Lester's lasers: Hitting lessons from the Cubs lefty

Recently, we noted that San Diego pitcher Tyson Ross had landed himself , pointing out that (with a favorably low sample size threshold) he'd actually hit the ball harder on average than Paul Goldschmidt or Yoenis Cespedes. But in the process, something else even more fascinating came up. Only two pitchers hit the ball harder than 91 mph last year, given 10 non-bunt batted balls. One was Ross, one of the best hitting pitchers around, so that's not surprising.

The other just set a Major League record for offensive futility. That's something that grabs your attention. Jon Lester, who went without a hit over his first 66 career plate appearances dating back to 2006 before finally getting one in July, hit the ball an average of 92.5 mph last season. It was harder than every non-Ross pitcher, even Madison Bumgarner, who cracked five homers. Take a look for yourself:

Batting exit velocity leaders, pitchers, minimum 10 non-bunt balls in play
1. Ross, 93.5 mph
2. Lester, 92.5 mph
3. James Shields, 90.6 mph
4. Carlos Martinez, 90.2 mph
5. Shelby Miller, 89.8 mph

We absolutely had to dig into that deeper, and so we did. The lesson learned is one we've been touching on since the early days of Statcast™: Exit velocity is cool, but it's only part of the story. Launch angle is a big part of it too.

Let's explain: Launch angle may sound fancy, but it's simply measuring the vertical angle of the ball off the bat. For example, if you were to hit the ball at 90 degrees, that'd be straight up -- a popup. We've been considering grounders to be 10 degrees or under, flies to be 25 and over, and line drives to be in between.

It matters, a lot, as shown by the embedded tweet below showing batting averages at various launch angles. If the ball comes off your bat at between 10 and 14 degrees, you're hitting .775, which is to say that it lands for a hit more than three-quarters of the time. If you hit it at an angle higher than 50 degrees, which is when flies turn into popups, you're toast -- just 80 of the 4,841 balls hit like that turned into hits, a .016 batting average.

Angle	Hit	AB	BA	HR	1B	2B	3B	Angle	Hit	AB	BA	HR	1B
"80-84"	0	1	0.000	0	0	0	0	"-10--6"	1340	5808	0.231	0	
"75-79"	0	11	0.000	0	0	0	0	"-15--11"	758	4720	0.161	1	
"70-74"	1	115	0.009	0	1	0	0	"-20--16"	447	3599	0.124	0	
"65-69"	3	521	0.006	0	3	0	0	"-25--21"	268	2706	0.099	0	
"60-64"	10	1006	0.010	0	4	6	0	"-30--26"	143	1917	0.075	0	
"55-59"	23	1348	0.017	1	13	9	0	"-35--31"	97	1195	0.081	0	
"50-54"	43	1835	0.023	1	26	16	0	"-40--36"	62	824	0.075	0	
"45-49"	100	2301	0.043	5	67	25	3	"-45--41"	59	625	0.094	0	
"40-44"	233	2954	0.079	85	94	50	4	"-50--46"	65	435	0.149	1	
"35-39"	646	3955	0.163	**362**	195	69	20	"-55--51"	40	274	0.146	0	
"30-34"	1468	5068	0.290	**889**	327	197	55	"-60--56"	36	192	0.188	0	
"25-29"	2609	5954	**0.438**	**1407**	522	557	123	"-65--61"	31	145	0.214	0	
"20-24"	3654	6788	**0.538**	**976**	1168	1348	162	"-70--66"	17	89	0.191	0	
"15-19"	4453	7189	**0.619**	**134**	2434	1707	178	"-75--71"	11	48	0.229	0	
"10-14"	5853	7553	**0.775**	2	4531	1214	106	"-80--76"	5	36	0.139	0	
"5-9"	4115	7228	**0.569**	0	3596	488	31	"-85--81"	2	12	0.167	0	
"0-4"	3135	7478	**0.419**	0	2813	302	20	"-90--86"	1	4	0.250	0	
"-5--1"	2006	6358	0.316	0	1820	176	10						

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Breakdown of Launch Angle stats from last year... Want to hit a HR? Launch it between 25-29 degrees @pobguy

It's a good lesson in how exit velocity and launch angle go hand-in-hand. By itself, launch angle can tell you a lot, as the numbers above show, but not everything. By itself, exit velocity can tell you a lot -- it correlates well to offensive success -- but again, not everything.

All of which leads us back to Lester, and how he could have hit the ball so hard without finding much success. (He ended up with four hits on the season in 71 plate appearances, a .065/.108/.065 line.) Part of it is that, like many pitchers, contact was an issue -- Lester's 42.3 percent strikeout rate was above the 37.7 percent average for pitchers.

But more importantly, it's because 19 of Lester's 24 tracked batted balls failed to get above 7 degrees of launch angle. Sixteen of those 19 failed to even achieve positive launch angle, which is to say that he pounded the ball into the ground constantly. Even Lester's first career hit, against former teammate John Lackey, came at an angle of -2.8 degrees, though it

was well placed and cracked at 92 mph:

Now, compare Lester's launch angle and exit velocity to those of Ross and Bumgarner, 2015's two best-hitting pitchers by traditional measures.

Ross: 93.5 mph, 10.6 degrees
Lester: 92.5 mph, -1.4 degrees
Bumgarner: 89.1 mph, 12.5 degrees

And there's your difference right there, along with superior contact rate. Hitting the ball hard is a very good thing to do, but if it's always going to be on the ground, then you're relying upon a whole lot of luck to get hits. In Lester's case, that luck never arrived until he managed to put one literally off Lackey's leg.

Think about it this way: Lester hit seven balls at 100 mph or more, topping out at 104.8 mph off Anthony DeSclafani in June. On average, balls hit at 100 mph or more turn into hits 61 percent of the time (or a .611 batting average, if you prefer). For Lester? Just one did, or a .142 average on those balls. Grounders just aren't a good value bet, if you can avoid them.

Despite the record he doesn't want, Lester was once a high school outfielder who was good enough with the bat that he would have made the pros as a position player. We never got to see that bat show up over nearly a decade in the American League, and the 0-for-66 streak would have you believe he doesn't know what he's doing at the plate. Not so, as the exit velocity shows. Lester can hit with plenty of authority, just not with enough angle. Hitting the ball hard is great. Hitting it hard to the right spot is better. Sometimes, it's crucial.

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