Triple Bandpass Filters

For NDVI and ENDVI Applications

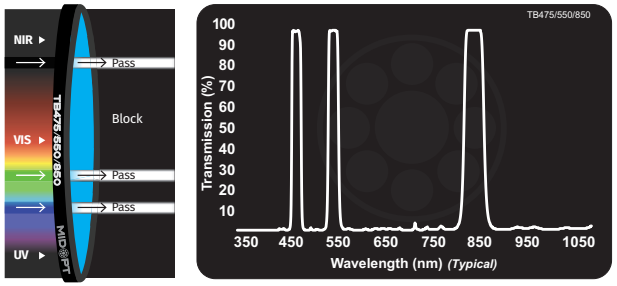
Assess crop health quickly, inexpensively and in real time using converted consumer cameras and unmanned aerial vehicles.

Triple Bandpass Filters are tools that allow us to go above and beyond traditional Normalized Difference Vegetation Index (NDVI) indicators to reinvent the way we monitor crop health and collect more information than ever before. Traditionally, true NDVI was used to determine plant health, which incorporates a camera with a red and (near-infrared) NIR filter and the equation NDVI = (NIR – Red) / (NIR + Red).

While this is a great tool, scientific advances have found that modifying this calculation can provide even more details about crop and field health. Similarly to red light, healthy plants also absorb visible blue light. And in addition to NIR light, healthy plants also reflect some visible green light.

With this knowledge, MidOpt designed two new Triple Bandpass Filters, which allow one camera to gather data results at all three wavelengths, making them an affordable, lightweight alternative to aerial surveillance applications that otherwise might require three or more cameras or sensors.

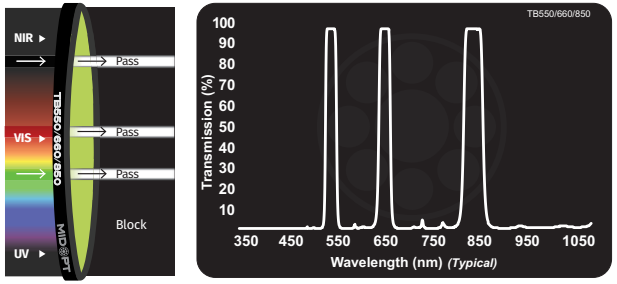
MOUNT & SIZE OPTIONS: MidOpt Triple Bandpass Filters are offered in various standard threaded mounts and custom mounts that are cut to fit any lens or camera size. Standard material thicknesses include 0.5 mm, 1.1 mm and 2 mm.



TB475/550/850 Blue + Green + NIR

Using the 475nm, 550nm and 850nm wavebands differ from earlier calculations, since it uses Blue + Green + NIR light instead of the red-based method. It's recognized as the Enhanced Normalized Difference Vegetation Index (ENDVI), a technique that can provide more detailed information. ENDVI may better isolate plant health indicators and can generate results and false color mapping to indicate values as far down as the pixel level. The ENDVI formula is as follows:

ENDVI = ((NIR + Green) – (2 x Blue)) / ((NIR + Green) + (2 x Blue))



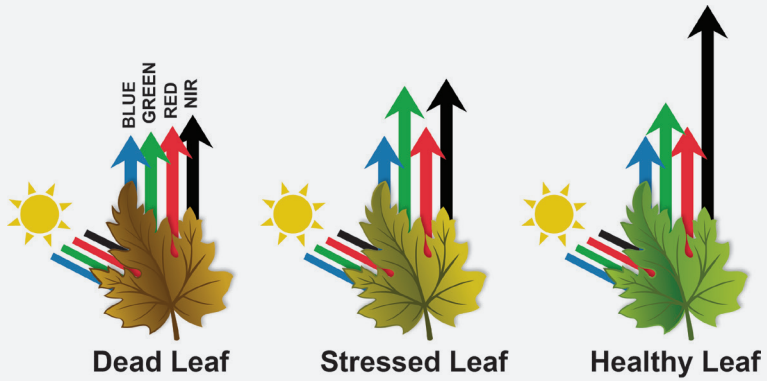
TB550/660/850 Green + Red + NIR

The TB550/660/850 filter takes traditional red and NIR measurements to a whole new level by adding green. Green + Red + NIR wavelengths are used for applications where Chlorophyll Vegetation Index (CVI), Normalized Green (NG) and other vegetative index monitoring is needed. Two of the calculations used are as follows:

CVI = (NIR x Red) / (Green ^ 2)

NG = Green / (NIR + Red + Green)

Plants reflect light at different levels based on their health. A healthy leaf absorbs blue and red light for photosynthesis, while it reflects some green light and strongly reflects (near-infrared) NIR light. A dead leaf reflects similar amounts of red, blue and green light, while also reflecting some NIR light—but not nearly as much as a healthy plant.



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