20	-2.39	0.00	0.00

Table 68: Quantitative results and z-scores for corn fortified with MON863 for all participants (DNA-based assays). Value highlighted in **yellow** indicates a z-score outside of the expected range, i.e., $z > +2$ or $z < -2$.

Event: MON863								
%w/w Fortification Level	0.0%	0.8%		0.0%	0.0%	0.5%		0.0%
Consensus Mean	0.0%	0.58%		0.0%	0.0%	0.38%		0.0%
Participant Number	Result	Result	z-score	Result	Result	Result	z-score	Result
1754	0.00	1.00	1.94	0.00	0.00	0.70	2.03	0.00
1764	0.00	0.55	-0.14	0.00	0.00	0.42	0.24	0.00
1844	0.00	0.56	-0.09	0.00	0.00	0.29	-0.59	0.00
1870	0.00	0.60	0.09	0.00	0.00	0.50	0.75	0.00
1875	0.00	0.55	-0.14	0.00	0.00	0.32	-0.40	0.00
2057	0.00	0.50	-0.37	0.00	0.00	0.26	-0.78	0.00
2112	0.00	0.71	0.60	0.00	0.00	0.41	0.18	0.00
2716	0.00	0.31	-1.25	0.00	0.00	0.22	-1.04	0.00
2723	0.00	0.59	0.05	0.00	0.00	0.41	0.18	0.00
3928	0.00	0.67	0.42	0.00	0.00	0.56	1.14	0.00
4945	0.00	0.20	-1.75	0.00	0.00	0.12	-1.68	0.00
4952	0.00	0.90	1.48	0.00	0.00	0.50	0.75	0.00
4960	0.00	0.40	-0.83	0.00	0.00	0.30	-0.53	0.00

Table 69: Quantitative results and z-scores for corn fortified with Herculex® RW for all participants (DNA-based assays). Value highlighted in **yellow** indicates a z-score outside of the expected range, i.e., $z > +2$ or $z < -2$.

Event: Herculex® RW							
%w/w Fortification Level	0.0%	0.1%		0.0%	0.0%	0.0%	0.0%
Consensus Mean	0.0%	0.11%		0.0%	0.0%	0.0%	0.0%
Participant Number	Result	Result	z-score	Result	Result	Result	Result
1754	0.00	0.10	-0.16	0.00	0.00	0.00	0.00
1764	0.00	0.13	0.59	0.00	0.00	0.00	0.00
1844	0.00	0.06	-1.15	0.00	0.00	0.00	0.00
1870	0.00	0.20	2.32	0.00	0.00	0.00	0.00
1875	0.00	0.11	0.09	0.00	0.00	0.00	0.00
2057	0.00	0.04	-1.65	0.00	0.00	0.00	0.00
2716	0.00	0.10	-0.16	0.00	0.00	0.00	0.00
2723	0.00	0.10	-0.16	0.00	0.00	0.00	0.00
2732	0.00	0.11	0.09	0.00	0.00	0.00	0.00
3928	0.00	0.12	0.34	0.00	0.00	0.00	0.00
4945	0.00	<0.1		0.00	0.00	0.00	0.00
4952	0.00	0.10	-0.16	0.00	0.00	0.00	0.00

Table 70: Quantitative results and z-scores for corn fortified with MIR604 for all participants (DNA-based assays). Quantifications marked in **red** indicate values determined to be either: (1) a negative value for a fortified sample (i.e. a false negative result); (2) a positive value for a non-fortified sample (i.e. a false positive result); or (3) an outlier determined by the “Grubb’s Test for Outliers”.

Event: MIR604								
%w/w Fortification Level	0.0%	0.0%	0.0%	0.0%	0.2%		0.1%	
Consensus Mean	0.0%	0.0%	0.0%	0.0%	0.16%		0.12%	
Participant Number	Result	Result	Result	Result	Result	z-score	Result	z-score
1754	0.00	0.00	0.00	0.00	0.10	-0.58	0.10	-0.40
1764	0.00	0.00	0.00	0.00	0.35	1.88	0.17	1.18
1844	0.00	0.00	0.00	0.00	0.09	-0.68	0.06	-1.30
1870	0.00	0.00	0.00	0.00	0.30	1.39	0.10	-0.40
1875	0.00	0.00	0.00	0.00	0.12	-0.38	0.06	-1.30
2057	0.00	0.00	0.00	0.00	0.11	-0.48	0.14	0.50
2716	0.00	0.00	0.00	0.00	0.10	-0.58	0.10	-0.40
2723	0.16	0.10	0.00	0.00	0.06	-0.98	0.18	1.40
4936	0.00	0.00	0.00	0.00	0.11	-0.48	0.00	
4945	0.00	0.00	0.00	0.00	<0.1		<0.1	
4952	0.00	0.00	0.00	0.00	0.80		0.80	
4957	0.00	0.00	0.00	0.00	0.25	0.90	0.15	0.73

Table 71: Quantitative results and z-scores for corn fortified with Event 3272 for all participants (DNA-based assays). Value highlighted in **yellow** indicates a z-score outside of the expected range, i.e., $z > +2$ or $z < -2$. Quantifications marked in **red** indicate outliers as determined by the “Grubbs Test for Outliers”.

Event: Event 3272									
%w/w Fortification Level	0.5%		1.0%		0.0%	0.0%	0.0%	0.2%	
Consensus Mean	0.50%		0.74%		0.0%	0.0%	0.0%	0.24%	
Participant Number	Result	z-score	Result	z-score	Result	Result	Result	Result	z-score
1754	0.80	2.04	1.00	1.71	0.00	0.00	0.00	0.40	1.43
1764	0.63	0.90	0.76	0.15	0.00	0.00	0.00	0.23	-0.05
1870	0.50	0.03	0.80	0.41	0.00	0.00	0.00	0.20	-0.32
1875	0.45	-0.31	0.78	0.28	0.00	0.00	0.00	0.20	-0.32
2057	0.44	-0.38	0.62	-0.77	0.00	0.00	0.00	0.42	1.60
2723	4.81		4.52		0.00	0.00	0.00	1.11	
2732	0.41	-0.58	0.54	-1.29	0.00	0.00	0.00	0.11	-1.10
3928	0.38	-0.78	0.83	0.60	0.00	0.00	0.00	0.13	-0.93
4957	0.36	-0.92	0.57	-1.09	0.00	0.00	0.00	0.20	-0.32

Table 72: Quantitative results and z-scores for corn fortified with MON 88017 for all participants (DNA-based assays). Value highlighted in **yellow** indicates a z-score outside of the expected range, i.e., $z > +2$ or $z < -2$ that is not considered an outlier. Quantification marked in **red** indicates a value determined to be a negative value for a fortified sample (i.e. a false negative result).

Event: MON 88017								
%w/w Fortification Level	0.0%	0.0%	0.0%	0.1%		0.5%		0.0%
Consensus Mean	0.0%	0.0%	0.0%	0.15%		0.41%		0.0%
Participant Number	Result	Result	Result	Result	z-score	Result	z-score	Result
1754	0.00	0.00	0.00	0.20	0.38	0.70	1.27	0.00
1764	0.00	0.00	0.00	0.12	-0.24	0.77	1.58	0.00
1844	0.00	0.00	0.00	0.08	-0.55	0.40	-0.06	0.00
1870	0.00	0.00	0.00	0.10	-0.39	0.40	-0.06	0.00
2057	0.00	0.00	0.00	0.10	-0.39	0.13	-1.26	0.00
2716	0.00	0.00	0.00	0.10	-0.39	0.10	-1.39	0.00
2723	0.00	0.00	0.00	0.05	-0.78	0.49	0.34	0.00
4936	0.00	0.00	0.00	0.00		0.41	-0.02	0.00
4945	0.00	0.00	0.00	<0.1		P		0.00
4947	0.00	0.00	0.00	0.50	2.70	0.20	-0.95	0.00
4952	0.00	0.00	0.00	0.10	-0.39	0.30	-0.50	0.00
4957	0.00	0.00	0.00	0.16	0.07	0.65	1.05	0.00

P- Qualitative data only, see Table #31

Table 73: Quantitative results and z-scores for corn fortified with MON 89034 for all participants (DNA-based assays). Quantification marked in **red** indicates an outlier as determined by the “Grubbs Test for Outliers”.

Event: MON 89034								
%w/w Fortification Level	0.0%	0.0%	0.0%	2.0%		1.0%		0.0%
Consensus Mean	0.0%	0.0%	0.0%	1.30%		0.52%		0.0%
Participant Number	Result	Result	Result	Result	z-score	Result	z-score	Result
1754	0.00	0.00	0.00	2.40	1.71	0.70	0.70	0.00
1764	0.00	0.00	0.00	1.50	0.32	0.95	1.67	0.00
1844	0.00	0.00	0.00	0.94	-0.55	0.48	-0.16	0.00
1870	0.00	0.00	0.00	0.60	-1.07	0.30	-0.86	0.00
2057	0.00	0.00	0.00	1.97	1.04	0.28	-0.93	0.00
2716	0.00	0.00	0.00	0.50	-1.23	0.35	-0.66	0.00
2723	0.00	0.00	0.00	0.70	-0.92	0.12	-1.56	0.00
4932	0.00	0.00	0.00	0.52	-1.20	1.90		0.00
4936	0.00	0.00	0.00	1.47	0.27	0.67	0.58	0.00
4947	0.00	0.00	0.00	1.25	-0.07	0.50	-0.08	0.00
4952	0.00	0.00	0.00	2.00	1.09	0.50	-0.08	0.00
4957	0.00	0.00	0.00	1.69	0.61	0.87	1.36	0.00

Table 74: Quantitative results and z-scores for corn fortified with MIR162 for all participants (DNA-based assays). Z-scores outside of the expected range, i.e., $z > +2$ or $z < -2$ were not observed in this data set.

Event: MIR 162								
%w/w Fortification Level	0.0%	0.0%	0.0%	0.8%		0.0%	0.2%	
Consensus Mean	0.0%	0.0%	0.0%	1.08%		0.0%	0.29%	
Participant Number	Result	Result	Result	Result	z-score	Result	Result	z-score
1754	0.00	0.00	0.00	1.10	0.03	0.00	0.40	0.59
1764	0.00	0.00	0.00	0.52	-0.78	0.00	0.12	-0.92
1844	0.00	0.00	0.00	0.60	-0.67	0.00	0.32	0.16
1870	0.00	0.00	0.00	0.70	-0.53	0.00	0.10	-1.03
2057	0.00	0.00	0.00	2.22	1.60	0.00	0.58	1.56
2723	0.00	0.00	0.00	0.20	-1.23	0.00	0.05	-1.30
3928	0.00	0.00	0.00	0.64	-0.61	0.00	0.18	-0.60
4932	0.00	0.00	0.00	2.32	1.74	0.00	0.57	1.50
4947	0.00	0.00	0.00	1.40	0.45	0.00	0.30	0.05
4962	0.00	0.00	0.00	1.07	-0.01	0.00	0.29	-0.01

Table 75: Quantitative results and z-scores for soybeans fortified with CP4 EPSPS as Roundup Ready™ (RUR) for all participants (DNA-based assays). Values highlighted in yellow indicate z-scores outside of the expected range, i.e., $z > +2$ or $z < -2$. Quantification marked in red indicates an outlier as determined by the “Grubbs Test for Outliers”.

Event: RUR							
%w/w Fortification Level	0.5%		0.0%	1.0%		1.0%	
Consensus Mean	0.38%		0.0%	0.69%		0.86%	
Participant Number	Result	z-score	Result	Result	z-score	Result	z-score
1754	0.50	1.06	0.00	0.90	1.14	1.10	0.87
1764	0.45	0.62	0.00	0.89	1.09	1.04	0.66
1783	0.42	0.36	0.00	1.49		1.07	0.76
1785	0.42	0.36	0.00	0.76	0.39	0.86	0.02
1788	0.27	-0.95	0.00	0.48	-1.11	0.37	-1.73
1844	0.36	-0.16	0.00	0.89	1.09	1.06	0.73
1855	0.38	0.01	0.00	0.55	-0.74	0.90	0.16
1870	0.30	-0.68	0.00	0.45	-1.27	0.62	-0.84
1875	0.11	-2.34	0.00	0.57	-0.63	0.31	-1.94
2034	0.30	-0.68	0.00	0.40	-1.54	0.40	-1.62
2057	0.41	0.27	0.00	0.73	0.23	1.10	0.87
2067	0.40	0.19	0.00	0.76	0.39	0.87	0.05
2692	0.34	-0.34	0.00	0.51	-0.95	0.51	-1.23
2716	0.37	-0.07	0.00	0.84	0.82	0.90	0.16
2723	0.72	2.98	0.00	1.00	1.68	1.61	2.68
3095	0.51	1.15	0.00	0.72	0.18	0.86	0.02
3927	0.44	0.54	0.00	0.63	-0.31	0.81	-0.16
3928	0.30	-0.68	0.00	0.50	-1.01	0.80	-0.20
4932	0.53	1.32	0.00	0.82	0.71	1.00	0.51
4935	0.26	-1.03	0.00	0.44	-1.33	0.56	-1.05
4936	0.31	-0.60	0.00	0.73	0.23	0.92	0.23
4942	0.39	0.10	0.00	0.80	0.60	1.00	0.51
4945	0.23	-1.29	0.00	0.63	-0.31	0.83	-0.09
4947	0.40	0.19	0.00	1.00	1.68	1.30	1.58
4952	0.25	-1.12	0.00	0.35	-1.81	0.60	-0.91
4957	0.41	0.27	0.00	0.72	0.18	0.85	-0.02
4960	0.36	-0.16	0.00	0.80	0.60	0.83	-0.09
4974	0.46	0.71	0.00	1.66		0.88	0.09

Table 76: Quantitative results and z-scores for soybeans fortified with A2704-12 (Liberty Link®) for all participants (DNA-based assays). Values highlighted in **yellow** indicate a z-score outside of the expected range, i.e., $z > +2$ or $z < -2$. Quantifications marked in **red** indicate a negative value for a fortified sample, i.e. a false negative result.

Event: A2704-12						
%w/w Fortification Level	0.1%		0.0%	0.5%		0.0%
Consensus Mean	0.11%		0.0%	0.34%		0.0%
Participant Number	Result	z-score	Result	Result	z-score	Result
1754	0.10	-0.22	0.00	0.30	-0.25	0.00
1764	0.20	2.29	0.00	0.74	2.65	0.00
1773	0.10	-0.22	0.00	0.30	-0.25	0.00
1783	0.06	-1.23	0.00	0.16	-1.17	0.00
1785	0.13	0.53	0.00	0.42	0.54	0.00
1855	P		0.00	0.33	-0.05	0.00
1870	0.10	-0.22	0.00	0.30	-0.25	0.00
2057	0.08	-0.73	0.00	0.29	-0.32	0.00
2067	0.12	0.28	0.00	0.39	0.34	0.00
2723	0.00		0.00	0.00		0.00
3095	NR		0.00	0.20	-0.91	0.00
4932	0.09	-0.47	0.00	0.29	-0.32	0.00
4945	<0.1		0.00	P		0.00

P- Qualitative data only, see Table #39,
NR- No Result

Table 77: Quantitative results and z-scores for soybeans fortified with CP4 EPSPS as Roundup Ready™ II (RUR II) for all participants (DNA-based assays). Z-scores outside of the expected range, i.e., $z > +2$ or $z < -2$ were not observed in this data set.

Event: RUR II						
%w/w Fortification Level	0.0%		0.5%		1.0%	
Consensus Mean	0.0%		0.30%		0.68%	
Participant Number	Result	Result	Result	z-score	Result	z-score
1754	0.00	0.00	0.40	0.97	1.00	1.62
1764	0.00	0.00	0.27	-0.30	0.67	-0.03
1773	0.00	0.00	0.40	0.97	0.90	1.12
1783	0.00	0.00	0.18	-1.17	0.58	-0.48
1785	0.00	0.00	0.44	1.35	0.89	1.07
1844	0.00	0.00	0.46	1.55	0.67	-0.03
1855	0.00	0.00	0.23	-0.68	0.55	-0.63
1870	0.00	0.00	0.20	-0.97	0.40	-1.39
1875	0.00	0.00	0.36	0.58	0.52	-0.78
2057	0.00	0.00	0.17	-1.27	0.44	-1.19
2067	0.00	0.00	0.25	-0.49	0.51	-0.83
2112	0.00	0.00	0.18	-1.17	0.51	-0.83
2716	0.00	0.00	0.35	0.48	1.05	1.87
2723	0.00	0.00	0.19	-1.07	0.72	0.22
4932	0.00	0.00	0.30	0.00	0.65	-0.13
4935	0.00	0.00	0.32	0.19	0.84	0.82
4947	0.00	0.00	0.50	1.94	0.90	1.12
4952	0.00	0.00	0.20	-0.97	0.50	-0.88
4957	0.00	0.00	0.26	-0.39	0.44	-1.19
4962	0.00	0.00	0.35	0.48	0.79	0.57

Table 78: Quantitative results and z-scores for soybeans fortified with DP305423 for all participants (DNA-based assays). Z-scores outside of the expected range, i.e., $z > +2$ or $z < -2$ were not observed in this data set.

Event: DP 305423						
%w/w Fortification Level	0.0%	0.0%	0.1%		1.0%	
Consensus Mean	0.0%	0.0%	0.09%		0.86%	
Participant Number	Result	Result	Result	z-score	Result	z-score
1764	0.00	0.00	0.08	-0.18	0.93	0.38
1855	0.00	0.00	0.07	-0.48	0.97	0.60
1870	0.00	0.00	0.06	-0.78	0.50	-1.89
2057	0.00	0.00	0.04	-1.38	0.59	-1.41
2067	0.00	0.00	0.10	0.42	0.88	0.12
2716	0.00	0.00	0.10	0.42	0.90	0.23
2723	0.00	0.00	0.05	-1.08	0.95	0.49
3095	0.00	0.00	0.12	1.02	0.82	-0.20
4932	0.00	0.00	0.09	0.12	1.16	1.60
4945	0.00	0.00	<0.1		0.73	-0.67
4952	0.00	0.00	0.15	1.92	1.00	0.75

Table 79: Quantitative results and z-scores for 35S, NOS, and FMV in corn for all participants (DNA based assay). Z-scores outside of the expected range, i.e., $z > +2$ or $z < -2$ were not observed in these data sets. Quantification marked in **red** in the FMV corn data indicates a negative value for a fortified sample, i.e. a false negative result. The sample size for events NOS and FMV corn are too small to be statistically significant.

Event: 35S										
Consensus Mean	3.9%		2.9%		0.0%	2.0%		1.8%		0.0%
Participant Number	Result	z-score	Result	z-score	Result	Result	z-score	Result	z-score	Result
1785	1.00	-1.29	1.80	-0.92	0.00	0.85	-0.94	0.85	-1.06	0.00
2723	7.90	1.73	4.39	1.33	0.00	3.53	1.27	3.51	1.92	0.00
4936	4.30	0.15	3.38	0.45	0.00	2.09	0.09	1.62	-0.20	0.00
4947	3.30	-0.28	2.80	-0.05	0.00	1.30	-0.57	1.70	-0.11	0.00
4960	5.60	0.72	4.10	1.08	0.00	3.80	1.50	2.30	0.56	0.00
4962	3.41	-0.24	2.20	-0.57	0.00	1.28	-0.58	1.59	-0.23	0.00
4964	2.12	-0.80	1.36	-1.30	0.00	1.05	-0.77	1.02	-0.87	0.00

Event: NOS											
Consensus mean	2.1%		3.5%		0.0%	2.3%		3.3%		2.1%	
Participant Number	Result	z-score	Result	z-score	Result	Result	z-score	Result	z-score	Result	z-score
1785	2.90	0.72	8.30	1.69	0.00	2.90	0.56	7.40	1.65	3.30	0.82
2723	2.20	0.08	3.85	0.12	0.00	3.78	1.34	3.90	0.25	3.59	1.01
4960	1.30	-0.75	1.45	-0.72	0.00	2.30	0.03	1.50	-0.71	2.30	0.15
4962	3.41	1.18	2.20	-0.46	0.00	1.28	-0.87	1.59	-0.67	0.00	-1.39
4964	0.77	-1.23	1.68	-0.64	0.00	1.06	-1.06	1.96	-0.52	1.20	-0.59

Event: FMV							
Consensus mean	0.0%	0.0%	0.0%	1.3%	0.5%	0.0%	
Participant Number	Result	Result	Result	Result	z-score	Result	z-score
2723	0.0	0.0	0.0	0.01	NA	0.0	NA

Note: Levels cited as Consensus Mean are averages of reported quantitative results of events containing these promoters and terminators. Assigning a more accurate quantification value is beyond the scope of this program at this time.

Table 80: Quantitative results and z-scores for 35S, NOS, and FMV in soybean for all participants (DNA based assay). Quantifications marked in red indicate outliers as determined by the “Grubbs Test for Outliers”. The sample size for events NOS and FMV soybean are too small to be statistically significant.

Event: 35S Soy							
Event: 35S Soy	Sample 1		Sample 2	Sample 3		Sample 4	
Participant Number	0.5%	z-score	0.0%	1.1%	z-score	0.8%	z-score
1862	0.36	-1.27	0.0	1.01	-0.39	0.64	-0.47
2723	3.09		0.0	6.12		4.07	
4936	0.47	-0.09	0.0	1.30	0.50	0.86	0.26
4960	0.58	1.10	0.0	0.95	-0.57	0.70	-0.27
4962	0.56	0.88	0.0	1.62	1.49	1.26	1.57
4974	0.42	-0.62	0.0	0.80	-1.03	0.45	-1.09

Event: NOS Soy							
Event: NOS Soy	Sample 1		Sample 2	Sample 3		Sample 4	
Participant Number	0.9%	z-score	0.0%	1.7%	z-score	1.6%	z-score
2723	2.11	1.15	0.0	3.18	1.12	3.5	1.15
4960	0.3	-0.56	0.0	0.68	-0.81	0.72	-0.52
4974	0.27	-0.59	0.0	1.34	-0.30	0.54	-0.63

Event: FMV Soy				
Event: FMV Soy	Sample 1	Sample 2	Sample 3	Sample 4
Participant Number	0.0%	0.0%	0.3%	0.7%
2723	0.0	0.0	0.01	0.02

Note: Levels cited as Consensus Mean are averages of reported quantitative results of events containing these promoters and terminators. Assigning a more accurate quantification value is beyond the scope of this program at this time.

Table 81: Descriptive statistics for participants reported quantifications relative to GIPSA fortification levels using DNA-based assays. % Relative standard deviation (%RSD_R) = [standard deviation/mean value x 100]. Outliers were determined by the Grubb's Test for Outliers and **excluded** from calculations involving reported mean, standard deviation, and % relative deviation but were **included** in the range of results.

Transgenic Event	Reported Results (N)	Gravimetric Fortification (%w/w)	Consensus Mean	Standard Deviation	% Relative Standard Deviation	Range of Results (%)
T25	10	0.1	0.09	0.05	55.6	0.0- 0.55
T25	10	0.5	0.29	0.27	93.1	0.07- 0.86
T25	10	2.0	1.59	1.11	69.8	0.10- 3.88
CBH351	5	0.1	0.09	0.02	22.2	0.07- 0.10
MON810	18	0.1	0.05	0.03	60.0	0.0- 0.12
MON810	18	0.1	0.07	0.03	42.9	0.0- 0.12
MON810	18	0.5	0.24	0.11	45.8	0.08- 0.48
MON810	18	2.0	1.03	0.57	55.3	0.29- 2.23
GA21	15	0.8	0.46	0.17	37.0	0.16- 1.47
GA21	15	1.0	0.41	0.16	39.0	0.11- 0.60
GA21	15	1.0	0.60	0.18	30.0	0.0- 2.96
Bt176	14	0.1	0.09	0.05	55.6	0.02- 0.19
Bt176	14	1.5	1.02	0.42	41.2	0.55- 1.60
Bt11	14	0.1	0.11	0.05	45.5	0.01- 0.20
Bt11	14	2.0	1.33	0.59	44.4	0.37- 2.10
NK603	14	0.5	0.31	0.15	48.4	0.0- 0.60
NK603	14	1.0	0.56	0.29	51.8	0.10- 1.10
Herculex	12	0.42	0.09	21.4	0.20- 0.54	0.42
Herculex	12	0.49	0.14	28.6	0.31- 0.78	0.49
MON863	13	0.5	0.38	0.16	42.1	0.12- 0.70
MON863	13	0.8	0.58	0.22	37.9	0.20- 1.00
HerculexRW	12	0.1	0.11	0.04	36.4	0.04- 0.20
MIR604	12	0.1	0.12	0.04	33.3	0.0- 0.80
MIR604	12	0.2	0.16	0.10	62.5	0.06- 0.80

Transgenic Event	Reported Results (N)	Gravimetric Fortification (%w/w)	Consensus Mean	Standard Deviation	% Relative Standard Deviation	Range of Results (%)
EV3272	9	0.2	0.24	0.11	45.8	0.11- 1.11
EV3272	9	0.5	0.50	0.15	30.0	0.36- 4.81
EV3272	9	1.0	0.74	0.15	20.3	0.54- 4.52
MON88017	12	0.1	0.15	0.13	86.7	0.0- 0.30
MON88017	12	0.5	0.41	0.23	86.7	0.10- 0.77
MON89034	12	1.0	0.52	0.26	50.0	0.12- 1.90
MON89034	12	2.0	1.30	0.65	50.0	0.50- 2.40
MIR 162	10	0.2	0.29	0.19	65.5	0.05- 0.58
MIR 162	10	0.8	1.08	0.71	65.5	0.20- 2.32
RUR	28	0.5	0.38	0.11	28.9	0.11- 0.72
RUR	28	1.0	0.69	0.19	27.5	0.35- 1.66
RUR	28	1.0	0.86	0.28	27.5	0.31- 1.61
A2704-12	13	0.1	0.11	0.04	36.4	0.0- 0.20
A2704-12	13	0.5	0.34	0.15	44.1	0.0- 0.74
RUR II	20	0.5	0.30	0.10	33.3	0.17- 0.50
RUR II	20	1.0	0.68	0.20	29.4	0.40- 1.05
DP305423	10	0.1	0.09	0.03	33.3	0.04- 0.15
DP305424	10	1.0	0.86	0.19	22.1	0.50- 1.16

Summary of Findings

It is recognized that some organizations participate in this program to retain their ISO accreditation. Participation also serves to provide a verification of current laboratory practices and/or aids in identifying areas for improvement. These factors should be taken into consideration when reviewing the following analyses.

GIPSA does not proscribe detection methods for biotechnology-derived traits. An individual laboratory may provide a Level of Detection (LOD) for its particular detection method. When the consensus mean in an event fortified sample falls below the provided LOD, a negative result is considered a correct answer, and is assessed as a provided negative.

- **Qualitative Sample Analysis**

DNA-based Testing. The typical method of DNA-based testing for qualitative determination of events is by conventional PCR which generally has a sensitivity of 0.01% w/w transgenic event. This level is consistent with what has been reported by Lipp et al. and represents the lowest concentration of genetic material that can be reliably detected by qualitative PCR.

The lowest gravimetric fortification level in this round of proficiency testing was 0.1% w/w; therefore, if the event was present it should be detectible by a laboratory that employs conventional PCR. As evidenced by the summary of performance scores (**Table 51** and **Figure 1**), all of the twenty-five transgenic events were correctly detected with greater than or equal to 92% reliability, and twenty-one of the twenty-five (21/25) transgenic events were correctly detected with greater than or equal to 95% reliability.

This program dissemination included a corn challenge sample prepared with transgenic events that do not utilize 35S as a promoter (Sample 6). Seven of forty-nine (7/49) participants submitting qualitative results identified the 35S promoter as present. (**Table 1**, Sample 6). All participants submitting quantitative results identified the 35S promoter in that sample as not present (**Table 79**, Sample 6). Participants using Digital PCR all identified the promoter as not present.

Five participants reported using an End-point PCR test method. Five participants reported using Digital PCR. Two participants reported using DNA based Conventional PCR. Digital PCR results were used for qualitative testing only, and reflected no significant difference in performance from the sampling population.

Protein-based Testing. The methods of protein-based testing were lateral flow strip (LFS) and enzyme-linked immunosorbent assay (ELISA). The LFS test has a sensitivity ranging between 0.17- 10.0% w/w for corn events and 0.1- 0.50% w/w for soybean events according to some kit manufacturers. Generally, ELISA has a sensitivity of 0.1- 1% w/w for corn and soy events (Ahmed, 2004). The test results for NK603 and MON88017 are combined because both traits express the *CP4EPSPS* protein, and protein-based testing cannot distinguish between the two events. The test results for MON863 and MON88017 are combined because both events express the *C3Bb1* protein. Events MON810, Bt11, and Bt176 are combined because these all express the *Cry1Ab* protein.

- **Quantitative Sample Analysis**

DNA-based Testing. The typical method of DNA-based testing for quantitative determination of transgenic events is by real-time quantitative PCR (qPCR). This analytical method has a limit of detection (LOD) of 0.01% w/w and a limit of quantification (LOQ) of approximately 0.1% w/w for a specified event (Ahmed, 2004; Lipp et al., 2005).

Composite Performance Assessment. These data combined the participants' reported quantifications and evaluated the group's performance by considering the mean value of "reported results" of all participants (**Table 81**). Because test samples were fortified ranging from 0.1- 2.0 %w/w of a particular event, it was expected that qPCR technologies would detect the traits in all of the fortified samples but not in non-fortified samples. Low instances of false positive results were observed when using qPCR to detect the presence of GE traits in these proficiency samples.

There are nine false negative results observed in the quantitative section of this report. Six of the false negatives were on samples fortified at 0.1%.

Seven participants submitted quantitative results for 35S, five participants submitted quantitative results for NOS, and one participant submitted quantitative results for FMV in corn (**Table 79**). The number of results for corn NOS and FMV are too small to hold statistical significance. The target %w/w levels for these traits should be additive for all events containing either 35S or NOS fortified into the sample. Validated methods to quantify with a high degree of accuracy for the presence of 35S and NOS, in samples fortified with multiple traits, is beyond the scope of the program at this time.

Six laboratories submitted quantitative results using qPCR (DNA-based testing) for the 35S event, three laboratories submitted quantitative results for the NOS event, and one participant submitted quantitative results for FMV in soybeans (**Table 80**).

Quantitative data from previous rounds of our proficiency sample distributions can be found at: http://www.gipsa.usda.gov/fgis/insp_weigh/proficprog.html

Individual Performance Assessment. The performance of each participating laboratory for quantifying transgenic events in the proficiency samples can be observed by inspecting Tables 60 through 80. To assess the accuracy of their reported quantifications z-scores were computed. Laboratories with z-scores above +2 or below -2 were noted and highlighted in yellow because their result was greater than two standard deviations from the target value. Interpretation of z-scores assumes that the data have a normal distribution. Data from samples with lower fortification levels (e.g., 0.1% w/w) and from tables with low numbers of results are not normally distributed and caution should be used when interpreting their z-scores.

Monitoring and improving the performance of laboratories that use PCR technologies for the detection and/or quantification of transgenic events in corn and soybeans will improve the reliability of testing methods and the marketing of these commodities. The USDA/GIPSA proficiency testing program should be a complement to other quality assurance measures that laboratories use to improve their analytical capabilities.

Note: 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. Reference standards are now commercially available for all transgenic traits used in this proficiency program and GIPSA encourages the use of these reference materials when developing internal validated methods.

To obtain additional information on the USDA/GIPSA Proficiency Program, contact Dr. Tandace Scholdberg, USDA/GIPSA Proficiency Program Manager, at US 816-891-0459, or by e-mail at Tandace.A.Scholdberg@usda.gov.

References

<http://www.itl.nist.gov/div898/software/dataplot/refman1/auxillar/consmean.htm>

Ahmed, F.E. (editor.). 2004. Testing of genetically modified organisms in foods. The Haworth Press, Inc., Binghamton, NY, pp. 174-176.

Definition of minimum performance requirements for analytical methods in GMO testing. 13 October 2008. European Network of GMO Laboratories and the Joint Research Council. <http://gmo-crl.jrc.ec.europa.eu>

Lipp, M., Shillito, R., Giroux, R., Spiegelhalter, F., Charlton, S., Pinero, D. 2005. Polymerase chain reaction technology as an analytical tool in agricultural biotechnology. Journal of AOAC International, 88 (1), 136-154.

Trait check Bt corn grain lateral flow test kit user guide. November 2001. Strategic Diagnostics, Inc., Newark, DE, part no. 3099998.

Trait check RUR bulk grain lateral flow test kit user guide. November 2003. Strategic Diagnostics, Inc., Newark, DE, part no. 3099956.

Appendix I: List of organizations who wished to be identified as a participant in the GIPSA October 2013 Proficiency Program. Participant identification numbers are listed below with permission from the organization.

BioGEVES

Station Expérimentale du Magneraud
CS 40052
Surgeres 17700
France
Attn: Stephane Fouilloux
Phone: 33-(0)546-683-036
Fax: 33-(0)546-683-100
stephane.fouilloux@geves.fr

Bolsa de Comersio de Rosario

Cordoba 1402-2 Pisa
Rosario S2000 AWV-Santa Fe
Argentina
Attn: Ariel Soso
Phone: 54-341-4213471 ext: 2397
Fax: 54-341-421 1000
asoso@bcr.com.ar; colsina@bcr.com.ar

Canadian Grain Commission

1404-303 Main Street
Winnipeg, MB R3C 3G8
Canada
Attn: Tigst Demeke
Phone: 204-984-4582
Fax: 204-983-0724
tigst.demeke@grainscanada.gc.ca

Central Laboratory (Thailand) Co., Ltd.

Bangkok Branch
50 Phaholyothin Rd.
Ladyao, Jatujak, Bangkok 10900
Thailand
Attn: Miss Poolsiri Pruekkanon, Miss Thanida Pimma
Phone: 66 2 940 6881-3, ext.241
Fax: 66 2 579 4895
ppkknnon@yahoo.com, thanida@centrallabthai.com

Centro Nacional de Alimentacion (AESAN)

Ctra. Pozuelo-Majadahonda km 5.1
C.P.28220 (Majadahonda) Madrid
Spain
Attn: Isabel Prieto Santos
Phone: +34 91 338 06 88
Fax: +34 91 338 09 80
mprietos@msssi.es

CNTA-Laboratorio del Ebro

Carretera NA- 134 km 50
31570 San Adrian
Navarra
Spain
Attn: Javier Butron Ilundain
Phone: 00 34 948 670 159
Fax: 00 34 948 696 127
jbutron@cnta.es

BIOTECON Diagnostics

Hermannswerder 17
14473 Potsdam
Germany
Attn: Dr. Christina Harzman, Dr. Hans-Henno Dörries
Phone: +49 172 2323 606
Fax: +49 331 2300-299
charzman@bc-diagnostics.com, hdoerries@bc-diagnostics.com

California Seed and Plant Labs

3556 Sankey Road
Pleasant Grove, CA 95668
USA
Attn: Sukhi Pannu
Phone: 916-204-8329
Fax: 916-655-1582
sukhi.pannu@csplabs.com
1752

Centro Nacional de Referencia en Detección de Organismos

Geneticamente Modificados/ SENASICA
km 37.5 Carretera Federal México-Pachuca
Col. Centro, Tecámac Estado de México.
C.P. 55740
Mexico
Attn: María Guadalupe Barrera Andrade
Phone: 52 55 59051000 ext 53039
maria.barrera@senasica.gob.mx
4936

Central Laboratory (Thailand) Co., Ltd.

Songkhla Branch
9/116 Kanchanawanich Rd.
Hat Yai-sadao, Songkla 90110
Thailand
Attn: Mr. Trirat Saimanee, Miss Thanida Pimma
Phone: 66 74 458 871-3
Fax: 66 74 45 8870
songklha_office@centrallabthai.com

Chemisches und Veterinäruntersuchungsamt

Münsterland-Emscher-Lippe (CVUA-MEL)
Joseph-König-Str. 40
D-48147 Münster
Germany
Attn: Dr. Claudia Brünen-Nieweler
Phone: 49-251-9821311
Fax: 49-251-9821250
molekularbiologie@cvua-mel.de

Dupont do Brasil S.A. Divisão, Pioneer Sementes

Rod. DF 250 km 20
Núcleo Rural Santos Dumont, Lote 50
Planaltina 73310-970 Brasília- DF
Brazil
Attn: Nadia Cristina Astafeief
Phone: 55 61 2106 1018
Fax: 55 61 2106 1060
nadia.astafeief@pioneer.com

Du Pont do Brasil S.A. – Divisão Pioneer Sementes
Rodovia BR 452, km 187, Cx. Postal 1014,
75503-970 Itumbiara – GO
Brazil
Attn: Stael Cunha
Phone: 55 64 3432 2677
Fax: 55 64 3432 2610
stael.cunha@pioneer.com

Eurofins Genescan, Inc.
2315 N. Causeway Blvd.,
Suite 200
Metairie, Louisiana 70001
USA
Attn: Dr. Frank Spiegelhalter, Gregory M. Ditta
Phone: 504-297-4330
Fax: 504-294-4335
gregoryditta@eurofinsus.com

Genetic Purity Lab Monsanto Argentina
Maipü 1210 piso 10
1006 Capital Federal
Buenos Aires
Argentina
Attn: Tatiana Gunther
Phone: 54 1143164172
Fax: 54 1143162525
tatina.gunther@monsanto.com

Germ Services
21, Chemin de Pau
64121 Montardon
France
Attn: Cedric Barbe-Barraillh/ Pilar Cambet
Phone: 05-59-12-67-61
Fax: 05-59-12-67-10
cedric.barbe@agpm.com

ifp Institut für Produktqualität
Teltowkanalstr. 2
12247 Berlin
Germany
Attn: Dr. Wolfgang Hauser
Phone: 0049(0)30-766860-13
Fax: 0049(0)30-766860-50
hauser@produktqualitaet.com

Institute of Agricultural and Food Biotechnology
36 Rakowiecka St.
02-532 Warsaw
Poland
Attn: Joanna Bucka-Kolendo
Phone: (48) 022 606 38 06
Fax: (48) 022 606 36 02
bucka@ibprs.pl

Laboratoire de la Santé des Végétaux – ANSES
7 Rue Jean Dixmèras
49044 Angers Cedex
France
Attn: Vincent Herau
Phone: +33 241207425
Fax: +33 241207430
vincent.herau@anses.fr

Eurofins do Brasil Análises de Alimentos Ltda
Rodovia Engenheiro Ermênio de Oliveira Penteado
km 57.7, Condomínio Industrial, Predio 1, B Tombadouro
CEP 13337-30 Indaiatuba SP
Brazil
Attn: Aline Ferreira
Phone: +55 (19) 2107-5510
Fax: +55 (19) 2107-5505
qualidade@eurofins.com.br

**Federal Office of Public Health
Consumer Protection Directorate**
Schwarzenburgstrasse 165
CH-3003 Bern
Switzerland
Attn: Dominik Moor
Phone: +41 31 324 93 78
Fax: +41 31 322 95 74
Dominik.Moor@bag.admin.ch

GeoChem Laboratories Pvt. Ltd.
Pragati Building, adjacent to Crompton Greaves,
Kanjurmarg East, Mumbai-4000042
India
Attn: Mr. P. Sureshbabu
Phone: +91 22 61951000
Fax: +91 22 61915101
sureshbabu.p@geochem.net.in
4939

**GMOs Analysis Lab, Biotechnology Research and Development
Department of Agriculture**
50 Phalolyothin Rd. Chatuchak
Bangkok 10900
Thailand
Attn: Ms. Khanitha Wongwathanarat, Dr. Piyyarat Thammakijjawat
Phone: 66-2579-1640-1
Fax: 66-2579-1533
kwongwath@yahoo.com, ppj98@yahoo.com

Indiana Crop Improvement Association
7700 Stockwell Rd
Lafayette, IN 47909
USA
Attn: Dr. Emily Dierking
Phone: 765-523-2535
Fax: 765-523-2536
dierking@indianacrop.com

Kantones Labor Zürich
Fehrenstrasse 15
8032 Zürich
Switzerland
Attn: René Köppel
Phone: +41 43 244 72 24
Fax: +41 43 244 71 01
rene.koepfel@klzh.ch

Laboratoire Phytocontrol
Parc Scientifique G. Besse II
180 Rue Philippe Maupas
30035 Nîmes
France
Attn: Karine Lacotte-Botelho
Phone: 33 4 34 14 70 00
Fax: 33 4 66 23 99 95
karinelacotte-botelho@phytocontrol.com

Laboratorio Central de Veterinaria
Ministerio de Agricultura Alimentación y Medio Ambiente
Carretera M106-Km14
28110- Algete, Madrid
Spain
Attn: Maria del Valle Perez Barbachano
Phone: 0034913474561
Fax: 0034913475601
mperezba@magrama.es

LANAGRO-GO
Ministry of Agriculture, Livestock and Food Supply
Rua da Divisa s/n Setor Jaó
Goiânia CEP: 74674-025
Brazil
Attn: Regina Morello
Phone: 55 62 81385701
Fax: 55 62 3235503
regina.morello@agricultura.gov.br

Landesbetrieb Hessisches Landeslabor
Druseltastraße 67
34131 Kassel
Germany
Attn: Dr. Ralf Reiting
Phone: 0049561-3101-208
Fax: 0049561-3101-242
ralf.reiting@lhl.hessen.de

LUFA Speyer
Obere Langgasse 40
67346 Speyer
Germany
Attn: Dr. Sartorius-Neef
Phone: 06232-136291
Fax: 06232-136110
neef@lufa-speyer.de

Monsanto GQA
800 N. Lindbergh
St. Louis, MO 63141
USA
Attn: Ryan Sizemore
Phone: 314-694-75288
Fax: 314-694-7560
rlsize@monsanto.com

National Bureau of Plant Genetic Resources, New Delhi
Pusa Campus
New Delhi-110
India
Attn: Dr. Gurinder Jit Randhawa
Phone: 9811974396
Fax: 091-11-25849419
gurinder.randhawa@rediffmail.com

IEH, (Pi Bioscientific, Inc.)
15300 Bothell Way NE
Forest Park, WA 98155
USA
Attn: Cesar Nadala, Youngsil Ha
Phone: (206) 522-5432
Fax: (206) 306-8883
cnadala@iehinc.com, yha@iehinc.com

Laboratório de Análises Genéticas Ltda- AgroGenética
Av. Olívia de Castro Almeida, Nº 273 L1C - Bairro Clélia Bernardes
Viçosa/Minas Gerais
CEP: 36.570-000
Brazil
Attn: Renata Flávia Ferreira e Freitas
Phone: (31) 3891-0817 / (31) 3891-1859
flavia@agrogetica.com.br

LANAGRO-MG
Laboratório Nacional Agropecuário - MG
Avenida Romulo Joviano, s/n, Centro
Pedro Leopoldo
Minas Gerais 33600-000
Brazil
Attn: Júlio César Garcia
Phone: 55 31 3660 9730
Fax: 55 31 3660 9737
julio.garcia@agricultura.gov.br

Landesamt fuer Verbraucherschutz Sachsen-Anhalt
Freiimfelder Str. 68
061112 Halle
Germany
Attn: Dr. Dietrich Maede
Phone: +49 345 5643 313
Fax: +49 345 5643 439
dietrich.maede@lav.ms.sachsen-anhalt.de
1870

Microbac Laboratories
505 E. Broadway Ave.
Maryville, TN 37804
USA
Attn: Robert Brooks
Phone: 865-911-1200 x 1229
Fax: 865-984-8616
robert.brooks@microbac.com

Monsanto- Europe
Croix de Pardies
F-40305 Peyrehorade
France
Attn: Bruno Zacommer
Phone: +33 558 73 21 64
Fax: +33 558 73 09 29
bruno.zacommer@monsanto.com

Nippon Yuryo Kentei Kyokai Yokohoma Laboratory
(Japan Oil Stuff Inspectors Corporation)
Nagataminami 1-2-34
Minami-Ku, Yokohama 232-0073
Japan
Attn: Kumi Goto
Phone: 045-722-3605
Fax: 045-722-3639
goto3045@nykk.or.jp
1782

GET Lab @ Pioneer Hi-Bred
810 Sugar Grove Ave.
Dallas Center, IA 50063
USA
Attn: Kerry Hastings
Phone: 515-535-6475
Fax: 515-535-7310
Kerry.Hastings@Pioneer.com

Planton GmbH

Am Kiel-Kanal 44
D-24106 Kiel
Germany
Attn: Christina Neßler
Phone: +49 (0)431 38015 0
Fax: +49(0)431 38015 11
nessler@planton.de

Riceseach, Tildariceland Pvt Ltd

42km stone NH 8 Delhi -Jaipur Highway
Gurgaon, Haryana 122001
India
Attn: Nandini Seshadri
Phone: 91-(0)124-304 0177
Fax: 91(0)124-304 0123
nandini@tildariceland.com

SGS do Brasil Ltda

Av. Vereador Alfredo das Neves
480 – CEP: 11095-510
Santos/Sao Paulo
Brazil
Attn: Mara Rubia Camolesi
Phone: +55 13 2105-9558
Fax: +55 13 3296-2921
mara.camolesi@sgs.com

Sistémás Genómicos

Parque Tecnológico de Valencia
Ronda G. Marconi, 6
46980 Paterna, Valencia
Spain
Attn: Amparo Girós Pérez
Phone: +34961366150
amparo.giros@sistemasgenomicos.com

TECAM

Rua Fábria 59
São Paulo SP CEP: 05051-030
Brazil
Attn: Felipe Franchim Madeira
Phone: 55 11 3677 2553
Fax: 55 11 3677 2555
biomol@tecam.com.br

Tobacco Research Board

Airport Ring Rd.
Kutsaga Research Station
Box 1909, Harare
Zimbabwe
Attn: Dr. Dahlia Garwe
Phone: 263-4-575 289/94
Fax: 263-4-575 288
dgarwe@kutsaga.co.zw

Voivodship Sanitary and Epidemiological Station in Bialystok

ul. Legionowa 8
15-099 Bialystok
Poland
Attn: Grazyna Ostrowska
Phone: +48 508859706
Fax: +48 85 7404899
dl@wsse.bialystok.pl

RAGT Semences

Les Molinières
F-12450 La Primaube
France
Attn: Aurelie Bousquet
Phone: +33 565 712 520
Fax: +33 565 712 525
aubousquet@ragt.fr

SGS Bulgaria Ltd - Laboratory Varna

1 William Froude Str.
Institute for Hydor and Aerodymanics, 7th floor
9003 Varna
Bulgaria
Attn: Veselka Pashova
Phone: +359(52)370988
Fax: +359(52)370979
veselka.pashova@sgs.com

SGS Brookings

241 34th Avenue
Brookings, SD 57006
USA
Attn: Heather Waxdahl
Phone: 605-692-7611
Fax: 605-692-7617
heather.waxdahl@sgs.com

SVUA Arnsberg

Staatliches Veterinäruntersuchungsamt
Zur Taubeneiche 10-12
D-59821 Arnsberg
Germany
Attn: Dr. Jochen Kilwinski
Phone: 49-2931-809-220
Fax: 49-2931-809-290
jochen.kilwinski@svua-arnsberg.nnw.de

Thionville Laboratories, Inc.

5440 Pepsi St.
New Orleans, LA 70123
USA
Attn: Leo Schilling
Phone: 504-733-9603
Fax: 504-733-6457
lab@thionvillenola.com

Veterinary Public Health Center,

Agri-Food and Veterinary Authority Singapore
10 Perahu Road, Singapore 718837
Republic of Singapore
Attn: Wang Zheng Ming (PhD)
Phone: 65-67952884
Fax: 65-68619491
wang_zheng_ming@ava.gov.sg

SynTech Research

17745 South Metcalf Avenue
Stilwell, KS 66085
USA
Attn: Karin E. Gaertner
Phone: 913-378-0998 ext. 142
Fax: 913-378-0094
kgaertner@syntechresearch.com