

### Highlights:

- Results in 5 minutes or less
- Available as 100-strip individual kits, or bulk-packaged strips

### Contents of Kit:

- 100 QuickStix Strips packed in two moisture-resistant canisters
- 100 Disposable Tissue Extractors (each consisting of a tube and pestle, with punch cap)
- 4 bottles (16 mL each) of Extraction Buffer

*Bulk-packaged kits can be purchased with or without Tissue Extractors, and will include Extraction Buffer Salts instead of dropper bottles of buffer.*

*Contact Envilab to order bulk-packaged strips.*

*To prepare the Extraction Buffer, dissolve one package of Buffer Salts and 2.5 mL of Surfactant into 1 liter of distilled or deionized water and mix until dissolved.*



*Obtain Leaf Tissue*

*Catalog Number AS 014 LS*

## Intended Use

The EnviroLogix QuickStix Kit for LibertyLink is designed to extract and detect the PAT/*pat* protein at levels typically expressed in LibertyLink corn leaf and seed tissue. The PAT/*pat* protein can be found in T25 corn, Herculex™ I, and YieldGard® Corn Borer (Bt11) corn. For PAT/*pat* detection in corn bulk grain, please use QuickStix Cat. No. AS 014 BG.

## How the Test Works

Corn that has been genetically modified with a *pat* gene expresses PAT/*pat* protein in its tissue. To detect the protein with the QuickStix Strip, tissue samples must be extracted and the protein solubilized in the Extraction Buffer provided.

Each QuickStix Strip has an absorbent pad at each end. The protective tape with the arrow indicates the end of the strip to insert into the extraction tube. The sample will travel up the membrane strip 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.”

## Sample Preparation

### To extract corn leaf tissue:

1. Sandwich a section of leaf tissue between the cap and body of the Disposable Tissue Extractor tube; snap two circular tissue punches by closing the cap. Push the leaf punches down into the tapered bottom of the tube with the pestle. Sample identification should be marked on the tube with a waterproof marker.
2. Insert the pestle into the tube and grind the tissue by rotating the pestle against the sides of the tube with twisting motions. Continue this process for 20 to 30 seconds or until the leaf tissue is well ground.
3. Uncap the bottle of Extraction Buffer and invert it directly over the Tissue Extractor tube. Carefully squeeze 10 drops (0.25 mL) of Buffer into the tube containing corn leaf.
4. Repeat the grinding step to mix tissue with Extraction Buffer. Dispose of the pestle (do not re-use pestles on more than one sample).

### To extract corn seed:

1. Crush a single corn kernel (*Suggestion: Use pliers with seed in resealable bag*). Transfer to a Disposable Tissue Extractor marked with sample identification.
2. Uncap the bottle of Extraction Buffer and invert it directly over the Tissue Extractor tube. Carefully squeeze 20 drops (0.5 mL) of Buffer into the tube.



Grind Tissue



Crush single seed



Extract seed sample



Insert QuickStix



Any pink Test Line is considered positive

Alternatively, remove the dropper tip from the bottle, or use prepared Extraction Buffer made from Buffer Salts, and dispense 0.5 mL (500 microliters) into each tube using a pipette.

3. Close the tube cap securely and shake the tube vigorously for 20 to 30 seconds. Allow the solid material to settle to the bottom of the tube.
4. Repeat the protocol for each sample to be tested, using a new tube and pestle for each. Use caution to prevent sample-to-sample cross-contamination with plant tissue, fluids, or disposables.

## 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 the strip into the Tissue Extractor. The sample will travel up the strip. Use a rack to support multiple tubes if needed.
3. Allow the strip to develop for 5 minutes before making final assay interpretations. Positive sample results may become obvious much more quickly.
4. To retain the strip, cut off and discard the bottom section of the strip covered by the arrow tape.

## 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.

If the sample extract contained PAT/*pat* protein, a second line (Test Line) will develop on the membrane strip between the Control Line and the protective tape, within 5 minutes of sample addition. *The results should be interpreted as positive for PAT/*pat* protein expression. Any clearly discernible pink Test Line is considered positive.*

If no Test Line is observed after 5 minutes have elapsed, the results should be interpreted as negative, meaning that the sample contained less PAT/*pat* protein than is typically expressed in the tissues of LibertyLink-modified plants.

**Warning:** A negative result with this test on corn seed or leaf extracts does not necessarily rule out the presence of genetically modified material in the sample.

## Kit Storage

QuickStix can be stored at room temperature, or refrigerated for a longer shelf life. 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. Do not open the desiccated canister until ready to use the test strips.



## Cross-reactivity

The following materials have been tested with this kit and have been found to cause no false positive results:

- Corn: Conventional, YieldGard® Corn Borer (Bt11, MON810), Knockout®/NatureGard® (Bt176), StarLink® (Cry9C), YieldGard Corn Rootworm (Cry3Bb), and Roundup Ready® (GA21 and Event 603).
- Soy: Conventional, Roundup Ready
- Cotton: Conventional, Roundup Ready, Bollgard® I (Cry1Ac), Bollgard II (Cry2A), and LibertyLink PAT/*bar*
- Canola: Conventional, Roundup Ready, LibertyLink (PAT/*bar*)
- Other conventional crops: Rice, sorghum, wheat, barley, sugar beet



Note: This test **will not** detect PAT/*bar* proteins as expressed in StarLink corn and LibertyLink PAT/*bar* canola or cotton. This test **will** detect PAT/*pat* proteins such as those found in LibertyLink (PAT/*pat*), YieldGard (Bt11 and PAT/*pat*), and Herculex I (Cry1F) corn; and LibertyLink (PAT/*pat*) canola. However, because of much lower expression levels in YieldGard and Herculex corn, the test lines will appear lighter than those appearing when testing LibertyLink corn.

## Precautions and Limitations

- This kit is designed for screening for presence or absence only and is not meant to be quantitative.
- As with all tests, it is recommended that results be confirmed with an alternate method if necessary.
- The assay has been optimized using the protocol and 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 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.
- A negative result with this kit does not mean that the sampled tissue has not been otherwise genetically modified.
- Warning: a strong positive result may safely be interpreted in as little as 2 minutes after sample addition. It is not safe, however, to conclude that a sample is negative before a full 5 minutes has elapsed, as a weak positive sample may require the full 5 minutes for a distinct Test Line to appear.
- Protect all components from hot or cold extremes of temperature when not in use. Do not leave in direct sunlight or in vehicle.



**For Technical Support  
Contact Us At:**

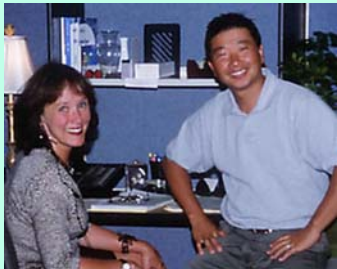
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