

SHAFT SELECTION FOR BOWHUNTERS

Choosing arrows is a two-part process. First, decide what arrow weight you want to shoot, which in effect helps determine the type of shaft you'll need. Second, choose the correct shaft stiffness to complement your draw weight and arrow length.

Determining weight and speed goals: Not every bowhunter needs to shoot the lightest and fastest arrows available. In fact, shooting feather-weights can damage your bow and accessories. Light arrows don't soak up as much of the bow's energy as do heavier ones, leaving more energy behind that has to be dissipated through vibration. If your arrows are too light, your bow can literally be shaken to pieces.

The Archery Manufacturer's Organization (AMO) proposed a standard minimum arrow weight of roughly six grains for each pound of your bow's maximum draw weight (60 pound bow = 360 grain arrow). By today's standards, a heavy hunting arrow will weigh 8 to 10 grains per pound. And, if you really want to go for all-out speed, the standard of 5 grains per pound set forth by the International Bowhunter's Organization (IBO) for its sanctioned 3-D tournaments is as light as you dare go.

Heavy-weight hunting arrows: Arrows weighing 8 to 10 grains per pound of peak draw force will make your bow fairly silent while soaking up a little extra penetration energy. These weights correspond with full-length aluminum arrows having medium thickness walls such as the 2115, 2215, 2315, 2314, 2216, 2317 and 2514.

Mid-weight hunting arrows: Arrows weighing between 6 and 8 grains per pound offer a good compromise between quiet shooting, long-term durability and flat trajectory. Consider either of the following three options: the arrow sizes listed above cut down for an overdraw, full-length thin-walled aluminum shafts such as 2212, 2213, 2312, 2413, 2512 and 2613, or all-carbon shafts.

Ultra-light hunting arrows: If you want to push things to the limit for the flattest possible trajectory, shoot arrows weighing 5 grains per pound of draw force. Two shaft choices exist: the same thin-walled aluminum arrows listed above cut down for an overdraw or full-length composite shafts made of aluminum and carbon (Easton ACC's) and the current selection of internal component carbon shafts such as the Beman ICS Hunter, Easton Evolution, Gold Tip and Carbon Express among others.

Correct shaft stiffness: Arrows released with fingers behave differently from those released with a mechanical aid. A finger-released arrow must go through a series of side-to-side oscillations called "paradox" which is started when the string moves laterally to clear your fingers. The bending of the shaft must be timed perfectly so that it passes cleanly around the bow without hitting the riser or rest. To achieve good flight, your arrow shafts have to be an exact match for your bow and your release style.

Since there is no sideways movement of the string, an arrow released with a mechanical aid flexes much less as it leaves the bow. The flex that does occur is generally confined to the vertical plane (up and down). When using a release aid, you can get away with a wider range of shaft stiffness and still enjoy good arrow flight. But to be on the safe side, it is best to stick with the recommendations of the shaft selection chart put together by each arrow manufacturer.

Because factors other than release style have a bearing on shaft stiffness, (such as whether or not you shoot an overdraw, string material, bow style and letoff) you will have to work out a "calculated" bow weight for use with these charts. If you request a brochure from an arrow manufacturer, it will have this step-by-step calculation spelled out for you. Make sure to work through it before referring to the shaft selection chart.

Point weight: Point weight is also an important element of choosing the correct arrow stiffness, especially if you release with fingers. Determine what broadhead weight you will be hunting with before choosing your arrows, and then use field points of the same weight for off-season practice.

Price vs. straightness: Most arrows are manufactured in grades. This is little more than a marketing ploy - a way to partition the market in order to charge more money for the high-grade product. In most cases, there is only one difference that separates the categories: straightness. Top grade arrows have straightness tolerances of +/- .001 to +/- .002 inch. Lower grade arrows have straightness tolerances of +/- .003 to +/- .006 inch. At most typical whitetail hunting distances there is no difference in accuracy between the various shaft grades.

Unless you're buying additional features (such as a better nock system or a camo finish) there's no reason to spend extra for arrows that are only a few thousandths of an inch straighter. You won't notice the difference. At Bowhunting.com we're big fans of value and when it comes to arrows the best value is found in Easton's Yukon aluminum shafts.

Shafts for whitetail hunters: The average whitetail hunter takes shots from 10 to 30 yards - 20 yards is about average. A mid-weight arrow will handle that challenge with ease. A heavyweight arrow, being slower will require slightly better distance judging ability past 20 yards, but will produce a quieter bow with maximum penetration. The lightweight arrows are fun to zip on the range and on the 3-D course where shots are long and distances unknown. However, in a tree stand they are typically not a necessity unless your hunting style routinely requires shots past 25 yards. No matter what your goals, a little experimentation will yield the perfect arrow.

Penetration vs. arrow speed: Most bowhunters over-emphasize the impact small changes in arrow weight have on penetration energy. Sure, it adds up if you are talking major weight changes, but 50 grains either way doesn't make a lot of difference on how deeply the arrow buries in the target. Sometimes it's not worth giving up speed for more penetration, especially if you already have plenty of energy for the game you hunt.

Let me clear this up with an example. Suppose a bowhunter shoots a 70-pound bow with a 30-inch draw length. For him, a lightweight arrow is going to weigh 350 to 455 grains. Assuming the bow has an AMO speed rating of about 235 fps (typical of most moderately aggressive bows on the market right now), this bowhunter will be getting speeds of around 275 to 300 fps. With a mid-weight arrow his speed will be 250 to 275 fps. With a heavy arrow his speed will be less than 250 fps. At 9 grains per pound, the speed will be right around the AMO rating of 235 fps.

Using the middle of each range as the comparison, the mid-weight arrow is roughly 10 percent faster than the heavy arrow (weighing 9 grains per pound). The lightweight arrow is roughly 20 percent faster than the heavy arrow.

Now let's look at how the penetration energy (kinetic energy) of the arrows change as they get lighter. Using data compiled by independent bow testers, I've been able to pull out the amount a typical aggressive bow's efficiency drops as arrow weight goes down. This translates directly into penetration energy lost.

By dropping the shaft weight from 9 grains down to 7.5 grains per pound, the bow's efficiency drops by about 3.5 to 5 percent (depending upon the bow), which means the arrow carries 3.5 to 5% less penetration energy. That's not a huge change.

When the shaft weight goes from 9 grains per pound of draw force down to 6 grains per pound (the middle of the lightweight arrow range), the bow's efficiency drops another 4 percent. The lightweight arrow from the same bow now carries 7.5 to 9% less energy than the heavy arrow. It takes a pretty large swing in arrow weight (210 grains) before energy loss starts to become significant.

In other words, if you need the extra arrow speed to flatten your trajectory for shots that typically range longer than 25 yards, you won't lose so much energy that you risk insufficient penetration. If you are already shooting a bow over 60 pounds with fairly aggressive cams, you probably have 10% to spare - especially if you will be hunting smaller big game animals.