

## **A new method for mapping visible-near infrared light levels in Fruit**

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We have developed a probe for measuring the light levels inside illuminated fruit. The probe has minimal effect on the light levels being measured and enables the sampling of the light flux at any point within the fruit. We present experimental light extinction rates within apple, nashi, kiwifruit, and mandarin fruit. Moving from the illuminated side to the far side of the fruit, the extinction level follows an initial power law decay as the light diffuses into the fruit then reduces to an exponential decay through the rest of the fruit. Significant variations in the rates of light extinction are found in the core, skin and differing flesh regions. Monte Carlo simulations of the light distribution in fruit, which use scattering and absorption coefficients for the diffusely scattering tissue, and boundary conditions for the skin effects, produce results that follow the experimental results closely.