

Shotgun Performance

BY LARRY NAILON

ALMOST EVERY CLAY TARGET SHOOTER IS INTERESTED IN IMPROVING THEIR SHOTGUN'S PERFORMANCE. THE VALUE OF BARREL MODIFICATIONS HAS LONG BEEN A PART OF THAT PROCESS. LONG FORCING CONES AND AFTER MARKET CHOKES, FOR THE MOST PART, DO INCREASE DOWN RANGE PERFORMANCE – TO A DEGREE.

Then there is a small percentage of shooters that back bore their barrels, increasing performance up another level. It is relatively easy to achieve a good shooting target gun with these modifications. The next step up in gun performance is far more difficult. Superior gun performance is almost always a combination of barrel modifications and a particular type or style of shot shell load.

All performance-increasing barrel modifications have one thing in common. They decrease the degree of pellet deformation in the shot charge at muzzle exit. You can measure it any way you want to, but the one most important factor in gun performance is how round and uniform the pellets are at muzzle exit. This is why the shot shell load is so important to down range performance and a vital part of a high performance target gun.

A good portion of shot deformation occurs as the powder

is ignited and the shot is crushed by the violent start of projectile acceleration. Envision a stack of relatively soft lead pellets contained on three sides, then hit with a force of 10,000 pounds per square in less than one half thousandths of a second. The upper part of the shot column simply crushes the lower pellets into out of round shapes. Even a long forcing cone and long choke system can't correct pellets deformed at powder ignition set back. Plus, with the variation in pellet sizes, the set back force is not evenly distributed within the shot column. The best magnum target shot will vary 6 to 10 thousandths of an inch in size which changes the pellet weight variation even more. The pellet size variation actually increases pellet deformation with different angles of force within the shot column during ignition set back.

Pattern performance of 75 per cent indicates that 25 per cent of the shot charge is deformed and pushed away from the point of aim as it encounters wind drag. The value of shot quality cannot be overstated when down range

performance is the goal. As an example of how important shot quality is, a tungsten #7 size pellet in normal target wads produces 100 per cent patterns of 20 inches diameter at 40 yards with only .010 (Improved Cylinder) choke constriction. These tungsten pellets are very expensive which eliminates them as a feasible shot for target shooting – but they clearly demonstrate the value of shot quality in down range performance.

Target shooters are at the mercy of shell manufacturers. We shoot what we can buy and for the most part believe anything printed about that particular shot shell. It always amazes me that target shooters buy expensive guns and demand complete precision in barrel modifications then stuff it full of untested shells – relying on a visual performance guess and a little clubhouse advice.

Some simple shell tests can create a positive attitude and quickly relate to higher scores. Knowing how your gun shoots with different chokes at different ranges creates a positive attitude – I have seen it work time and time again. A shooter comes to the pattern plate and fires a series of patterns, sometimes with different shells. With a good evaluation of those patterns you can feel his confidence growing. To take the test up another level, we can perform some accurate velocity tests with a chronograph, relating

those tests to the patterns. In almost every instance the shooter's scores improved at the next tournament. Knowledge about your gun load combination is a powerful target breaking tool.

Pattern your gun/load combination as accurately as possible. Use measured distances and record all information for future reference – including load, choke constriction and gun description. Factory shells vary a lot in velocity and shot quality. It is not uncommon to find a 12 per cent variation in muzzle velocities with the same shell, just out of a different production run – that can be a 150fps difference in muzzle velocities! This directly effects pattern performance just like the shot quality.

As a general rule, the faster you push the shot charge the more open it will pattern. High velocity exaggerates the wind drag effects on even slightly deformed pellets. The round pellets of the shot charge fly true to the point of aim and deformed pellets add little to performance while increasing recoil. When you find a shell and gun combination that produces good consistent patterns, buy a big lot of those shells out of the same production run! Production lot numbers are stamped on the shell boxes as well as the flat or carton. Sure it's a little trouble – but the rewards far outweigh the effort involved. ■