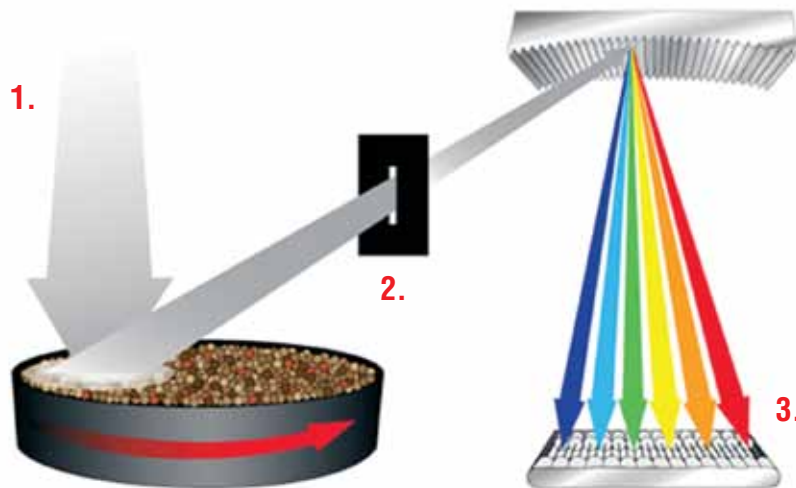


NIR (Near Infrared Spectroscopy)

Two years ago AGVISE purchased an instrument that has the capability to analyze grain and feed samples in a matter of seconds. The instrument we purchased is called a near infrared analyzer(NIR). Grain elevators often use a NIR analyzer to measure the protein and moisture content of grain samples. Other users include feed mills, oilseed crushing plants, seed breeders, ethanol plants, corn mills and the dairy industry. We are currently using our instrument to test hay samples for quality and grain samples for moisture, protein, oil and starch along with a host of other parameters.



The principle behind NIR is specific organic molecules absorb specific wavelengths of near infrared light energy. The absorptions are directly correlated with the concentration of the organic molecules in the sample. This relationship must be correlated with a primary technique, otherwise known as wet or bench chemistry. Therefore, the NIR is dependant upon the wet chemistry methods to attain the linear relationship between the molecular absorptions and the actual constituent concentrations.

The above schematic from Perten Instruments (the manufacture of our instrument) illustrates how a modern near infrared analyzer works.

1. A lamp illuminates the sample with white light. Some of the light is absorbed (depending on the composition of the sample) and the rest is reflected.
2. The light, which is reflected, hits a stationary grating, which separates the light by wavelength. Instead of white light, we now have a “rainbow”.
3. A dedicated detector measures each wavelength.



AGVISE currently uses calibrations developed by the manufacture for analyzing the grain and feed samples we test. When we analyze large sample sets of wheat, we often run some samples on a nitrogen analyzer to confirm that the factory calibration for protein is accurate.

One potential use of the NIR technology is predicting the ability of a soil to mineralize nitrogen. Research from the Netherlands has indicated a correlation between a NIR spectra reading on soil with the nitrogen uptake by greenhouse plants. In this study, the correlation between uptake and NIR was satisfactory with a r-value of 0.87. The same research also found an even better correlation between the 15-day N-mineralization test and a NIR reading. The development of correlation between a 6 second NIR scan and the soils ability to mineralize nitrogen would be a huge benefit to the agricultural industry.

If you have either a large or small number of grain samples you need to have analyzed for quality parameters, give us a call. We would be glad to provide you with a price quote.