

# Ag 101: What is NDVI?

Normalized Difference Vegetation Index or NDVI is an index used to compare healthy and unhealthy regions of a field by identifying anomalies in fields that may otherwise be impossible to spot with the naked eye.

Simply put, NDVI measures the state and health of crops or crop vigor. This vegetation index is an indicator of greenness and has a strong correlation with green biomass, which is indicative of growth. NDVI values are also known to have a high correlation with crop yield, meaning it can be used as a tool for measuring crop productivity and predicting future yield potential.

## Did you know?

Agriculture is now the most popular industry leveraging such advantages of satellite data.

## How to use NDVI in Agriculture?

- Measure biomass and assess the state and health of crops
- Identify insects, diseases, fungus, or overly dried spots in the field before the damage is done
- Monitor pasture conditions and productivity
- Detect areas of concern within the field faster, and spend water, crop nutrients, and pesticides more effectively
- Monitor drought and assist in forecasting fire-hazardous areas
- Observe vegetation dynamics throughout the growing season
- Establish normal growing conditions for the crops in the specific area



## How does NDVI work?

Basically, it works by mathematically comparing the amount of absorbed visible red light and the reflected near-infrared light. The chlorophyll pigment in a healthy plant absorbs most of the visible red light, while the cell structure of a plant reflects most of the near-infrared light. It means that high photosynthetic activity, commonly associated with dense vegetation, will have fewer reflectance in the red band and higher reflectance in the near-infrared one. By looking at how these values compare to each other, you can reliably detect and analyze vegetation cover separately from other types of natural land cover.

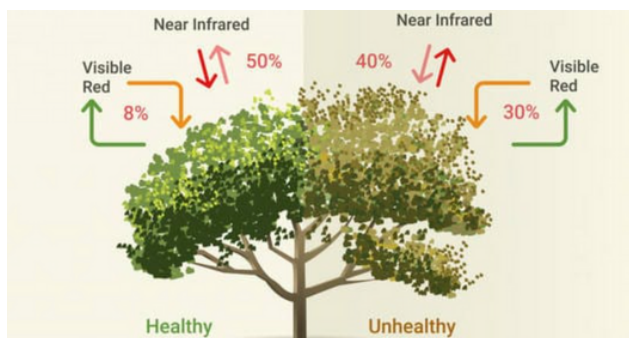


Image Source: Earth Observing System

## What NDVI value represents healthy vegetation?

The results of the NDVI calculation range from -1 to 1.

- Negative values correspond to areas with water surfaces, man made structures, rocks, clouds, snow
- Bare soil usually falls within 0.1- 0.2 range;
- Plants will always have positive values between 0.2 and 1.
  - Healthy, dense vegetation canopy should be above 0.5,
  - Sparse vegetation will most likely fall within 0.2 to 0.5\*.

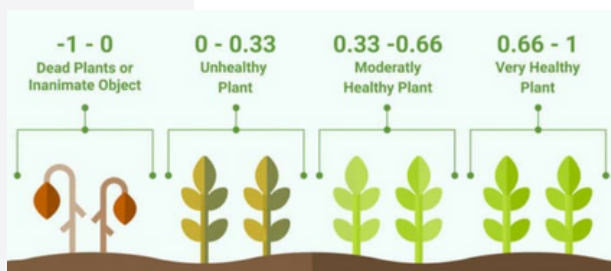


Image Source: Earth Observing System

\*These are only guidelines and you should always take into account the season, type of plant and regional peculiarities to know exactly what NDVI values mean.