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## Do Darts Deliver?

Recent research by Dr. Hans Coetzee, department head and professor of anatomy and physiology, Kansas State University; Michael D. Kleinhenz, graduate student, Kansas State University and a slew of others from Iowa State University, has looked into the efficiency of dart guns.

The use of pneumatic darts to deliver medication to livestock animals has been gaining popularity, said Dr. Hans Coetzee, head of the department of anatomy and physiology at Kansas State University (K-State). Due to an increase in the number of reports of the use of the technology by producers and practitioners from the field, Dr. Coetzee, in collaboration with colleagues at the College of Veterinary Medicine at Iowa State University, recently published a study in the Journal of Animal Science detailing the use of pneumatic darts to administer tulathromycin (Draxxin®) to cattle.

Historically, darting is a practice more commonly used to deliver drugs to wildlife. However, the use of pneumatic darts to deliver medication to sick cattle has seen an increase in some parts of the U.S. In pasture and range conditions, where handling facilities are not immediately available, producers and practitioners have employed the use of darting to administer medication as soon as an illness is identified.

The team's first surprise came with the discovery that the darts did not consistently deliver the drug, Dr. Coetzee said. "There were four out of 15 animals that were successfully darted where the dart failed to deliver the drug altogether."

In other cases, trace amounts of the drug were found in the animals, not at levels effective against the bacteria causing the infection, but at levels that could pose a risk of tissue residues or promote the development of antimicrobial resistance.

It's a significant finding, because when a dart is delivered, it can remain attached to the animal receiving treatment for up to an hour following delivery. Without retrieving the dart, producers would not know if the drug was delivered.

"In all cases, we would recommend that producers label the darts and retrieve them after they are expelled so they know if the drug was actually delivered through the dart to the target animal," Dr. Coetzee said. Dart retrieval will also prevent the needles from posing a risk to off-target animals and the environment.

A second finding from the study determined animals that were darted had a lower overall exposure to Draxxin® compared to animals that were held in a squeeze chute and injected under the skin. Total drug exposure is a critical requirement for treatment success with drugs like Draxxin®.

"The question our study raised is that with these delivery technologies, is the drug being delivered under the skin or in the muscle?" Dr. Coetzee pointed out. "Drugs like Draxxin® are only approved for injection under the skin. In our study we found that the drug behaved differently in the animal when it was darted versus when it was injected under the skin suggesting that some of the drug may have been injected into the muscle. What we don't know at this time is whether the site of injection will impact the effectiveness of the drug or the potential for violative tissue residues." That will take additional studies, he said.

Dr. Coetzee also pointed out a handful of animal welfare concerns surrounding the technology. According to the study, darting appears to result in increased pain sensitivity and inflammation at the injection site, and appears to be more stressful compared to placing animals in a squeeze chute and administering the injection subcutaneously.

Darting can potentially be a useful tool, Dr. Coetzee maintained, but warned producers and practitioners of the limitations to the technology when treating animals.

"There are significant challenges with making sure the drug is delivered correctly," he said. "If producers are going to use this technology, they should be aware that our study represented the best-case scenario," he said. "Animals were restrained with rope halters at a fixed distance from an experienced veterinarian who was delivering the dart from a dead rest."

In spite of this, in one-third of the study animals, the dart was not administered in the Beef Quality Assurance (BQA)-compliant area of the neck.

While darting can be a convenient way to deliver a drug in range conditions, Dr. Coetzee concluded, there are significant limitations to this technology that producers should consider before they decide to deliver drugs this way.

David G. Hallauer  
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## Sunscald

When a tree doesn't perform up to expectations, it can sometimes be difficult to pin the issue on a single cause. Drought stress, for example, seems to make even a small problem seem a lot larger. Sunscald is one such problem.

Seen mostly on younger trees, any of our smooth barked species (honeylocust, ash, oak, maple, willows, and just about *any* of our fruit tree species) are considered susceptible to sunscald and bark cracks. Damage from sunscald may appear pretty mundane, especially at first. Over time, noticeable declines in tree performance may be noted. Damage may be compounded by drought or heat stress.

Damage from sunscald typically occurs following sunny, warm days we often see in winter. You know the ones: a breath of spring in the midst of a blustery winter? Unfortunately, those winter 'breaks' can cause big problem. Georgia research on peach trees has shown that the 'sunny' side of the tree's trunk might get as much as forty degrees warmer than the side in the shade. For us, that means that the south or southwest side of many of our thin barked trees see a marked outer bark temperature difference than the north side. When that occurs, the warmed side may lose cold hardiness, resulting in cells becoming active. If that occurs late in the spring, we may warm up and be just fine. If it is followed by colder weather, especially to below freezing temperature drops at night, cells can be severely damaged.

Damage doesn't manifest itself right way, but will often become evident in later spring, with bark tissue becoming sunken and discolored. This damaged bark will eventually crack and slough off.

The damage doesn't have to mean guaranteed death, but trees will likely benefit from a little more attention in the future. Start by making sure that damaged trees are watered appropriately during dry weather. The damaged tissue doesn't transfer water and nutrients well, meaning these trees will likely be the first ones stressed. If you have had the problem in the past – or want to do what you can to prevent issues – application of a light-colored tree wrap might be a good idea. Apply the wrap in October or early November starting at ground level and extending it upwards to the start of the first branches. This is especially important for young trees or trees that have experienced damage in the past. **Warning:** be sure to remove the tree wrap in the spring. Failure to do so can cause other problems with the tree.

For more information on sunscald, feel free to contact me via one of our District Offices or via e-mail at [dhallaue@ksu.edu](mailto:dhallaue@ksu.edu). For more information on sunscald, including a picture for your reference, see the information sheet available online at: <https://hnr.k-state.edu/extension/info-center/common-pest-problems/common-pest-problem-new/Sunscald%20on%20Trees.pdf>

Cindy S. Williams  
Meadowlark Extension District  
FACS

No news from in the midst of moving.

Nancy C. Nelson  
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Family Life

## Bonding Through Board Games

Families live in a busy world in which time together is often lost in the buzz of activity. Board games provide face-to-face interaction, helping families get connected, have fun together and create lasting memories. Here are some things to have in mind when carving out time for a family game night.

Schedule a regular day and time on the calendar for playing a board game. Designate the same day every week. Keep it short at the beginning and then add more time as desired.

Avoid choosing a board game that is too hard for your kids' ages, or one that everybody hates playing. Start by playing one that your youngest child definitely can play. After that, let your youngest team up with someone for a bit more challenging game.

Only family members and friends are invited. Make it a rule that technology be set aside until your game night is over.

Keep a stash of great board games around the house. You'll be sure to find a taker when you ask, "Does anyone want to play a game?"