

## Highlights:

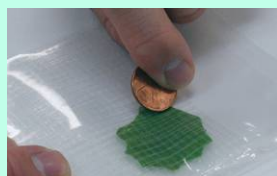
- Results in 10 minutes or less
- Simple protocol
- Accurately differentiate soybean rust from other pathogens

## Contents of Kit:

- 50 QuickStix Strips packed in moisture-resistant canisters
- 50 mesh bags
- 50 disposable pipettes
- 50 disposable reaction vials
- EB6 Extraction Buffer



Leaf sample should be approx. 1" diameter, roughly the size of the canister cap



Place leaf sample in mesh bag, rub with hard object



Add 1 pipette (5.0 mL) buffer, massage to mix

Catalog Number AS 107 LT

## Intended Use

The EnviroLogix QuickStix Kit for Soybean Rust screens for the presence of soybean rust caused by *Phakopsora pachyrhizi*. The strip test can detect the presence of the pathogen at the very early stages of infection, from chlorotic lesions (before formation of a pustule) to immature pustules (not releasing spores). During this period it is often difficult yet critical to differentiate the soybean rust symptoms from other diseases caused by bacterial, viral or fungal infections and/or insect damage. In addition, the test can also be used to detect advanced rust symptoms with uredinospores and teliospores, complementing visual inspections.

In controlled inoculation studies with levels as low as 100,000 spores/mL, this kit has been shown to detect the presence of soybean rust infection before the appearance of visual symptoms. Infection levels in the field may vary depending on environmental conditions.

## How the Test Works

This test is for use on leaf tissue that is suspected to be infected with soybean rust spores. To detect infected tissue with the EnviroLogix QuickStix Strip, leaf tissue must be extracted with the buffer provided.

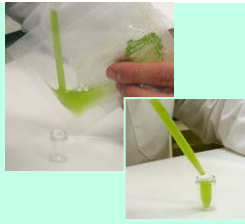
Each QuickStix Strip has an absorbent pad at both ends. The protective tape with the arrow indicates which end of the strip to insert into the extraction tube. The sample travels up the membrane strip and is absorbed into the larger pad at the top of the strip. The portion of the strip between the protective tape and the absorbent pad at the top of the strip is used to view the reactions as described under "Interpreting the Results".

## Sample Preparation

1. Select a leaf or portion of leaf that measures approximately 1" (2.5 cm) diameter and place in mesh bag (use the end of the canister as a guide). Using a hard object (e.g. coin) rub across the surface of the mesh bag against a hard surface until the leaf has transparent areas where the mesh has been forced through.
2. Add 5 mL of Extraction Buffer directly into the mesh bag (this can be done by adding 1 full draw with the provided transfer pipette). Massage the exterior of the mesh bag with fingers while holding the top of the bag closed to prevent the buffer from spilling.
3. Using the same pipette, fill the reaction vial with extract. Discard pipette and mesh bag after use.

## How to Run the QuickStix Strip Test

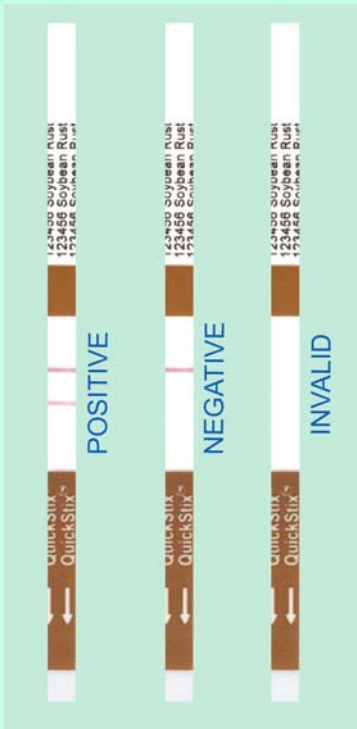
1. Allow refrigerated canisters and Extraction Buffer to come to room temperature before opening. Remove the QuickStix Strips to be used. Avoid bending the strips. Reseal the canister immediately.
2. Place the strip into the reaction vial. The sample will travel up the strip. Use the cardboard rack provided to support multiple vials.
3. Allow the strip to develop for 10 minutes before making final assay interpretations. Positive sample results may become obvious more quickly.
4. To retain the strip, cut off and discard the bottom section of the strip covered by the arrow tape.



Transfer liquid into vial with pipette



Add a test strip to the vial, wait 10 minutes



Any pink test line is considered positive

## Interpreting the Results

Development of the Control Line within 10 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 contains Soybean Rust infection, a second line (Test Line) will develop on the membrane strip between the Control Line and the protective arrow tape. The results should be interpreted as positive for soybean rust. The Test Line will typically be lighter than the Control Line.

If no Test Line is observed after 10 minutes, the results should be interpreted as negative for the sample tested. See Precautions and Notes.



Any pink Test Line is a positive result.

## Kit Storage

This QuickStix Kit 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 kit does not cross react with *Phakopsora meibomiaae*, or several other rust infections caused by *Uromyces*, *Puccinia* and *Melampsora* species. No cross reactivity was observed with other common fungal genera including *Aspergillus*, *Cercospora kikuchii*, *C. sojina*, *Fusarium*, *Penicillium*, *Peronospora mansurica*, *Pseudomonas savastanoi* pv. *Glycinea*, *Rhizoctonia*, *Rhizopus*, *Septoria*, and *Xanthomonas campestris* pv. *Glycinea*. No cross reactivity has been observed with similar-looking diseases such as frogeye leafspot, powdery mildew, downy mildew, brown spot, bacterial blight, bacterial pustule.

## Precautions and Notes

- This kit is designed for screening the presence or absence of Soybean Rust and is not meant to be quantitative. As with all tests, it is recommended that results be confirmed by alternate method.
- Important Note: The kit will detect its target pathogen regardless of the pathogen's viability. It should not be used to determine the efficacy of treatment efforts, because although the pathogen may be rendered non-viable, the protein is still present and will cause a positive result.
- 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 test is recommended to be used on single leaf sample only. Compositing or pooling of samples is not recommended and may result in false negative.
- A strong positive result may safely be interpreted in as little as 5 minutes after sample addition. It is not safe, however, to conclude that a sample is negative before a full 10 minutes has elapsed. A weakly positive sample may require the full 10 minutes for a distinct Test Line to appear.
- A negative result does not preclude the presence of soybean rust infection in other areas or at other times.
- Protect all components from hot or cold extremes of temperature when not in use. Do not leave in direct sunlight or in vehicle. A small portable cooler is recommended for field testing applications to protect the kit from extreme temperatures.



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*Alternative Method*



## APPENDIX

### PUNCH CAP METHOD

**For an alternative method of testing a suspected spot on a leaf, disposable tissue extractors are available as an accessory item (ACC #002) with the following protocol:**

1. Sandwich a section of leaf tissue between the cap and body of the Disposable Tissue Extractor tube. Include the suspected spot within the circle. Snap **two** circular leaf punches by closing the cap.
2. Push the leaf punches down into the tapered bottom of the tube with the pestle and grind by rotating the pestle against the sides of the tube with twisting motions. Write the sample identification on the tube with a waterproof marker. Use the blue foam provided in the kit to support multiple tubes.
3. Add 0.5 mL of buffer to the tissue sample (use a pipette or otherwise fill vial to the 0.5 mL mark). Insert the pestle into the tube and grind again. Continue this process for 20 to 30 seconds or until the leaf tissue is well ground.
4. Continue on to the “How to Run the QuickStix Strip Test” section. Insert the QuickStix Strip into the punch cap vial; no need to transfer extract to the reaction vial.