

Bucks that go into winter in poor shape have a harder time expressing their genetic potential the next year. Good management addresses this concern. *Photo by Ralph Hensley*

A BETTER START

One of the most common questions we receive at the Institute for White-tailed Deer Management & Research relates to factors affecting the growth and size of antlers.

BY DR. JAMES C. KROLL

Genetics and age clearly play major roles in determining what a buck's rack will be. Yet a commonly ignored factor is stress brought on by fluctuations in diet. Whitetails face two primary stress periods: late summer and late winter. The severity of each is of course influenced greatly by geography. Both times are outside the normal antler-growth period, so how can they affect the size of antlers grown the next spring and summer?

GENDER DIFFERENCES

Years ago, our landmark telemetry work revealed that bucks and does often prefer different habitats and they have vastly different movement patterns, annual home range sizes and nutritional needs over the year. In a nutshell, at the times of year bucks are fat, does are skinny; when does are fat, bucks are skinny.

Land managers tend to limit nutritional supplementation to the warm season, especially in areas where supplemental feeding is illegal. Yet the two most critical periods for both bucks and does are the two stress periods discussed above.

Necropsies of deer taken by permit during late summer and winter can tell us a great deal about how the deer on specific properties are doing. And these data correlate beautifully with antler growth the following spring and summer. There's a big difference in the amount of kidney fat on does and bucks taken from the same area in late winter. Does typically will have a lot of it, bucks little or none.

There are two kinds of fat in mammals: white and yellow. We hear a lot about how a high-fat diet in humans leads to heart disease — but in the deer world, being fat is a good thing. Whitetails tend to store predominately white fat and very little or no yellow fat. The difference between the two is striking. Yellow fat has a very high melting point; white fat has a low one. Deer depend on their white fat for energy during the two stress periods. This is why digestible energy, not protein, is the greatest limiting factor for deer.

The low melting point of white fat allows deer to mobilize stored energy very quickly. Now think about that. When a buck in an area with a long, hard winter comes out of the rut, he has to survive for at least four more months before spring green-up. Winter is far less stressful on female deer.

A buck will lose 25-40 percent of his early-fall weight by the end of the rut, whether he's in Canada, Mexico or anywhere in between. Bucks generally are "off feed" during the rut, and testosterone-influenced constant movement quickly exhausts stored resources. This is especially true with minerals. Much of the calcium and phosphorus in antlers is pulled from the flat bones (such as the ribs and skull), not just from the plants a buck eats in spring and summer.

To generalize, what I'm saying is that a buck's antlers are influenced more by the demands placed on him during the *previous* year's antler-growing season, plus resources lost and stress experienced during fall and winter, than during the *current* year's antler-growing season. The amount of nutritional

ABOUT THE AUTHOR > Dr. Kroll is founder and director of the Institute for White-tailed Deer Management & Research in Nacogdoches, Texas.

resources he stores prior to the rut has a tremendous impact on what he has on his head the following year.

So how can we mitigate rut and winter stress to allow bucks to at least approach their true genetic potential? Here's what I've learned.

FALL CONDITIONING

If a buck comes into fall without a surplus of stored resources, he's less likely to emerge from winter in good condition. So my management strategy always has been to get bucks into the rut in the best possible shape.

High-quality deer forages present in large quantities are key to accomplishing this. The backbone of a whitetail nutrition management plan involves providing high-quality natural forage evenly distributed across the landscape. Management strategies such as timber thinning and harvest, burning, herbicide use and mechanical treatments are the most important activities for making this happen. They encourage new growth that's nutritious and within reach of browsing deer.

I'm convinced the most critical time for antler development is the 2-4 weeks of transition from winter to spring. To narrow it down even more, the single most critical month, North or South, is March.

However, there are times when natural forage is limited. That's when a sound supplemental nutrition program can make the difference. Our studies show that planting just 2 percent of your land to well-managed warm-season crops, such as soybeans, clover, chicory or cowpeas (with exact choices depending on geography and climate) can have a significant impact on the *following* year's antler growth.

This especially is true if you can ensure a surplus of supplemental forage during the critical late-summer stress period. These crops are rich in digestible energy, protein, calcium, phosphorus and a host of micronutrients and antioxidants that help maintain immunity to diseases such as epizootic hemorrhagic disease (EHD).

At Turtle Lake Club near Hillman, Michigan, we've planted warm-season crops annually for the past 12 years. As a result, our bucks now are reaching February with reserve fat stores! Of course, this also is coupled with a more balanced buck:doe ratio than we once had, reducing stress on individual bucks by shortening the rut.

Our goal is to get the bucks out of winter with stored reserves. In the early days of our management program, bucks came out of the winter very thin, and with faded, poor coats that indicated very poor physical condition. Today, Turtle Lake bucks emerge from winter "fat and sassy," with dense, healthy coats. The change has been dramatic.

Where legal, properly done supplemental feeding can do wonders for post-rut buck recovery. We recommend one free-choice feeder per 80 acres or every 12-15 deer. By spreading out the herd, we significantly reduce stress and disease transmission; most diseases are density-dependent and stress-related. Some view feeding as a disease threat, but if properly done, it spreads deer across the landscape and increases their health. That means reduced problems with disease and overall healthier animals.

An alternative strategy is to plant a mix of corn and soybeans inside electric fences to "bank" food until late fall or even into winter. This strategy has worked very well for us at our northern research and demonstration areas. Strategically distributed plots have the same effect as feeding in spreading deer over the landscape.

POST-WINTER RECOVERY

I'm convinced the most critical time for antler development is the 2-4 weeks of transition from winter to spring. To narrow it down even more, the single most critical month, North or South, is March. What happens then will set limits on antler growth for that year. Hence, you must consider management strategies to allow your bucks to recover from winter stress as quickly as possible.

Again, the first step is to get them into fall and winter in the best shape possible. The second is to provide what I refer to as "recovery foods" in early spring. Winter-hardy crops such as cold-hardy oats and wheat, planted in late summer to early fall, generally survive even the harshest of winters, provided a snow blanket forms before low temperatures set in. You can dig down through the snow in February and find green plant material. Deer quickly learn to "mine" through the snow for these foods.

Another strategy is to plant cold-hardy forages as soon as snowmelt begins. In the North we often frost-seed cereal grains and clover in early spring for this. In the South we plant oats, clover and chicory in late February.

Where legal, this also is a time to provide high-energy foods such as corn. Some biologists object to feeding corn, but our experience strongly supports it as a high-energy deer feed. We've not seen the rumen problems (acidosis) some biologists mention as a reason not to feed corn in winter.

KEYS TO LARGE RACKS

There are no "magic bullets" for producing better antler growth. However, there are some key elements that, if followed, will take you a long way.

The first is to manage for a herd with good sex and age structure. You don't want to place unnatural stress on your bucks during the rut. A 1:2 or 1:3 buck:doe ratio is a key goal.

Next, develop a year-round strategy to provide critical foods and nutrients when deer need them. This includes sound natural-forage management to keep quality foods in reach and available for the longest possible time.

Finally, have a supplemental forage or (where legal) feeding program tailored to provide conditioning and recovery foods before and just after the rut and winter stress periods. Work with local biologists or professional managers to develop a nutrition plan that's both sound and economically feasible. **NAW**