

# Scientific Target Test

By Jon Teater

## SpyderWeb S 1.5XL

SpyderWeb Targets were introduced to me several years ago at the ATA Show. I recall the company originally tailoring their products for the commercial arena, specifically range targets. They also offered a target or two for the general consumer. At that time I was looking for a product that could withstand an arrow hit of 350-400 fps. Fortunately, they did build a target in this range, while others were not offering a comparable target – at least as it relates to “stopping” abilities.

Many competitors’ products have reached the mentioned speed threshold set by SpyderWeb several years ago. I continue to see speed ratings increasing, especially in the targets designed for crossbows. SpyderWeb has improved its target line with the most recent S-Series products. Within the line is the S 1.5XL; this product is establishing a new speed ceiling – 450 fps. That ceiling seems safely above what today’s bows and crossbows are capable of producing. It can survive heavy hits by today’s standards but is also able to handle the likely faster arrows of the future. I suspect some other target designers and manufacturers are thinking along the same lines. In the meantime, SpyderWeb is stepping ahead in the speed race with this new line.

Kelly Branch, SpyderWeb’s founder, is quite pleased with the most recent line. I commend Branch and his team with growing the company and increasing the consumer line. The company offers a sizable selection under the S-Series. The series includes targets with multiple sizes, weights and stopping characteristics. Branch explained that the S-Series line is superior to other products based on the target’s ability to handle a greater amount of interior material, which is approximately twice the amount of a normal field point target. I’ll discuss more about the target’s composition later.

### The Test

I see very few target tests, which has made developing test parameters a little difficult. With that said, these uncharted territories sparked my interest and I am hopeful these tests introduced in the May issue of *ArrowTrade* will help all of us gain a better understanding of targets in general and the product that is spotlighted in each article. The test methods used and presented in this article are similar in nature to other tests I have done. Moreover, I have considered more recent philosophies on testing archery products as it relates to industry standards.

The test equipment used is as follows: an automated drawing/shooting machine, compound bow (setup at 60 pounds, 29 inches), carbon arrow, AMS fiberglass arrow



### Product Information

Manufacturer	SpyderWeb Targets
Model	S 1.5 XL Portable Target
Measured Weight	34 Lbs
Advertised Dimensions	18"X18"X14"
MSRP	\$129.99

(with chisel tip point, without outsert), load cell, hydraulic lift and high tensile rope.

The compound bow and arrow combination are measured for velocity during the test and those figures are included in this article. In addition, the target’s distance from the bow is standardized. The distance from the target is measured by taking the vertical projection of the bow’s pivot point, to the approximate path of the arrow, and measuring 10 feet (+/- 1 inch) to the front of the target.

The testing is split into three parts, namely: Penetration Test, Arrow Removal Test and Durability Test.

#### Penetration Test (Hole in Hole)

The purpose of this test is to evaluate the design integrity and “stopping” characteristics of the S 1.5XL. As mentioned, the target is 10 feet away from the compound bow. The fast speeds of the arrow and close distance to the target is an extreme scenario as compared to normal shooting, but this was done with a purpose. The target is close to the bow to assure that the arrow is shot in the same hole as each time. Otherwise, a small change in point of impact will invalidate the results.

The arrow is measured utilizing ATA Guidelines

Bow Setup and Distance from Target - Penetration Test	Compound Bow	Draw	Arrow	Kinetic		Distance to Target (ft)		
		Weight (lbs)	Length (inches)	Weight (grains)	Velocity (fps)*		Energy (lb-ft)	Momentum
		60	29	360	290	67.24	14.88	10

\* The rating velocity is measured per ATA/BOW-104-2008

(ATA/ARR-201-2008). The actual arrow length used in this portion of the test is 29 inches. The arrow is marked 18.625 inches from the leading end of the arrow shaft, which is approximately 64 percent of the total arrow length. The distance from the front of the shaft is not derived arbitrarily. The remaining 10 or so inches of arrow gives an archer enough room to grip the arrow without making contact with the fletching as the arrow is pulled from the target.

The S 1.5XL is mounted to a hydraulic lift table. The table allows the target to be raised and lowered and moved left/right if needed; this permits the bow to remain in a single position. The bow is mounted to a rigid, sophisticated automated shooting machine. The bow is shot multiple times with an identical arrow at the same location until the arrow reaches 18.625 inches of penetration or greater. In some cases, the arrow will exceed the 18.625 inch threshold, which is tallied only if the previous shot did not reach the threshold mark. The test is repeated several times and the results are recorded. The average measurement represents the amount of shots it takes to meet or exceed the threshold marking.

The results illustrate the target's ability to "endure" heavy hits from an arrow at close range. On average, it takes 28 shots placed in the same location to reach 18.625 inches or greater of penetration based on the bow and arrow setup mentioned in this portion of the test.



A photograph of typical penetration into the target after 28 shots from close range into the same hole.

Penetration Test	
Parameter (Shot)	Front of Target
1	26
2	23
3	26
4	32
5	20
6	31
7	25
8	35
9	28
10	29
Average Shots*	28

\* The average calculation does not consider the highest and lowest measurements

#### Arrow Removal Test (Pull Test)

Many of us have probably wondered how much force it takes to remove an arrow from a target. That seems like a difficult thing to quantify when dealing with many variables. So after much thinking, I developed a test that allows me to measure the amount of force it takes to remove an arrow with some of the mentioned equipment.

An AMS fiberglass arrow is modified by removing the outsert and incorporating a chisel tip only onto the shaft. The modification of the arrow creates a profile similar to a typical hunting/target arrow. The fiberglass arrow is used because it has a stopping device and an AMS safety slide, which allows me to retract the arrow from the target. The fiberglass arrow is significantly heavier than most hunting arrows. Do not be put off because of this difference. The typical penetration of the slower fiberglass arrow into the S 1.5XL is approximately the same as the faster hunting arrow used in this test. Any variation in penetration is mostly attributable to the differences in momentum. In addition, the friction coefficients of dry/clean fiberglass and carbon surfaces are very similar; therefore, it is difficult to say those differences create any disparity.

As mentioned before, the target is mounted to a heavy duty hydraulic lift table. The bow fires an arrow at the target, and a machine retracts the arrow with use of weight measuring equipment. The bow is shot at various locations on the target, but never in the same hole as previously



Bow Setup and Distance from Target - Arrow Removal	Weight (lbs)	Draw Length (inches)	Arrow Weight (grains)	Velocity (fps) *	Kinetic Energy (lb-ft)	Momentum	Distance to Target (ft)
Compound Bow	60	29	1142	170	73.30	27.68	10

\* The rating velocity is measured per ATA/BOW-104-2008

shot. The force measurements are recorded and averaged.

The results confirm that it takes on average 6.8 pounds of peak force to remove an arrow from the S 1.5XL. The test represents data from 25 shots, and the results are based on the bow and arrow setup mentioned in this segment of the test.

### Durability Test

A compound bow is fired at approximately 10 feet away from the target. The bow is shot 25 times and is oriented so the arrow hits within a two inch circle. The target is photographed before and after the bow is shot. The test revealed no pass-throughs. The face had little to no damage, which is attributable to the target's Spylar technology.

### Pros/Cons

The S 1.5XL offers two shooting sides. Each side provides different shooting options. On one side, you will find the recognizable blue spiders and partial web. The other side consists of whitetail vitals, a trademarked

Arrow Removal Test	
Average (lbs)*	6.8

\* The average calculation does not consider the highest and lowest measurements

technology known as the Vitalator. The vitals simulate a 175 pound whitetail's at 40 yards. An archer that hunts will certainly find the Vitalator appealing.

The company's stopping claim of 450 fps is something that many may believe is extreme. I think most of us can agree that safety factors are an important aspect of almost any product – especially shooting products. For those archers that are shooting crossbows near the 400 fps mark or compound bows at 350 fps, this product is ideal. For the archer that wants that added security from a penetration standpoint, this target would be a good choice, which the hole-in-hole test validates. The product's strength and durability give way to a minor weakness - weight. The S 1.5XL is heavier than some of the competitors' products of similar sizes. Therefore,

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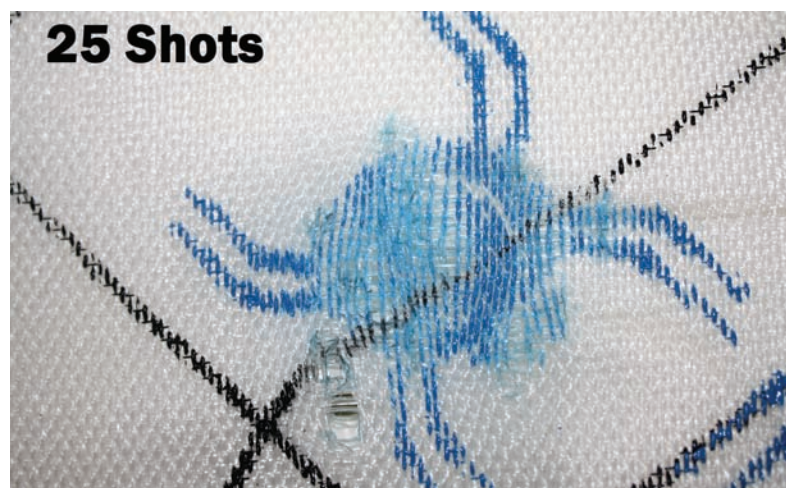
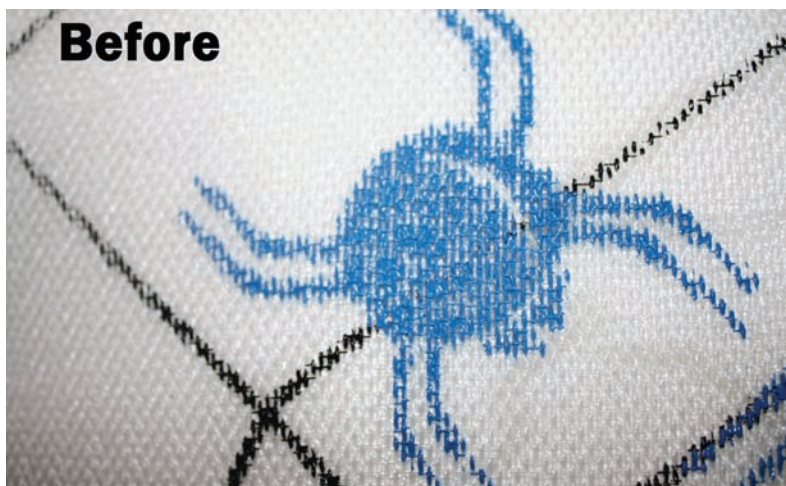


make sure the archer is prepared to tote the product around in their backyard.

The Spylar technology incorporated into the S 1.5XL is a distinguishing characteristic. The SpyderWeb technology consists of proprietary synthetic fibers. As an arrow makes contact with the target these fibers begin to separate, forming a void, and ultimately helping to slow/stop the arrow. The fibers that come in contact with the arrow are quite resilient. On numerous occasions during the testing I checked and re-checked strands to see if there were any breaks or frays. The results revealed no visual damage. If you want to "renew" your S 1.5XL, you can actually rub the face of the target and the strands will return to their original position. (To maximize the target life, points should be smooth and free of burrs and other damage.)

The foremost selling point with this target is the ease of pull. The results in the article detail the lowest recorded average peak force measurements to date from the products tested this year. Yet archers would be even more amazed to know if you calculate the work required to remove the arrow throughout the entire pulling sequence the results would show that the product is by far lower than almost any competitor. Furthermore, throughout the early and middle segments of the pulling sequence my scales remained at 2-4 pounds of peak force. With that said, any claims from the company of being a two finger pulling target are undoubtedly true. Archers can take the company up on the two finger challenge, and pro-shops should relay this point to potential customers.

There were only three real negatives I could see with this target. The target is not meant to be a broadhead target. That may be a limiting characteristic to some archers that prefer to shoot both field points and broadheads into targets. If broadheads are used damage can occur to the face, which is really no different from other field point targets, but an important point nonetheless. The second shortcoming is related to outdoor use. The SpyderWeb target is promoted to be weather resistant. I have no doubt that it can withstand the elements. However, over time I can see the target becoming susceptible to rain, creating a very heavy and worn target, so make sure to remind the consumer it is best to bring the target in after use or build some type of shelter to shield it from the weather. My final point relates to the aim points on the S 1.5XL. Because the reference points are located on a coarse woven surface they are less sharp and defined when compared to a screen printed target face. It's a minor negative, yet many archers get caught up in the appearance of things and lose track of the real purpose of the product they're buying. Therefore, remind them of the performance characteristics if they voice concerns about the decoration.



### Overall

All-in-all, this product exudes stopping power. The face of the target and high density interior provide more than ample characteristics to slow and stop the fastest products on the market. The product scores well in most of the subjective categories I can think of. I would rate the product above average in craftsmanship and workmanship, above average in design integrity, exceptional in performance and supreme in the ease of pull category.

**Special Thanks:** I would like to thank the manufacturer and sponsor who supported this event; without them and their support, this evaluation would never have been possible.

AMS Bowfishing is one the finest producers of bowfishing gear in the country. They offer reels, bows, arrows and accessories, which are all essential to success in the field. Their fiberglass arrows proved to be vital in my testing and survived hundreds of shots without failure.

