Welcome to EnviroLogix. We are a world leader in the development of diagnostic test kits for the international agricultural industry.

Along with test kits for GMOs, we offer a complete grain testing solution for grain elevators, merchandisers, and exporters that has been used for years by organizations ranging from multi-billion dollar conglomerates to small country elevators.

Our industry leadership in testing and traceability is rooted in our QuickScan System; a powerful platform combining world-class software and quantification with a familiar and easy-to-use computer interface.

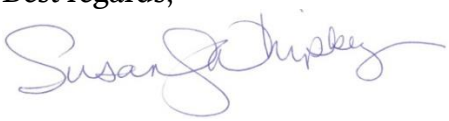
In this packet you will find detailed information on our GMO test kits and QuickScan traceability system. We hope to make a compelling case for making us your strategic partner for all your grain quality and traceability needs.

As well as GMO testing, our portfolio of rapid tests also includes QuickTox test kits for mycotoxins such as Aflatoxin, DON (Vomitoxin), Fumonisin, and more.

The traceability and identity preservation capabilities of our QuickScan System add even more value to your testing, along with enabling storage and analysis of data to help you carry your business forward.

To learn even more about our technology, feel free to visit our website, www.envirologix.com, or contact a member of our sales team at 1-866-408-4597 ext. 3.

Best regards,



Susan J. Whipkey
Product Manager

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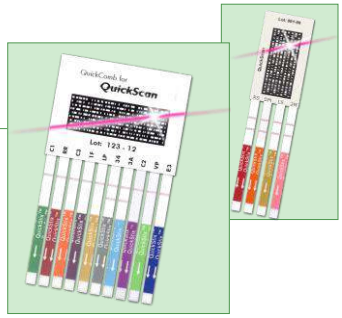
Office: 207-797-0300 • Toll Free: 866-408-4597 • Fax: 207-797-7533 • envirologix.com

GMO Testing – Getting Started

QuickScan System

QuickScan is a highly flexible and precise strip-reading system that quantification and traceability system. Developed specifically for EnviroLogix, it offers users objective, fast and quantifiable results.



QuickComb Kits for Soy and/or Corn

Soy QuickComb kits test for four types of GMOs and the Corn QuickComb kits can detect ten distinct GMOs. Kits include 40 or 100 combs.
(call for pricing)

Industrial-Grade Blender or Coffee Grinder to Prepare Samples

EnviroLogix recommends the Bunn Grinder G3 for corn or soy samples (available on eBay for various prices, new and used). Alternatively, you can purchase a laboratory grade blender with ice blades, a safety cover (in case the glass blender jar breaks) and extra glass jars. If testing alfalfa, the commercial blender is required (prices range from $150 to over $400).

Water and a Measuring Device

Water is needed to mix with the ground sample - either potable tap or bottled water is acceptable. You will need a graduated cylinder or other means of measuring the water in mLs.

Digital Scale for Weighing Samples

A variety of scales are available online. Must be able to weigh in grams.

Extraction Vessels

EnviroLogix recommends stand-up pouches for extracting GMO samples. However, you may purchase any vessels that hold 500 mL, disposable or reusable, that can be tightly sealed for mixing.

QuickGuide
AQ-036

GMO QuickComb
Corn Bulk Grain

SAMPLE PREPARATION

1. Determine sample weight for the number of kernels tested

2. Grind a representative sample with Bunn Grinder

Or, use an alternate method of grinding

TEST PROCEDURE

*Weigh out sample, then calculate the volume of water needed

Grams of Corn x 1.5 = mL of water

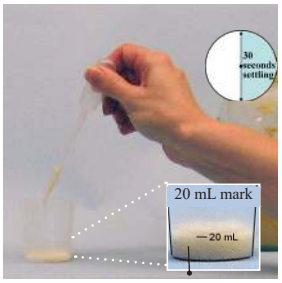
For example, 800 kernels with average seed weight of 0.3g:

(800 kernels x 0.3g) = 240g of ground corn

240g x 1.5 = 360 mL water

1. Measure and add ground corn and water to jar or bag*

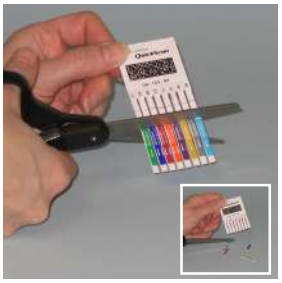
2. Seal container, shake to wet entire sample, settle 30 seconds



3. Pipette into cup to 20 mL line; settle 30 seconds

4. Alternatively, pour from jar or bag to the 20 mL line; settle 30 seconds

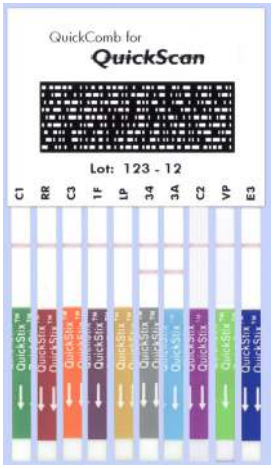
5. Insert comb into cup with arrows pointing down; wait 5 minutes



6. To retain results, cut off tail-pads. For QuickScan, cut tailpads & scan immediately

TEST INTERPRETATION

Protein/Trade Name	Sensitivity
Cry1Ab/Bt11, YieldGard Corn Borer	0.8% (~6 kernels in 800)
Event 603/Roundup Ready	0.5% (4 kernels in 800)
Cry3Bb/YieldGard Rootworm	0.5% (4 kernels in 800)
Cry1F/Herculex I	0.5% (4 kernels in 800)
T25/Liberty Link	0.5% (4 kernels in 800)
Cry34/Herculex RW	0.5% (4 kernels in 800)
mCry3A/Agrisure RW	0.9% (~8 kernels in 800)
Cry2A/*in* SmartStax (MON98034)	0.9% (~8 kernels in 800)
Vip3A/Viptera	0.25% (2 kernels in 800)
eCry3.1Ab/Duracade	0.1% (~1 kernel in 800)



Control Lines confirm test is valid

If two lines form, the sample is positive

ENVIROLOGIX

QuickGuide

AQ 076 TCK

TotalTrait

Soybean Bulk Grain - Quantitative

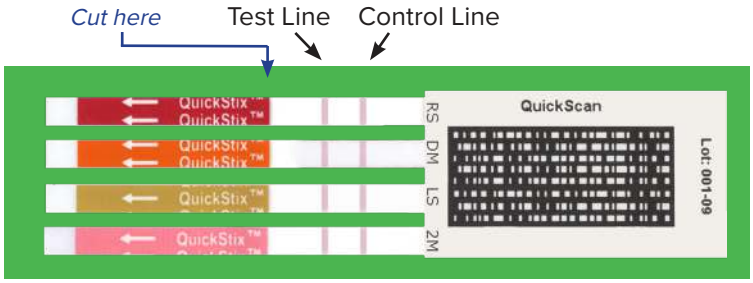
1. Determine sample weight and grinding method. Weigh sample into an appropriate container.

2. Grind soybeans until finely ground, product insert gives grind times for various methods.

3. Measure water using the Soybean Common Extraction™ (1:5). Add to container, cover and shake to wet entire sample.

4. With pipette, remove 12 mL sample from liquid on top (about 3 pipettefuls, avoid particulates), dispense into a reaction cup.

5. Insert comb into the liquid in the cup. Wait 5 minutes, cut off tailpads of strips, and read in QuickScan-- be sure to activate TotalTrait Soy Sum to get the most accurate GMO reading.



Protein/Trade Name	Sensitivity
CP4 EPSPS / Roundup Ready	1 soybean in 400 (0.25%)
DMO / RR2 Xtend	1 soybean in 400 (0.25%)
PAT/*pat* / LibertyLink	1 soybean in 200 (0.5%)
2m EPSPS / GT27	1 soybean in 1000 (0.1%)

QuickGuide
AQ-045-AH

CP4 EPSPS
Ground Hay

SAMPLE PREPERATION

1. Collect a representative sample, mix well before subsampling.

2. Grind a subsample resulting in material that will pass a 40-mesh sieve.

3. This shows a one-minute grind compared to a 40-mesh sieved sample – use the finest material possible from the blender.

TEST PROCEDURE

4. After grinding sample, remove 1 gram and place in extraction vessel. Weigh out the ground material carefully.

5. Add 80 mL 1X Extraction Buffer and shake vigorously for 1 minute. Confirm all material is wet.

6. Transfer 0.5 mL to the Reaction Vial.

7. Tip sample cup if needed to avoid particulates when pipetting.

8. Add a QuickStix Strip to the Reaction Vial.

9. Wait 5 minutes; read the results.

TEST RESULTS

10. Remove strip from vial immediately after 5 minutes. Cut off and discard bottom pad with arrow tape, place in QuickScan carrier, face down.

Alternatively, strip may be read visually at this point. A visible pink test line will appear if the sample contains 0.1% CP4 EPSPS or more

11. Slide carrier in and click "Read Test" on main menu. Results Screen will appear when scanning is complete. Enter sample identification data and use buttons to save or print report.

ENVIROLOGIX

QuickGuide QuickScan II

Before testing, be sure to scan any new-lot MMBCs for mycotoxin kits. It is also recommended that a Clean Test and CheckComb be run at least once daily.

1. Turn unit on; QuickScan **Main Menu** will appear (if program has been closed and Windows desktop is visible, double-click QuickScan icon to open Main Menu)

2. **After cutting tailpads off test strip(s),** push in on the carrier to pop it out of the scanner, revealing the strip tray (remember, strips or combs must be read immediately after reaction time)

3. **Place the comb and/or strip(s) face-up** in the carrier, and slide it back into scanner

4. **Click "Read Test"** button on the Main Menu screen (scanner will read comb)

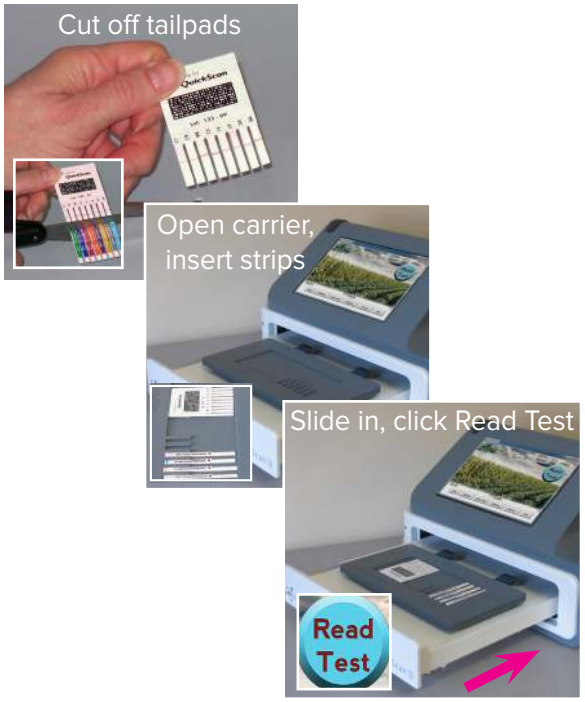
5. When the Results Screen appears, **enter Sample ID and/or Supplier data** where indicated (i.e. scale-ticket number or "ABC Trk 27")

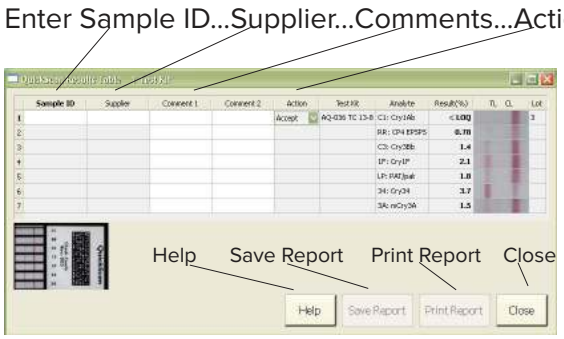
6. **Click "Save Report"** button to save a PDF version of the results (software can be configured to "Save All Reports" automatically to avoid this step)

7. **Click "Print Report"** button to create an immediate hard copy of test results, if required ("Print Receipt" prints abbreviated Report, if activated)

8. **Click "Close"** button to exit results screen and perform the next test (be sure to enter Sample ID info, or the data will not be saved)

MAIN MENU





RESULTS SCREEN

ENVIROLOGIX

Portugues – p. 3

QuickComb™ Kit for QuickScan

Contents of Kit:

- *7 to 10 QuickStix Strips per comb, 100 combs packaged 5 per foil bag*
- *Sample cups and disposable transfer pipettes*

Items Not Provided:

- *Bunn grinder or equivalent*
- *Graduated cylinder*
- *Tap water*
- *QuickScan System*

Catalog Number AQ 036 TC

Intended Use

This EnviroLogix QuickComb Kit for bulk grain is designed to detect and quantify the presence of certain proteins at the levels typically expressed in genetically modified corn bulk grain. The QuickComb may contain any combination of five to ten of the following QuickStix™:

Protein/Trade Name	**Sensitivity**	
Cry1A (MON810) / YieldGard Corn Borer*	0.8%	~6 kernels in 800
CP4 EPSPS / Roundup Ready	0.5%	4 kernels in 800
Cry3Bb / YieldGard Rootworm	0.5%	4 kernels in 800
Cry1F / Herculex I	0.5%	4 kernels in 800
PAT/*pat* / LibertyLink	0.5%	4 kernels in 800
Cry34 / Herculex RW	0.5%	4 kernels in 800
mCry3A / Agrisure RW	0.9%	~8 kernels in 800
Cry2A / *in* SmartStax (MON89034)	0.9%	~8 kernels in 800
Vip3A / Viptera	0.25%	2 kernels in 800
eCry3.1Ab (Event 5307) / Duracade	0.1%	~1 kernel in 800

* The Cry1A strip will also detect Cry1A.105 and Bt11, but the detection level and quantification calculations are based on MON810.

How the Test Works

In order to detect the proteins expressed by genetically modified bulk grain, the sample must first be extracted to solubilize the protein. All QuickStix included in the QuickComb are specially formulated to detect their analytes in a Common Extraction.

Each QuickStix Strip has an absorbent pad at each end. The protective tape with the arrow indicates the end of the strips to insert into the reaction cup. The sample will travel up the membrane strips and be absorbed into the larger pad at the top of the strip. The portion of the strip between the protective tape and the absorbent pad at the top of the strip is used to view the reactions as described under "Interpreting the Results." Results are then scanned and interpreted quantitatively with the EnviroLogix QuickScan System. Please avoid bending the comb.

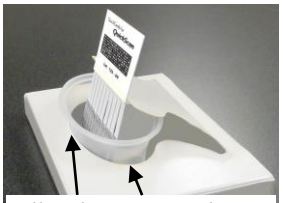
Sample Preparation

1. Collect a composite sample according to USDA/GIPSA instructions found in the reference documents listed in Precautions and Notes.
2. Determine the **average weight** of the grain from the lot to be tested. Count and weigh 100 kernels/seeds, then divide by 100. Corn kernels vary widely from region to region and from year to year. Be sure to test the desired number of kernels by checking average kernel weight periodically.
3. Calculate the sub-sample weight (g) needed for testing, (number of seeds X **average seed weight**). A sub-sample size of at least 200 grams is required to create enough extract for the test. Note: it is necessary to grind more than the calculated sub-sample weight—subsample is weighed out after grinding (Step 5).
4. Calculate water volume needed for sample preparation. The Common Extraction Method calls for a water volume to sample weight ratio of **1.5 to 1** (see example, right).
5. Grind corn using the Auto-Drip setting on the Bunn grinder (or equivalent), then weigh out the subsample calculated in Step 3. The sample should be the consistency of coffee grounds – 60-70% of the sample should pass through a 20-mesh sieve.
6. Weigh out subsample calculated in Step 3, then place subsample into an appropriately sized jar or stand-up, zip-type plastic bag and add the volume of tap water calculated in Step 4.
7. Close the jar or bag and shake vigorously for 30 seconds, then allow sample to settle for another 30 seconds.
8. Assemble cardboard holder and lift the QuickComb support. (Note: save and reuse holders.) On a flat surface, insert sample cup in the space provided, then transfer approximately 35 mL of the liquid portion from above the settled sample into the sample cup. Use a fresh pipette from the kit, or pour slowly and carefully, until the depth of the sample is level with the upper surface of the cardboard holder. Important: Avoid transferring particles as much as possible, and after transfer, allow the liquid in the sample cup to settle for 30 seconds so that any particles will settle at the bottom of the cup.
9. To prevent cross-contamination, thoroughly clean blender parts and jars to remove dust and residue prior to preparation of each sample, and use a new sample cup for each. If pipetting, always use a new pipette for each sample.

Corn Common Extraction™
g of corn X 1.5 = mL of water

Example:
800 kernel sub-sample with an average kernel weight of 0.3g.

0.3 g X 800 =240 g…
240 X 1.5 =360 mL water



Fill with extract until even with holder's upper surface

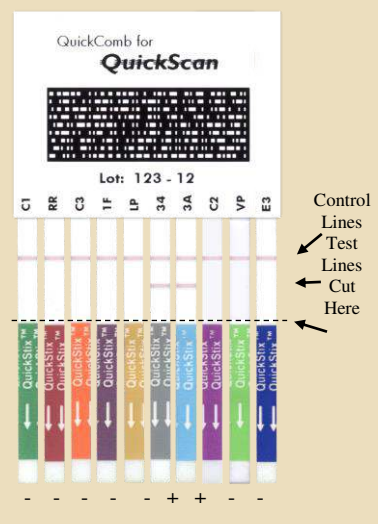
How to Run the QuickComb Test

1. Remove a QuickComb from the foil bag and return unused combs to original container (avoid handling loose comb end). Use the blank space on the back of the comb to label sample, if desired. Place the QuickComb into the sample cup, using the comb support to hold the it upright, and being sure to insert the end indicated by the arrows on the protective tape.
2. After inserting the comb into the extract, liquid will travel up the membrane strips toward the absorbent pads at the top of the strips. Soon after complete wetting of the membranes, lines will appear on the membranes approximately 1/4 inch below the top absorbent pad. These are the Control Lines.
3. Allow the strips to develop for a full 5 minutes before making final assay interpretations. Remove the QuickComb from the cup; cut off and discard the bottom section of each strip covered by the arrow tape; and place QuickComb in the QuickScan Reader - combs must be read immediately after cutting, while still wet.

Interpreting the Results

Development of the Control Lines within 5 minutes indicates that the strips have functioned properly. Any strip that does not develop a Control Line should be discarded and the sample re-tested using another strip.

Results are scanned and interpreted quantitatively with the QuickScan System. Place QuickComb into the carrier, slide in, and press "Read Test" on the screen. QuickScan will return a result as "% GMO" or "<LOD" (less than the Limit of Detection) for each strip on the comb. Please consult the QuickScan User Manual for details.



Kit Storage

This QuickComb Kit should be stored at room temperature, or refrigerated for longer shelf life. Please note the shelf life on the kit box for each storage temperature. The kit may be used in field applications; however, prolonged exposure to high temperatures may adversely affect the test results. Important: do not open the foil bag until ready to use the combs. Allow container to come to room temperature before opening to prevent condensation.

Precautions and Notes

- The QuickComb is designed to give quantitative results using the QuickScan System and is not intended to be visually interpreted.
- As with all tests, it is recommended that results be confirmed by an alternate method when necessary.
- The assay has been optimized to be used with the protocol provided in the kit. Deviation from this protocol may invalidate the results of the test.
- The results generated through the proper use of this kit reflect the condition of the working sample directly tested. Extrapolation as to the condition of the originating lot, from which the working sample was derived, should be based on sound sampling procedures and statistical calculations which address random sampling effects, non-random seed lot sampling effects and assay system uncertainty. A negative result obtained when properly testing the working sample does not necessarily mean the originating lot is entirely negative for the analyte or protein in question.
- Protect all components from hot or cold extremes of temperature when not in use. Do not leave in direct sunlight or in a vehicle.
- USDA References:
  - **www.gipsa.usda.gov/fgis/handbook/BK1/BookI_2015-09-18.pdf** - USDA Grain Inspection Handbook, Book 1, Grain Sampling.
  - **www.gipsa.usda.gov/fgis/biotech/sample2.htm** - Guidance document entitled Sampling for the Detection of Biotech Grains.
  - **www.gipsa.usda.gov/fgis/biotech/sample1.htm** - Practical Application of Sampling for the Detection of Biotech Grains.
  - **www.gipsa.usda.gov/fgis/biotech/samplingplan1.xlsx** - This website provides a simple to use Sample Planner (29K Excel Spreadsheet). The planner allows you to enter different assumptions in terms of sample size, number of samples, acceptable quality level and to determine the probability of accepting lots with given concentration levels. It also plots the probabilities in graph form for easy interpretation. Specific data can be saved for documentation and future analyses.

LIMITED WARRANTY

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This Limited Warranty states the entire obligation of EnviroLogix with respect to the Products. If any part of this Limited Warranty is determined to be void or illegal, the remainder shall remain in full force and effect.

License

EnviroLogix has developed this kit using proprietary reagents as well as reagents licensed from Monsanto Company.

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Jaguariuna/SP, CEP 13820-000, Brasil

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Página na web: www.envirologix.com.br

ENVIROLOGIX

TotalTrait™ Soy Comb

Catalog No. AQ 076 TCK 267/2367

Intended Use

This TotalTrait™ Comb is designed to extract and detect the presence of certain proteins at the levels typically expressed in genetically modified soybeans. The TotalTrait Comb may contain the following QuickStix™:

Protein/Trade Name	Sensitivity
CP4 EPSPS / Roundup Ready®	1 soybean in 400 (0.25%)
DMO / Roundup Ready 2 Xtend	1 soybean in 400 (0.25%)
PAT/pat / LibertyLink®	1 soybean in 200 (0.50%)
2m EPSPS / Balance GT27™	1 soybean in 1000 (0.10%)

Contents of Kit:

- 100 or 40 TotalTrait Combs, packaged 5 combs per foil pouch
- Sample cups and disposable transfer pipettes

Items Not Provided:

- QuickScan System*
- Blender for sample prep:
  1. Oster® Sunbeam blender model #4094 or equivalent (with 4 oz. polystyrene blender jar, ice crusher blade, gasket, and blender base)
     ~or~
  2. Waring blender model 31BL91 or equivalent (with glass Mason jars and jar adapter [Eberbach #E8495] along with protective cover
     ~or~
  3. BUNN coffee grinder (industrial style grinder set on AutoDrip setting), plus extraction vessels for sample and water
- Graduated cylinder
- Tap water
- Protective cover for blender jar while grinding
- Digital scale for weighing samples
- Timer
- Scissors

How the Test Works

In order to detect the proteins expressed by genetically modified bulk grain, the sample must first be extracted to solubilize the protein. All QuickStix included in the TotalTrait Comb are specially formulated to detect their analytes in a Common Extraction.

Each QuickStix Strip has an absorbent pad at each end. The protective tape with the arrow indicates the end of the strips to insert into the reaction cup. The sample will travel up the membrane strips and be absorbed into the larger pad at the top of the strip. The portion of the strip between the protective tape and the absorbent pad at the top of the strip is used to view the reactions as described under "Interpreting the Results." Results may then be scanned and interpreted quantitatively with the EnviroLogix QuickScan System. Please avoid bending the comb.

Sample Preparation

Step 1: Determine Number and Size of Sub-samples

1. Collect a composite sample according to USDA/FGIS instructions found in the reference documents listed in Precautions and Notes.
2. The following is another helpful reference for use in designing a sampling plan: Remund, K.M., Dixon, D.A., Wright D.L., Holden, L.R. "Statistical considerations in seed purity testing for transgenic traits", Seed Science Research, June 2001, Vol. 11 No.2, pp. 101-119.
3. To select the appropriate sample size, determine the purity standard and the degree of confidence required. Confidence level means the statistical probability that the % of GMO soybeans in the lot is below the selected purity standard. This calculation should be done for each trait tested, then choose the largest sub-sample volume result.

Step 2: Determine Sub-sample Weight, Jar Size, Grind Times and Water Volume Needed for Sample Preparation

1. Determine the **average weight** of the grain from the lot to be tested. Count and weigh 100 kernels/seeds, then divide by 100.
2. Calculate the sub-sample weight (g) needed for testing, (number of seeds X **average seed weight)**.
3. Calculate water volume needed for sample preparation. The Soybean Common Extraction uses a water volume to sample weight ratio of **5 to 1.**

   Example Calculation using a 100 seed sub-sample with an average seed weight of 0.15g.
   0.15g x 100 =15 g x 5 mL = 75 mL water for extraction
4. Choose an appropriate jar size and grind time based on the type of blender available for sub-sample preparation (see Table 2). Oster Sunbeam Blender with ice crusher blade is recommended over the Waring Blender for its bean grinding efficiency. (Note that bean grind time is longer and requires additional steps* when using a Waring Blender). The grind quality should be such that 40-50% passes through a 20-mesh sieve.

Table 2 - Soybeans

# of Beans (approximate)	Blender Type	Sub-sample weight (g)	Jar size (oz.)	Grind Time on High Speed
100-200	Oster Sunbeam	16-38	8	20 seconds
100	Waring	16-38	8	60 seconds (2 X 30 sec.*)
200-400	Waring	38-65	16	60 seconds (2 X 30 sec.*)

* For best results blend beans for ½ of total time, remove the jar and shake to redistribute larger particles, replace and resume grinding.

Step 3: Prepare the Sample

1. Weigh sample into the appropriate vessel.
2. Put protective cover over glass jars.
3. Grind sample on high speed all whole beans are finely ground.
4. Add the volume of tap water calculated above (see formula above or at left).
5. Cap and shake jar vigorously for 30 seconds, ensuring that the entire sample is wet. Sample will begin to settle immediately and liquid can be drawn off at that time. Avoid pulling up particles with the transfer pipette.
6. Transfer 12 mL of the liquid portion from above the settled sample into the sample cup. The level should be above the bottom of the arrows but below the top of the lower colored portion of the TotalTrait Comb strips.
7. To prevent cross-contamination, thoroughly clean blender parts and jars to remove dust and residue prior to preparation of each sample and use a new sample cup for each. If pipetting, use a new tip or disposable pipette for each sample.

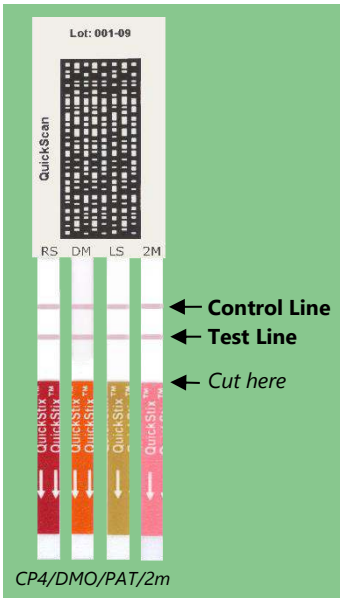
How to Run the TotalTrait Comb Test

1. Allow refrigerated foil pouch to come to room temperature before opening. Remove the combs to be used. Avoid bending the strips or handling the loose comb end.
2. Place the comb into the three-ounce cup containing 12 mL of the liquid soybean extract. The sample will travel up the strips.
3. Allow the comb to develop for 5 minutes before making final assay interpretations.
4. Remove the TotalTrait Comb from the cup. Cut off and discard the bottom section of each strip covered by the arrow tape, and insert into QuickScan for reading.

Note: Use extreme caution to prevent sample-to-sample cross-contamination with grain, fluids or disposables.

Use of the QuickScan System

Detailed instructions for use of the QuickScan System are supplied with each unit and can also be found at envirologix.com/support. In summary, the TotalTrait Comb is inserted into the reader and the strips are read by touching or clicking on the "Read Test" area of the screen. TotalTrait combs utilize the QuickScan Software feature "TotalTrait GMO Soy Sum," a proprietary feature than when activated returns the most accurate GMO total when screening for today's traited soybeans. Activation and use of the TotalTrait GMO Soy Sum is recommended over the legacy GMO Soy Sum. Results are then recorded in an electronic worksheet, allowing each user to report and track data easily.



Interpreting the Results

Development of the Control Lines within 5 minutes indicates that the strips have functioned properly. Any strip that does not develop a Control Line should be discarded and the sample re-tested using another comb or corresponding strip.

Results are scanned and interpreted quantitatively with the QuickScan System. QuickScan will return a result as "% GMO" or "<LOD" (less than the Limit of Detection). Please consult the QuickScan User Manual for details.

Kit Storage

This Kit may be stored at room temperature or refrigerated for longer shelf life. Please note the shelf life on the kit box for each storage temperature. The Kit may be used in field applications; however, prolonged exposure to high temperatures may adversely affect the test results. **Important: do not open the foil pouch until ready to use the combs. Allow container to come to room temperature before opening to prevent condensation.**

Precautions and Notes

- This kit is designed to be read quantitatively when used with the QuickScan System.
- As with all tests, it is recommended that results be confirmed by an alternate method when necessary.
- The assay has been optimized to be used with the protocol provided in the kit. Deviation from this protocol may invalidate the results of the test.
- The results generated through the proper use of this kit reflect the condition of the working sample directly tested. Extrapolation as to the condition of the originating lot, from which the working sample was derived, should be based on sound sampling procedures and statistical calculations which address random sampling effects, non-random seed lot sampling effects and assay system uncertainty. A negative result obtained when properly testing the working sample does not necessarily mean the originating lot is entirely negative for the analyte or protein in question.
- Protect all components from hot or cold extremes of temperature when not in use. Do not leave in direct sunlight or in a vehicle.
- CAUTION: Tightly closed containers of soy extract, if left sitting for several hours, may ferment and cause the lid or container to burst. Dispose of extract when testing is complete.

- USDA/AMS/FGIS (formerly GIPSA) References:
  - www.gipsa.usda.gov/fgis/handbook/BK1/BookI_2015-09-18.pdf - USDA Grain Inspection Handbook, Book 1, Grain Sampling.
  - www.gipsa.usda.gov/fgis/biotech/sample2.htm - Guidance document entitled Sampling for the Detection of Biotech Grains.
  - www.gipsa.usda.gov/fgis/biotech/sample1.htm - Practical Application of Sampling for the Detection of Biotech Grains.
  - www.gipsa.usda.gov/fgis/biotech/samplingplan1.xlsx - This website provides a simple to use Sample Planner (29K Excel Spreadsheet). The planner allows you to enter different assumptions in terms of sample size, number of samples, acceptable quality level and to determine the probability of accepting lots with given concentration levels. It also plots the probabilities in graph form for easy interpretation. Specific data can be saved for documentation and future analyses.

LIMITED WARRANTY

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This Limited Warranty states the entire obligation of EnviroLogix with respect to the Products. If any part of this Limited Warranty is determined to be void or illegal, the remainder shall remain in full force and effect.

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QuickStix™ Kit for QuickScan - CP4 EPSPS Ground Alfalfa Hay

Catalog Number AQ 045 AH *Part # 11968*

Contents of Kit:

- *50 QuickStix Strips packed in a moisture-resistant canister*
- *20X EB2 Extraction Buffer Concentrate**
- *reaction vials*
- *transfer pipettes*

**1X Extraction Buffer must be prepared from 20X Concentrate*

Items Not Provided:

- *Oster blender or equivalent for grinding hay*
- *Portable scale to weigh ground hay (ProScale CP-120 or equivalent)*
- *40-mesh sieve (optional)*
- *Graduated cylinder†*
- *Sample extraction vessels (eg, disposable sample cups with lids)†*

† Available through EnviroLogix as Accessories, see page 3

Use Oster Blender or equivalent

40 mesh sieve size equates to particles that are 420 microns (0.42mm) in size

Intended Use

This EnviroLogix QuickScan Kit for CP4 EPSPS Ground Alfalfa Hay detects and quantifies CP4 EPSPS protein in ground alfalfa hay at 0.1%, dependent upon the expression level of the Roundup Ready plant.

This test is intended to give the producer, purchaser, or exporter a screening method for identification of the presence of Roundup Ready alfalfa hay from ground hay samples at levels of 0.1%, based on weight/weight (w/w) ratios. The results of each sample tested are only as representative as the sample is of the entire lot, so adherence to proper principles of hay sampling is key; see "Important-Representative Sample" below.

How the Test Works

In order to test for the CP4 EPSPS protein expressed by Roundup Ready alfalfa hay, an extract of the composite hay sample must be prepared. Extracts of cored hay and ground hay are prepared for testing using different methods (see Sample Preparation section).

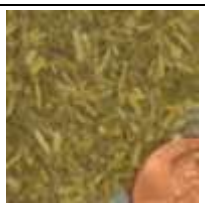
Each QuickStix Strip has an absorbent pad at each end. The protective tape with arrows indicates the end of the strip to insert into the sample extract. The sample travels up the membrane strip and is absorbed into the larger pad at the top of the strip. The portion of the strip between the protective tape and the absorbent pad at the top of the strip is used to view the reactions as described under “Interpreting the Results.” Results are scanned and interpreted quantitatively with the EnviroLogix QuickScan System. Please avoid bending the strips.

Sample Preparation

Prepare 1X Extraction Buffer: *Mix 50 mL of 20X Concentrate with 950 mL of distilled or deionized water. Store refrigerated when not in use; allow to come to room temperature before using.*

Important-Representative Sample: It is very important that the sample tested is **representative of the entire lot of hay**. A composite sample for each hay lot is required to run the test. A helpful reference is "Sampling Considerations for Detection of Genetically Engineered (GE) Traits in Alfalfa Hay" by Dan Putnam, University of California, Davis. Once a representative sample has been obtained, grind hay using an Oster blender or equivalent to a consistency that will allow ground materials to pass through a 40-mesh sieve, see illustration below showing grind quality.

Unground sample



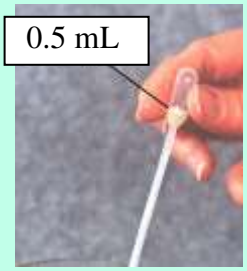
Ground for 1 minute, contains plenty of 40-mesh particles—test the finest particles possible

Example of a sample sifted through 40-mesh sieve

Carefully weigh out sample and measure 1X Extraction Buffer

Shake well – the sample may tend to clump together and/or adhere to the cup, so check carefully and make sure all dry material is wet

Tip sample cup if needed to avoid particulates when pipetting



Transfer 0.5 mL to reaction vial

Important-Clean Between Samples: All grinding and weighing equipment, as well as testing surfaces, must be **cleaned thoroughly if a sample tests positive** to ensure there is no cross-contamination to the next sample. It is advisable that disposable pipettes and vials be stored closed and only removed when used to prevent the potential for dust affecting the performance of the test on subsequent samples. If possible, use separate rooms for grinding/weighing and testing.

1. After grinding composite sample, **remove 1 gram** and place in the extraction vessel. Use a balance to weigh out ground material carefully and avoid cross-contaminating samples with hay fines. Measure carefully and **add 80mL** of prepared 1X Extraction Buffer to the disposable sample cup containing hay and securely close the lid.
2. Shake cup for 1 minute by hand. Look at the bottom of the cup and confirm that all material is wet from the shaking process before proceeding. Continue shaking until all material is wet.
3. Draw up enough liquid portion from the settled sample to fill the long narrow tip of the transfer pipette up to the line at the top of the flared portion of the pipette bulb (see illustration, left). Avoid pulling up particles. Dispense extract (~0.5 mL) into reaction vial.

How to Run the QuickStix Strip Test

1. Allow refrigerated canisters to come to room temperature before opening. Remove the QuickStix Strips to be used. Avoid bending the strips. Reseal the canister immediately.
2. Place one strip, colored arrows pointing down, into the reaction vial containing extract. The sample will travel up the strip.
3. Allow the strip to develop for 5 minutes before making final assay interpretations.
4. Immediately cut off and discard the bottom section of the strip covered by the arrow tape and place in the QuickScan Reader. Strips must be read while still wet. Alternatively, strips may be read visually at this point. Do not save strips.

NOTE: Use extreme caution to prevent sample-to-sample cross-contamination with hay, dust, fluids, or disposables.

Interpreting the Results

Development of the Control Line within 5 minutes indicates that the strip has functioned properly. Any strip that does not develop a Control Line should be discarded, and the sample re-tested using another strip.

Results are scanned and interpreted quantitatively with the QuickScan System. Place QuickStix into the carrier, slide in, and press "Read Test" on the screen. QuickScan will return a result as "% GMO" or "<LOD" (less than the Limit of Detection). Please consult the QuickScan User Manual for details.

The test may be used qualitatively without the use of QuickScan. A visible pink test line will appear if the sample contains 0.1% CP4 EPSPS or more.

If the extract is from a sample with less than 0.1% CP4 EPSPS, the strip will only develop the Control Line.

Kit Storage

This kit can be stored at room temperature, or refrigerated for a longer shelf life. Please note the shelf life on the kit label for each storage temperature. The kit may be used in field applications; however, prolonged exposure to high temperatures may adversely affect the test results. Do not open the desiccated canister until ready to use the test strips.

Precautions and Notes

- This kit is designed to give quantitative results using the QuickScan System and may also be visually interpreted.
- The strips will detect Roundup Ready protein in sample extracts prepared following the specified extraction procedure at composite hay levels of approximately 0.1% (w/w) Roundup Ready alfalfa or more, and is dependent upon the expression level of the Roundup Ready alfalfa plant.
- An example of a 0.1% (w/w) sample would be a mixed composite sample containing 0.1 grams of Roundup Ready alfalfa hay and 99.9 grams of conventional alfalfa hay.
- This product is currently not applicable for use in any other crop.
- As with all tests, it is recommended that results be confirmed by an alternate method when necessary.
- The assay has been optimized with the protocol and with the buffer provided in the kit. Deviation from this protocol may invalidate the results of the test.
- The results generated through the proper use of this diagnostic tool reflect the condition of the working sample directly tested. Extrapolation as to the condition of the originating lot, from which the working sample was derived, should be based on sound sampling procedures and statistical calculations which address random sampling effects, non-random seed lot sampling effects and assay system uncertainty. A negative result obtained when properly testing the working sample does not necessarily mean the originating lot is entirely negative for the analyte or protein in question.
- A negative result with this kit does not mean that the sampled tissue has not been otherwise genetically modified.
- It is not safe to conclude that a sample is negative before a full 5 minutes have elapsed.
- Protect all components from hot or cold extremes of temperature when not in use. Do not leave in direct sunlight or in vehicle.

Accessories available through EnviroLogix

▪ Sample cups with lids (50)	ACC 012	11224
▪ Sample cups with lids (500/case)	ACC 012-CS	10167
▪ Graduated cylinder (100 mL)	ACC 068	11207

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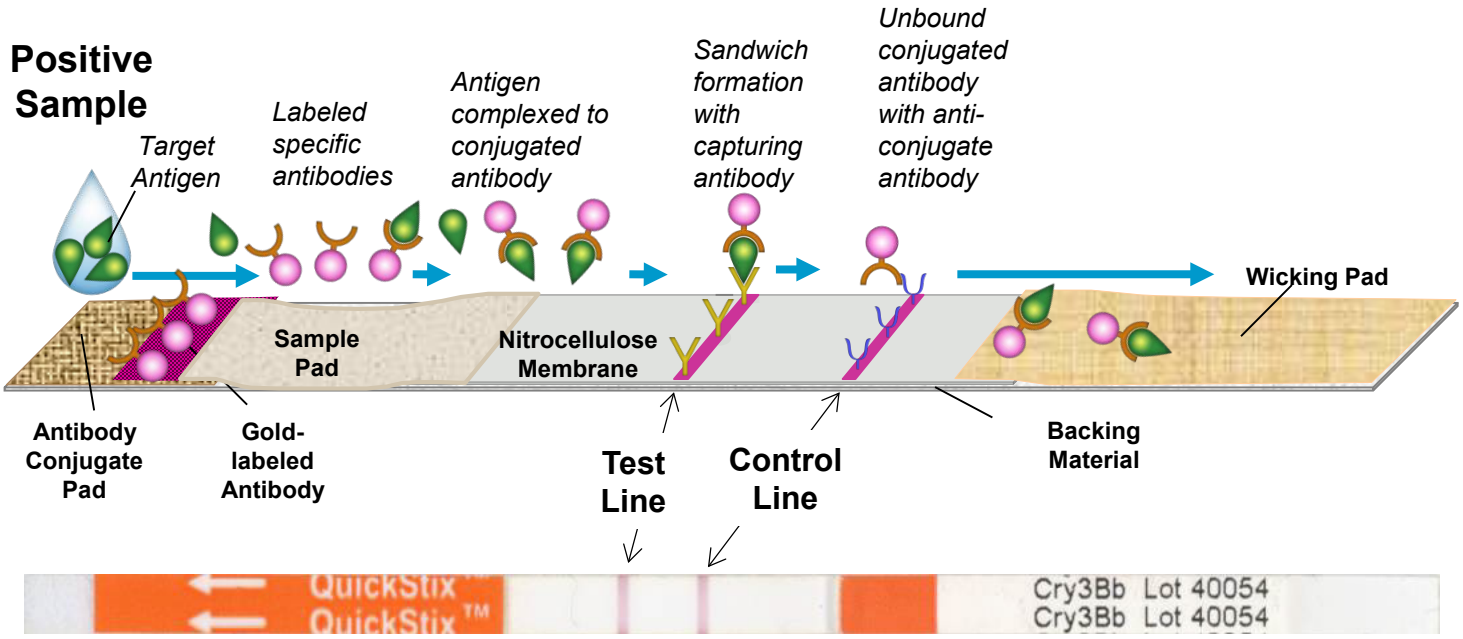
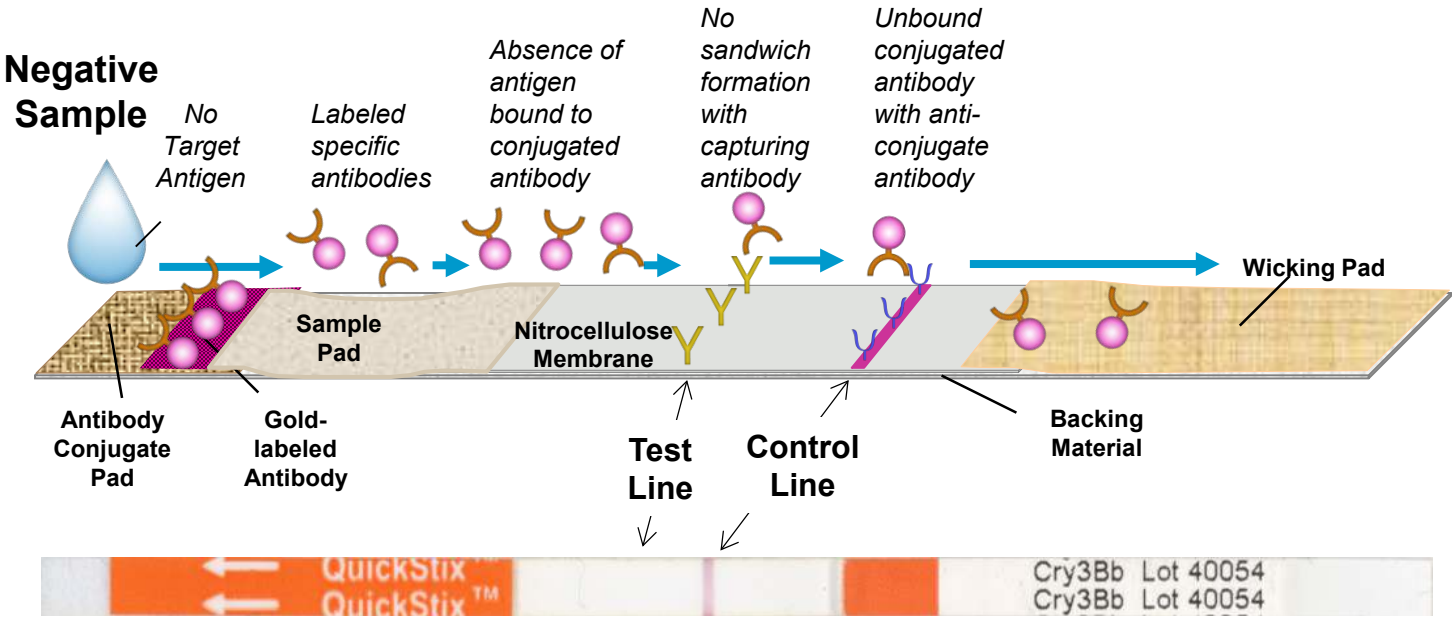
Lateral Flow Devices - LFDs

Sandwich Assay

Cross-Sectional View - Positive Result



Cross Sectional View - Negative Result



GMOs in Corn - Event Summary

		Herbicide (glyphosate) resistance					Herbicide (dicamba) resistance	Herbicide (glufosinate) resistance		Herbicide (2,4-D) resistance	Corn Borer and other lepidopteran pest resistance						Corn Rootworm and other coleopteran pest resistance					Drought resistance	Amylase boost for ethanol
		NK603 (RR) *AS 010 AQ 010 AP 010*	MON 87427 (RR)	MON 87419 (RR+ DMO)	MON 87411 (RR+ C3+ dvs)	GA21 (mEPSPS)	DMO	T25 (PAT/pat) *AS 014 AQ 014 AP 014*	(PAT/pat) unattributed	DAS 40278 (aad-1)	Bt11 (Cry1Ab) *AS 003 AQ 003 AP 003*	Mon810 (Cry1Ab) *AS 003 AQ 003 AP 003*	Mon 89034 (Cry1A.105 +Cry2Ab2) *AS 005 AP 005 (Cry2)*	MIR162 (Vip3A) (no corn borer res.) *AS 085 AP 085*	TC1507 (Cry1F) *AS 016 AP 016*	DP 4114 (Cry1F+Cry34)	DAS 59122-7 Cry34/35 *AS 054 AP 054*	MIR604 mCry3A *AS 037 AP 037 AP 050*	Mon863 (Cry3B) *AS 015 AP 015*	Mon 88017 (Cry3B+ RR) *AS 015 AP 015*	5307 eCry3.1Ab *AP 074 AQ 074 AS 074*	MON 87460 *(cspB) AS 027*	Event 3272, *amy797E AS 070 AP 070*
Syngenta	Agrisure GT																						
	Agrisure CB										x												
	Agrisure RW																	x					
	Agrisure Artesian										x							x					
	Agrisure 3000GT										x							x					
	Agrisure Viptera 3122										x				x		x	x					
	Viptera 3110 Stack (Viptera+GT/CB/LL)										x			x									
	Viptera 3111 Stack (Viptera + 3000GT)										x			x				x					
	Viptera 3220 Stack (Vip+GT/CB/LL+Hx)										x			x	x								
	Viptera 4										x			x				x					
	Duracade																				x		
	Duracade 5112										x				x			x			x		
	Duracade 5222										x			x	x			x			x		
	Enogen																						x
	Enogen + 3000										x							x					x
Monsanto	RoundupReady	x																					
	RoundupReady (reg w/all SS traits)		x																				
	Yieldgard Corn Borer											x											
	YG Rootworm																		x				
	YGPlus											x							x				
	YG VTRW	x																			x		
	YG VT Triple	x										x									x		
	Genuity VT Dbl PRO	x											x										
	Trecepta	??? Or -->											x	x									
	Genuity VT Triple PRO	x											x								x		
	Genuity SmartStax	x						x					x		x		x				x		
	??											x							x				
	Genuity DroughtGard (registered with NK, 88017, 88017+89034, and NK+89034)																					x	
Dow	Enlist																						
	Enlist x RR	x																					
	PowerCore	x											x		x								
	Enlist + PowerCore	x											x		x								
	??	x											x		x						x		
	??	x											x		x		x				x		
	Herculex I														x								
	Herculex I + RR	x													x								
	Herculex RW							x									x						
	Herculex RW / RR2	x															x						
	Herculex Xtra							x							x		x						
	Quad-Stack (Xtra+RR2)	x						x							x		x						
	SmartStax	x						x					x		x		x				x		
DuPont/Pioneer	Qrome	x						x				x			x	x	x	x					
	Optimum AcreMax							?				x			x								
	Optimum AcreMax1							x							x		x						
	Optimum AcreMax2							x				x			x		x						
	Opt. AcreMax Xtra Opt. Intrasect Xtra	x										x			x		x						
	Optimum TRIsect	x						?							x			x					
	Optimum Intrasect	x						?				x			x								
	Opt. Intrasect Xtreme	x						x				x			x		x	x					
Bayer	AS 014 AP 014 LibertyLink							x															
	Cry1LL							x				x											
	InVigor Maize											x											

= not detectable by our BG test

GMOs in Cotton - Event Summary

		Herbicide (glyphosate) resistance			Herbicide (glufosinate) resistance		Dicamba	2,4-D	Isoxaflutole HPPD	Bollworm, budworm, other lepidopteran pest resistance								
		MON1445 *AS 011 AP 010*	MON 88913 *AS 011 AP 010*	GHB614 (2mEPSPS) *AS 084 AP 084*	PAT/*pat* *AP 014 AS 014*	PAT/*bar* (LLcotton25) *AP 013 AS 013*	MON 88701 *(dmo) AS 050 AP*	DAS 81910 *(aad-12) AS 418*	GHB811 *(hppd) AS 026 Restrict*	MON 15985 Cry1Ac/2A AS 005 Cry2 *AP 051*	MON531 (Cry1Ac) *AP 003 AS 003*	DAS 21023 (Cry1Ac-*Btk*) *AS 003*	COT67B *(Cry1Ab) AS 003*	T304-40 (Cry1Ab) *AS 088 (1Ab/2Ae)*	GHB 119 (Cry2Ae) *AS 083 AP*	DAS 24236 (Cry1F-*Bta*) *AP 016 AS 016*	COT102 Vip3A (Bt) *AS 485*	MON88702 Lygus Cry51 *AS 051*
Bayer/legacy Monsanto	Roundup Ready	x																
	RR Flex		x															
	Bollgard										x							
AS 034	Bollgard/RR	x									x							
AS 012 AP 051	Bollgard II									x								
AS 046	Bollgard II/RR	x								x								
AS 046	Bollgard II/RR Flex		x							x								
	RR Flex/Xtend		x				x											
AS 079	BG II XtendFlex		x		x		x			x								
	Bollgard III									x							x	
	Bollgard III/RRF		x							x							x	
	BG III/RRF/DMO		x				x			x							x	
AS 096	New stack?		x				x			x							x	x
Dow	Cry1Ac				x							x						
	Cry1F				x											x		
	Widestrike				x							x				x		
AS 060	Widestrike/RR	x			x							x				x		
	Widestrike/RR Flex		x		x							x				x		
	Widestrike 3											x				x	x	
	WS 3/RR Flex		x		x							x				x	x	
	Enlist??																	
	Enlist commercial1											x				x	x	
	Enlist commercial2		x									x				x	x	
BASF/legacy Bayer	Fibermax - LL					x												
	Fibermax - RR	x				x												
AS 047	Fibermax - BGII					x				x								
	GlyTol			x														
AS 089	GlyTol/LL (H2)			x		x												
	TwinLink																	
	TwinLink Plus																x	
AS 025	GlyTol/LL/TwinLink			x		x												
	GlyTol/LL/TLPlus			x		x											x	
	GlyTol/BGII/Vip			x						x							x	
	HPPD Resistant																	
	HPPD MULTI																x	
Syn-genta	VipCot / RR Flex		x										x				x	

x = not detectable = not detectable by our test

GMOs in Soybeans - Event Summary

		Herbicide (glyphosate) resistance					Herbicide (glufosinate) resistance		Imidazolinone (Cultivance)	Isoxaflu- tole HPPD Balance Bean	Mesotrione & Isoxaflu-tole HPPD	2,4-D		Insect Resistance (lepidopteran)			Output Traits High-Oleic		Output Trait ethylene
		GTS 40-3-2 AQ 010 *AS / AP 010*	MON 89788 *AQ 010 AQ 010 AP 010*	MON 87712 (CP4+ bbx photosy)	MON 87769 CP4+ Pj/Nc mod oil	2m EPSPS	PAT/*pat* *AQ 014 AS 014 AP 014*	MON 87708 *(dmo) AS 050*	CV 127 *(csr1-2)*	FG72, HPPD w336 & 2mEPSPS	SYHT0H2 avhppd-03	DAS 68416 aad-12 & pat	DAS 44406 aad-12 & 2m & pat	MON87701 Cry1Ac *AS-AQ 433 AP 003*	MON87751 Cry1A.105+Cry2A *AQ098 BGBR*	DAS81419 LL & C1Ac & Cry1F	MON87705	DP305423	HB4
Bayer/legacy Monsanto	Roundup Ready	x																	
	Roundup Ready		x																
	(diff promoter) Roundup Ready			x															
	Roundup Ready				x														
	Intacta RR2 Pro (aka Genuity RR2Yield)		x											x					
AS 062	Genuity RR 2 Xtend		x					x											
	Intacta2 Xtend		x					x						x					
	Vistive Gold		x																
	Vistive Gold +??		x					x											
Du Pont Pioneer	BOLT (native + RR)		x																
	Plenish																		
	Plenish+RR (95%+)	x																	
BASF/legacy Bayer	A2704-12,21						x												
	???						x												
	A5547-127,35						x												
	???						x												
	GU262						x												
	W62, W98						x												
	GT27																		
	LL GT27						x												
BASF	Cultivance CV127																		
DOW	Conkesta																		
	Enlist																		
	Enlist + RR 'Duo'		x																
	Trade name?																		
	Conkesta Enlist E3																		
SYNGENTA	MGI						x				x								
Verdeca																			

GMOs in Alfalfa - Event Summary

			Herbicide (glyphosate) resistance						Output traits		
			MON00101 J101 *AS 045*	MON00163 J163 *AS 045*					MON00179 KK179 (lignin)		
Monsanto	AS 045	Roundup Ready	x								
	AS 045	Roundup Ready		x							
	AS 045	Roundup Ready (J101 x J163)	x	x							
		HarvXtra (stacked w/RR, not sure which)	x						DNAble only		

x = *not detectable by our test* = *no test*

GMOs in Canola - Event Summary

			Herbicide (glyphosate) resistance					Herbicide (oxynil) resist	Herbicide (glufosinate) resistance								Output traits		
			MON 89249-2 CP4 GT200/RT200 *AS 017*	MON 00073-7 CP4 (GT73/RT73) *AS 017*	MON 88302 CP4 EPSPS *AS 017*	73496 gat4621	61061 gat4621	OXY-235 bxn	PAT/pat HCN 28 (T45) *AS 040 LS*	PAT/bar HCN 10	PAT/bar HCN92	PAT/bar & barnase MS1	PAT/bar & barnase MS8	PAT/bar & barstar RF1 *AP125 Barstar*	PAT/bar & barstar RF2 *AP125 Barstar*	PAT/bar & barstar RF3 *AP125 Barstar*	PAT/bar, barnase & barstar PHY14,23,35,36 *AP125*	MON 23-18-17 (Event18) (lauric acid)	MON 23-198 (Event 23) (lauric acid)	MPS 961/2/3/4 phos. uptake
Monsanto	AS 017	Roundup Ready	x																	
	AS 017	Roundup Ready		x																
	AS 017	TruFlex Rdp. Ready			x															
		Laurical																		
		Laurical																		
Bayer	AS 040 LS	InVigor							x											
		InVigor TruFlex			x				x											
		LL Independence																		
		LL Innovator																		
		LL Innovator TruFlex			x															
		InVigor																		
		InVigor TruFlex			x															
		InVigor																		
		InVigor																		
		InVigor																		
		InVigor																		
		InVigor																		
		InVigor TruFlex			x															
		InVigor TruFlex			x															
		??		x																
		InVigor																		
		InVigor																		
		InVigor																		
		??			x															
		InVigor																		
		Navigator																		
DuPont Pioneer		Optimum Gly																		
		no name yet																		
		(no name yet)																		
BASF		Phytaseed																		

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