In February 2006, Dennis Froehlich, general manager of Tire Environmental, Muscatine, Iowa, called Paul Gormley, CIRAS southeast Iowa account manager, for assistance in finding markets for its products. At the time, Tire Environmental was looking to explore additional markets for its recycled shredded tire products. While the company had already gained ground in the septic field aggregate and landscape mulch arena, it was interested in moving into markets where it could add more value and reap higher margins. After Gormley’s initial visit, it was clear that the company had a good concept of tasks it wanted to do but lacked some of the key resources to get them done quickly.

Finding an easy fix
The company’s first and most easily addressable problem was a significant amount of downtime caused by inadequate conveyor belts on a critical piece of machinery. Wire fragments exposed in the shredding process were penetrating the belts and requiring frequent fixing and replacement. Gormley connected Tire Environmental with a mutual client, Apache Hose and Belting of Cedar Rapids. After a short visit on the phone, a conveyor belt specialist was able to recommend a solution to the problem. The result of replacing just two belts was 50 percent less downtime, which allowed the company to focus on its more long-term goals of producing a new product for the marketplace—a first for Tire Environmental.

Tough sorting problem
Tire Environmental had its eye on a slice of the landscape mulch industry. However, to produce products usable as landscape mulch, e.g., playground mulch, the pieces of shredded tire with exposed wire needed to be eliminated and virtually all remaining steel removed. While Tire Environmental had been using magnetic separation to screen out a good portion of the shredded tire bits that contained exposed wire strands, the company was still forced to employ a time-consuming and costly visual inspection process to detect the final entrapped steel bits in the mulch. Without a considerable leap in capabilities, the company would not be able to scale up high or fast enough to make a profitable venture from mulch.

That is when Gormley asked Dave Utrata, manager of the Institute for Physical Research and Technology’s NDE group, to review the company’s process. As some of the pragmatic aspects of such inspection were beyond the specialty of the group, IPRT invited an Iowa firm, Industrial Motion Technologies, who represented Eriez Magnetics, a firm that specializes in magnetic separation, to get involved. The team reviewed the metal detection process at Tire Environmental and immediately made practical suggestions for improvement. Also, the company performed trial metal separations using suggested new equipment.

Meanwhile, Dave and IPRT’s NDE group verified the use of x-ray inspection to reliably detect wires trapped in batches of shredded tires. While this testing was not anticipated to be practical in the field, it helped the team validate proposed alternate sorting methods. As a result of the collaboration, Tire Environmental has significantly improved sorting capabilities with verified quality. “Since we finished the NDE project, the quality of our product has changed so much for the better,” says Froehlich. “No one else in the industry seemed to have the answers for me; I am just so glad that Dave and his team were able to help us with this tough problem.”

Making it pretty
The end products that Froehlich and his team had envisioned were not black rubber. “This was meant to replace products like wood chips on playgrounds and in landscaped spaces,” Froehlich says. “The black material had all the positive characteristics it needed to be sold, except it didn’t look like the products it was supposed to replace.” This problem was shared with Gormley, and within a few days Froehlich and his team were speaking

About NDE and IPRT
Company Assistance
Nondestructive evaluation, or NDE, is a collection of powerful methods such as ultrasound and x-rays that can be used to detect defects and measure physical or mechanical characteristics of a material or component. NDE is ideally suited to the demands of today’s manufacturing processes, where it can help improve quality and productivity.

Iowa manufacturers have a leg up on using NDE, thanks to experts from the Institute for Physical Research and Technology (IPRT) Company Assistance. With a staff dedicated to working with Iowa companies, IPRT’s NDE group provides short-term assistance and education on NDE technology and applications. As part of Iowa State University’s outreach efforts, IPRT’s NDE group works closely with CIRAS to provide access to world-class expertise and equipment and help Iowa manufacturers and entrepreneurs address technical problems and R&D needs. The NDE group is also part of IPRT’s Center for Nondestructive Evaluation, a world-renowned scientific research group that develops noninvasive methods and instruments for assessing the integrity of structures and materials.

IPRT is a network of scientific research centers at Iowa State University and has been assisting companies from all corners of Iowa since 1987. Each year IPRT helps about 150 companies—from one-person start-ups to Fortune 500 corporations—solve scientific and engineering problems.
with two more clients of CIRAS, Becker-Underwood and Marion Mixers. Gormley says, “I knew of two Iowa companies that work in the colored wood mulch industry that could help Tire Environmental make their ideas real. So I set up some phone calls, and they took it from there. Sometimes it’s just about putting the right people together.”

**Every cloud has a silver lining?**

On June 1, 2007, Tire Environmental sustained a direct blow from a tornado that wreaked substantial havoc on Muscatine and its business community. The roof of the company’s production facility was badly damaged, and its offices were almost completely destroyed. But, after the storm, which luckily did not seriously injure anyone in the building, Tire Environmental fought back. While replacing the roof and streamlining its process, the company perfected the new sorting system and implemented the new coloring technology. Even with the setback, during what should have been its ramp up to a busy spring season, Tire Environmental was able to sell 200 tons of safe black ground cover and 50 tons of the colored material in 2007.

“We have had nothing but good comments from our dealers and customers; sales are increasing as more and more people are exposed to our mulch,” says Froehlich. “The (coming) spring season looks good. Without the help we received from CIRAS and IPRT NDE, we would still be working to solve our problems, sales would not be there, and we would be looking at a less-than-desirable future in the mulch business.”

CIRAS’ Gormley sums it up by saying, “We can do a lot of things at CIRAS, but what makes us capable of making significant impact with some companies is our ability to call on great partners like IPRT Company Assistance and people like Dave Utrata. Without his expertise and genuine interest to help, we would not have been able to help this client like we did.”