

# Working With RTA, RailWorks, 8TH GRADER TAKES TOP PRIZE At Science Fair

By Kristen McIntosh

**W**hen Mark Baumgartner of Milford, Ind., contacted the Railway Tie Association (RTA) about a science fair project his son, Vince, an eighth grader at Milford Middle School, was developing on crosstie longevity, the wheels of progress began to spin rather quickly.

"We have seen concrete, composite and steel ties, and even some called Polywood," Mark wrote in an e-mail to Jim Gauntt, RTA executive director. "We would also like to report on...the environmental impacts of the materials and track deflection. Our goal is to find manufacturers that would lend us or give us cross-sections of the different crossties for display. Some of the school staff think this will never get off the ground. Vince is hoping to prove them wrong."

Well, not only did the project get off the ground, it won first place in the science fair.

Vince said he got the idea to do a project on railway track structure from his dad who explained that most people don't really understand what makes up railroad track. "Being a rail fan, I wanted to show what trains need to run on," Vince said,



adding that the only instructions for the science fair project were to conduct an experiment to prove or disprove a hypothesis and "to document what happened along the way. The teacher, in all 15 years of the science fair, had never seen a project on crossties—or even rail related—so this was definitely a first for Milford Middle School," Vince said.

In an effort to see which type of crosstie—wood, composite or concrete—would stand up to abuse better, the Baumgartners managed to collect a concrete tie, a composite tie and a pressure-treated wood crosstie and proceeded to strike them with equal amounts of force with a sledge hammer and a tie plate. "We couldn't do a real load-bearing test from a train, so this had to do," Mark said. "The concrete tie took 30 hits to show fatigue, the composite took 50 hits, and the wood took at least 80."

Gauntt said he viewed Baumgartner's initial e-mail to RTA as an opportunity to communicate to a youngster the success of the wood crosstie in railway track structure and immediately set about to educate the Baumgartners about the benefits of wood crossties. "First of all, treated wood (many different species) accounts for approximately 93 to 94 percent of all ties manufactured and used in the United States and

Canadian railroad systems. Even though alternative materials have been around for many decades, this is true because wood offers a unique set of performance properties and is the most economical to install both at the initial point of use and throughout its life cycle," Gauntt responded. "Wood ties last an average of 33 to 35 years system-wide."

Gauntt further explained that concrete ties have found a niche that accounts for only about 5 percent of the overall market but said that wood is also used in the same applications. "And there are well more than 2,000 line items of economic factors that are considered when making the choice between wood and alternative materials," he said. "Costs prohibit the widespread use of concrete ties for most applications."

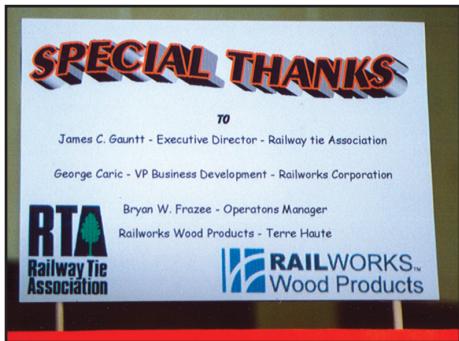
Gauntt also explained that steel, which has also found a niche in certain track applications, accounts for less than 1 percent of the total tie market. "Steel is even more expensive than concrete."

Gauntt also mentioned that plastic and composite materials are seeing a small amount of experimental use in freight applications, with the goal of the manufacturers of alternative-material ties being to mimic wood performance so that they can be interspersed with wood when maintaining wood tie track. "Costs, however, are at least as much as steel and, for some manufacturers, much more. Performance issues are still a question with these products."

While producers of alternative material ties hope that their ties will last at least 50 years, the theory has not been proven and has in fact been disproved in some cases, Gauntt said. "Regardless, the up-front expense of using these alternative materials is the biggest issue for railroads since railroads still do not earn their cost of capital each year."

Gauntt also told Baumgartner that environmental studies have proven the benign nature of creosote wood ties. "Creosote

Vince Baumgartner took home first place for his science fair project on crossties.



will be reregistered for use in wood crossties this year by the U.S. Environmental Protection Agency. Railroads have gone on record as supporting this."

To assist Vince, Gauntt provided volumes one and two of the "Tie Guide," "The Legacy of the Wood Crosstie" video, a list of tie specifications and a CD-ROM about tie grading, various other assorted literature, a copy of the latest issue of *Crossties* magazine, and a box of wood samples containing most species of wood used for crossties today.

Mark said to make the project work, he and Vince reached out to industry organizations, including RTA, which was the first one on board. "Vince and I were completely blown away when RTA pretty much said, 'Here is what we can do.' The booklets were really a great help, and we all liked the video. The wood samples were key in the display because most people don't have a clue what kind of wood can be used as a crosstie."

In an effort to give Vince an up-close-and-personal look at wood ties, Gauntt

connected the Baumgartners with George Caric, vice president of business development for RailWorks Corp. Caric introduced them to Bryan Frazee, plant manager for RailWorks' Terre Haute, Ind., plant, which is located about a five-hour drive from the Baumgartners' home.

Caric and Frazee invited the two to visit the plant on a Saturday morning for a complete tour, which Mark said was the highlight of the entire experience. "RailWorks rolled out the red carpet for us, and even gave us hats. Our first-hand view of how crossties were made probably pushed the project into the winner's circle. Bryan is really easy to talk to, and we sat at the end of our tour talking about our lives and exchanging notes about rail fanning. We are planning to meet Bryan again, but this time near the tracks somewhere. Vince also made a 'thank you' sign for the visual board mentioning RTA and RailWorks and everyone else who helped with this project."

Mark said Vince, who has won first place in the science fair for three years in a row, is already considering a career on the

engineering side of railroading. "The report was awesome and was all Vince. He took many notes on the RailWorks tour, which he applied to the experiment. Vince is a notorious rail fan, railroad photographer and O-gauge modeler, which most of his friends have been over to see. The teacher said this was a first for him and gave much credit to Vince for doing something so different. We are really proud of Vince!"

Caric said it is important for organizations such as RTA and RailWorks to connect with students to communicate the value and success of wood crossties in track. "I've spoken to students about wood, crosstie disposal, cradle-to-grave issues and how the industry is taking care of its own problems," he said. "This is definitely something we should do more of because these kids probably only hear one side of the story. They don't understand that wood is a renewable resource and that pressure treating wood ties with creosote helps the ties last longer in track—that the wood tie is the best thing going for railroads." §

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