OFDA Laser Scanning: **The Basics**

By Ian Watt

The Optical-based Fibre Diameter Analyser (OFDA) 100 is designed for use in a lab, to analyze the consistency of fiber within a bale. Over 250 instruments are in use in more than 30 countries.

The Optical-based Fibre Diameter Analyser (OFDA) laser scanning technology has revolutionized fiber testing all over the world, especially in fiber producing animal industries. An Australian technology developed out of Perth, Western Australia, the OFDA system offers reliable, efficient, and consistent fiber testing analysis. It is the technology of the future and is widely used by wool and alpaca fiber producers, breeders, and processors around the world. For North American alpaca breeders, there are two primary OFDA testing services available. One is the laboratory-based OFDA 100 and the other, the portable OFDA 2000. While the technology is the same in both systems, the application and results are different.

The OFDA 100

The OFDA 100 was developed primarily as a technology to more accurately describe what is in a pressed bale of wool. Traditionally, wool is classed by hand and eye in the shearing shed and placed in bins of like description fleeces. These descriptions are univeral in their wording and intent and include such descriptors as length, micron, freedom from vegetable matter, etc.

When hand-classed fleeces are compressed into bales, there can be some inconsistencies through the bale, no matter how consistent the classing is on the table. The OFDA 100 was developed to test the consistency of what was in the bale through a sampling technique called coring, which in essence is a number of rods pierced through the bale from different directions, thus collecting samples of a range of fleeces and, in some cases, within any particular fleece, which are then chopped into 2mm lengths and analysed by laser scan.

The results give an accurate description of the micron, standard deviation, and other relevant measurements valuable to the efficiency and productivity (therefore profitability) of that bale for the buyer and processor.

The protocol relies on a random sampling of sites along the entire length of the staple as the core passes through the fleeces.

The OFDA 100 test offered in the USA is the butt sample test, a variation of the above protocol. In the butt sample test, a 2mm sample is cut from a mark approximately 1 cm (about a half-inch) from the cut end (nearest the skin) of the sample. As it is submitted to the laboratory and it is this sample that is measured. 2mm represents about seven days' fiber growth for an average alpaca. Butt sample testing in the USA also uses a quality assurance standard in the preparation of the sample prior to testing. This standard ensures that every sample is tested in the same environment after washing, drying, and stabilizing prior to cutting and reading.

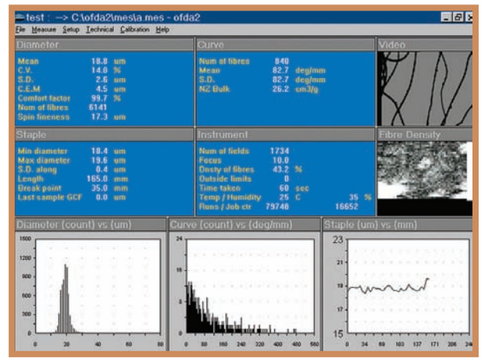
The standard enables results to be compared not only between laboratories, but also between years, as it narrows the possibility of inconsistencies between results.

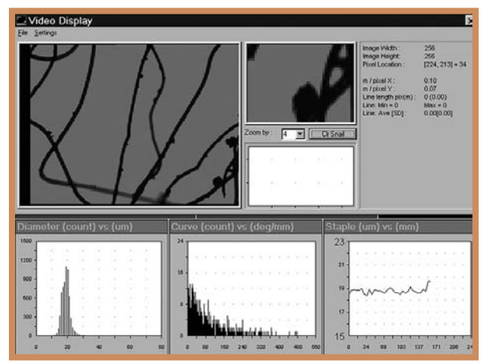
Applying a quality assurance standard to a test does not validate the test itself nor the outcome, it does validate the consistency of testing preparations.

The OFDA 2000

The OFDA 2000 uses the same technology as the OFDA 100 but applies it in a different fashion and gives a different result, making the two test results incomparable.

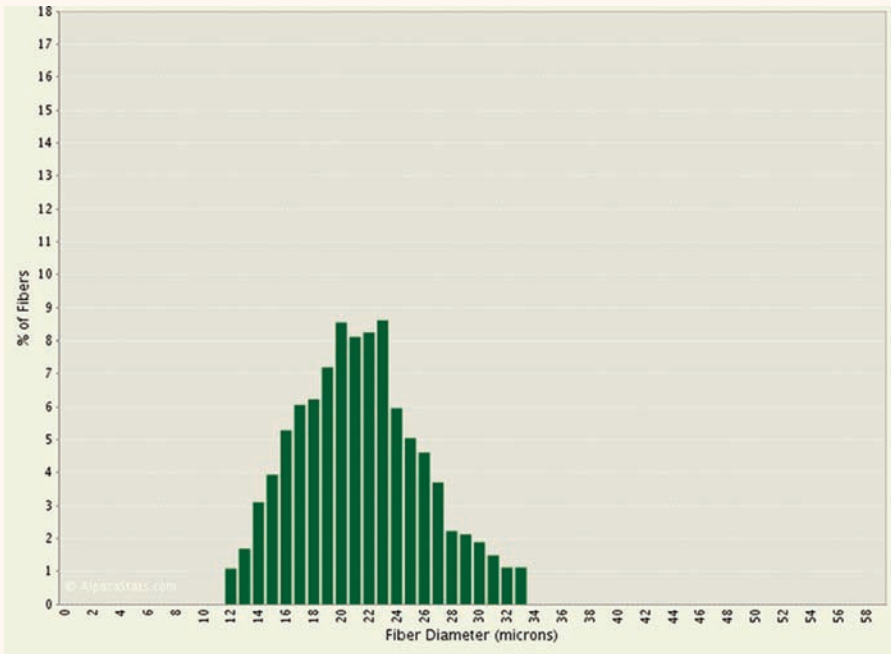
The OFDA 2000 requires a sample to be spread across an inert plastic grid in a way that exposes as many fibers as possible to scanning. As the laser moves across the sample tray, the field of fibers is exposed to the scan. Within the field of the laser, as it moves

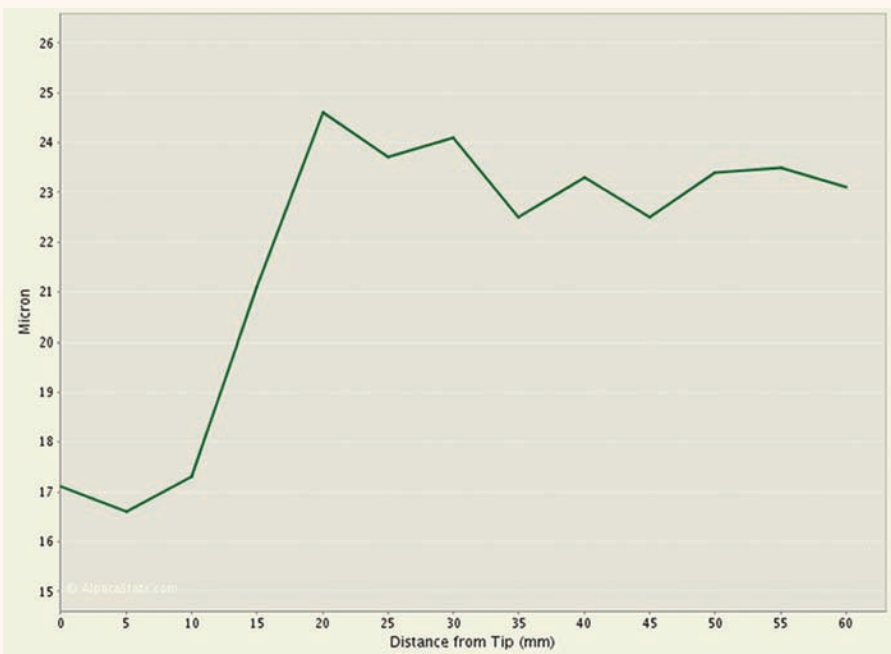




The OFDA 2000 is portable and meant for use in the field, for example, as animals are being sheared. The data screen shots at right are from the ODFDA 2000.

Report Date	01/01/2008	Min (micron)	16.6
AFD (micron)	21.48	Max (micron)	24.6
SD (micron)	5.03	Stretched Length (mm)	0
CV (%)	23.43	Unstretched Length (mm)	0
CF (%)	94.69	Growth Rate (mm/day)	
Staple Length (mm)	65.0	Crimp/cm	0.0





The Average Fiber Profile illustrated here represents the typical effect of colostrum and milk on fiber microns. The longer-term micron range for this animal is not near the in-utero measurement (the left hand side of the profile) but more in a band across the top of the graph.

across and down the sampler tray, fibers that are crossed or not allowing a minimum field of measurement, are excluded from the count. Thus, only fibers free from others are measured.

As the scan progresses, the data is compiled, analysed, and plotted and an average fiber profile is developed, created by the measurements recorded with each passing scan of the sample tray. The results are therefore representative of the total length of the fiber/staple, which is what buyers purchase and is what classers class. The technology measures the temperature and humidity at the time of testing and also makes an allowance for grease content as it develops the results.

The Pros and Cons

The nature of each testing system denies users the opportunity to compare differently tested samples consistently. Research has shown there are times when the two tests on the same sample (or as close to same as one can get) give the same result. These are few in number when compared to those that are not similar.

Ian Watt is an alpaca industry consultant living on Morro Bay, California and operates Alpaca Consulting USA as well as Alpaca Fiber Testing USA, a testing service devoted solely to the US alpaca industry. He has been breeding alpacas since 1991, has been the National President of the Australian Alpaca Association, and continues to share his knowledge of the alpaca fibre industry through seminars held across the USA. Ian can be reached at alpacaconsult@earthlink.net.