

Adventitious presence is a term used to describe when one type of commodity, grain, or seed is mixed with small amounts of another commodity, grain, or seed. This commingling is generally unintentional or accidental and includes both biotech and non-biotech products. Adventitious presence can occur when a biotech product, such as a herbicide tolerant soybean, is accidentally mixed into a non-biotech product like a conventional soybean variety.

## **Flow Strip Test**

Flow strip tests are antibody based tests that use a support structure in the form of a stick that has imbedded antibodies. The flow strip is placed into a liquid sample and is allowed to absorb. A positive result is indicated if lines develop after a few minutes. Many different biotech traits can be detected using this type of test including herbicide and insect resistance. Some of the crops that can be tested for biotech traits in this manner include canola, corn, cotton, and soybean. Flow strip tests can be typically performed in less than 30 minutes.

## **ELISA Test**

ELISA stands for Enzyme Linked Immunosorbent Assay and is another type of antibody based test similar to a flow strip test. In this test, a plate is used that contains wells coated with a specific antibody that targets an antigen or protein that is of interest. In the case of adventitious presence of biotech crops, the protein could be produced by the Roundup gene in biotech soybeans. The antibody captures the protein and the test allows the user to then detect the protein. The department currently conducts ELISA tests for the detection and quantification of low levels of Roundup Ready® soybean (less than 3%) in conventional soybean. ELISA tests can be performed in less than one day.

## **DNA Test**

Flow strip tests and ELISA tests detect proteins that are produced by a biotech trait. A DNA test actually targets the gene of the biotech trait or regions next to the gene using the process of PCR (polymerase chain reaction) to detect this area of interest. This test is very specific and can be used in a qualitative form (presence or absence) or a quantitative form (exact percentage) of a particular biotech trait. Many different biotech traits can be detected in this manner including those from corn, cotton, canola, and soybean. DNA tests are sensitive and can detect small amounts of biotech traits in a sample. DNA tests can be performed in 1-2 days depending upon the sample. The seed department currently conducts a qualitative DNA test in soybean for the presence or absence of the Roundup Ready gene.

## **Bioassay Test**

Herbicide bioassay tests can also be used to detect an adventitious presence in a sample. Most herbicide tolerant crops have bioassay tests that are designed to verify that a seed source has a minimum acceptable level of herbicide tolerance. These same tests can be used to identify the presence of a herbicide tolerant biotech trait in a conventional sample. Tests can be conducted for a number of biotech traits including Roundup Ready soybean, canola, and corn; Liberty® Link canola and corn, and several others including non-biotech herbicide tolerant traits such as STS soybean and Clearfield® corn, canola, and wheat. Bioassay tests usually take 7 days to complete. Several different types of herbicide bioassay tests are offered by the department including Roundup Ready soybean and canola, Liberty Link canola, and Clearfield wheat, canola, and sunflower.