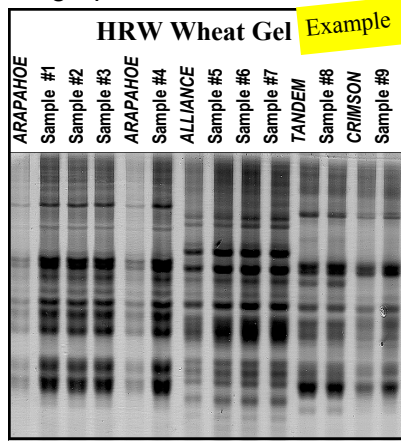


## Polyacrylamide Gel Electrophoresis (PAGE) Testing

Electrophoresis is a process which separates proteins of varying size and/or electric charge. When cereal proteins are separated the resulting banding pattern is used as a fingerprint for that particular variety. Using this technique for varietal identification is fast and economical. Primary use of polyacrylamide gel electrophoresis tests has been in variety verification by Crop Improvement Associations, but use is growing among seed companies and farmers in variety verification/identification of purchased seed (non-certified varieties). There may be the case where the producer isn't 100% sure which bin has the winter wheat vs. the spring wheat seed. This can be a costly mistake, but is preventable with an electrophoresis test.



Actual gels and pictures are much clearer. A trained analyst can detect differences between varieties—see the back page for an explanation of how to read a gel. Check samples are in italics.

### Crops which can be tested:



The SDSU Seed Testing laboratory currently tests wheat, oats, millet (foxtail and proso), and to an extent soybeans and barley, and some grass crops. Potentially any crop may be tested once a protocol has been developed for that crop. Samples submitted are assumed to be from a pure seed lot (single variety) and a bulk test (100 seeds) is performed. Single seeds or seedheads can also be tested (used by

breeders, foundation seed programs to check suspected offtypes). When samples are submitted, the sender needs to indicate which variety or varieties to compare their sample against. In conducting an electrophoresis test, a known sample of the suspected variety or varieties (Foundation, Breeder, or Registered seed) is run in the tests for comparison. Varieties in a mixture cannot be determined unless single seed analysis is conducted. Such tests are more expensive due to the greater number of lanes needed than in the bulk tests. For information on single seed analysis, contact Dr. Brent Turnipseed at 605-688-4590.

## Fees for Electrophoresis

**Base Sample Fee:** a base fee of \$40.00 will be charged for each time a sample or samples are submitted.

**Sample well fees:** Will vary depending on crop and type of test needed. Each check sample required for comparison will be charged at that specific crop rate.

**Wheat/Oats:** \$35.00 per well

**Millet:** \$50.00 per well

**Soybean & other crops:** call for information

**Barley:** \$50.00 per well

### Gel Photographs:

Scanned gel images (annotated)—no charge

### PAGE Applications:

- Quality Control Programs
- Varietal Verification/Identification
- Regulatory (PVP enforcement)
- Part of PVP applications

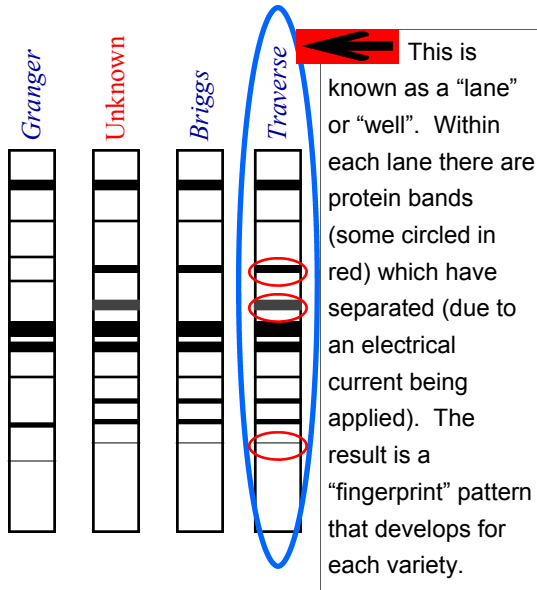
For information contact Dr. Brent Turnipseed in the SDSU Seed Testing Laboratory at 605-688-4590.

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## How to use and read an Electrophoresis Gel

Electrophoresis testing at SDSU utilizes the proteins in a seed to obtain a “fingerprint” pattern (unique for each variety) and compare it to a check sample (known variety) to verify or identify the variety of the sample. Below is a simplified example and explanation using HRS wheat variety names.



Within each lane are protein bands (each horizontal band is a different protein). Bands in lanes are compared or matched (using band size, location, and intensity) to determine or verify varietal identification of the unknown sample submitted. In this example you can see that our unknown matches the variety “Traverse” (showing differences from other spring wheat varieties listed).

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### To submit samples, send to:

#### By US Postal Service:

SDSU Seed Testing Lab  
Box 2207A  
AG Hall 244  
Brookings, SD 57007

#### By UPS/FEDEX/SPEE-DEE:

SDSU Seed Testing Lab  
SDSU Innovation Campus  
2380 Research Parkway  
Brookings, SD 57006

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# SDSU

## Seed Testing Laboratory

*Varietal Verification or Identification using Electrophoresis testing*



Seed Testing Laboratory  
SDSU Innovation Campus  
2380 Research Parkway  
Brookings, SD 57006

Tel. 605-688-4589  
Fax 605-688-5249  
E-Mail: [sdsu.seedlab1@sdstate.edu](mailto:sdsu.seedlab1@sdstate.edu)

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