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Being a Cool Deer During the Hot Summer

by Dean Wiemers, Timothy Fulbright, and David Hewitt

How often do you observe deer during hot sultry afternoons in the dog days of summer? Chances are you see fewer deer during summer than other seasons, especially in South Texas. This edition of the Deer Associates eNews will help biologists and managers understand why white-tailed deer become scarce during summer and discuss management actions to help deer through this difficult season.

Background – Dumping Heat

Like all mammals, deer must maintain their body temperature in a narrow range or die. Deer continually produce metabolic heat, which can help them remain warm in a cold environment. However, in a hot environment, heat produced by deer must be dissipated. Complicating matters during summer in South Texas, deer gain heat from sunlight and their hot surroundings. This environmental heat also must be dissipated for the deer to maintain its body temperature.

As long as their surroundings are cooler than their body, deer can lose heat by laying on a cooler surface, such as the soil, and by allowing the cooler air to carry heat away. When deer cannot lose heat fast enough using these passive processes, they increase heat loss by evaporating water. Unlike humans, deer lose very little heat by sweating. Instead, deer pant, which is simply a way to increase water evaporation by forcing air over the moist membranes of the respiratory tract. A drawback of panting is that it uses a lot of energy.

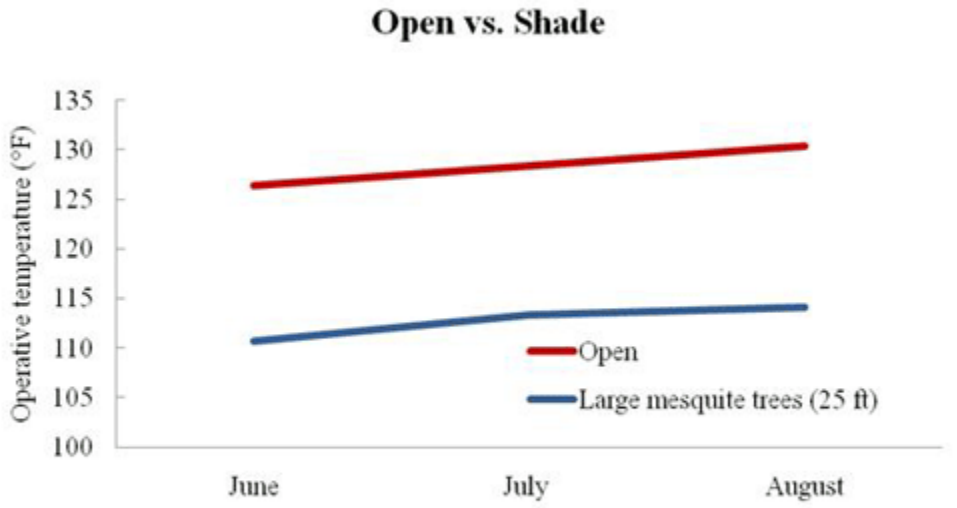
A Summer Dilemma

When food availability and forage quality are low, deer must forage longer to meet energy demands. Unfortunately, food availability and nutritional quality may be low in South Texas during summer. Deer are therefore faced with the conundrum of having to acquire food from an environment in which food availability and quality are restricted while at the same time minimizing energy expenditure and exposure to high temperatures.

Solving the Conundrum

Shade
Deer may avoid excessive heat loads by selecting shade during the hottest period of the

day. Brush communities that provide shade and cooler temperatures under the canopies allow deer to minimize heat from the sun and increase heat loss to their surroundings. Intensity of shade provided by various plant communities may even differ. Maintaining mature brush communities that provide maximum shade will enable deer to avoid the intense heat of direct sunlight.



* Operative temperatures were averaged for each month in 2009 during the hottest time of day, approximately 2:00 PM.

Water

Water is essential for maintaining body and metabolic functions, but water loss can occur at high rates during summer if deer must pant to remain cool. Deer may meet this increased need for water by using free-standing sources of water such as cattle troughs or ponds, and by increasing consumption of succulent vegetation such as prickly pear pads and fruits, and fruits of woody plants. Deer management should strive to provide drinking water and succulent vegetation near bedding and feeding areas so that deer are not required to travel long distances to meet their water needs. Deer may also lay down on wet soil to remain cool. Thus, maintaining brush in drainages where soil tends to remain moist will also enable deer to maintain body temperature during hot days.

Wind

Convection is a process by which wind removes heat from the surface of an animal. Because wind velocities decrease with increasing forest canopy cover, heat loss from wind may be greatest in open environments and least in thick brush. However, protection from the heat of the sun is greatest in heavily shaded environments. The best compromise may be mature brush mottes in which a tall tree canopy provides shade, but a relatively open understory allows wind to cool the deer.

GroundCover

The importance of ground cover is readily apparent when comparing how hot you feel on a summer day while standing in a parking lot versus a mown lawn. The parking lot reflects sunlight and radiates heat, while the lawn more readily absorbs the sun's heat. Thus, good range management in which herbaceous ground cover is maintained should better enable deer to cope with hot summer temperatures compared to over-grazed rangelands in which heat radiates off bare ground.

Activity

When a deer is active, it produces heat. For this reason, deer choose to remain inactive during the midday heat of summer. Deer forage, travel to water, and engage in social interactions during dawn, dusk, and at night and thereby produce heat during times when it can be more easily dissipated. Human activities on a ranch should be planned so that deer are allowed to remain inactive during mid-day.

Conclusion

Not seeing deer during summer is testament to the whitetail's ability to cope with hot summer temperatures. During summer, deer spend daylight hours inactive and in the shade. We are conducting research to fully understand strategies deer use to deal with heat. Managers should strive to provide an environment in which white-tailed deer are able to maintain their body temperature while using as little energy as possible. Doing so will allow deer to use their energy for other important processes, such as antler growth, gestation, lactation, and body growth.

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