

THOUGHTS ON BROADHEADS

STORY AND PHOTOS BY DAVE HOLT

This article obviously has an African flavor because it is where I hunt for our entire summer – their winter. Africa has many species from large to small so it's a great testing ground – a wonderful place to gain experience. Naturally there are differences but I have found that everything covered in this article holds true regardless of the geographical location or the species of animal hunted. – Dave Holt

Most bowhunters embrace a high measure of fascination and respect for broadheads, because at the moment of truth, a sizable portion of our bowhunting success depends on our broadhead choice.

When making that all-important broadhead selection, we must consider many factors. Size, design, durability, accuracy, and sharpness are important attributes. If the broadhead fails to perform, a great hunt can be turned upside down in the blink of an eye.

Much like bows and arrows, broadheads have improved far beyond my wildest childhood dreams. New designs, coupled with stronger materials and improved production techniques, have turned the broadhead world upside down.

Like most experienced bowhunters, I think I know a fair amount about broadhead performance and shot placement. But strongly held opinions are common, so my choices and views will certainly differ from some readers of this dissertation. I also realize that our bowhunting equipment choices are personal so, here, I will share my experiences and opinions for others to consider.

Our views regarding broadheads are usually based on an assortment of things: the “looks” of the broadhead, our strongly held beliefs, and our varying degrees of experience. My background includes 60 years of bowhunting with involvement in broadhead design and controlled penetration testing. During those many years I have



shot over 2,000 animals. In the course of the last 7 years, I have been involved in an African culling and genetic improvement project where I often shoot over 100 animals per year.

For many years prior to that, I booked bowhunting safaris to Africa. I videoed others and hunted myself for months at a time. This involved spending time with bowhunters in camp, so I heard the stories, and was able to examine animals in the skinning area and cool room.

In addition, Africa provides an opportunity not available in America, because in America it is not legal to use firearms during the bowhunting seasons. In most African locations, it is legal to use firearms and dogs for follow-up on those not-so-perfect bow shots. These conditions provide opportunities to examine broadhead wound channels on animals that may not have otherwise been collected. Recoveries under these circumstances are extremely educational.

A problem I see is that bowhunters tend to judge broadheads on a small number of results. Primarily, if a shot was successful, the broadhead is fantastic, but if the shot was not effective, the broadhead is junk. If only it were that clear and simple.

Fundamentally, shot placement is always more critical than the broadhead used. Unfortunately, shot placement cannot be precisely duplicated on animals. Consequently, there may be only a moderate amount of improvement when using a better broadhead. This is especially true if the shot placement is good in all cases. Therefore, just a few kills will not provide an accurate “big picture” assessment.

Blood trails are also quite variable. I believe that it takes an even larger sample of them to get an accurate representation. To obtain a preponderance of evidence, we need a large data base for both subjects – in other words, a large number of shots and recoveries.

When choosing broadheads, however, it doesn't mean that we shouldn't “see” with our eyes and “judge” with our minds. For example, some broadhead ferrules are made from a single piece of steel. Others have an aluminum



Entrance wounds caused by the 2" 125 grain rage hypothermic broadheads.



A large piece of lung material found 30 meters into a blood trail. The kudu bull was recovered at 90 meters.

ferrule, with a steel point screwed or pressed into the front. Two blade traditional heads may be stronger if machined from a single piece of steel and supported well to the tip. The steel must be of good quality and hardened correctly. All broadheads should be “razor” sharp, and be easy to sharpen and/or repair. I’ll mention more about the repair issue below when I address my preferences.

Because there is a strong desire for bowhunters to “chase” arrow velocity, 100 grain broadheads are the most popular and they dominate the market place. In my opinion, broadheads of that weight are not the best choice for such an important job. The minor arrow velocity gained in trade for a lighter, weaker broadhead is a bad deal. They also add less weight to the arrow, and don’t help move the balance point forward as much as heavier broadheads. Light weight arrows are also detrimental to the performance of the bow’s internal ballistics.

When starting at 300 grains of arrow weight, the addition of 100 grains might improve the internal ballistics of your bow by 4 percent. This is the bow’s ability to transfer stored energy to the arrow – dynamic efficiency. The next 100 grains – moving from 400 to 500 grains – might add an additional 2 to 3 percent. Also, the arrow’s external ballistics improves with this added mass. This is the arrow’s ability to maintain its velocity while traveling downrange. Additional arrow weight also quiets the bow a little. But slower velocities do increase the arrow’s trajectory path.

The “speed craze” started before the advent of laser rangefinders. But rangefinders are much more reliable than a little extra arrow velocity. Therefore they should be used on all longer shots to help prevent missing and wounding. When a rangefinder is used, arrow velocity is less of an issue.



When using large broadheads it is no longer uncommon to see lung material protruding from entrance wounds.

I do not use 100 grain broadheads. Today's carbon arrow shafts are light and stiff so I wish I could purchase 150 grain broadheads in the style I prefer. This additional "meat" would make them even stronger, and eliminate the need for me to add weight to the front end of my arrows. But because of the limited options, I use and recommend broadheads of at least 125 grains.

Choosing the best broadhead style for the job depends to a large degree on kinetic energy. The arrow's kinetic energy is a result of the bow type, its brace height, the shooter's draw length, the draw weight, and the arrow's weight. The size of animal to be hunted is also an important consideration.

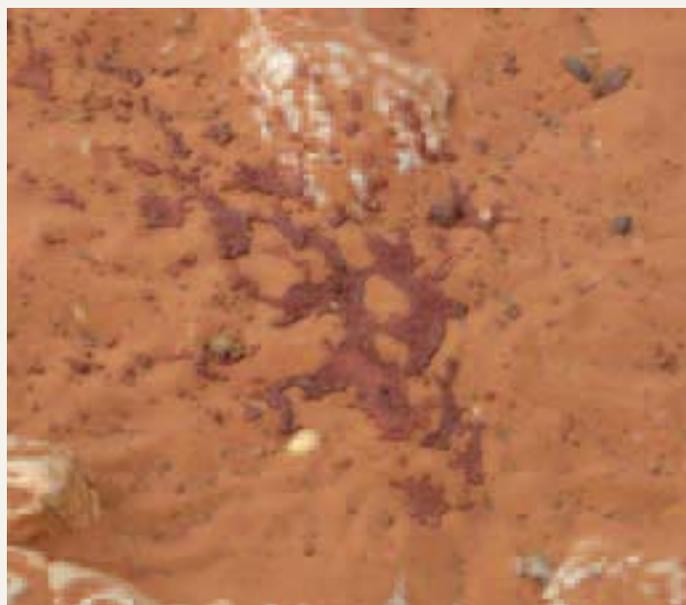
If you have a chronograph and a grain scale available, you can calculate your arrow's kinetic energy by using the following formula: the arrow velocity (in feet per second) times the arrow velocity times the arrow weight (in grains), divided by 450,240 equals the kinetic energy of the arrow in foot pounds. If you wish to use 2" expandable broadheads on animals much larger than whitetails I feel it's wise to shoot arrows that possess at least 65 foot pounds of kinetic energy.

Some agencies and foreign countries have made recommendations related to the draw weight and/or the kinetic energy needed to hunt certain species. In my opinion, these numbers are often unrealistically high. They may even be unattainable for many folks, particularly those choosing to use traditional style bows.

I use a 125 grain two blade expandable broadhead, which will be discussed below. My total arrow weight is about 500 grains and from my 58 pound Mathews Triax bow I achieve 68 foot pounds of kinetic energy. By today's standards, 500 grains is neither a light nor heavy arrow. It's a midrange arrow weight. My friend Dr. Randy Ulmer also prefers arrows in this weight range. For the majority of game animals and bow choices a good general recommendation for arrow weight is between 400 and 550 grains.

I use my 500 grain arrows with the 125 grain two blade 2" expandable broadhead, and the mentioned 68 foot pounds of energy, to hunt everything up to and including moose and eland which may weigh up to 1800 pounds.

Many bowhunters strongly prefer to have an exit wound. Rifle hunters, however, often choose to have their



Blood trails are often more obvious and shorter when using large broadheads. These are from shots with 2" expandables without exit wounds.

bullets stop just under the hide on the far side, thereby delivering all of the bullet's energy to the animal. I too prefer to use all of my arrow's energy cutting tissue. If my broadhead creates a large entrance hole and wound channel, and then stops on the far side of the animal, that's fine with me. If I make a reasonable shot, the animal will be recovered in a surprisingly short distance and, in most cases, the blood trail will be easy to follow.

With my 2" expandable heads, I only achieve exit wounds about 25 percent of the time. This is for broadside shots on animals in the size range of kudu, wildebeest, gemsbok and eland. On smaller animals, like whitetails,



The Rage Hypo•ermic 125 stoppe• just un•er the hi•e on the off si•e of this elan• bull – near my right han• in the photo. Recovery •istance 30 meters.



Ku•u - recovery •istance 90 meters.



Elan• - Recovery •istance 105 meters

impala and such I most often get a pass through shot, unless the shot is taken from a quartering away angle.

Because of my reduced number of exit wounds, I have attempted to compare blood trails with and without exit wounds. I have found blood trails to be so variable that I have not been able to find a correlation between an exit wound and no exit wound. This study is ongoing because I will always be extremely interested in blood trails and their causes.

Broadhead types and testing:

1. It is generally agreed that traditional or blade-to-the-tip broadheads penetrate best. But most broadheads in that style feature a fairly narrow cutting width - about 1 1/8 inches on average. Therefore they usually do not cut large wound channels. In large cutting widths they often encounter flight and accuracy issues.

Coupled with heavy arrows, they are often the choice for large animals like giraffe, buffalo, and pachyderms. They can also be a good choice for hunters using bows that produce low amounts of kinetic energy.

2. Central column replaceable blade broadheads are typically next in line in the penetration department. I tested central column two-blade heads against two-blade traditional broadheads of the same cutting size and found a four percent difference in the depth of penetration.

These broadheads feature removable blades that can be easily replaced and/or sharpened. The Striker offered by G5 is one of many such designs, and they employ some of the sharpest blades I've used.

3. Expandable broadheads are usually last in the depth of penetration category but much depends on their cutting width. Larger expandable broadheads cut more square inches of tissue, so they cannot be expected to penetrate as deeply as the smaller fixed blade and traditional broadheads.

Expandable broadheads are sometimes criticized for not opening. Many of these reports might come from the fact that the blades are often found in the closed position. Many designs close easily, once the forward pressure ceases. So unless the animal is recovered and the wound channel is examined, there is no proof either way.

Unlike other broadhead designs, expandable blades do not have support struts touching the ferrule at the rear of the blades. They are like airplane wings – out there on their own. So naturally, without this strut support, the blades are

more susceptible to stress and damage. But I don't find this to be a major problem.

The reasons I now prefer 2", 2 blade, expandable broadheads are:

1. With good shot placement, they provide shorter and better blood trails on average than do the smaller fixed and replaceable blade heads.
2. With marginal shot placement, they also provide shorter and better blood trails on average than do the smaller fixed and replaceable blade heads. Also shorter waiting periods are likely on those marginal hits. For example, with stomach shots, I previously recommended waiting eight to 12 hours. With 2" expandable broadheads four hours seems to be a long enough waiting time in most cases.
3. They are more likely to impact in same place as field points.
4. They usually provide better accuracy than do fixed

blade broadheads.

MY BROADHEAD PREFERENCES

Currently, my first choice in broadheads is the Rage Hypodermic 125 grain head. Please note: I have not used other broadheads in the Rage line; therefore I make that distinction here and make no other recommendations. I have used the 125 grain Hypodermic heads since about the time Rage introduced the Shock Collar blade retention system. I have now shot over 250 animals with them, so I feel that I know them well.

The blades slide rearward into place, rather than flipping over the top. As mentioned, there have been stories about expandable broadheads not opening on impact and deflecting. Even with my high number of shots, I have not experienced either situation, but I am careful about my shot choices and shot angles. And the Hypodermics always make a large entry wound (see photos).

The ferrules are made of steel, and feature a sleek,



Blue Wilbeest - recovery distance 85 meters.



Kudu - recovery distance 40 meters.



Bush pig - recovery distance 120 meters.



Gemsbok - recovery distance 160 meters.

modern design. With over 250 shots, I have seriously damaged just two ferrules. They were on a pass through shots on small animals and those arrows struck large rocks with most of their energy.

The blades are susceptible to bending, partially because of the lack of a “strut” mentioned above. Because I always do repairs, and sharpen and reuse the blades, I have been conducting a blade durability test. I am convinced that the stress caused by large animal impact shots weakens the blades to some degree, and that the weakening is cumulative. In other words, the blades become more likely to bend or break, the more often they are shot.

In the end, I doubt that this stress-related blade weakening is much of an issue, because very few bowhunters will reuse the blades as many times as I do. I track the number of shots on my blades by employing different colored nocks.

Another fantastic thing about the Rage Hypodermic 125's is that they are simple to repair, by far the easiest I've found. The blades are also relatively easy to sharpen.

Because the ferrules are tough, I purchase mostly extra blades and shock collars. The Rage Hypodermic is an expensive head but by replacing just the blades and shock collars my price per shot cost is reduced significantly. I estimate that I've use several of my ferrules 15 to 20 times. I use the blades about three times on average.

I also experience less arrow breakage when using the expandable broadheads, because they often pull out before the animal falls. I think this happens because the wound channel is large, and the blades often slip forward, making the head smaller. As the animal runs and the arrow may fall out without being damaged.

Currently the Rage Hypodermic rates at the top of my list in initial performance and reparability.

My choice of fixed-blade broadheads is the G5 Striker 125 grain 1 1/2 inch replaceable three blade head. The 125 grain ferrules will also accommodate the 1 1/8 inch blades. The Strikers offer 3 thicknesses of brass retention rings, which fit just behind the blades. These rings allow for some small adjustment to the broadheads weight.



Eland - recovery distance 60 meters.

As mentioned, the Striker blades are extremely sharp. The ferrules are made from steel, and the blades recess into the triangular point of the ferrule, which should improve strength and penetration. G5 also offers the Montec, but I feel the Striker is a tremendously better broadhead choice.

OTHER BROADHEADS I HAVE USED

I shot many animals with the New Archery Products 125 grain Kill Zone when I was testing them. They are a 2" rearward deploying expandable broadhead with an aluminum ferrule and steel point. I found that they functioned very well on the first shot, but were extremely difficult to disassemble and repair.

I've also shot many animals with a variety of the Grim Reaper expandable broadheads. Most feature 3 or 4 blades with 1 1/2 to 1 3/4 inch cutting diameters. They are "over the top" deploying expandable heads, with an aluminum ferrule and steel point. They function well, but do suffer blade breakage and bent ferrules on occasion. They employ several internal parts, and are a bit tedious to repair. But



Gemsbok - recovery distance 190 meters.



Gemsbok - recovery distance 120 meters.



Impala - recovery distance 5 meters.



Elan - recovery distance 80 meters.



Warthog - recovery distance 105 meters.

they often cost less than other expandable broadheads.

When separating the top performing broadheads, it takes good observational skills, good record keeping, and no pre-conceived ideas. Factors such as sponsorship may affect the conclusions reached by those promoting a product.

Today we have many choices when it comes to broadheads. Most of all, I see improved recovery rates when larger broadheads are used. In fact, knowing what I know today, it would cause me to lose some confidence if I was forced to use the broadheads I thought were the best just 10 years ago.

Like most bowhunters, I feel that my current broadhead choice is the best available for my style of bowhunting. Most of all, I hope your broadheads perform well, and you enjoy many great bowhunts.



Kafuelechwe - recovery distance 1 meter.



Duiker - recovery distance 0 meters.