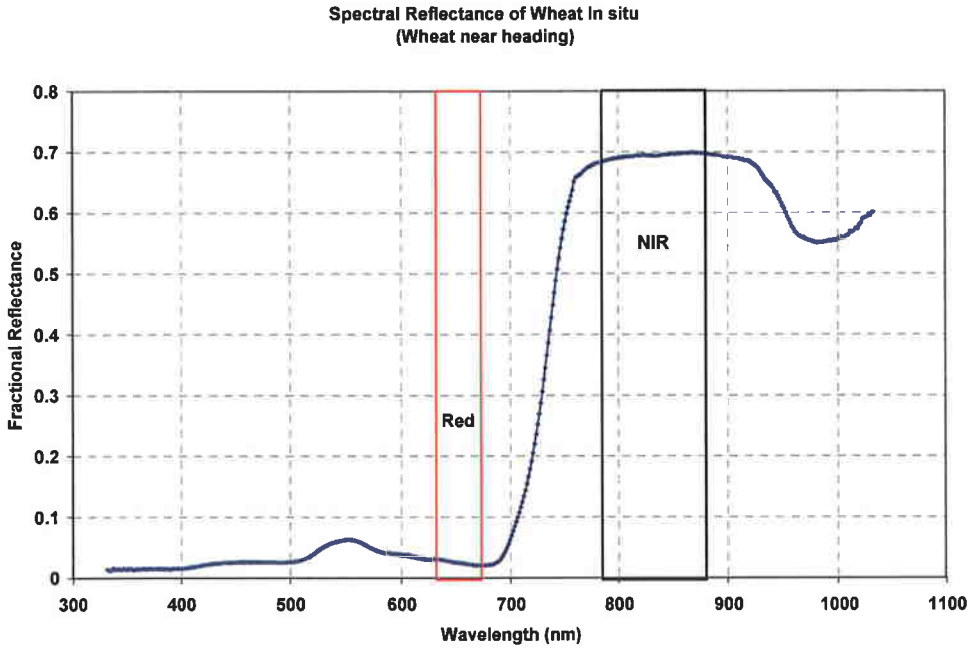
NDVI was developed originally for use in satellite image interpretation. NDVI is a measure of reflected energy in the red band of the optical spectrum relative to the reflected energy in the near infra-red band of the optical spectrum. It is normally well correlated to green biomass and even better correlated to nitrogen uptake in crop plants. As such it is being used in fertilizer management and in spot spraying.

NDVI was originally calculated using data from NASA's AVHRR (Advanced Very High-Resolution Radiometer) satellite and is calculated using channel 1 (580 to 680 nm) and channel 2 (725 to 1100 nm) of the AVHRR sensor using the following formula:

$$NDVI = (ch2 - ch1) / (ch2 + ch1)$$

For crop sensing systems a more refined form of NDVI is normally used. Where AVHRR data may be affected by sun angles affecting the color of illumination among other factors, crop reflectance sensing is normally based on fractional reflectance where a fraction of 1.0 of the light is reflected off of a perfectly reflective target and a fraction of 0 is reflected off of a perfectly black absorbing target. Rather than use the raw channel values, reflectance in the red and NIR bands are used eliminating effects of variation of the illumination color. In addition, a slightly narrower bandwidth for both red and NIR is normally used. This results in a more sensitive NDVI.
The following plot shows a typical plant reflectance spectra with the bands indicated that are typically used for determination of NDVI.




The computation is shown in the following formula:

$$NDVI = \frac{\rho_{NIR} - \rho_{red}}{\rho_{NIR} + \rho_{red}}$$

Where $\rho_{red}$ is reflectance from the crop in the 640 to 680 nm band and $\rho_{NIR}$ is the near-infra-red reflectance in the 780 to 880 nm band.