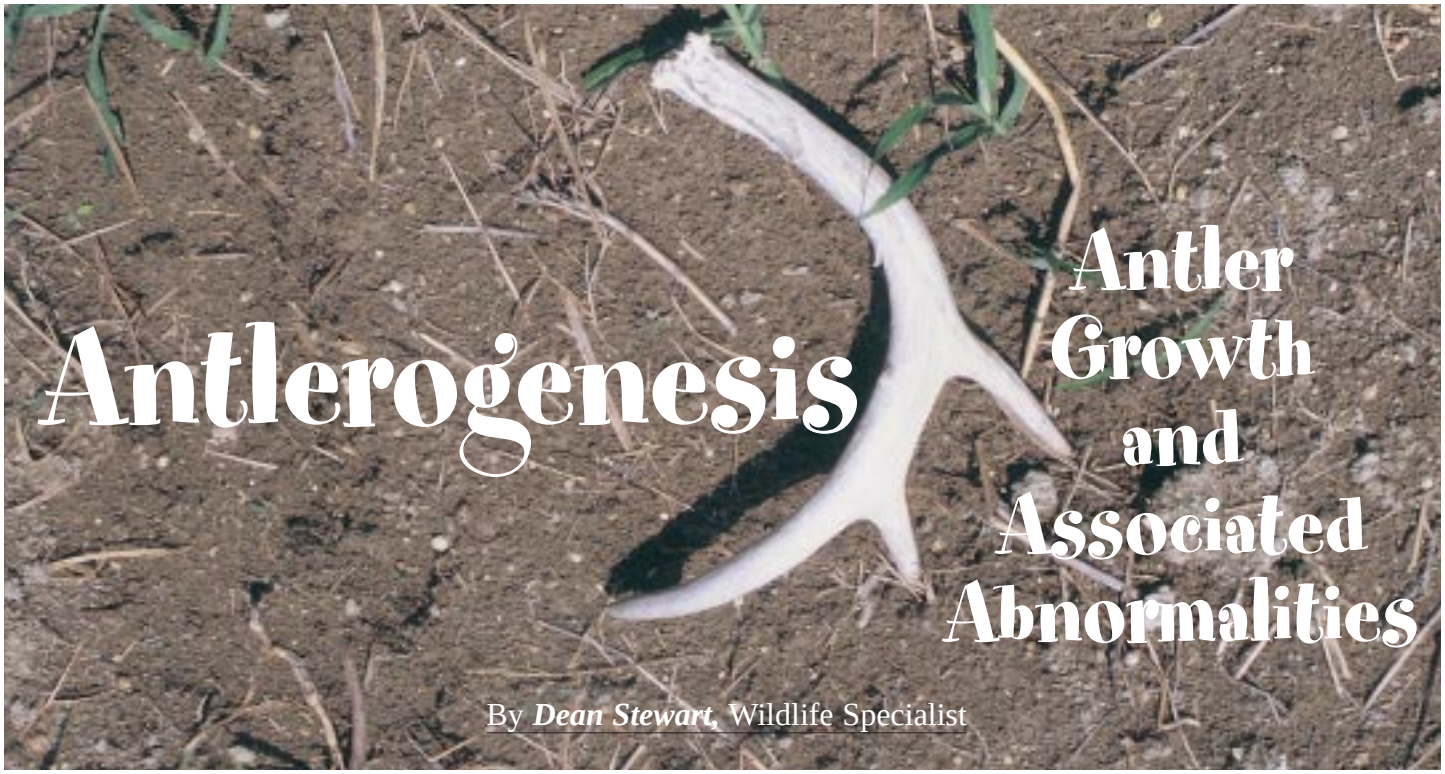

Photo by Claude Jenkins

Antlerogenesis

Antler Growth and Associated Abnormalities

By ***Dean Stewart,*** Wildlife Specialist

Man has long been fascinated by deer and deer antlers, as evidenced by paintings and etchings found in prehistorically-occupied caves. Even today, when deer hunters gather, the conversation often focuses on antlers. Let's look briefly at how antlers grow and some of the reasons for asymmetrical and abnormal antler expression.

The terms "antlers" and "horns" are often used interchangeably, but they are quite different. Antlers, unlike horns, are found only in the deer family (*Cervidae*), grow from the tip, and are shed and regrown each year. Antlers are the fastest growing form of true bone in nature.

Antlers are a secondary male sexual characteristic. Change in seasonal photoperiod (day length) in the spring signals the testes and certain organs to alter production of testosterone and other hormones. These hormones then initiate antler growth, velvet shedding, or antler casting at the appropriate time.

Our southern white-tailed deer grow antlers in about seven months. Beginning in March or April of the year following birth (one year of age), the yearling buck develops his first set of antlers. They grow until mineralization occurs in early fall. Mineralization involves replacement of soft, blood-and-protein-composed antler tissue with minerals from the skeletal structure. In late September or early October, the blood flow to the antlers ceases, and the velvet is shed.

A buck "in velvet."

Photo by Claude Jenkins

Nutrition, age, genetics, and other factors are responsible for the annual expression of antlers. The "typical" antler conformation includes a "normal" number of points that originate from traditional locations on the rack. "Non-typical" and "asymmetrical" antler configurations usually have numerous extra points originat-

ing from non-traditional locations on the rack. Since well-developed antlers are a product goal, hunters and managers want to know why antlers develop in different ways, including abnormal development. Let's examine some of the causes of typical, asymmetrical, and abnormal antler growth.

Nutrition is likely the most important influence on antler growth and development. To achieve antler potential for their age, whitetails need diets containing 16 percent protein, a 2:1 calcium to phosphorus ratio, and other trace minerals. Deer on a poor nutritional diet may show decreased antler growth and early casting.

As deer **age,** antler mass increases. Maximum antler development is reached at 5.5 to 7.5 years old. Antlers generally become more non-typical at or beyond 4.5 years old.

The influence of **genetics** on antler development has been studied, but there is still much to be learned. Genetics controls the potential for normal antler development at appropriate ages. At this time, it is impractical to manipulate the genetic structure of most wild deer herds. Genetics influences both symmetrical and asymmetrical antler growth, and genetic-caused abnormalities are often repeated each year.

Injury to the growing antler is the most common cause of asymmetrical development. If the tip is injured, abnormal growth will occur. Injuries sustained during early antler growth (spring) generally produce more profound abnormalities compared to later injuries and may result in either reduced or increased antler growth. Skull or pedicle damage can also produce abnormal growth resulting in small, poorly-formed antlers. These antlers may be found on other regions of the head, such as on other parts of the forehead or around the eyes.

Although not completely understood, injury to nerves in the antler can affect antler growth. Nerve injury to one side of the rack may affect growth of the other side and may permanently affect antler growth.

A common antler deformity results from damage to a deer's front or rear leg. Rear leg injuries produce a "contralateral" antler deformity (malformed antler on the opposite side from the injury), possibly due to one side of the brain controlling the opposite side of the body. After a very serious leg injury, a buck may never produce a quality rack. Injury to a front leg may produce a malformed antler on either, both, or neither sides. Body injuries may or may not cause antler abnormalities.

If bucks lack sufficient testosterone as a result of castration or dysfunctional testes with no testosterone, they will maintain their antlers and velvet permanently, adding antler growth each year. "Cryptorchidism" is a related phenomenon and results from failure of the scrotum to descend into the scrotal sac. These bucks can shed velvet and develop hardened antlers but are reproductively sterile.

On extremely rare occasions, does produce a small set of antlers, but they often remain in velvet. Antler development in does can be caused by excessive testosterone production, perhaps from an absence of ovaries, or hermaphroditism, when an animal has both male and female sex organs.

Antler growth is a fascinating process influenced by nutrition, age, genetics, and other factors. Managers can positively impact antler development by increasing buck age and the herd's nutritional plane. Additionally, other herd characteristics such as sex ratio must be addressed to effectively manage antler development.

In late September or early October, the blood flow to the antlers ceases, and the velvet is shed. Photo by Claude Jenkins

Dean Stewart is owner of FarView Forest and Wildlife Services, a consulting firm. Service areas include wildlife, land, and timber management. Area of specialty is working with large private or corporate landowners to integrate and maximize potential of wildlife and forestry resources. This may include preparation and execution of timber sales, reforestation, intermediate silvicultural techniques in forest stands, quality deer management, other game species and habitat management, coordination of hunting leases and club communication, and wildlife business management. Previously, Stewart was extension wildlife specialist with Department of Wildlife and Fisheries, Mississippi State University, and before that spent 14 years doing forest and wildlife management with forest industry.
FarView Forest and Wildlife Services, 817 South Lake Rd., Starkville, MS 39759. Phone 662-324-6443. Email: deanstewart3@hotmail.com