

# HIGH VELOCITIES:

*'For donkey's years we all got by with two types of local shotgun ammunition', writes Charles Duff. 'They were the low brass Trap & Skeet or "Club" cartridges, in 24, 28 and 32 gram loads, shot sizes 7 and smaller; and the high brass "Game" or "Veld" hunting loads, sizes 6 and larger in 35 gram loads. There was no information on the boxes or cases as to velocities or pressures. Needless to say, we all shot with what was available quite happily, without feeling terribly deprived...'*

**T**hings have changed, and these days well known international brands are commonplace in our market. The information on their boxes is just as sparse, there is nothing except shot size and load. The only arguments about cartridges that one hears in the hunting field are about what shot size is best for which bird. However, this does not hold true in clay pigeon shooting circles, where there is a continuous undercurrent of mumbling and muttering about the velocities of various brands as well as much swapping of shot weights and sizes depending upon the target. It is not uncommon to find clay shooters with four pockets full of cartridges of four different shot weights.

Swartklip's 'Club' loads all have a MV of 380 m/sec. (1, 247 fps), except the #9s which reach 400 m/sec. (1,312 fps). The more impressive high-brass 35 gram 'Game' loads in actual fact toddle along at a quite sedate MV of 370 m/sec. (1, 214 fps). Since their pressure and recoil are already significantly more than the 32 gram, any higher velocity would really whump the shoulder. They have stated that trying to get faster velocities with their cases, wads and powders definitely produces poorer patterns. It is apparent from overseas magazines and from the imported ammunition

# Are they a marketing ploy?

now flowing into the country, that higher and higher velocities are being touted as very much the 'in' thing.

Muzzle velocities over 1,400 fps are rapidly becoming the norm, and there is even a 24 gram cartridge which claims a MV of 1,610 fps (491 m/sec.). Gamebore advertise their 'Patriot' at 1,500 fps and their slowest load is 'the Blue Diamond' at 1400 fps, both in shot sizes 7 1/2 to 9s and only in 28 gram. Eley Hawk got into the act with a Pigeon 6 1/2, 32 gram load at 1,425 fps. SAGA, RC, Clever Mirage and all the others tout faster loads as well. Yet Winchester's famous 'AA Club' and 'Super XX' loads are only 399 m/sec. (1,309 fps), and 410 m/sec. (1,345 fps) respectively; whilst their fastest load – the 'Prestige Silver' – cruises along at 418 m/sec. (1,371 fps).

Much is made of the higher speeds, as if speed alone is all that is required. What these manufacturers don't say is how their cartridges pattern. But this, of course, you have to find out for yourself. If this is more than just acceptable, which it must be or they wouldn't sell, then they must be doing something significantly different to Swartklip. Those that I've examined appeared to have much the same sort of hardened (chilled) lead shot – in fact Swartklip's is frequently superior. The wads do not appear to be that different in design, though the esoterics of power-piston and shot buffering is not something that gets much mention in current literature and perhaps there are nuances that are missed by the untutored.

And of course, there's always a down-side. Increase the velocity on any given weight of shot and inevitably the pressure and recoil must increase. The laws of physics are immutable.

Obviously, birds are not killed at the muzzle! What is important is the 'down-range' velocity at between 20 to 40 yards. Only problem is, of course, to get meaningful figures for this requires the old type of chronograph with foil screens, a very tightly choked gun and some serious protection for the chrony. Or a set of very sensitive light screens that will work on a shot cloud out to 40 yards. Since it is the retained kinetic energy in the shotgun pellet that kills, not sheer speed alone, it stands to reason that heavier pellets have more kinetic energy than lighter ones at the same velocity. A spherical pellet has a lousy drag coefficient, not to mention sectional density, and loses velocity much quicker than any half-way decently shaped rifle bullet. Since energy is a factor of mass and velocity, it is apparent that a concurrent loss of energy also occurs almost as rapidly.

At forty yards range the average shotgun pellet can be expected to have lost about 40% of its initial velocity. In fact the pellet velocity loss is the greatest over the first 20 yards, where up to 25% dissipation occurs and thereafter it tails off somewhat, relatively speaking.

The smaller sizes of shot are too light and lose out to air resistance quickly, the larger have too much surface area which gives much the same end result, though they do retain velocity slightly better, because in the velocity/mass/energy equation, mass is the predominating factor. It is also apparent that the quicker a shot charge starts out, the more quickly this initial velocity gets dissipated. 'Sports Afield' magazine has stated that the most ballistically efficient shotgun velocities are between 1,180 and 1,220 fps. In other words, at these speeds the average medium-sized pellet loses the least velocity, and retains more kinetic energy down-range.

Of course, all the above is common knowledge to birdshooters. The bigger the bird, the larger the shot needed for

a sure kill, until the bugbear of sparse patterns comes in to muddy the puddle. The longer the range, so the chance of wounding increases exponentially. But the Sporting Clays shooter needs only to hit the clay with one or two pellets to break it. Local tests have shown that a 28 or 32 gram load of 7 1/2 shot will consistently break a (stationary) clay edge-on at 35 metres, half-face at 40 metres and full-face at 45 metres, with a full-choked gun.

There are very few of our birds that any shot load, of any size, will do more than wound at 45 metres! We sincerely trust that everyone keeps to a conservative maximum hunting range of 40 yards.

So what price the search for, and marketing of, higher and higher shotgun cartridge velocities? Are high velocity loads the answer to a shot-gunner's moist dreams that current advertising by the overseas manufacturers and some gun scribes would make them out to be?

Let's dive gaily into some arithmetic and assume for the sake of the exercise that an average velocity of (initial + down-range) divided by two is valid, which it isn't quite. Using our fastest gamebird, the rock pigeon, as an example, let us assume that one is cruising along at 60 mph, or 88 fps, 40 metres out and moving at 90 degrees to us. Using the Swartklip Trap & Skeet load, with a MV of 1,247 fps, a down-range velocity of 724 fps can be expected at this distance. Average velocity is thus 986 fps, so time to target is 0.133 seconds. During this time the 'rockie' has travelled 11.71 feet. With an average length of 14 inches, to hit the bird your lead would need to be 10.03 birds' lengths.

Push the MV up to 1,440 fps, and down-range velocity becomes 806 fps, average 1,123 fps, thus time to target is now 0.117 seconds. This means that the 'rockie' travels 10.30 feet in this time, and the lead comes down to 8.83 birds' lengths, a whole 1.2 bird's lengths less than the 'slow' 1,247 fps load. Wow! I don't know of anyone who is that exact in either range or lead estimations, not even taking into account the length of the shot string or the angle the bird is flying!

This demonstrates, I believe, quite clearly that higher speeds are really not of any great significance to a bird shooter. What is really important is that he gets used to one speed of load and sticks with it. Changing backwards and forwards from one load to another will just lead to confusion, especially if you consciously think about increasing or decreasing your lead to allow for the different velocities.

However, these differences in velocity and lead could well become quite critical in clay pigeon shooting. With the testing targets now prevalent, the Sporting Clays shooter needs all the help he can muster, and one to three feet less required lead might be the difference between an irritating miss and a satisfying shower of bituminous chips. But the user has to accept the inevitable increase in recoil, which between 1,214 fps and 1,440 fps is quite substantial. A 32 gram load at 1,440 fps requires a rather heavy gun to absorb the recoil.

So to answer the question – are higher velocities, with concomitant higher recoil really necessary in shotgun shooting? – I believe that the truthful answer is: 'Possibly Yes' for clay pigeons and 'Not Really' for game birds. After all, to prevent bruising and flinching, youngsters and women are frequently given subsonic loads to use, which are at best sauntering and not even ambling along, yet they can still hit the targets confidently.

— Charles Duff