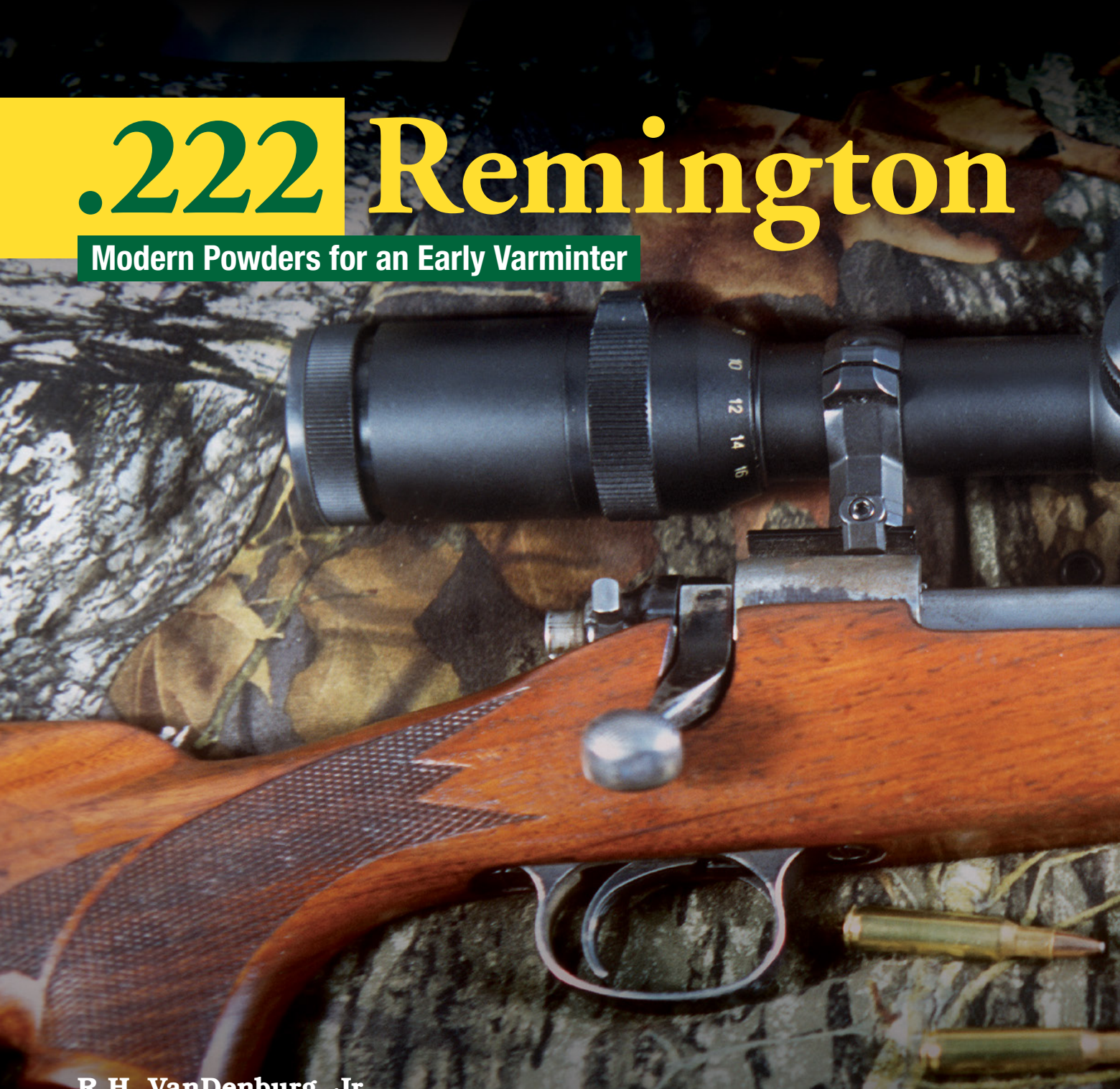
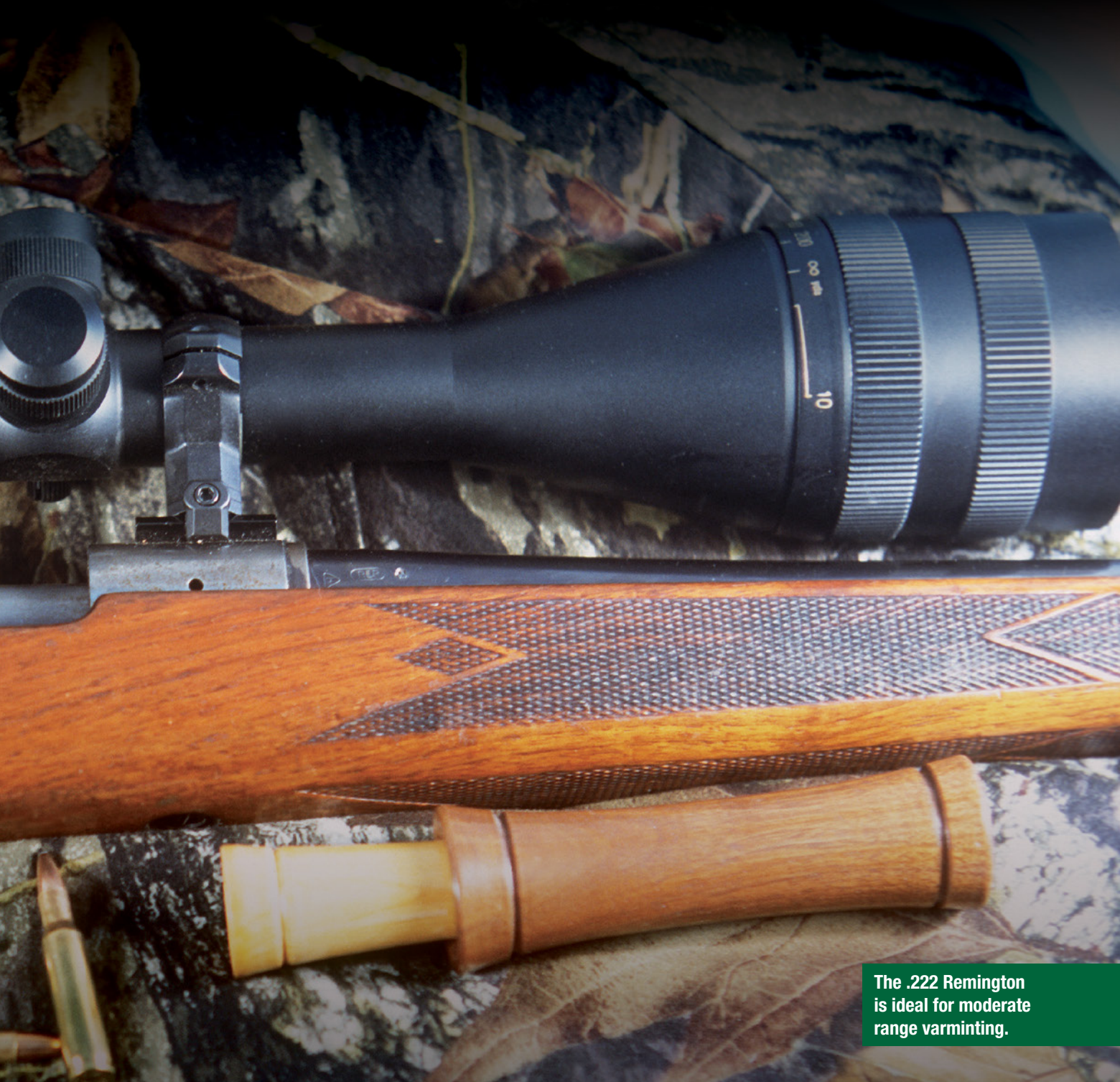
.222 Remington

Modern Powders for an Early Varminter



R.H. VanDenburg, Jr.

At the end of World War II, returning servicemen anxious for some varmint shooting with scope-sighted, bolt-action rifles found that the list of commercial varmint cartridges was still but four: .22 Hornet, .218 Bee, .219 Zipper and the .220 Swift. All were developed in the 1930s. The first three were rimmed cartridges and the latter, semirimmed. As arms and ammunition companies moved away from their wartime footing and were able to address growing civilian commercial needs, new cartridge development moved to the top of the list. In 1950 Remington Arms Company introduced what was both the first new commercial cartridge since the war and the first commercial rimless varmint cartridge, ever, the .222 Remington.



The .222 Remington is ideal for moderate range varminting.

Developed by Remington's Mike Walker, the cartridge's unique characteristic was its size. Not based on any existing case, it had a case rim of .378 inch and a nominal dimension in front of the extractor groove of .376 inch. Case length was 1.700 inches. It was initially chambered in the short-action Remington Model 722 with a 26-inch barrel. The cartridge first attracted the attention of varmint hunters, as it was intended to do, but rapidly began to find favor among the truly accuracy-conscious benchrest crowd. Walker first used the cartridge in benchrest competition in the summer of 1950.

Gun writers of the day took notice, universally praising the cartridge. Warren Page of *Field & Stream*, Jack O'Connor of *Outdoor Life* and Townsend Whelen all noted the cartridge's exceptional accuracy. Page used the cartridge to shoot his way into the Benchrest Hall of Fame. Bullets of the era were frequently made by the benchrest shooters themselves or purchased from individuals who made highly accurate projectiles. Weights for .22s were usually 50 to 55 grains but eventually seemed to settle on 52 or 53 grains. Today Berger, Sierra, Hornady and several smaller firms turn out match-grade bullets.

Among powders, after some shaking out, DuPont's 4198 emerged as the powder for the .222 Remington.

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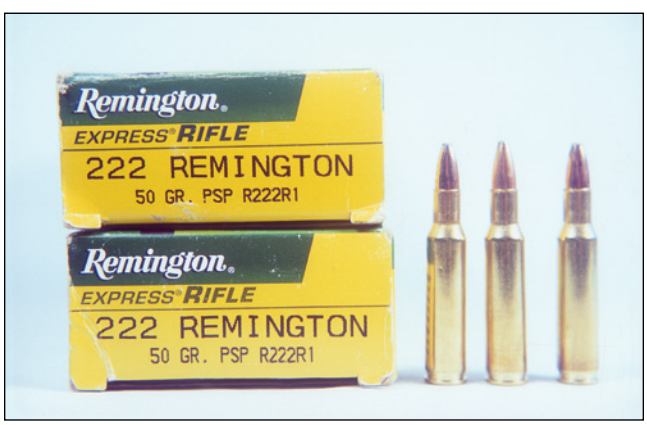
The most popular loads were 20.5 and 21.0 grains with bullets from 50 to 53 grains. Heavier 55-grain bullets sometimes were paired with the same charge but were often cut back to 19.5 or 20.0 grains. While both the 20.5- and 21.0-grain charges went on to earn classic status among handloading cognoscenti, a quick look at the most recent load data from Hodgdon, which offers 4198 under its IMR label (the former DuPont powder) and its own H-4198 (manufactured in Australia) shows these loads to exceed currently acceptable maximums.

Hodgdon's maximum for 50-grain bullets with IMR-4198 is 19.3 grains; for 53- and 55-grain bullets, it's 18.7 grains. Hornady, on the other hand, in its *9th Edition Handbook of Cartridge Reloading*, lists 21.0 grains with 50-grain bullets and 20.5 grains with 53 to 55 grainers as acceptable.

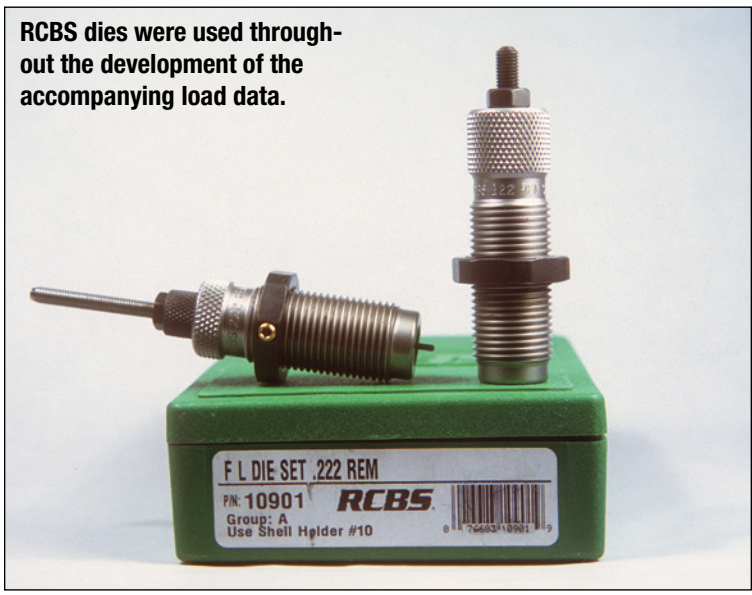
It wasn't long before the .222 Remington shouldered aside the previous benchrest darling, the .219 Donaldson Wasp, and reigned supreme, for the most part, until the advent of the next accuracy phenom, the .22 PPC. It, in turn, gave way to the present reigning champ, the 6mm PPC. The .222 Remington held on as the favorite moderate range varmint cartridge until it was steamrolled by the upstart .223 Remington. No one could argue that the .223 was more accurate than the .222; but it was, and is, our military cartridge, and everyone was chambering rifles for it.

With the growing interest in guns built on the AR-15, which is built around the .223/5.56 NATO, the .222 Remington has faded into oblivion. No major rifle manufacturer in this country chambers the cartridge any more, although many smaller manufacturers will chamber it on request. This is sad, perhaps, for the cartridge is as accurate as it ever was, has the same modest report and general range of usefulness – but time and the tide of public opinion wait on no one.

There are a full half-dozen powders that qualify as both new, or reasonably so, and suitable for use in the .222 Remington. Three are single-base, extruded powders: Hodgdon Benchmark, IMR-8208 XBR and Accurate



Today's .222 Remington factory ammunition still performs quite well and has maintained its integrity over the years.

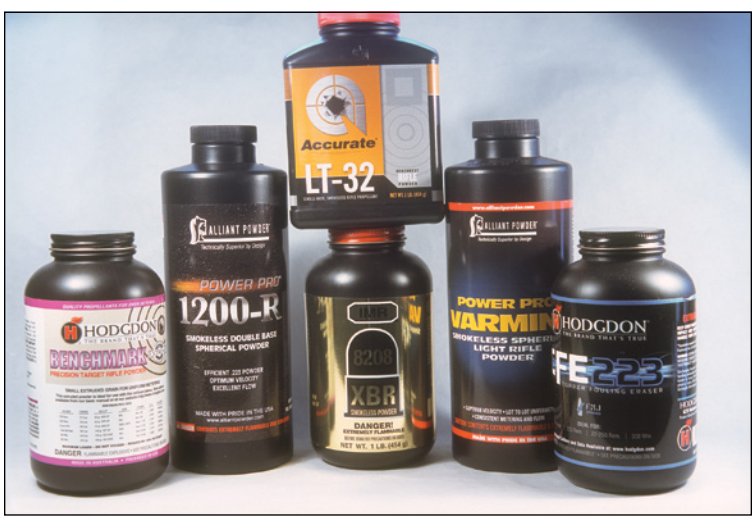


RCBS dies were used throughout the development of the accompanying load data.

LT-32. The other three are ball powders: Alliant Power Pro 1200-R, Power Pro Varmint and Hodgdon CFE 223.

Benchmark is the oldest of the powders included here, introduced about 2000. It is part of Hodgdon's Extreme Series, meaning it is almost impervious to extremes in temperature. Manufactured in Australia by the then ADI, now part of the THALIS Group, Benchmark is a very short-cut powder having a burning rate slower than IMR-3031 and generally close to H-335. It meters quite well, burns cleanly and seems to enjoy success in Hodgdon's lineup.

IMR's 8208 XBR entry into this group is a fascinating story – far too long to be told here. A brief summary is that the Thunderbird Cartridge Company purchased large quantities of a government surplus powder manufactured by DuPont and offered it for sale as 8208. Walt Berger, of benchrest and bullet fame, purchased one lot of the powder and sold it as T32. As supplies of all of these were running low, Hodgdon was approached by several people to make more. It didn't, but instead offered a new powder that was met with great favor by



These powders were used in assessing the .222 Remington handloads.

.222 Remington Load Data

bullet (grains)	powder	charge (grains)	OAL (inches)	velocity (fps)	group (inches)	remarks
32 Cutting Edge HP	Benchmark	24.0	2.120	3,321	.625	
		25.0		3,602	.750	maximum
	IMR-8208 XBR	24.0		3,305	.688	
		25.0		3,434	.750	maximum
	LT-32	24.0		3,745	.500	
		25.0		3,925	.750	do not exceed
	Power Pro 1200-R	22.5		3,475	.563	
		23.5		3,642	.563	maximum
	Power Pro Varmint	25.5		3,493	.563	
		26.5		3,550	.688	maximum
35 Nosler Lead Free	Benchmark	24.0	2.130	3,434	.750	
		25.0		3,575	.813	maximum
	IMR-8208 XBR	24.0		3,273	.813	
		25.0		3,449	.875	maximum
	LT-32	24.0		3,661	.375	
		25.0		3,723	.625	do not exceed
	Power Pro 1200-R	22.0		3,378	.688	
		23.0		3,483	.438	maximum
	Power Pro Varmint	25.5		3,336	.625	
		26.0		3,355	.688	maximum
40 Hornady V-MAX moly-coated	Benchmark	24.0	2.130	3,379	.750	
		25.0		3,513	.813	maximum
	IMR-8208 XBR	24.0		3,292	.563	
		25.0		3,403	.688	maximum
	LT-32	24.0		3,584	.500	
		25.0		3,681	.625	do not exceed
	Power Pro 1200-R	21.5		3,246	.688	
		22.5		3,390	.750	maximum
	Power Pro Varmint*	24.5		3,145	.813	maximum
40 Berger FBHP	Benchmark	24.0	2.130	3,365	.688	
		25.0		3,483	.750	maximum
	IMR-8208 XBR	24.0		3,216	.500	
		25.0		3,373	.625	maximum
	LT-32	24.0		3,568	.563	
		25.0		3,744	.750	do not exceed
	Power Pro 1200-R	21.5		3,272	.625	
		22.5		3,343	.688	maximum
	Power Pro Varmint*	24.5		3,050	.875	
		25.5		3,182	.750	maximum
45 Nosler Solid Base	Benchmark	23.5	2.130	3,215	.625	
		24.5		3,369	.688	maximum
	IMR-8208 XBR	22.5		2,997	.813	
		23.5		3,115	1.125	maximum
	LT-32	22.5		3,267	.625	
		23.5		3,478	.750	do not exceed
	Power Pro 1200-R	20.8		3,119	.938	
		21.8		3,206	.750	maximum
	Power Pro Varmint	24.5		3,112	.750	
		25.5		3,226	.688	maximum

(Continued on page 24)

benchrest insiders who tested it. It is also manufactured in Australia and Hodgdon introduced it as an IMR canister powder in 2010 (IMR-8208 XBR.) It is not the same as the original military surplus powder. Similar in appearance to Benchmark, it, too, is short cut, meters very well and burns cleanly. Both are a light gray/green in color.

Western Powders, under its Accurate Powder line, eventually approached General Dynamics in Ontario, Canada. This is the facility that manufactured DuPont powders in its later years before divesting itself of its smokeless powder division and manufactured all of IMR's powders before Hodgdon's purchase of the company. The facility also makes all of Accurate's current extruded powders. It is from this facility that the original military powder was manufactured. Accurate's goal was to actually duplicate the original powder – at the same facility on the same equipment. Remember Berger's T32 offering? Accurate's powder is LT-32. Not having any of the original military powder, I can't speak to how close Accurate came to meeting its goal. I can say that LT-32 is faster burning than Benchmark which, in turn, is faster than IMR-8208 XBR. LT-32 is similar in appearance to both but is much darker in color, obviously employing a larger percentage of graphite in its makeup. Like the others, it meters very well and is very clean burning.

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The ball powders are all manufactured by St. Marks Powders, a General Dynamics subsidiary, in its plant in St. Marks, Florida. When Alliant Powder announced its Power Pro ball powders, the fastest-burning rifle powder was to be known as Power Pro 1000. Things change, and it was eventually released as Power Pro 1200-R. It is a double-base, spherical powder ideally suited for modest case capacity varmint and benchrest cartridges. It is the fastest burning of the powders tested.

Prior to the release of Power Pro 1200-R, Alliant released another of its Power Pro line intended for a broader range of varmint cartridges, Power Pro Varmint. The powder works well in the .222 Remington but does not produce quite the velocity of the other powders and is perhaps best suited for cartridges with a larger case capacity.

One final powder is Hodgdon CFE 223. This one came about as a result of a government request that

.222 Remington Load Data

(Continued from page 23)

bullet (grains)	powder	charge (grains)	OAL (inches)	velocity (fps)	group (inches)	remarks
50 Barnes Varminator	Benchmark	23.0	2.130	3,174	1.125	
		24.0		3,286	1.375	maximum
	IMR-8208 XBR	22.3		2,942	.625	
		23.3		3,085	.938	maximum
	LT-32	22.3		3,129	.688	
		23.3		3,334	.625	do not exceed
	Power Pro 1200-R	19.5		2,901	.750	
		20.5		2,986	.813	maximum
	Power Pro Varmint	24.3		2,994	.875	
		25.3		3,116	1.125	maximum
	CFE 223	25.0		2,944	.813	
		26.0		3,060	1.000	maximum
50 grain Berger	Benchmark	23.5	2.130	3,148	.750	
		24.5		3,325	.688	maximum
	IMR-8208 XBR	22.5		3,046	.750	
		23.5		3,114	.688	maximum
	LT-32	22.5		3,216	.625	
		23.5		3,353	.563	do not exceed
	Power Pro 1200-R	19.7		2,981	.813	
		20.7		3,012	.625	maximum
	Power Pro Varmint	24.5		3,033	1.000	
		25.5		3,153	1.063	maximum
	CFE 223	25.5		3,009	.875	
		26.5		3,147	.688	maximum
50 Hornady V-MAX moly-coated	Benchmark	23.0	2.130	3,026	.875	
		24.0		3,152	.750	maximum
	IMR-8208 XBR	22.0		3,021	.813	
		23.0		3,149	.625	maximum
	LT-32	22.0		3,297	.563	
		23.0		3,374	.813	do not exceed
	Power Pro 1200-R	19.5		3,012	.625	
		20.5		3,099	.688	maximum
	Power Pro Varmint	24.0		2,987	.813	
		25.0		3,019	.750	maximum
	CFE 223	25.0		3,041	.938	
		26.0		3,139	1.063	maximum
55 Hornady Spire Point	Benchmark	22.2	2.130	2,992	.875	
		23.2		3,112	1.125	maximum
	IMR-8208 XBR	22.2		2,914	1.125	
		23.2		3,033	1.500	maximum
	LT-32	22.0		3,179	.625	
		23.0		3,251	.438	do not exceed
	Power Pro 1200-R	19.0		2,789	1.125	
		20.0		2,864	1.000	maximum
	Power Pro Varmint*	23.3		2,856	1.125	
		24.3		2,944	1.250	maximum
	CFE 223*	25.0		2,916	n/a	
		26.0		3,241	.625	maximum

* Cases used were R-P.

Notes: A Remington Model 700 with a 24-inch barrel (1-in-14-inch twist) was used to test-fire all loads. W-W Super cases and Remington 7½ Benchrest primers were used in all loads, except were indicated with an asterisk (*).

Be Alert – Publisher cannot accept responsibility for errors in published load data.

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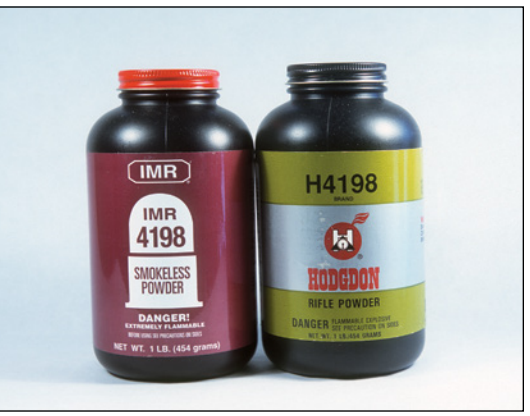
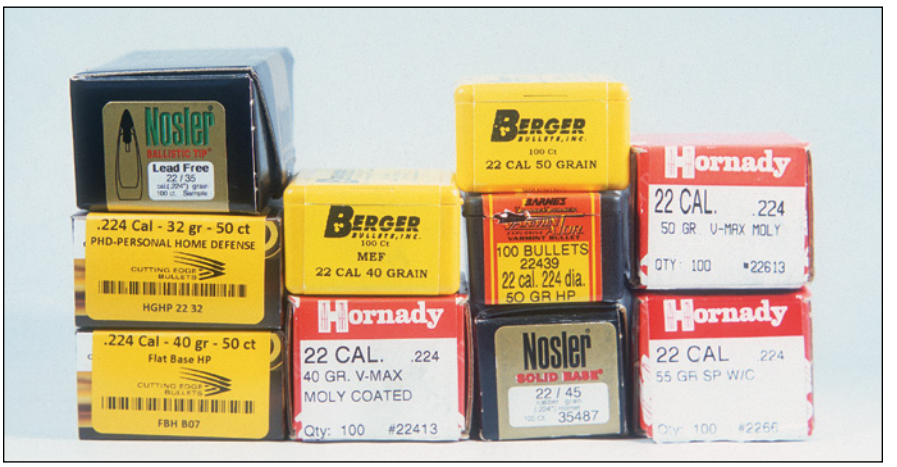
St. Marks Powders investigate the possibility of reducing metal fouling in rapid-fire arms through enhancements to the powder used. The result, for the canister market, is CFE 223 (for Copper Fouling Eraser and its target cartridge, the .223 Remington or 5.56 NATO). A CFE Pistol powder was introduced in 2014. Interestingly, my research found that CFE 223 was not paired with any bullets of less than 50 grains in the .222 Remington or 40 grains in the .223 Remington. As with the others, it is a spherical, double-base powder that meters to perfection and burns well in the .222. It is the slowest burning of all the powders tested.



The early standard powder for the .222 Remington was IMR-4198. Hodgdon H-4198 is similar but slower burning.



A variety of bullets continue to work well in the .222 Remington.

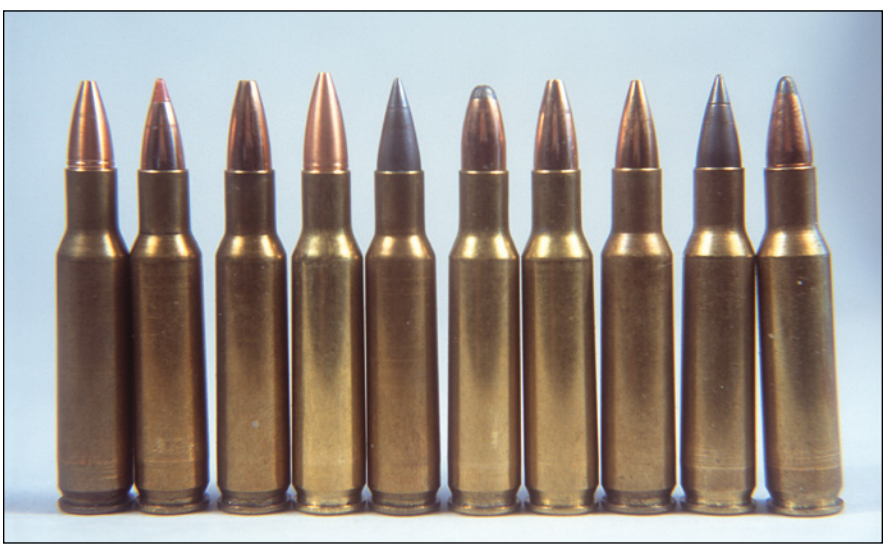
Bullet selection was fairly easy with a dozen different choices on hand which were winnowed down to an even 10. The lightest, 32 grains, is from a relatively new entry into the bullet trade, Cutting Edge. The company's products are lathe-turned on CNC equipment of either brass or copper. The product line is growing rapidly. For these tests I used the 32-grain PHD hollowpoint. A 40-grain flatbase hollowpoint is available but will not stabilize in the .222's one-in-14-inch twist. It would be ideal in the faster-twist .223 Remington. Next was a Nosler 35-grain Lead Free Ballistic Tip with a fragmenting copper core. A pair of 40-grain bullets were run through their paces: a Berger flatbase HP and a Hornady V-MAX with moly coating. Continuing upward, a Nosler 45-grain solid base proved interesting. A cup-and-core bullet with an exposed lead tip and a moderately shaped boat-tail base, it lacked the high ballistic coefficient profile of most of the others but performed well nevertheless.

The 50-grain bullets included a svelte, flatbase hollowpoint from Berger, a Varminator hollowpoint from Barnes and another Hornady V-MAX with moly coating. The final selection was a Hornady 55-grain Spire Point. It was the only bullet with a cannelure and the only bullet that did not perform well in my rifle.

Tests began by first firing and chronographing Remington factory 50-grain loads. In Ken Waters' "Pet Loads" on the .222 Remington in 1968, he chronographed factory 50-grain loads at 3,159 fps; in his 1977 revisit of the cartridge, factory 50-grain ammunition clocked 3,121 fps. My efforts sped over the screens at 3,146 fps, suggesting that Remington has maintained a consistent control over .222 Remington performance. Group sizes averaged right at .75 inch at 100 yards – not bad for a lightweight, rather used field gun.

Measuring the pressure ring in front of the extractor groove was next. New factory loads measured from .372 to .373 inch; after firing, the same cases measured .375 inch. Because of this and the original SAAMI specs, a maximum acceptable pressure ring measurement was established at .376 inch.

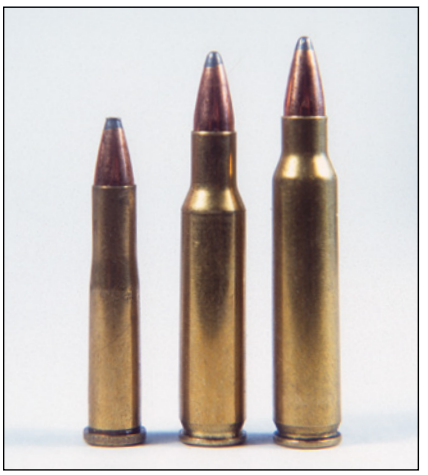
Quite a few cases were on hand, sorted, sized and trimmed to 1.690 inches and weighed. It turned out



Sample bullets loaded for testing include, from left: Cutting Edge 32-grain PHD, Nosler 35 Lead Free, Berger 40 HP, Cutting Edge 40 FB, Hornady 40 V-MAX, Nosler 45 SB, Barnes 50 Varminator, Berger 50, Hornady 50 V-MAX and Hornady 55 Spire Point.

Federal, Winchester Super Speed and W-W Super cases all weighed approximately the same – within a few tenths – at 94.3 grains. R-P cases, on the other hand, averaged 88.9 grains. Almost all the loads in the accompanying table employed W-W Super cases. Those instances where R-P cases were used demonstrated no discernible difference in performance.

The first loading attempt was to duplicate the original .222 Remington efforts with IMR-4198 charge weights of 20.5 and 21.0 grains with 50-grain bullets. I repeated the tests with H-4198. In each case, the 50-grain Berger bullet with a cartridge overall length of 2.130 inches was used. I was more than pleased to find the 20.5/IMR-4198 load clocked 3,307 fps and produced a nifty .563-inch group at 100 yards. The 21.0-grain load was even more impressive at 3,384 fps and a .438-inch, three-shot group. H-4198 wasn't far behind with its 20.5-grain load recording 3,240 fps while registering a .625-inch group. The 21.0-grain load came in at 3,374 fps and an .688-inch spread. It is easy to see why "4198" was, and is, so popular.



The .222 Remington fits naturally between the earlier .22 Hornet (left) and the newer .223 Remington (right).

Case stretching was explored at some length. There were some cases approaching the 1.700-inch maximum after the third reload. This can be slowed by avoiding the maximum powder charge in most loads. Fortunately, this can be backed up by the fact that frequently the tightest group was obtained with the less-than-maximum load in each powder listing.

In reviewing results with the new powders, there were no disappointments. Among the extruded, single-base powders, I was very impressed with Accurate LT-32 and IMR-8208 XBR. Among the double-base ball powders, Alliant's Power Pro 1200-R gave very good results. Hodgdon CFE 223 deserves further study for its reduction in metal fouling qualities alone. Fortunately, the powder held its own in accuracy as well. I would suggest that the starting loads for each powder be at least 2.0 grains below the listed maximum and increased only if warranted. *Do not exceed listed maximums.* Fans of the original 4198 have nothing to hang their heads over, but some of these newer powders can increase velocity a bit without loss of accuracy. ●