



Comparison between Delta-T Devices *SunScan* Canopy Analysis System and Decagon *AccuPAR LP-80*

	SunScan	AccuPAR
PAR Readings	SunScan measures PAR (400-700nm) along its 1m probe (64 PAR sensors), which can be used for many purposes such as PAR mapping and directly measuring the PAR interception.	The LP-80 measures PAR (400-700) along an active length of 0.8m (80 sensors).
Light Conditions	SunScan will calculate LAI under steady and changing light conditions but is best in bright daylight.	The LP-80 will calculate LAI under steady and changing light when used with external PAR sensor.
Above Canopy Reference	Above canopy BF3 Beam Fraction Sensor provides immediate compensation as incident light varies. A Radio-link will be available for cable-free connection.	LP-80 can measure above canopy PAR (but only with a 2m lead). LP-80 estimates beam fraction from global PAR levels, which can be inaccurate in many conditions.
Use without external reference	Both systems can be used to take alternate above and below canopy measurements using the long probe. The SunScan system can directly measure beam fraction in this mode as well.	
Leaf Area Index	Uses inversions to calculate LAI, taking account of Direct/Diffuse light partitioning and the incomplete absorption of light by leaf elements.	Uses similar, though simpler, inversions to obtain LAI. LP-80 provides a useful table of ELADP values for different crops.
Theory	Both instruments assume a uniform canopy, random distribution of leaf elements and ellipsoidal Leaf Angle Distribution. They therefore have similar difficulty in measuring the LAI of highly clumped canopies eg conifers. <i>(HemiView, also from Delta-T, is very suitable for irregular canopies - see separate data sheet).</i>	
Data Storage	Psion Data Collection Terminal has 2Mb internal memory. Optional 1Mb Flashcards available.	LP-80 limited to 1MB memory.
Annotation	SunScan has a well structured file format and readings can be fully annotated with additional information about site or conditions.	You need to carry a notebook as well. Data must be annotated after download with site locations and conditions.
Ergonomics	SunScan designed to be hand-held.	
Autologging	Auto-logging – define intervals from 1sec to 1day, define average intervals, plus ignore/include night time.	Auto-logging - set 1min and 60min intervals.
Linear Quantum Sensor	Logging function – connected to a data logger to record average PAR incident on the Probe (used as a sensor).	
Individual PAR sensor readings	All 64 PAR sensor readings can be used for detailed PAR mapping and transects.	PAR sensors grouped into 10 segments for shortening effective probe length.

References:

1. Ground-based measurements of Leaf Area Index: A review of Techniques and Approaches – Dr Nathalie JJ Bréda, 5th International Workshop on Field Techniques for Environmental Physiology, Tenerife 2003.
2. Comparison of three Leaf Area Index Meters in a Corn Canopy – W.W. Wilhelm, K. Ruwe & M.R. Schlemmer, Crop Science, 2000, 40: pp1179-1183.

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