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One Gifford Pinchot Drive • Madison, WI 53726-2398 • Website: www.fpl.fs.fed.us

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Contact: Rebecca Wallace, (608) 231-9275

E-mail: rwallace@fs.fed.us

Broken bat incidents down by half in Major League Baseball thanks to research at USDA Forest Products Laboratory

MADISON, Wis.— As the 2011 Major League Baseball season heads toward summer, an unlikely relationship has quietly entered its third year.

Since 2008, the USDA Forest Service has worked with MLB to help make America's grand ol' pastime safer, and the results have been impressive.

"Since Major League Baseball's partnership with the USDA Forest Service began in 2008, we have witnessed a dramatic decrease in the number of broken bats thanks to the extensive efforts of the scientists from the Forest Products Laboratory, especially Dave Kretschmann," said Dan Halem, MLB's Senior Vice President of Labor Relations.

In fact, thanks to Kretschmann's research, there has been an eye-opening 50 percent reduction in multiple-piece failure (MPF) rates in baseball bats in the last three seasons.

Kretschmann, a research engineer at the FPL in Madison, Wis., has seen video of every shattered bat. He's tested and analyzed hundreds of bats, and recorded the who, when, and how of every breakage in 2009, 2010, and through the early parts of the 2011 season. Through his recommendations and the cooperative work of TECO, an independent certification and testing agency for wood products overseeing changes from the factory to the dugout, baseball players, owners and fans have reaped the rewards of increased safety through practical science.

"Most of my initial recommendations addressed "slope of grain" issues," says Kretschmann. Slope of grain refers to the straightness of the wood grain along the length of a bat. Straighter grain lengthwise is associated with less likelihood for breakage.

"One change made to address this issue, something that players and fans can easily see," says Kretschmann, "is a small ink dot placed on the face-grain of bat handles. This helps identify grain characteristics at just a glance."

While broken bats have always been part of the game, MPF is something relatively new. With recent changes in bat geometry, wood species used to manufacture bats, and inconsistencies in the grain of the wood itself, up until 2008 there had been an increase not only in cracked or broken bats, but also in bats dangerously shattering into multiple pieces on contact.

One particular modern bat design feature, a thick barrel tapering quickly to a much thinner handle, is also associated with increased multiple-piece failure. All MLB bats need to weigh about the same, so a bat using a larger volume of wood needs to use lower density wood, which is also

weaker. Over-drying during the production process, says Kretschmann, can create weaknesses and affect a bat's strength integrity.

Thanks to these findings, the 2010 season saw limits to bat geometry dimensions, wood density restrictions, and wood drying recommendations. Shattered bat incidents continued to decrease under these new limits, and the trend has continued into the early parts of the 2011 season.

"We are pleased to be able to work with Major League Baseball to help make the game safer for fans, players and everyone else at the game," said US Forest Service Chief Tom Tidwell. "Safety is important, at work and play, and I'm proud that our collective 'grain trust' could score a win by coming up with recommendations that have reduced the number of broken bats by half over recent years."

And there's still more work to do.

"We will continue to work closely with the Forest Products Laboratory and the bat manufacturers to further decrease the number of broken bats in order to ensure the safety of all on-field personnel and our fans," Halem said.

Safety is a strong part of Forest Service ethos. As such, it makes good sense for Forest Service researchers to contribute to the safety of the players and fans of Major League Baseball. It is one strong American institution contributing to the wellbeing of another because, truly, safety is no accident.

The USDA Forest Service Forest Products Laboratory was established in 1910 in Madison, Wisconsin, with the mission to conserve and extend the country's wood resources. Today, FPL's research scientists work with academic and industrial researchers and other government agencies in exploring ways to promote healthy forests and clean water and improve papermaking and recycling processes. Through FPL's Advanced Housing Research Center, researchers also work to improve homebuilding technologies and materials. Information is available at FPL's Web site: www.fpl.fs.fed.us.

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