

## Answers

1. Apart from the panchromatic band, WorldView-3 data include 8 multispectral bands and 8 shortwave infrared bands (SWIR). On the other hand, WorldView-2 data do not include the 8 shortwave infrared bands.
2. There is little reflectance difference in the red, red edge and near infrared 1 and 2 bands between WorldView-3 and WorldView-2 data. So they can be used together to monitor the same tree.
3. The main function of HSDC is to normalize spectral digital numbers (DNs) for the effect of varying solar illumination. HSDC normalization is employed in order to reduce the variability of canopy vegetation brightness caused by varying illumination of the leaves.
4. The spectral reflectance of healthy *Ficus microcarpa* may rise to about 50% for the trees presented in the charts.
5. The spectral reflectance of stressed *Ficus microcarpa* may drop to about 26% for the trees presented in the charts.
6. In WorldView-2 and WorldView-3 data, the red edge band lies in the range from 705 to 745 nm. It is the region of sharp change in vegetation reflectance between the very low reflectance in the red region due to chlorophyll absorption and the very high reflectance in the near infrared region due to leaf and canopy scattering. A shift in the position of the red edge to the bands of shorter wave length is an indication of stressed condition.
7. The drop in reflectance in the near infrared region is due to degraded leaf cellular structure.
8. The following warning signs are revealed:
  - (a) Drop in reflectance in the near infrared region.
  - (b) Shift of the red edge position to shorter wave length
  - (c) Rise in reflectance in the red band region.