

## **Side-by-Side Broadhead Test of Aerovane 2 vs. Aerovane 3** 26 January 2013, 16 February 2013 by Jeff Bailey

While at this years ATA show, I was shown one of the new Firenock products for 2013, Aerovane 3. Just the look alone was enough to intrigue me on its performance. Compared to Aerovane 2, Aerovane 3 was lighter (5 grains vs. 7 grains) and shorter (0.39 inches vs. 0.55 inches). However, the most intriguing part was the winglet at the top of the vane. This winglet, or fold, adds to the overall airfoil design; which will cause even greater lift and a higher rotational speed causing the arrow to spin faster. When given the chance to compare the performance of Aerovane 3 to Aerovane 2 with broadheads, I said "Yes" without hesitation. I know first hand the performance capability of Aerovane 2 with broadheads and was extremely eager to see how Aerovane 3 performs as well. The equipment I used for all testing is as follows:

- 2012 Limbsaver Proton, 69 lbs, 29 inch
- 28.5 inch Black Eagle Rampage 350s
- Firenock "A" Target and Hunting nock
- Scott Wildcat release
- Sword sight

In order to get a base line of Aerovane 3's performance with broadheads, I first needed to conduct some comparison tests using field points. The three tests I used were speed, vertical line, and group. The speed test was just to shoot the arrows through a chronograph from 0 yards – 30 yards and record the speed. The vertical line test entailed shooting both Aerovane 2 and Aerovane 3 at a vertical line 40 yards away. I placed my 20 yard pin at the top of the vertical line, then shot both arrows. Whether the arrows landed on the line, to the left or right would tell me if I had my bow tuned correctly. The final test was the group test. I would shoot 3 Aerovane 2 arrows, and 3 Aerovane 3 arrows into a target at 40 and 60 yards away, then record the distance between the center of both groups. The results of these tests are listed below. Unfortunately, I was experiencing technical difficulty and was not able to take any pictures during this portion of the testing.

### **Speed Comparison**

	0 yards	10 yards	20 yards	30 yards
Aerovane 2	287	283	279	272
Aerovane 3	289	285	280	274

### **Vertical Line**

Aerovane 2	On the line
Aerovane 3	On the line

### **Group Test**

40 yards	Aerovane 3 - 1.5 inches higher than Aerovane 2
60 yards	Aerovane 3 - 2.5 inches higher than Aerovane 2

Based on the above results, I expected the broadheads to hit higher, or possibly hit to the right side of the target due to the increased spinning attribute of Aerovane 3. The broadhead test consisted of shooting an Aerovane 2 fletched arrow followed by an Aerovane 3 fletched arrow tipped with the same type of broadhead into a target 30 yards away, then measure the distance between the two arrows, and the distance from each arrow to the center of the bulls-eye. Each group will be shot three times to ensure accuracy in recording of the results. Prior to shooting the broadheads, each arrow was spin tested to ensure proper broadhead – arrow alignment. The same equipment was used as with the previous test. The below table summarizes the results from the broadhead comparison. The technical difficulty was removed by the time I conducted this test, and therefore, I am able to include pictures for this portion.

### **Side-by-Side Broadhead Test**

Broadhead	Distance (inches)			Cutting Diameter
	A2 - A3	Center - A2	Center - A3	
Grim Reaper Practice*	1	2	2.5	Field Point
Grim Reaper Hades	4	1	5	1 3/16 "
Hartcraft Exchange Trophy I	0	1	1	1 1/8"
Hartcraft Exchange Trophy II	2	8.5	10.5	1 1/2"
NAP Thunderhead Razor	8.75	9.5	3.25	1 1/8"
Ramcat	5	2.25	7	1 3/16"

\*Grim Reaper Practice: Both the Aerovane 2 and Aerovane 3 arrows flew straight with no left or right waver. The Aerovane 3 arrow hit the target then flared up; which is why it looks to be at a different angle in the picture. I do not consider this to be any fault of the arrow, but possibly where it hit the target.





After completing the initial side-by-side broadhead test in January, Dorge Huang (Owner and President of Firenock) and I were discussing the results. We both wondered what would happen if we conducted the same test from a bow that shot faster than 300 feet per second. Thus, we created part II of the side-by-side broadhead test. In order to conduct this test, I made a few changes. The equipment I used to for this testing was the same except for the arrows. I also changed out the NAP Thunderhead Razor for the NAP Thunderhead Edge, and removed the Harcraft Xchange Trophy II due to the previous interference issue. The equipment I used is listed below:

- 2012 Limbsaver Proton, 69 lbs, 29 inch draw
- 28.5 inch Victory VForce HV V1 350s
- Firenock "S" Target and Hunting nock
- Scott Wildcat release
- Sword sight
- Limb Driver Rest

I used the same format as with the previous testing and created a base line to compare the performance of the two Aerovanes using field points. The same three tests of speed, vertical line and group were used. All three tests are described below along with their respective results. In the speed test, I would shoot the arrows through a chronograph from 0 yards – 20 yards and record the speed. The vertical line test entailed shooting both Aerovane 2 and Aerovane 3 at a vertical line 40 yards away. I placed my 20 yard pin at the top of the vertical line, then shot both arrows. Whether the arrows landed on the line, to the left or right would tell me if I had my bow tuned correctly. The final test was the group test. I would shoot 3 Aerovane 2 arrows, and 3 Aerovane 3 arrows into a target at 40 and 60 yards away, then record the distance between the center of both groups. The results of these tests are listed below. By the time I was able to conduct the 60 yard group testing, as you can tell by the photos, I was down to two arrows. This was due to either vanes being stripped off by earlier testing, or inserts coming out of the shaft. However, in the spirit of the test, I shot this target three times and came up with the

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### Side-by-Side Broadhead Test

Broadhead	Distance (inches)			Cutting Diameter
	A2 - A3	Center - A2	Center - A3	
Grim Reaper Practice	1	1.5	0.75	Field Point
Grim Reaper Hades	4.5	4.5	0	1 3/16 "
Harcraft Xchange Trophy I	2	0.75	1	1 1/8"
NAP Thunderhead Edge	N/A	4.5	N/A	1 1/8"
Ramcat	5	3.5	5	1 3/16"

### Speed Comparison

	Weight(gn)	0 yards	10 yards	20 yards
Aerovane 2	356	303	299	289
Aerovane 3	352	304	300	290

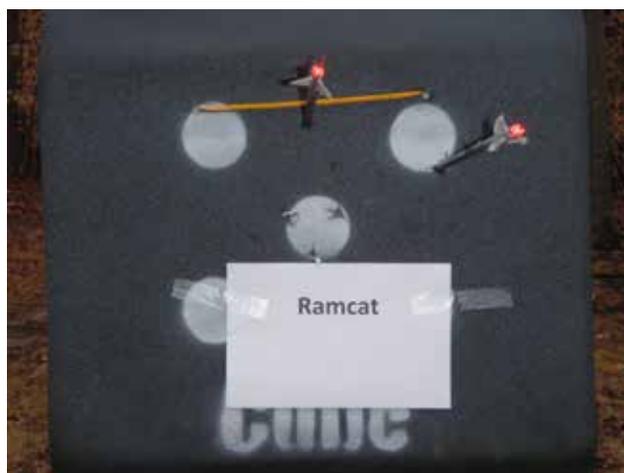
### Vertical Line

Aerovane 2	On the line
Aerovane 3	Slightly right - less than 0.5 inches

### Group Test

40 yards	Less than 0.5 inches between the two arrows
60 yards	Aerovane 3 - 2.75 inches higher than Aerovane 2





### Tester's Opinion and Conclusion

**Grim Reaper Hades:** The Aerovane 2 arrow flew straight without any left or right waver. The Aerovane 3 arrow flew straight for approximately 20 yards, then it started to spin right and down as expected based on my earlier testing.

**Hartcraft Exchange Trophy I:** The intent of this test was to shoot the group of arrows (Aerovane 2 followed by Aerovane 3) three times. However, with both of the Hartcraft Exchange arrows (Trophy I and Trophy II), I was only able to shoot one round. Both arrows tipped with the Trophy I flew straight without any left or right waver. In fact, the Aerovane 2 arrow exactly in flight and removed a vane in the process of entering the target.

**Hartcraft Exchange Trophy II:** As with the Trophy I, I was only able to shoot one round of comparison testing with this broadhead. Although the Trophy II with a 1 1/2" cutting diameter just barely hit the rubber bumper on the shelf of my bow, it was enough to cause both arrows to hit the bottom left portion of the target. The consistency of the broadhead – arrow combination had the Aerovane 3 arrow bump off the Aerovane 2 arrow before entering the target and slicing a vane in the process.

**NAP Thunderhead Razor:** This broadhead – arrow combination reacted differently than expected. The Aerovane 2 arrow started to swirl to the left in less than 20 yards. However, the Aerovane 3 arrow flew straight, but dropped prior to hitting the target.

**Ramcat:** Both the Aerovane 2 and Aerovane 3 arrows would fly straight to the target without any left or right waver, but would drop in the last few yards before the target. The Aerovane 3 arrow seemed to always drop more than the Aerovane 2 arrow.

In my opinion, this was a very good test. Some of the broadheads performed better than others, but the overall spinning effect of Aerovane 3 was evident.