

Photo by Russell Graves



Browse usually makes up half or more of the mule deer diet.



WHAT DO MULE DEER EAT?

Article by STEVE NELLE

Every serious rancher and wildlife manager strives to learn what the animals on their land eat, using that information in turn to help make good land management decisions. Many landowners in West Texas are interested in mule deer including their food habits and how to manage the food supply. This article is about the feeding habits and management of desert mule deer in the Trans-Pecos region of Texas.

Digestive Biology

In the world of ruminant physiology, mule deer are known as concentrate selectors. They are more selective in what they eat than many other ruminants, choosing those food items that provide a higher concentration of nutrients. Their narrow muzzle, prehensile tongue and flexible lips give deer the dexterity to choose the specific food items that will best meet their nutritional needs. Deer are nibblers, eating thousands of tiny bites each day to optimize the intake of protein, energy, minerals and other nutrients. Mule deer, like their white-tailed cousins, have the ability to cherry-pick individual leaves or plant parts that have greater nutrient content while rejecting the more mature, less nutritious material.

Kent Mills, a Texas Wildlife Association director and nutritionist with Hi-Pro, explained that the rumen of deer is smaller in proportion to its body size than that of goats, sheep, most exotics or cattle. Mills said, “The rate of passage through the digestive system is faster in deer, meaning there is less time to extract nutrients. Plants eaten by deer pass completely through their system in only 18 to 24 hours while plants eaten by cattle take 48

to 72 hours to pass through. This means that deer must select for a higher quality, more easily digested diet than most other species.”

Mule deer consume a large volume of food—about 4 to 8 pounds per day on a dry weight basis. So, even though they are selective, they cannot afford to be too picky; they must settle for what is available even if it is not their first or second choice. Mule deer, after their first year of life, are tough animals able to survive the harsh conditions of the Trans Pecos and Chihuahuan Desert.

Diet Studies

Many good mule deer food studies have been done in Texas and the southwest over the past 60 years. These studies confirm that mule deer feed primarily on woody plants including browse (leaves

and twigs) and mast (fruit, beans and berries). Mule deer also make heavy use of cactus and other desert succulents such as lechuguilla, yucca, sotol and candelilla. Whenever available, deer consume forbs—broadleaf flowering plants often called “weeds.” Forbs provide the highest overall nutrition, especially protein; mast, cactus and succulents provide high energy; and browse provides the most reliable source of yearlong food. Mule deer eat very little grass, usually less than 5 percent of their yearly diet.

Five diet studies from different locations are summarized in tables illustrating the range of conditions found across the Trans Pecos. Because of different soils, topography, elevation and rainfall, the diet of mule deer varies from place to place. I appreciate Dr. Louis Harveson of



Photo by Russell Graves



Sul Ross State University and the Borderlands Research Institute providing copies of some of these studies. (See page 14 for results of these studies.)

Bread and Butter Plants

Bread-and-butter plants for mule deer are those staple plants which are most important and most dependable. In the mountains, oak is often the single most important plant. There are more than 20 species of oak native to the Trans-Pecos. Sumacs are very important and include skunkbush sumac, evergreen sumac and littleleaf sumac. Several species of acacia and mimosa are also important, including white-thorn acacia, roemer acacia, mesquit acacia, catclaw acacia and catclaw mimosa. Pricklypear (pads and fruit) and cholla (fruit) are critical for the sustenance of mule deer in many locations.

Other staple browse plants include juniper, mountain mahogany, apache plume, silktassel and skeletonleaf goldeneye. It should be mentioned that most of the first choice browse plants are not staple plants—they may be highly preferred but are

usually not abundant enough to contribute significantly to the mule deer diet. Important forbs for mule deer include spurge, dalea, flax, sticky sallow, globemallow, wild mercury, croton, milkwort, menodora, wild buckwheat and bladderpod.

It may be surprising to some that lechuguilla is a staple plant for mule deer. The spiny relative of century plant grows abundantly across much of the region. In spring, mule deer relish the new flower stalks, resembling large asparagus spears which provide a windfall of good nutrition. Deer also consume the white, fleshy part of the leaves where they emerge from the plant's base. Deer apparently paw at the plants to expose the base and consume the softer part of the leaves. Lechuguilla is toxic to sheep, goats and cattle, but mule deer are able to make good use of it.

Managing the Food Supply

It is important to know what plants are eaten by mule deer, but it is even more important to put that information to practical use. For mule deer in the Trans-Pecos, habitat management is usually limited to low-intensity methods applied over large areas.

Photo by Steve Nelle



Healthy habitat is characterized by a diversity of woody plants, succulents and forbs.





Mule deer spend a lot of time foraging and consume 4 to 8 pounds of food each day.

Intensive management methods used for white-tailed habitat usually are not practical for mule deer management. Common sense habitat management for mule deer includes maintaining a yearlong water supply, very conservative grazing management, and in some cases, judicious brush management or practices to increase rainfall penetration.

Areas that are far away from water have limited value to deer, even though they may contain an abundance of deer food. Adding water locations can materially increase the accessibility of new food supplies. If the manager wants these areas to be off limits to livestock, the water can be fenced off.

Grazing management is perhaps the single most important way landowners can affect the deer food supply. When growing conditions are favorable, light or moderate seasonal grazing and rotational grazing is compatible with good mule deer habitat. The best way to insure that livestock grazing does not impact the

deer food supply is to vacate pastures when conditions get dry and the food supply becomes more limited. But always be sure to maintain permanent water when livestock are removed. When using rotational grazing, the more pastures that are resting from grazing at any one time will favor the best mule deer food supply.

Everyone knows that cattle are mostly grass eaters, while mule deer eat primarily woody plants and forbs. This fact is sometimes misinterpreted to say that cattle and mule deer do not compete. However, diet studies done on Chihuahuan Desert ranches shows that forbs and browse often make up 20 to 40 percent of the yearlong cattle diet. In practical terms, this means that on average each cow is consuming 5 to 10 pounds of deer food each day. When grass is green and abundant, cattle will not have any ill effect on the deer food supply, but when grass is scarce and/or dry, cattle will consume significant amounts of deer food. This may be one reason why mule deer tend to move away from





Acacia



Wild Buckwheat



Low Wild Mercury



Apache Plume



Parry Ruellia



Littleleaf Sumac



Skunkbush Sumac



Snoutbean



Redberry Juniper



Gray Oak



Globemallow



Bundle Flower





Candelilla



Oak Acorns



Acacia Seed Pods



Lechuguilla Base



Lechuguilla Stalk



Cholla



Pricklypear Tuna



Pricklypear Seed



Yucca Stalk



RESULTS OF MULE DEER DIETS STUDIES IN FIVE TEXAS LOCATIONS

Big Bend National Park Paul Krausman; 1972-1974

Type of Vegetation	Percent of Diet
Browse	31
Succulents	44
Forbs	22
Grass	3

Top 10 Plants Consumed	Percent of Diet
Lechuguilla	24
Spurges	15
Pricklypear	14
Guayacan	5
Acacia	5
Dalea	5
Skunkbush Sumac	4
Evergreen Sumac	4
Silktassel	3
Menodora	2

Del Norte Mountains TPWD; 1956-1957

Type of Vegetation	Percent of Diet
Browse	58
Succulents	28
Forbs	14
Grass	Trace

Top 10 Plants Consumed	Percent of Diet
Mohr Oak	20
Skunkbush Sumac	15
Pricklypear	11
Cholla	9
Skeletonleaf Goldeneye	9
Littleleaf Sumac	9
Lechuguilla	6
Prairie Clover	6
Spurges	4
Apache Plume	3

Sierra Diablo Mountains TPWD; 1956-1957

Type of Vegetation	Percent of Diet
Browse	47
Succulents	30
Forbs	23
Grass	Trace

Top 10 Plants Consumed	Percent of Diet
Lechuguilla	11
Littleleaf Sumac	10
Low Wild Mercury	10
Wavyleaf Oak	9
Yucca	8
Spurges	7
Pricklypear	6
Skunkbush Sumac	6
Cholla	5
Buffalogourd	5

Guadalupe Mountains Allen Anderson; 1956-1960

Type of Vegetation	Percent of Diet
Browse	59
Succulents	13
Forbs	27
Grass	1

Top 10 Plants Consumed	Percent of Diet
Wavyleaf Oak	18
Redberry Juniper	14
Mountain Mahogany	12
Yucca	11
Skunkbush Sumac	5
Flax	4
Silktassel	4
Sagewort	2
Spurges	2
Dogweed	2

Stockton Plateau Dan Ratliff; 1977

Type of Vegetation	Percent of Diet
Browse	50
Succulents	Trace
Forbs	45
Grass	5

Top 10 Plants Consumed	Percent of Diet
Mohr Oak	12
Littleleaf Sumac	8
Gregg Dalea	6
Redberry Juniper	6
Sticky Selloa	6
Roemer Acacia	5
Longstalk Greenthread	5
Mariola	4
Spurges	4
Bluets	4



Photo by Steve Nelle

Browse line on madrone is a sign of too many mule deer and elk.



Photo by Wyman Meinzer



The abundance and quality of mule deer is directly tied to their stable yearlong food supply.

livestock concentrations and prefer to live in pastures that are being rested from grazing.

A common brush control method on many Trans-Pecos ranches has been the use of Spike® (tebuthiuron), a pelleted herbicide used to kill creosote bush and tarbush. The herbicide is usually very effective in killing these brush species, and the grass response is often impressive after several years. However, a major drawback is that Spike also kills desirable browse plants and perennial forbs.

Spike® is a non-selective broadleaf herbicide that stays active in the soil for several years and will greatly reduce or eliminate most desirable deer food plants. For this reason, Spike® must be used with great caution and restraint if wildlife habitat is important. Using Spike® will increase forage for livestock, improve fawning and nesting cover, and improve rainfall infiltration, but it will hurt the food supply for deer, pronghorns and quail for many years.

Anything that landowners can do to increase rainfall infiltration and boost the growth of forbs will be favorable to mule deer and other wildlife. Mechanical brush control, contour ripping, rainfall harvesting or anything that is done to slow runoff will result in better infiltration and forb growth.

Learning Plants

Serious mule deer managers should develop good plant identification skills. By knowing what plants deer eat and which ones they prefer, and by observing the degree of consumption on plants, managers can learn to read the habitat's condition.

A new book is available to help ranchers, managers, hunters and students learn the browse plants of far West Texas: *Woody Plants of the Big Bend and Trans Pecos*, 2016, by Louis Harveson, with contributions by eight TPWD Wildlife Biologists. This book contains photos and descriptions of 87 species of woody plants along with their value to wildlife and their response to management. It would make a great Christmas gift for anyone interested in mule deer or other Trans-Pecos wildlife. 

Photo by Steve Nelle



Excessive browsing will cause the decline and death of desirable browse plants such as kidneywood.

