

Theileria orientalis Ikeda in Tennessee
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With the rapid relocation and movement of animals comes the ever-present potential of spreading diseases among cattle. Since 2017, the movement of the Asian Longhorned tick (ALT) has been closely monitored. This tick was first found in the United States in New Jersey and has migrated towards the southeast since. The big concern with the introduction of this tick is that it carries *Theileria orientalis* Ikeda. This is a protozoon that cattle in the US are naïve to and causes illness and death with potential loss of large numbers of cattle. Up until this point, TN has not had any reported cases despite the ALT being here, but on 6/9/22, cases of theileriosis were reported in a county in central TN.

What is *Theileria Orientalis* Ikeda?

Theileria orientalis is a tickborne protozoon that infects red and white blood cells and causes bovine infectious anemia. Clinical signs of theileriosis are similar to anaplasmosis in cattle and include anemia, jaundice, and weakness. Native genotypes of *T. orientalis* in the United States are usually nonpathogenic; however, *Theileria orientalis* genotype Ikeda is a virulent strain that is novel to US cattle. *T. orientalis* Ikeda infections have been reported to cause mortality in up to 5% of infected cattle. Pregnant heifers and calves are particularly susceptible to the infection. Additional factors, such as breed or age, may increase disease susceptibility in cattle. Clinical findings include weakness, reluctance to walk, and abortion. Physical examination may reveal pale mucus membranes, high fever, and elevated heart and respiratory rates. Cattle that recover from *Theileria* infections usually become carriers, which is a source of infection for other cattle in the herd.

Transmission

This is a blood borne disease, so cattle are thought to become infected within 3 weeks of being placed on pasture containing infected tick vectors. Disease is seen more frequently when naïve animals are introduced into an endemic area or when infected animals are introduced to a herd where a competent vector is present. *Theileria* sporozoites (the infective stage) are transmitted to susceptible animals during tick feeding through the tick's saliva, or through needles that have been used on an infected animal, then a naïve animal. The incubation period is about 10 -14 days after a tick feeds, and if environmental temperatures are high, infective sporozoites can develop in ticks on the ground (off host) and may enter the host within hours of tick attachment. Ticks can remain infected on a pasture for up to 2 years under favorable conditions.

Treatment

There is not an approved effective treatment or vaccine for *T. orientalis*. Because of this, prevention and biosecurity are imperative.

Prevention & Control

- Regularly inspect cattle for ticks. The ALT is small and may go unnoticed with only a quick look. Focus on the head and the neck, but also check the flanks and back, the armpits and groin, and under the tail. Tick larvae, nymphs, and adults may all be found at the same time on a single animal.
- Cattle with low weight gain, are lethargic or anemic, have patchy hair or generally look unthrifty should always be inspected for ticks.
- Animals may have large numbers of ALT, but only a few ALTs may be sufficient to transmit cattle disease. Submit tick samples to your local Extension agent or veterinarian for species confirmation.
- Once ALT is confirmed on your animals, you should assume it is established in the area and that management for this tick will be a continuing process.

Chemical Control

- There appears to be an elevated risk of cattle disease transmission by ALT in February-March and August-September. Tick control is highly recommended during these time periods, but ALTs are active during much of the year. Consider chemical control for ALT from March into November.
- A single pesticide application method may not be fully effective against ALT. Consider using pesticide-impregnated ear-tags along with backrubbers and other devices.
- Ear tags: Use permethrin or organophosphate ear tags. However, ear tags will not be effective in areas that the tick prefers. Do not mix classes of chemicals with insect control. Use the same class of chemicals for one to two years, then rotate.
- Use backrubbers and siderubbers (“bullets”) or similar devices charged with permethrin. Hang rubs in such a way that cattle must contact the rub as they move past, spreading the pesticide along the top of their bodies. Vertical strips hung from a backrubber help apply material to the head and flanks as the cattle move past.
- Recharge devices regularly following the pesticide label. ALT management may require recharging devices every 2-3 weeks.
- Pour-ons. Use permethrin at the rate recommended on the label. Apply along the topline of the animal in a narrow strip, start at the back of the withers and continue all the way to the tail head. Be aware that heavy rain may wash pesticides off the animal. Increased fly burdens at several days after a heavy rain may indicate the need to retreat the animal.

- Treat all animals in a herd for ticks at the same time. Apply formulations specifically labeled for tick control. Follow all label recommendations for all pesticides (including ear tags, backrubbers, pour-ons, etc.) used, including time to retreat, withdrawal periods, beef vs. dairy, lactating vs dry, use of personal protection, etc.
- Chemical treatment of pastures is not recommended except when tick populations are extremely large. Carbaryl (Sevin) labeled for use on pastures should be restricted to sections of the pasture with the highest number of ticks. Pasture treatments should be used in conjunction with other treatments.
- Chemical control greatly reduces tick burdens on animals but does not eliminate the chance of ticks, tick bites, or acquiring tick-borne diseases

Herd Management

- Inspect purchased cattle for ticks and treat if found before adding to the established herd.
- Consider having animals tested by a vet for tickborne disease if ticks are found on them, especially if the cattle are not gaining weight, have patchy hair, appear lethargic, or show symptoms of anemia.
- Keep pastures mowed short as long grass and brush enhance ALT survival. Leaving pastures ungrazed will not control ticks as they can survive about a year without feeding. Wildlife in the ungrazed pastures will support tick survival in the absence of cattle, too.
- Mow pastures short before rotating stock back into them, even if the cattle have been treated for ticks.
- Keep cattle out of wooded areas. If possible, fence cattle 20 feet away from wooded areas.
- Wildlife, such as deer, small mammals, and birds, can serve as alternative hosts for ticks and assist their spread.
- Check pets if any ticks are found on cattle.
- People working in areas infested with ticks of any species should inspect themselves regularly for ticks

It is important that movement of this tick is documented to prevent disease. Dr. Rebecca Trout-Fryxell is a UT entomologist that is extremely helpful in monitoring the movement of this tick in TN. She has distributed tick collection kits to your local county Extension agents for collection and submission of ticks to keep track of the movement of ALT. If you find ticks on your cattle, contact your local Extension agent or veterinarian so that the tick can be submitted to our entomology department for identification. If you have any questions, please feel free to contact me, 865-974-3538, lstrick5@utk.edu, or askdrlew.tennessee.edu.

References

USDA Emerging Risk Notice https://www.aphis.usda.gov/animal_health/downloads/theileria-orientalis-ikeda-notice.pdf

Virginia Cooperative Extension Publication ENTO-382NP Theresa Delinger & Eric Day