

Key Food Plants for Deer in South Texas

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The South Texas or Rio Grande Plains is an area of about 20 million acres covering all or part of 29 Texas counties. Most of the area is rangeland where large cattle ranches still predominate. South Texas has long been known for its white-tailed deer herds, and especially for the numbers of mature, high quality bucks which are harvested each year. Concern for the perpetuation of quality in the deer herd has led to much recent interest in proper deer management.

The economic importance of deer to the ranching industry of South Texas is the primary reason why this interest in sound deer management exists. With an average mature buck bringing from \$1,000 to \$3,000, the average return ranges from \$2 to \$6 per acre. Much of this income is net profit to the ranch. The raising of quality deer by the rancher and the marketing of those deer to the hunter is one of the few businesses in the ranching industry that is still profitable.

The deer management objective for most South Texas ranches is to raise the optimum number of mature, high quality bucks for harvest by hunters on a sustained, long-term basis in connection with a live-stock ranching operation. This goal of optimizing buck numbers with buck quality will certainly not happen by itself. It requires purposeful management.

Most game managers and ranchers will agree that there are three essential elements that make a high quality deer herd: a good age structure; good genetic potential; and proper nutrition. Providing the proper nutrition through the natural diet is the hardest to achieve and is the true challenge of deer management.

Deer Nutrition

The basic inputs on which good deer nutrition are based are deer numbers, cattle numbers, grazing systems for cattle and brush management. Your ranch management decisions that dictate these factors will determine what nutritional level and thus what quality potential your deer herd will have.

The three factors that determine how much nutrition deer will gain from their diet are the amount, quality and palatability of the food. Figure 1 shows the general quantity and quality requirements of deer if they are to perform to their potential. Nutritional needs will, of course, vary according to age, sex and season. Table 1 illustrates three important points: 1) deer have definite nutritional needs just as cattle do if they are to perform to their potential; 2) deer eat a significant amount of range forage and should not merely be considered by-products of a ranching operation; and 3) deer require a higher quality diet than do cattle, and the potential for competition between cattle and deer is very real. Competition may limit quality deer production on many ranches.

The third factor affecting deer nutrition is palatability. Palatability is directly related to succulence and tenderness, with young, new growth always being more palatable than older, mature growth. Range plants may be adequate in quantity and quality, but if they are not palatable, deer will not eat enough of them to meet their nutritional needs. Palatability plays an important part in deer nutrition. Contrary to popular belief, an animal will not consume larger amounts of a poor quality feed to compensate for the low

Table 1. Nutritional Requirements of White-tailed Deer

Diet Component	Daily Requirement	Yearly Requirement
Total Feed	3.5 lbs. dry wt.	1,300 lbs. dry wt.
Energy	2.5 lbs. TDN	900 lbs. TDN (equiv. of 1,100 lbs. corn)
Protein	16% of diet about 1/2 lb.	200 lbs. (equiv. of about 1,000 lbs. of 20% breeder cubes)
Phosphorus	0.3% of diet	4 lbs. (equiv. of 33 lbs. of 12-12 mineral)
Calcium	0.7% of diet	9 lbs.

nutritional value. Instead, an animal will simply eat less of an unpalatable forage.

Deer Food Plants

There are four broad classes of deer food plants: browse; forbs; cactus; and grass. The brush that is eaten by deer is called browse. It is the leaves, tender twigs and fruits of woody plants. On most South Texas deer range, browse makes up the bulk of deer diets. Indeed, the abundance and diversity of woody plants has earned South Texas the name "brush country," and to many people good brush equates with good deer habitat. This brush certainly is an asset to deer habitat and to sound deer management. The large number of evergreen brush species, their ability to remain green during drought and their relatively low growth habit make browse a key part of deer diets. Additionally, the presence of thorns on many brush species has kept cattle utilization of those key forages to a level that has allowed their perpetuation. A long history of low goat numbers in South Texas has also contributed to the present existence of high quality browse plants.

Appendix I lists the browse plants of South Texas and their relative value as deer food. This listing is separated into six categories of importance for deer food. Category I plants are known as "ice cream" plants, since they are so highly palatable and nutritious that they are sought after and heavily browsed in preference to most other browse plants. Regardless of deer and cattle numbers, these "ice cream" plants are normally heavily used, showing a strong hedging effect. This class of browse usually does not make up a large part of deer diets, since the plants are usually not a significant part of the brush community. These plants are not normally useful as indicators or barometers of browsing pressure, as they will be sought after even with relatively low deer and cattle numbers. Unfortunately, "ice cream" browse plants are not reproducing well on most South Texas range due to overbrowsing on the young seedlings at this very vulnerable stage. Management practices that would allow for establishment of new plants are impractical to the average rancher.

Category II plants are those high value plants which are abundant enough on most ranches and palatable and nutritious enough to make up a large part of the deer diet. This class of brush can be used to gauge the relative browsing pressure in a given area. These plants, under proper range management, should show light to moderate hedging. Heavy hedging and/or browse lines on these plants should alert the manager of excessive browsing by cattle and/or deer and steps should be planned and carried out to reduce the pressure before the problem worsens.

Category III plants are medium value browse plants. They are generally lower in nutritional quality and palatability than are the high value plants. However, due to their great abundance in most areas of South

Texas, these plants often contribute a significant part of the total deer diet. If deer are receiving the bulk of their diets from these plants they will probably not be receiving adequate nutrition. Plants in this category are often listed among the most unwanted brush species and the ones contributing most to the brush problem in South Texas.

Despite more than 40 years of effort in controlling these plants, they are increasing, while many of the better quality brush plants are decreasing. What does the future hold? It should be understood that these first three categories of browse plants are subjective and relative. If, for example, a certain range does not have any of the Category I "ice cream" plants, then certain plants in Category II will take on the characteristics of such plants. Likewise, in some situations, some plants in Category III may be of more importance than plants in Category II. Generally speaking, however, range with an abundance of Category II plants will be better deer habitat than range where Category III plants dominate.

Category IV, or low value, plants are those that are present on many sites but are rarely, if ever, important as deer food. Palatability and nutritional quality are low, and deer would likely starve to death in the midst of these plants if they were the only ones available.

Category V plants are not of widespread importance across South Texas, but they are of localized importance in certain areas or on select range sites.

Category VI plants are seasonally important plants. These food items are actually flowers or fruits of plants mentioned in other categories that have a short-term seasonal importance. These items may only be present for a few weeks each year, but during that time they may make up the bulk of deer diets due to their palatability and nutritional quality.

Forbs are the next class of deer food plants. Forbs are the broadleaved plants most people call weeds. Forbs are divided into two categories—perennial and annual. Annual forbs, as the name implies, are short-lived and provide forage in South Texas from about February to April. These winter weeds, as they are called, are abundant only in wet winters and are gone as soon as spring temperatures rise. A good crop of winter weeds is a bonus to the rancher, since both cattle and deer receive a flush of high quality, highly palatable forage that is otherwise not present.

Perennial forbs are present year-long and should make up a large part of deer diets. The high quality perennial forbs are, however, lacking on most South Texas ranches. The relative abundance of the better perennial forbs on a ranch will usually be directly related to the way in which livestock have been and are now managed. Excessive cattle numbers and continuous grazing will severely limit the good perennial forbs. Proper livestock numbers combined with some form of periodic pasture rest will favor the presence and increasing numbers of these plants. Appendix II

lists some of the more important forbs used as deer food in South Texas.

Cactus is the third class of deer food plants, with prickly pear being the most important plant. Although cursed by ranchmen in other parts of the state, prickly pear is considered an asset by most South Texas ranchers. Besides being a primary deer food plant (comprising about a third of the total diet in some studies), "pear" has saved many a cattleman from disaster during drought. Prickly pear grows well on virtually all range sites, is drought tolerant, is a good source of vitamin A and is exceptionally high in digestible energy. It is, however, low in protein and phosphorus.

Despite the assets that prickly pear holds, excessive pear, just like excess brush, is a tremendous competitor for sunlight, nutrients and, most of all, moisture. Its ability to grow from broken-off pads has allowed it to spread to undesirable levels on many ranches. But even after all of the bad things about pear are mentioned, it is still considered by some to be the single most important plant to deer in South Texas. It is also an essential component in the diet of the javelina.

Grasses do not usually make up a significant part of the deer diet. However, some grass is eaten year-round, and at certain times it contributes important nutrients to the diet not found in the other classes of plants.

Meeting Nutritional Needs

Unlike cattle, South Texas deer must receive virtually all of their nutrition from range plants. Almost all deer food plants vary widely in their palatability and nutritional content from season to season. For this reason, deer must choose those plants that will come closest to meeting their nutritional needs all year. There will be certain seasons (usually summers), and sometimes entire years, when needs for optimum production will not be met due to drought or excessive competition between cattle and deer.

An ideal deer diet for South Texas can only occur when the range is properly managed from both a livestock and deer standpoint. Notice that forbs will make up the bulk of the diet in late winter, spring and much of the summer. Browse (which in this chart includes cactus) makes up the bulk of the diet in fall and most of the winter. This kind of diet would come closest to meeting deer needs for protein, energy and minerals year-round, and would allow for a high quality deer herd.

There are many differences between a deer diet on range where deer and/or cattle numbers have exceeded the carrying capacity and one on an ideal range. Forbs make up a much lower portion of the diet while browse makes up the bulk of the diet and grass increases in the diet. While the crude protein needs in the diet are probably met, the energy requirements may not be, since browse will not contain adequate

energy levels year-round. If the range has adequate prickly pear, then energy needs would be met. Contrary to popular belief, however, not all South Texas range has enough prickly pear for deer. This diet would likely be very low in phosphorus, an essential mineral for body growth, reproduction and antler growth. Browse plants are usually very low in phosphorus during all seasons except spring. Forbs generally have adequate phosphorus levels. Grass, too, is fairly high in phosphorus and may contribute to meeting the need for this mineral in deer. Calcium is more than adequate in virtually all South Texas plants and is not a limiting nutrient for deer.

Cattle/Deer Competition

All South Texas ranchers know that cattle eat prickly pear (burned or unburned) and that they relish certain kinds of brush. They also know how much cows like a good crop of winter weeds. Cattle do eat a lot more than just grass, and they do compete with deer for the same choice food plants.

On a properly managed ranch there will be enough of the good forbs and good browse for both cattle and deer without hurting the plants. Problems arise, however, when cattle numbers exceed the carrying capacity of the range. Under proper conditions, cattle are predominantly grass eaters. Where this is true, cattle and deer are able to co-exist together, with both animals being able to meet their nutritional needs.

However, the cattle diet changes drastically when cattle numbers get too high. When this occurs, cattle must consume large amounts of forbs and browse in an attempt to meet their dietary needs. This is when they compete excessively with deer and when cattle and deer diets have a large overlap. This is what the rancher wants to avoid if he wishes to raise deer. The rancher trying to raise both good cattle and good deer should strive for relatively little diet overlap.

Where Do You Stand?

It is very difficult to look at a ranch and tell what is happening in the diets and nutrition of the animals. The not-so-obvious signs of overgrazing or overbrowsing in their varying degrees should be learned to allow recognition of this situation. Overgrazing of grasses is apparent when the medium and good classes of grasses are always grazed short. The absence of the better grasses in the open, with their presence mostly in the protection of brush and cactus, indicates past and present overuse. Likewise, when the prime perennial forbs, which are so important in the deer diet, are able to exist only in the protection of brush, this, too, is a sign of overgrazing and thus habitat deterioration.

Much of the overbrowsing of choice brush plants is the result more of cattle pressure than of deer pressure. Virtually all South Texas browse plants will

exhibit a hedge effect with heavy browsing. This makes a normally open bush appear much more dense and compact, just as a hedge in one's yard would look with periodic trimming. Slight to moderate hedging is acceptable for the better browse plants. If, however, severe hedging exists where the plant takes on a rounded appearance and the ends of the stems are all stiff, thick and blunt, then overutilization is occurring and the plant will be hurt. Continued overbrowsing will severely weaken and even kill brush plants.

How to Reverse the Trend

Even though South Texas as a region has probably the best deer habitat in the state, if not the country, the quality of the herd has declined in recent years and there are improvements to be made. Improvement cannot occur on a regional basis until it occurs on a ranch-by-ranch basis. If the decision makers for a ranch are committed to dual cattle/deer production as a management objective, then there are several principles that must be followed.

First, such a ranch will need to have at least half and preferably two-thirds of its acreage in brush. The brush must then be well distributed in all areas of the ranch so that there are few areas farther than about 250 feet from protective cover. If additional brush work is warranted and economically feasible, then it should be done in some sort of pattern where clearings are interrupted by adequate brush. Additionally, the method of brush management should be considered as a factor in deer habitat. The more intensive and expensive methods are generally more detrimental to deer habitat than are the less intense methods.

The second principle that should be adhered to for proper cattle/deer management is that of grazing management involving periodic pasture rest. No one sys-

tem or method of grazing rotation is always the correct one. In general, any system of moving cattle among properly stocked pastures where at least half of the range is resting during the growing season will be adequate for maintenance or improvement of deer habitat and range condition.

The third and last basic principle to follow for optimizing a cattle/deer operation is that of having animal numbers at the proper level for the prevailing conditions. The signs of overgrazing and overbrowsing mentioned earlier are the best ways to determine if excessive numbers exist. If these signs are present in years of average rainfall, then reductions in cattle and deer numbers should be significant to realize any improvement. Once the symptoms of overutilization are noticed, reductions of at least 30 percent and up to 100 percent are often in order if the ranch manager is serious about improvements.

Range Management is the Key

Good deer nutrition, and thus good deer quality, is dependent on sound livestock management. Livestock grazing in many cases has more impact on deer nutrition than does any other single factor. Therefore, the way in which livestock are managed has a very great influence on the quality of the deer a ranch is capable of producing.

The dollar value placed on a quality buck has increased faster than inflation in recent years. For the operator who is willing to raise and market these products of his ranching operation, deer may be the best option for showing a net profit in today's and tomorrow's uncertain ranching industry. It is the rancher who holds the key to the future of the South Texas deer herd.

Appendix I

Browse Plants of South Texas and Their Relative Values as Deer Food

Common Name	Localized Name	Scientific Name
Category I - Ice Cream Plants		
Fourwing saltbush	Chamisa, Hauha	<i>Atriplex canescens</i>
Chomonque	Chomonque	<i>Gochnatia hypoleuca</i>
Kidneywood	Vara dulce, Palo azul	<i>Eysenhardtia texana</i>
Ephedra	Popotillo	<i>Ephedra arctisiphylitica</i>
Elbowbush	Panalero	<i>Forestiera angustifolia</i>
Category II - High Value Plants		
Prickly pear	Nopal	<i>Opuntia engelmannii</i>
Lime pricklyash	Colima	<i>Xanthoxylum fagara</i>
Spiny hackberry	Granjeno	<i>Celtis pallida</i>
Spiny bumelia	Coma	<i>Bumelia angustifolia</i>
Guayacan	Guayacan	<i>Porteria angustifolia</i>
Bluewood condalia	Brasil	<i>Condalia obovata</i>
Ebony	Ebano	<i>Pithecellobium flexicaule</i>
Guajillo	Guajillo	<i>Acacia berlandieri</i>
Catelaw	Una de gato	<i>Acacia greggii</i>

Appendix I (continued)

Common Name	Localized Name	Scientific Name
Category III – Medium Value Plants		
Lotebush	Clepany	<i>Condalia obtusifolia</i>
Blackbrush	Chaparro prieto	<i>Acacia rigidula</i>
Twisted acacia	Huisachillo	<i>Acacia tortuosa</i>
Huisache	Huisache	<i>Acacia farnesiana</i>
Mexican persimmon	Chapote	<i>Diospyros texana</i>
Desert yaupon	Capul	<i>Schaefferia cuneifolia</i>
Retama	Retama	<i>Parkinsonia aculeata</i>
Lantana	Monte Christo	<i>Lantana macropoda</i>
Hogplum	---	<i>Colubrina texana</i>
Palo verde	Palo verde	<i>Cercidium macrum</i>
Purple sage	Cenizo	<i>Leucophyllum frutescens</i>
Shrubby blue sage	Mejorana	<i>Salvia ballotaeflora</i>
Mesquite (leaves)	Mesquite	<i>Prosopis glandulosa</i>
Category IV – Low Value Plants		
White brush	Reventador	<i>Aloysia lycoides</i>
Wolfberry	Cilindrillo	<i>Lycium berlandieri</i>
Althorn goatbush	Amargoso	<i>Castela texana</i>
Mountain laurel	Mescal	<i>Sophora secundiflora</i>
Creosote bush	Gobenadora	<i>Larrea tridentata</i>
Coyotillo	Coyotillo	<i>Karwinskia humboldtiana</i>
Althorn	Junco	<i>Koeberlinia spinosa</i>
Screwbean	Tomillo	<i>Prosopis reptans</i>
Knifeleaf condalia	Costilla de vaca	<i>Condalia spathulata</i>
Category V – Plants of Localized Importance		
Algerita	Agrito	<i>Berberia trifoliolata</i>
Barreta	Barreta	<i>Helietta parvifolia</i>
False mesquite	Plumita	<i>Calliandra eriophylla</i>
Calderon ratany	---	<i>Krameria ramosissima</i>
Southwestern bernardia	---	<i>Bernardia myricaefolia</i>
Skeletonleaf goldeneye	---	<i>Viguiera stenoloba</i>
Shorthorn zexmania	---	<i>Zexmania brevifolia</i>
Feather dalea	---	<i>Dalea formosa</i>
Littleleaf sumac	---	<i>Rhus microphylla</i>
Skunkbush sumac	---	<i>Rhus aromatica</i>
Running liveoak	---	<i>Quercus virginicus</i>
Hackberry	Palo blanco	<i>Celtis laevigata</i>
Mariola	Mariola	<i>Parthenium incanum</i>
Category VI – Plants of Seasonal Importance		
Mesquite beans	Mesquite	<i>Prosopis glandulosa</i>
Yucca flowers	Pita	<i>Yucca treculeana</i>
Persimmon fruits	Chapota	<i>Diospyros texana</i>
Prickly pear flowers	Nopal	<i>Opuntia engelmannii</i>
Coma berries	Coma	<i>Bumelia angustifolia</i>
Liveoak acorns	---	<i>Quercus virginicus</i>

Some Important South Texas Forbs Used as Deer Food

Common Name	Scientific Name
Annual Forbs	
Talloweed	<i>Plantago rhodosperma</i>
Talloweed	<i>Plantago hookeriana</i>
Poppingweed	<i>Lesquerella gracilis</i>
Pepperweed	<i>Lepidium lasiocarpum</i>
Deer vetch	<i>Vicia leavenworthii</i>
Prostrate euphorbia	<i>Euphorbia prostrata</i>
Annual dozedaisy	<i>Aphanostephus kidderi</i>
Gaura	<i>Gaura brachycarpa</i>
Verbena	<i>Verbena</i> sp.
Annual saltbush	<i>Atriplex</i> sp.
Filaree	<i>Erodium cicutarium</i>
Tetraneuris	<i>Tetraneuris linearifolia</i>
Sleepy daisy	<i>Xanthisma texanum</i>
Wild mustard	<i>Sisymbrium</i> sp.
Draba	<i>Draba cuneifolia</i>
Tumbleweed	<i>Salsola kali</i>
Perennial Forbs	
Bush sunflower	<i>Simsia calva</i>
Orange zexmania	<i>Zexmania hispida</i>
Dayflower	<i>Commelina erecta</i>
Groundcherry	<i>Physalis viscosa</i>
Velvet bundleflower	<i>Desmanthus velutinus</i>
Prostrate bundleflower	<i>Desmanthus virgatus</i>
Western ragweed	<i>Ambrosia psilostachya</i>
Winecup	<i>Callirhoe involucrata</i>
Low menodora	<i>Menodora heterophylla</i>
Dutchmans britches	<i>Thamnosma texana</i>
Wood sorrel	<i>Oxalis drummondii</i>
Bearded dalea	<i>Dalea pogonathera</i>
Golden dalea	<i>Dalea aurea</i>
Western indigo	<i>Indigofera miniata</i>
Perennial dozedaisy	<i>Aphanostephus riddellii</i>
False ragweed	<i>Parthenium confertum</i>
Threadvine	<i>Cynanchum baroigerum</i>
Hoopflower	<i>Psilostrophe gnaphalodes</i>
Trifolium	<i>Petalostemum</i> sp.
American Snoutbean	<i>Phynchosia americana</i>
Sensitivebriar	<i>Schrankia</i> sp.
Spreading sida	<i>Sida silicalis</i>
Neptunia	<i>Neptunia</i> sp.
Rainlily	<i>Cooperia</i> sp.