

Appendix H



Specific Management Recommendations for White-tailed Deer

Introduction

The white-tailed deer in west Texas is a species that attracts a wide range of opinions. Many landowners, protective of their prized mule deer herds, resent the “invasion” of the white-tailed deer into areas previously unoccupied by the “lesser species.” Others view the white-tailed deer as an additional source of recreation (hunting, photography, observation, etc.) and/or income.

The western Edwards Plateau (Reagan, Crockett, Terrell, and eastern Pecos counties) supports relatively high numbers of white-tailed deer, a direct result of intensive predator control associated with the sheep and goat industries. High numbers of deer and livestock, combined with limited precipitation, commonly result in small-bodied, modest-antlered deer. However, on a few properties where animal numbers are kept below carrying capacity, a year of average rainfall can produce some impressive white-tailed bucks (especially in the deeper soils of the Permian Basin).

Deer Diets and Nutrition

Understanding the food habits of deer is fundamental to their management. Numerous diet studies have shown that deer prefer forbs (weeds) and browse (leaves, twigs, and buds from woody plants). Grasses make up a very small portion of a deer’s diet, and they will use them only when they are tender and green (they are unable to digest mature grasses). Forbs are relatively high in protein and minerals and are highly digestible (~80%), but the production, quality and palatability of forbs is highly dependent on rainfall and season of year. This is especially true of annual forbs. Some important perennial forbs are bushsunflower, showy menodora, wild bean, prairie acacia, penstemon, dayflower, bundleflower, snoutbean, chickthief, milkwort, trailing ratany, gaura, spiderling, and Angel trumpet. Although lower in digestibility on average (~50% digestible), browse is a more reliable source of nutrition during drought. Key browse plants occurring in west Texas include guayacan, hackberry, kidneywood, elbowbush, bernardia, desert ceanothus, littleleaf leadtree, Roemer acacia, butterflybush, feather dalea, evergreen sumac, littleleaf sumac, lotebush, narrowleaf foresteria, and various oaks (especially red oaks). Important mast (fruit) producers include mesquite, Texas persimmon, acacias, prickly pear, and oaks. Succulents such as lechuguilla, sotol, tasajillo, prickly pear, and yucca can be important to deer in west

Texas during drought for subsistence-level nutrition and as a water source.

HABITAT MANAGEMENT

Grazing Management

The most important factor influencing deer habitat in west Texas is the number of grazing and browsing animals (deer and livestock). Not only is livestock grazing prevalent throughout the region, but it has a direct impact on the quantity and quality of food plants, fawning cover, and to some extent, on woody cover. Grazing can be beneficial or detrimental to deer habitat, depending on numbers and kinds of livestock, grazing method, season of use, and grazing distribution.

All of these livestock grazing variables are important management considerations, but the overriding influence on habitat quality is livestock numbers. Regardless of the type of livestock or the grazing method, too many animals of any kind (including deer) will result in range deterioration and a reduction in food and cover for deer and other wildlife. Overgrazing obviously has a direct impact on the health and survival of individual deer; but more importantly, it probably will result in a long-term reduction in carrying capacity of the range and productivity of the herd. (Carrying capacity is the number of animals that a habitat can support without causing resource deterioration).

The kind of domestic animals that are grazed can greatly affect habitat characteristics, especially the availability of deer foods. Under light stocking rates, competition for forage between deer and livestock is minimal. Even under moderate stocking rates, there is very little competition between deer and cattle because the plants preferred by deer are seldom used by cattle (although there can be a substantial effect on fawning cover). Cattle primarily eat grass (85-90%) and occasionally use forbs and browse. Deer prefer forbs and browse with very light use of grasses. Although grasses may represent up to 20% of a deer's diet in early spring, grasses represent only 5-7% of the diet on an annual basis. On an overgrazed range, competition between cattle and deer for forbs will increase as the quantity and quality of grasses decline.

Keep in mind that during extended drought, a moderate stocking rate operates like a heavy stocking rate with regard to plant health and soil stability.

Competition for food becomes more of a concern when sheep and/or goats are present. Sheep primarily eat forbs and grass and thus will often compete with deer for forbs. The greatest diet overlap occurs between deer and goats (especially Spanish goats), both preferring browse and forbs. The range condition will have a direct effect on diet overlap among different kinds of animals. Overlap will be greatest in pastures that have a low diversity of forage plants.

Grazing methods or "systems" can also have a substantial impact on deer habitat. Grazing methods generally fall into one of two categories, continuous or rotational (See Appendix D – Livestock Grazing Management for the advantages and disadvantages of

various grazing systems).

Brush Management

Woody plants (brush) provide escape cover, loafing cover, thermal protection, and food (browse and mast) for white-tailed deer. However, there are instances when brush densities exceed optimal habitat requirements and preferences of deer. Excessive brush densities can hinder movement, reduce visibility of approaching danger, reduce herbaceous forage by competing for moisture and nutrients, and can promote increased predator populations. Brush thickets can present similar management problems concerning livestock. In such instances, a land manager may want to consider some method of brush management as an option for improving livestock management and habitat quality for deer and other wildlife species. However, managers should avoid excessive removal of woody cover because inadequate cover can be just as detrimental as too much brush.

Several brush management options are available to help accomplish deer management objectives. Most of these options fall into 3 categories: herbicides, prescribed fire, and mechanical treatments (See Appendix E – Recommendations for Brush Management in West Texas for detailed information).

Providing Supplemental Nutrition

The questions most frequently asked by deer managers regarding supplemental feeding are “What should I feed?” and “How much should I feed?” A more appropriate question would be “Is supplemental feeding an effective management tool?” And for some managers, another important question might be “Is supplemental feeding of deer cost-effective?” That is, does it pay? The answer to the first “appropriate” question is that it can be, if you provide the right kind of feed at the right time of year. The answer to the second question is “probably not.” Feed and labor is extremely expensive, and it is difficult to get the feed into the specific animals that you are targeting. If your goal involves antler development, 70-80% of your feed will be going to non-target animals (does and fawns). Even if your goal involves feeding the entire deer herd, a substantial portion of the feed may be going to javelinas, livestock, raccoons, birds, and small mammals (rats and mice). Non-target loss of feed substantially increases the cost of the feeding program.

Before discussing the details of deer nutrition and feeding, it is important to understand 3 basic facts. Fact #1: Under good forage conditions (when plants are green and growing), deer generally will not take feed and they don’t need it. A diversity of green forage contains all the protein, energy, and minerals they need. Fact #2: Feeding can increase deer numbers, IF you provide enough of the proper nutrients during the appropriate season. Fact #3: Feeding can improve antler quality, IF you provide enough of the proper nutrients to the bucks during the appropriate season (and the bucks consume adequate amounts).

When considering the implementation of a supplemental feeding program for deer, nothing is more important than clearly defining your objective. If your objective is to increase deer numbers, the feeding program must focus on doe conception and fawn survival. Of course, this simple formula assumes that you don't already have too many deer. The nutrition of the doe is important throughout pregnancy, but soon after giving birth, the doe's energy demand doubles. If the does are nutritionally stressed during lactation (late June, July, and August are critical), the result will be lower fawn weights and decreased survival. A high protein/high energy feed can improve fawn survival during a summer drought. During years with adequate fall precipitation, the does can easily recover from the stress of lactation and be in good condition by breeding season (late November). If the late summer and fall period is dry, a good feeding program (moderate protein and moderate energy) can substantially increase conception rates and the incidence of twins vs. single fawns (dictated by doe condition).

If improving antler quality is the goal, a completely different strategy should be implemented. The feeding program must focus on providing adequate protein and minerals during the antler growth period (March – August). Once again, this simple formula is not effective if you have too many animals (deer or livestock) on the range. Protein is extremely important during the first half of antler development, whereas minerals become more important during the latter stages of antler growth. If animal numbers are in balance with native forage, antler quality can be improved by providing a high-protein feed (20%) from February or March through June or July, and then followed by a moderate protein feed (16%). A mineral supplement should be initiated in June if adequate minerals are not present in the feed. Important macro-minerals for antler development and hardness are calcium, phosphorus, magnesium, potassium, and sodium. Important trace minerals are iron, copper, zinc, selenium, and manganese.

Various types of feed or grain are used to bait deer to a particular area during the hunting season to improve hunter opportunity for harvest. This does not constitute a supplemental feeding program. The most commonly used deer "bait" is corn, which is a good source of Vitamin A and an excellent energy supplement. Thus, corn may be beneficial to does during lactation and to the deer herd during winter when carbohydrates are low in native forages. However, corn contains only 7-10% protein and lacks some key minerals that are essential for proper body and antler growth. In a supplemental feeding program, high-protein pellets are superior to corn as a choice for supplemental feed. A desirable pellet formula contains 16-20% protein along with proper amounts of minerals and Vitamins A, D, and E. If an automatic feeder is used, a 3/16-inch pellet size may help to avoid clogging the feeder (mixing with corn or peas may also help). Cottonseed is less expensive than protein pellets and is an excellent source of protein and energy. Cottonseed has the added advantage of being unpalatable to most non-target wildlife species. Cottonseed is relatively low in mineral content; therefore, a mineral supplement (mineral mix or blocks) should be provided, especially during the last 2-3 months of antler growth.

Food plots are another alternative for providing additional year-round nutrition for a deer herd, as well as benefits to various other wildlife species. Food plots have been

successful in many areas of Texas in improving individual deer performance when used with a proper deer harvest program to keep deer numbers balanced with forage. However, in west Texas food plots are usually successful only during years of abundant rainfall. The rangeland forage conditions are normally so good during these years that the plantings are of little value. In the rare circumstance where irrigation is possible, food plots can be extremely valuable. Several scattered food plots 5-10 acres in size, located near existing escape cover, can help to provide quality forage during times of nutritional stress such as winter and late summer. Winter wheat and oats are excellent choices for a cool-season food plot because of their high protein content and digestibility during the early stages of growth. Grain sorghum and alfalfa can be a good combination for a warm-season food plot, especially for managers who are also interested in enhancing quail and turkey habitat.

A supplemental feeding program may be beneficial under certain conditions. In most cases, however, the best way to provide your deer and other wildlife species with adequate nutrition is through proper habitat management and maintaining a balance between livestock and deer numbers and the available forage.

Water Development

Water is a critical component of white-tailed deer habitat in west Texas. On most west Texas ranches, water facilities are adequately distributed and maintained for livestock production. White-tailed deer and other wildlife species are beneficiaries of these livestock watering systems. In areas where permanent water is limited or absent, deer managers can improve habitat use and the land's carrying capacity for deer by developing additional water sources. Studies of white-tailed deer in arid regions indicate that their home range is closely associated with permanent water sources. The tendency for deer and livestock to congregate around permanent water sources often results in excessive use of forage plants in the surrounding area, while other areas receive little use. This situation can be improved by distributing water sources throughout the deer herd's range. Permanent water sources should be no greater than 2 miles apart to promote adequate use of habitat. Establishing water sources approximately 1 mile apart can further improve white-tailed deer distribution on many ranches. Conventional water sources such as windmills and pipeline systems will work for most areas; however, they usually become cost-prohibitive in rough, inaccessible terrain. An effective solution is a water development system for wildlife called a "guzzler." Guzzlers are adaptations of cisterns used in many arid regions to catch and store rainfall. Most rainfall catchment devices are designed to stay recharged with 8 inches of annual rainfall. Water catchment devices can effectively enhance deer habitat if properly located and periodically maintained.

POPULATION MANAGEMENT

Deer management is often described in 2 separate phases: habitat management and population management. Habitat management is the manipulation of food, cover, and water to improve deer nutrition, reproduction, and survival. Population management

refers to the management of deer numbers, sex ratio, age structure, and sometimes genetics. In reality, the 2 phases are not clearly separable. The quality of the habitat has a direct influence on deer productivity and deer numbers. Similarly, excessive deer numbers can affect the quality of the habitat. Although this section devotes considerable attention to the management of deer numbers and herd structure, the foundation of any deer management program is the development and maintenance of quality habitat.

One of the first steps in population management is to determine the status of the deer herd with regard to deer numbers, sex ratios, and fawn survival. This information can be obtained by conducting a deer survey.

Deer Surveys

The reason that deer counts are referred to as “surveys” rather than “censuses” is that it is impossible to obtain an exact count of deer on a property. Instead, surveys provide only an estimate of deer numbers. Estimates are valuable because it is not important to know exactly how many deer are present; it is much more important to know what the **trend** is over time (whether it is the trend in deer numbers or buck quality). There are several survey methods available, and if conducted properly, the estimates can provide a reliable indication of herd trend. Each survey method has strengths and weaknesses, and some methods will suit a particular property better than others, depending on vegetation, topography, the road system, as well as landowner objectives and finances. The two methods most applicable in west Texas are helicopter surveys and spotlight surveys. Refer to Appendix I -- Deer Survey Techniques in the Trans-Pecos Region for detailed information on the advantages and disadvantages of various survey techniques.

Harvest Records

When landowners initiate a deer management program, the manager or biologist often emphasizes the importance of deer surveys, with considerably less emphasis given to recording harvest information. Although surveys are important, often more information for making management decisions can be obtained from harvest records than from any of the survey methods. Records from harvested deer can provide information about the nutritional status of the deer herd, age structure of the herd, proper or improper harvest rates, mortality rates, and if does are harvested, information about fawn survival. The hunting season offers one of the few opportunities for a manager to collect this hands-on information about the deer on his ranch.

Thorough harvest records should include the date of harvest, the ranch, the hunter, age of the deer, field-dressed weight, antler measurements (basal circumference, beam length, inside spread, number of points), apparent body condition, and whether the does are lactating. Some managers also maintain visual records by taking a photograph of each harvested deer, which can later be developed into a useful marketing resource. The percent of does that are lactating can provide a good indication of fawn survival.

Weights, antler measurements, and general body condition are indicators of nutrition. Body condition of deer can be categorized as "good" (fat across the back and base of tail; fat on kidney and in body cavity), "fair" (little or no excess fat, bones not showing), or "poor" (ribs, backbone, and pelvic girdle prominent under skin). But field-dressed weights and antler measurements are of little value without the respective age of the deer. Age-specific information is necessary to determine whether body weights and antler growth is acceptable or below standard for each particular age class.

Age class is important for determining whether the herd is receiving adequate nutrition, but recording the age of deer is important for another reason. The age distribution in the harvest can provide valuable information about the age distribution of deer on the ranch. The harvest will not necessarily reflect the exact age distribution in the population because the type of deer harvested is directly related to the management objectives of the ranch, harvest strategies, and hunter decisions. However, when the majority of bucks harvested are 3.5 years old and less, it suggests that the buck segment is being heavily harvested. Likewise, if the majority of white-tailed does harvested on a ranch are 4 to 7 years old, this indicates that they are, at most, under a very light harvest.

Equipment that may be needed for collecting harvest information are weigh scales, measuring tape, jaw-spreader/remover, flashlight, wash bottle, clipboard, and data sheets. For hunters or managers that are new to the toothwear aging technique, it may be useful to have a jawboard or some other type of reference collection of deer jaws that represent each age class.

Harvest Management

The first step in any deer management program is establishing a set of deer management objectives for the property. The objectives may include a desired deer density, a specific quality-class of bucks with details about antler and body size, and/or more subjective interests concerning the quality of the recreational experience. Whatever the objectives, they will dictate harvest strategies and habitat management needs. Collection and analysis of survey data and harvest records will help the manager determine the status of the deer herd concerning deer numbers, age structure, sex ratio, nutrition, and productivity. With this baseline information, the manager can make informed decisions and develop a harvest strategy that will help to accomplish his/her deer management goals. More importantly, the harvest and survey data can be used to evaluate progress toward deer management goals and to adjust harvest strategies and other management practices on an annual basis.

Sex Ratio

There is no such thing as a "perfect" sex ratio. The appropriate buck to doe ratio for a given property will be dictated by manager objectives, fawn production, and natural mortality rates of adult deer. That is, the sex ratio is a product of proper management and the population dynamics of a particular deer herd. There is tremendous energy

expended by some managers who attempt to shift the sex ratio to some preset “target” ratio. When a manager establishes a particular sex ratio as a management goal without consideration for the population dynamics of the local herd, they often will be working against nature rather than working in concert with the natural conditions of the property.

Some ranches strive to achieve a 1:1 buck to doe ratio, using the logic that there are more bucks available for harvest. This may be true at a given point in time, but more bucks can be harvested over a period of years with a slightly higher number of does or “producers” (e.g., 1:1.5 or 1:2). To illustrate this point, let’s look at an example of 2 livestock operations. Which rancher will produce more bull calves in the long-run – the one running 20 bulls to 20 cows or the one running 3 bulls to 40 cows?

Rancher #1

20 bulls: 20 cows

(Assuming a 90% calf crop and 1 animal unit/cow and 1.2 animal units/bull)

18 calves per year

Approx. 9 bull calves/year

Rancher #2

3 bulls: 40 cows

36 calves per year

Approx. 18 bull calves/year

Similarly, which deer manager will produce more buck fawns in the long-run – the one with 100 bucks and 100 does or the manager with a 1:2 buck to doe ratio? A 1:2 buck to doe ratio will produce about 33% more buck fawns each year. To achieve and maintain a 1:1 ratio on most ranches, the manager must harvest the doe segment very intensively. Therefore, this strategy is only practical on ranches with relatively high fawn survival. The other requirement in maintaining a 1:1 ratio is a very conservative buck harvest. The usual result is a relatively high rate of natural mortality among the bucks. Many of these are mature bucks that could have otherwise been harvested. This buck production argument does not take into account the other negative factors associated with a 1:1 ratio such as antler breakage and buck mortality from excessive fighting. Finally, there is the misunderstanding that buck and doe numbers can be “traded” equally when moving the sex ratio toward an “even” ratio. More forage is required to support a 170 lb. buck on an annual basis than a 100 lb. doe. That is, a pasture that can support 100 does and 40 bucks can not support 70 does and 70 bucks on the same nutritional plane.

For the deer manager interested in producing quality bucks, the management formula is simple. Harvest no more than 15-20% of the buck segment annually, and control deer numbers through doe harvest. The higher the fawn crop, the higher the resulting adult sex ratio (e.g., 1:1.5). The lower the fawn crop, the lower the resulting adult sex ratio (e.g., 1:2). This is only logical because fewer (if any) does need to be harvested when fawn survival is low. The result of this simple strategy will be a sufficient number of bucks in the mature age classes and a sex ratio that is appropriate for your objectives and your country.

Spike Bucks and Culling

How does the issue of spike-antlered bucks and culling fit into the harvest management equation? This is an interesting question, but unfortunately deliberation over this issue has often been responsible for depreciating more important practices such as habitat enhancement, reducing animal numbers, and improving the herd age structure. The question of whether or not to cull spike bucks for genetic improvement is a valid consideration only on ranches with good to excellent deer habitat, moderate animal numbers (deer and livestock), and a mature age structure among the bucks.

Antler growth and development are dependent on the combined effect of nutrition, age and genetics. The ability of a buck to express its genetic potential for antler development is dependent on obtaining adequate levels of protein, carbohydrates, fats, vitamins, and minerals. Inadequate nutrition will result in decreased antler mass and usually the number of points. Many 1½ year old spike bucks have the genetic potential to produce 6 or 8 points as yearlings; however, they fall short not only in antler development but also in body growth because of inadequate nutrition. Most of these deer are capable of producing quality antlers in subsequent years, provided they obtain adequate amounts of the essential nutrients.

On the other hand, there are deer that will produce spike antlers at 1½ years of age regardless of the diet quality they obtain. Some of these deer may produce spikes in subsequent years, a few will eventually develop quality antlers when they reach maturity, but most will produce forked antlers at maturity that have slightly fewer points and less mass than the average buck. Some managers refer to these yearling deer as "genetic" spikes (in contrast to "nutritional" spikes).

Spike antlers are relatively common among bucks that were born late in the previous fawning season. The primary factors responsible for an extended fawning season are widely skewed sex ratios (e.g., 1:5 or 1:6) and a malnourished deer herd. The early season fawns may be 4 months older than the late fawns and have a much better chance of developing a decent set of antlers in their first year. In fact, research in Mississippi has shown that it takes several years for these late-season fawns to "catch up" in antler development. However, at maturity there is no difference in antler development between the bucks born early and late in the fawning season. These yearling bucks are sometimes referred to as "lag effect" spikes, in that there is a time lag of several years before they reach their genetic potential.

It should be obvious why the question regarding the culling of spike-antlered bucks can not be answered quickly and simply. When deer managers or hunters ask about culling deer and harvesting spikes because they are dissatisfied with the antler quality, there are several important factors that should be addressed first.

1. Make certain that nutrition is not a problem – not only deer condition in November and December, but year round – especially during antler growth (collect deer weights and antler measurements by age class, monitor fawn crops, conduct forage surveys, make year-round observations, etc.).
2. Make certain that buck age structure is not a problem – young bucks can be

mistaken for poor quality mature bucks (determine ages of harvested bucks).

3. Make certain that a skewed sex ratio is not a contributing problem (annual surveys).

Many deer managers are producing bucks with good antler development (good age structure and good nutrition), but they want to further increase the antler quality through genetic manipulation (culling). This objective involves a question that is much more difficult to answer: "How much improvement on buck antler quality can I expect through culling of spikes and other 'inferior' deer?" Superior genetics can produce substantial improvements in the livestock industry, and selection for antler traits has been demonstrated in deer research pens. What might prevent deer managers from accomplishing the same kind of improvements on a large ranch?

There are several reasons why genetic culling of deer may not result in a noticeable improvement in antler quality in a ranch situation. We need to learn more about heritability of antler traits, but data from the only 2 studies that have been conducted indicate that the degree of heritability may be lower than desired to make a significant change in antler traits. Research has shown that the probability is greater for a "quality" buck than an "inferior" buck to produce male offspring with quality antlers. If "degree of heritability" was the only concern, it would be well worth the effort to cull. Unfortunately, there are other factors that dilute the selection effort on ranches.

Depending on the year and resulting forage conditions in west Texas, spikes may represent 20-90% of the yearling age class. From a logistical perspective, it would be very difficult to harvest this number of deer on a large ranch. From a biological perspective, it would be highly undesirable. Very few bucks would ever reach the mature age classes, and this strategy could result in a very skewed sex ratio (1:4, 1:5, or worse). A skewed sex ratio can lead to an extended fawning season and an increased number of spikes (lag-effect).

The vast majority of ranches in west Texas use low fences (net-wire or barbed-wire) that are easily negotiated by white-tailed deer. Unless your neighbors are culling just as intensively as you are and in the same manner, deer movements between properties will further dilute culling efforts.

The greatest stumbling block to genetic improvement in deer is intensity of selection. In livestock selection work and deer pen studies, there is absolute control over not just the sires (bucks) but also the dams (does). In a ranch situation, especially in a hunting situation, genetic selection is impossible on at least half of the adult population (50-75% depending on the sex ratio). Doe deer are contributing half of the genetic material for antlers and other physical traits of their fawns, and there is no way to select the "superior" and "inferior" does. This further dilutes the efforts of any culling practices.

Deer managers often conclude that progress can be made through culling, citing the importance of genetics in livestock herds. Livestock breeds have relatively little genetic variability because the variability was intentionally eliminated in the development of the breed. The isolation of specific traits required numerous generations and intensive

selection of sires and dams to eliminate the undesirable traits. The lack of variability among livestock breeds can not be compared with the relatively high degree of variability (heterozygosity) found in white-tailed deer. This is why the principle of “hybrid vigor” is successful in livestock production but does not apply to white-tailed deer management.

There are other problems associated with the logistics of harvesting at an adequate intensity. Most ranches in the western Edwards Plateau are not able to harvest enough deer to keep the deer population in check (can't find enough hunters, don't want more hunters, etc.). Most ranches would have to substantially increase their harvest intensity and harvest selectivity to produce a measurable improvement in antler quality. There are also problems associated with culling the “right” deer, especially when ranches are relying on hunters with a very wide range of experience in recognizing “inferior” deer.

Does this mean that culling and genetic improvement will not work? Absolutely not – selection for antler traits has been demonstrated in deer research pens. Genetic improvement will work best on very small, high-fenced properties. It is less practical on large, high-fenced properties. It is least practical on ranches with low fences.

Deer managers should not be disappointed by this information. With proper habitat management to boost nutrition, every ranch in Texas has the capability of producing some quality white-tailed bucks once they reach a mature age. Producing quality whitetails is more of a challenge in west Texas where weather can severely impact nutrition, and where habitat conditions (preferred plant species and grass cover) must be restored after many decades of overuse by grazing animals (livestock and deer) and the absence of periodic fire.

Summary

The most important step in a deer management program is establishing a well-defined set of objectives. Annual surveys and harvest records will assist the manager in making annual harvest recommendations, but more importantly, they are critical tools for evaluating progress toward deer management goals. The buck harvest should be used to manage the age structure of the buck segment, while the doe harvest should be implemented to meet objectives regarding deer numbers and nutrition (i.e., increase, maintain, or decrease deer numbers). Nutrition and age structure are the keys to producing quality bucks. In west Texas, nutrition is the primary factor limiting herd health and buck quality, and deer numbers can not be managed independently of livestock numbers. Genetic improvement may be a valid consideration, depending on the individual ranch and hunting operation. However, do not substitute “culling” efforts for more important practices such as proper grazing management, brush management, prescribed burning, controlling deer numbers, and establishing quality sources of food and water.