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# USE OF DONKEYS TO GUARD SHEEP AND GOATS IN TEXAS

MURRAY T. WALTON<sup>1/</sup> AND C. ANDY FEILD<sup>2/</sup>

## ABSTRACT

Though livestock guarding dogs have received considerable attention in recent years, other animals including donkeys (*Equus asinus*) are being used to protect sheep and goats from predation by coyotes (*Canis latrans*). In Texas many ranchers prefer donkeys due to low cost, relatively small maintenance requirements, and compatibility with other predator control methods. This paper describes husbandry practices for use of guard donkeys and relates rancher accounts of their effectiveness in protecting sheep and goats.

## INTRODUCTION

Texas leads the United States in number of sheep and number of angora goats with 1.9 and 1.5 million head respectively (Texas Agricultural Statistics Service 1989). Texas also has approximately 400,000 Spanish goats and a smaller but significant number of dairy goats. The sheep and goat industry centers on the Edwards Plateau region of the state. Most of the range utilized for sheep and goat production is gently rolling to rugged limestone hills with moderate to dense brush. Predation losses to coyotes, domestic and feral dogs (*C. familiaris*), bobcats (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), red fox (*Vulpes vulpes*), feral hogs (*Sus scrofa*), golden eagles (*Aquila*

*chrysaetos*), and other predators averages about \$9 million per year (Mulder 1988). Coyote predation accounts for over half of the damages.

With the ban on the use of toxicants for predator control in the 1970s, many producers and researchers began exploring other methods of predator management. Considerable attention was focused on European and Eurasian breeds of livestock guarding dogs, and soon a number of excellent instructional publications regarding guard dog husbandry practices such as *Guarding Dogs Protect Sheep From Predators* (Green and Woodruff 1983) became available to livestock producers. While use of dogs was capturing much attention, many Texas sheep and goat producers began using donkeys and mules (*E. asinus* x *E. caballus*) as guard animals. This practice capitalizes on the herding instincts as well as the innate dislike and aggressiveness of some donkeys and mules to dogs and coyotes. In 1988, the Texas Department of Agriculture initiated a predator management training program for certification of sodium fluoroacetate (Compound 1080) Livestock Protection Collar (Rancher's Supply, Inc.) applicators and recertification of M-44 sodium cyanide applicators. This program, which is described by Walton (1989), includes training on alternative methods of predator control to fulfill conditions of the Livestock Protection Collar use restrictions and is a reflection of the Department's commitment to promoting selective and nonlethal predator management practices.

Along with llamas (*Llama glama*) and various breeds of dogs, use of donkeys as livestock guarding animals is mentioned in the

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training materials. During the first year of training, it became apparent that a number of Texas sheep and goat raisers were using guard donkeys with varying degrees of success. However, only scanty popular accounts of donkey use and husbandry practices (Fohn 1987, Krusekopf 1988, and Ranch Magazine 1989) are currently available.

This paper presents a preliminary look at the extent of donkey use, effectiveness, and husbandry practices in Texas.

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## METHODS

In June, 1989, a survey (survey 1) to collect information on guard donkey husbandry practices was mailed to 19 individuals. The group receiving the four-page questionnaire included 17 individuals identified as donkey users on site review forms or questionnaires previously returned by licensed Livestock Protection Collar applicators, one certified M-44 applicator known to use a donkey, and one other individual observed using a donkey for several months in 1989.

An additional survey (survey 2) to collect information on incidence of donkey use and an estimate of effectiveness was mailed out in July, 1989. The Texas Agricultural Statistics Service selected a stratified sample of 500 producers from its mailing list to be representative of all sheep and goat producers in the state. By having the mailing done by the Texas Agricultural Statistics Service and with no requirement for identification on the postage paid return postcard, confidentiality of the

Service's producer list could be maintained.

Information on husbandry practices and donkey guarding behavior was also obtained through discussions with ranchers using guard donkeys and casual observations of approximately a dozen donkeys with sheep or goats.

## RESULTS

### Survey 1

Seventeen returns (89%) were received from the 19 individuals mailed the questionnaire on guard donkey management practices. Utilization of guard donkeys by this group ranged from 0.5 to 8 years with a mean, median, and mode of 3 years of experience. These sheep and goat producers reported having used a total of 58 donkeys of which 52 were still in service. Fifteen respondents were currently using donkeys. Of the 2 respondents who no longer used donkeys, one reported good results but the donkey had died whereas the other reported effectiveness in keeping coyotes away but disposed of the donkey due to aggressive behavior by the donkey towards sheep. The latter individual has switched to a guard dog with good results.

The most common source of donkeys was through private treaty sale with 14 donkey users reporting acquiring donkeys in this manner. Average private treaty purchase price was \$144 with a reported range of \$65 to \$250. Seven respondents reported producing donkeys. Auction barn sale (\$110 purchase price), Bureau of Land Management Adopt-A-Burro (\$75), and borrowed were each reported by one person. Age at which these donkeys were placed with livestock to be guarded varied from birth to over 2 years. Three responses indicated acquiring donkeys of unknown age but with previous use as guard animals. Annual upkeep cost for a donkey was reported at zero to \$300

and averaged \$66. Worming was cited as the only expense by one respondent.

Fourteen of the respondents raise sheep and 11 raise goats. All 14 sheep producers used a donkey to guard sheep, and 9 of the 11 goat producers were using a donkey to guard goats. The average number of sheep or goats guarded per donkey was 213 and maximum number reported per donkey was 1200 head. Pasture size where donkeys were used ranged from less than 100 acres to over 1000 acres with a majority (12) reporting some use in pastures of over 200 acres and over half (9) reporting use in pastures larger than 600 acres. Eleven ranchers also had cattle in the pastures where donkeys guarded sheep or goats. Responses to a question on the type of livestock in adjacent pastures were cattle in 17, goats in 7, sheep in 6, horses in 6, and donkeys in 3.

In response to a question regarding species of predators killing livestock, coyotes were checked on 17 returns, dogs on 4 returns, foxes on 7, bobcats on 5, eagles on 5, and feral hogs on one. All 17 respondents had acquired a donkey to guard against predation by coyotes; 14 listed protection from dog predation as a reason for acquiring a donkey; 5 indicated fox predation; and one stated bobcat predation. Six producers reported predation on livestock to be stable over the last 5 years; 2 producers reported predation as decreasing over this period; and 9 reported increasing predation on livestock. One of those who reported an increase clarified the answer to indicate a decrease after use of a donkey began.

In addition to guard donkeys, methods of predator control being used were M-44 sodium cyanide, Livestock Protection Collars, night penning, calling and shooting, steel-jaw traps, snares, guard dogs, exclusion fencing, aerial gunning, and frightening device. Thirteen of the sheep and goat producers also receive assistance

from the Texas Animal Damage Control Service.

Data from responses to a request for effectiveness evaluation of guard donkeys by sex could not be fully evaluated because numbers of donkeys per respondent varied and some respondents gave a single response for all donkeys of a particular sex while others split the ratings. The 58 donkeys included a minimum of 34 jennies (females) of which 29 were rated good or fair. Only 3 donkeys known to be females from information on the questionnaire were rated as poor, and 2 were of unknown effectiveness. Only 2 or 3 geldings (castrated males) were reported in use. Three responses indicated use of jacks (intact males), and 2 of those reported poor results. A minimum of 34 (59%) of the 58 donkeys were rated as good or fair.

Only 2 donkey users described personal observation of donkeys actually attacking a predator or potential predator:

“Observed one guard donkey chasing dog out of sheep”

“Run on back feet, paw w/ front & bray loudly”

Two second hand accounts were offered:

“A friend said he let his dog out, and donkey like to have killed him before he could get him back.”

“My cousin has seen donkey protect goats from wild dogs - the jenny got pretty riled-up!”

Respondents offered the following comments and advice on husbandry practices:

1. Use only one donkey per pasture.
2. Do not use donkeys in pastures adjacent to pastures with horses or other donkeys.
3. Place donkeys (jennies) with sheep or goats at an early age (3 - 6 months).
4. Raise donkeys away from dogs; don't use dogs to gather sheep or goats in pastures

- with guard donkeys.
5. Do not allow donkeys access to feeds containing Rumensin or other additives intended only for ruminants.
  6. Jennies in heat may kill kids and may need to be removed temporarily.
  7. Best results can be expected in small pastures with 400 or fewer head of sheep or goats.
  8. Donkeys cannot be expected to work well if sheep or goats are scattered.
  9. Some donkeys will not work.
  10. Donkeys are cheap, easy to keep, can be used with most other predator control methods, and are less likely to stray than dogs.

### Survey 2

Usable responses were received from 275 (55%) of the 500 sheep and goat raisers mailed the survey card. Sixty (22%) of the returns reported guard donkey use, and 45 (16%) of the responses indicated that donkeys were being used at the time of the survey. A total of 133 donkeys were reported to be in use. Rating of effectiveness by respondents having experience using guard donkeys is presented in Table 1.

Several reply cards had unsolicited comments. One response indicated that

donkeys killed more goats than predators. Another indicated excellent results against coyotes stating that the three donkeys being used were usually with the cows but that no losses were being sustained. A former guard donkey user who indicated fair results against coyotes allowed that "[S]ome trained or experienced donkeys or jennies are real assets. I lost 25 to 35 goats per year. I had the unexperienced ones." Also of interest, one non-user indicated that guard donkeys are a "total failure" because he had aurally gunned coyotes in a pasture containing a donkey.

### Communications and Observations

C. Fountain (pers. commun.) reported observing a coyote attacking several sheep being guarded by a donkey. Although the donkey was trying to fight off the coyote, it was not able to dispatch the attacker, which eventually got to the sheep.

A participant (anon.) at a predator management training session in Brownwood, Texas on January 5, 1989 gave an unsolicited testimonial about his gelding. The donkey was observed fending off 3 coyotes trying to attack a group of sheep bunched up behind the donkey at a fence corner. The donkey was successful in this effort.

Table 1. Percentages of 60 Texas sheep and goat producers reporting various effectiveness ratings of guard donkeys against common mammalian predators.

Species	Percentages					
	Excellent	Good	Fair	Poor	Failure	Unknown
Coyote	3	17	20	25	17	18
Dog	2	18	22	13	15	30
Fox	0	10	13	5	8	69
Bobcat	0	5	5	5	13	72

Several ranchers emphasized that jacks should not be used due to overly aggressive behavior. A donkey producer related that one goat raiser was insistent on buying a jack instead of a jenny but returned for the jenny after the jack killed several billies (D. Carson, pers. commun.).

One of the most experienced guard donkey users in Texas uses 16 to 17 jennies and tries to isolate the guard donkeys away from other donkeys, horses, and mules in pastures of less than a section. Donkeys have provided some help in reducing coyote predation but have been totally ineffective against feral hogs (P. Bushong, pers. commun.).

Culling of ineffective donkeys was cited as important by one rancher. A prospective guard donkey user should start by selecting an animal of adequate size and good conformation. Aggressive tendencies towards dogs and coyotes can be tested by introducing a dog into a small pen containing the prospective guard animal (J. Feild, pers. commun.).

A Livestock Protection Collar applicator reported that a coyote would kill goats in the pasture across the fence from the pasture containing his guard donkey and would switch pastures when the donkey was moved (H. Hitzfelder, pers. commun.). Through a combination of night penning and donkey use, targeting with Livestock Protection Collars was enhanced so that five collar punctures by coyotes were recorded in less than a month with use of only 8 collared kids. Two coyotes poisoned by puncturing collars were found.

Several donkey users have noted that individual differences between donkeys may be significant and that donkey users should make adjustments as necessary to capitalize on particular qualities and avoid problems.

Most donkeys observed in use in 1988 and 1989 were single jennies or geldings. Also

observed in use were a jenny and foal. A gelding donkey in a small pasture with 15 sheep and a gelding horse under observation an average of three times per week for 6 months in 1989 was always with the sheep. On only 5 occasions was the donkey seen grazing closer to the horse than a sheep. The horse is often at an opposite end of the pasture from the donkey and sheep. The donkey remained with the sheep during lambing with no apparent problems. When approached the sheep tend to move behind the donkey. This behavioral pattern of sheep (and goats) moving behind the guard animal has been observed on several occasions.

## DISCUSSION

Use of guard donkeys is becoming a common practice among the approximately 11,000 Texas sheep and goat raisers. Based on the percentage of returns to survey 2 reporting having used a donkey (22%) and using a donkey at the time of the survey (16%), it is estimated that 2400 Texas sheep and goat producers have tried guard donkeys and 1800 producers are currently using donkeys. A more conservative estimate based on the respective percentages of the total survey mailout would be 1300 producers have tried donkeys and 1000 producers are currently using donkeys. Donkeys are also being used throughout the United States with over 100 farmers in Virginia using guard donkeys (Green 1989). Green and Woodruff (1988) estimated that at least 1,200 livestock producers in the United States and Canada have used guard dogs. Because nothing more than purchasing an inexpensive animal and dumping it in a pasture may be involved, it is highly likely that the number of guard donkey users have surpassed the number of dog users.

Reported success of donkeys for predator control appears to be highly variable. Poor husbandry practices and unrealistic expectations

may contribute to many failures as much or more so than any inadequacies of particular donkeys. Some donkeys are expected to guard more than 1000 head of scattered sheep or goats in pastures greater than 2 sections. This is an impossible task. Under proper conditions some donkeys have proven to be great assets for protection of sheep and goats from coyotes and dogs. Fifty-nine percent or more of the donkeys used by survey 1 respondents were rated as good or fair. About 40% of the survey 2 respondents rated donkeys as fair to excellent for protection against dogs and coyotes, however, a large percentage were undecided. Effectiveness against foxes and bobcats was unknown by 69% and 72% of the donkey users that responded to survey 2. Guard dogs have received higher effectiveness ratings in user surveys (Green et al. 1984, Green and Woodruff 1988).

Design of survey 1 and pattern of responses hampered evaluation of effectiveness and precludes a direct comparison of the two surveys. However, the relative proportion of donkey users achieving satisfactory results is much higher in the survey 1 group than the representative sample of sheep and goat raisers included in survey 2. Comments received on survey 2 regarding the possibility of trained donkeys working or dismissing effectiveness because of observation of coyotes in the same pasture indicate knowledge of the behavioral mechanisms that contribute to livestock protection by donkeys is lacking. Performance by guard donkeys deployed by some members of the survey 2 group could probably be improved through education on proper husbandry. Most of the 19 sheep and goat raisers who were included in survey 1 are known to have a history of predation problems and experience in predator control methods. This group can be expected to have a greater

degree of expertise, and their use of other predator control methods indicates that they were not expecting total protection by donkeys.

Despite the availability of Bureau of Land Management donkeys in Texas, this source does not appear to be a significant direct source for guard donkeys. Restrictions with adoption which would prevent immediate disposal of donkeys that fail as guard animals could reduce desirability of such animals. The prevalence of private treaty sales as a source of donkeys is probably indicative of local availability. Donkeys are available at auctions and reported prices run from \$75 to \$135 for jennies and \$20 to \$60 for jacks (Livestock Weekly 1989). Occasionally, classified ads are run in livestock publications advertising guard donkeys for sale. However, guard dog adds are far more numerous.

Average purchase price and annual care expenses for guard dogs reported by Green et al. (1984) run 2 to 3 times those for donkeys. This large advantage in lower capital outlay as well as ability of donkeys to forage for themselves and not require special provisions for feeding contribute to their popularity. With an average first year cost of \$210 for purchase and care and virtually no labor costs, a guard donkey should reach the break even point by saving as few as 4 head of sheep or goats of average value.

Donkeys should also hold an advantage over dogs in useful life. Survey 1 did not directly address guard donkey longevity, but responses indicated that 52 of 58 donkeys were still in service for sheep and goat raisers averaging 3 years of use. A respondent with 8 years of use had used 9 donkeys with 8 still in service. Other ranchers had not suffered any losses of donkeys in 5 to 6 years of use. Although guard dogs may provide up to 10 years of productive service (Green et al. 1984), over 30% of guard dogs used at the U.S. Sheep Experiment Station

were culled or were dead within 3 years of birth. Lorenz et al. (1986) reported similar results for dogs placed with cooperators of Hampshire College's Livestock Dog Project and indicated that survivorship curves for working guarding dogs resembled those of wild animals with high mortality in early years. Donkeys provided little care under range conditions may also have reduced life expectancies. Feral donkeys (burros) in the Mohave Desert, California have been reported to have an age distribution skewed to young ages with less than 2% of 631 donkeys living longer than 10.5 years (Johnson et al 1987). Males lived longer than females with maximum estimated ages of 15.5 and 20.5 years for females and males, respectively. Higher mortality of jennies was attributed to stress of foaling and lactation. Texas forage conditions should be better; many jennies will not be bred; and some level of veterinary care and supplemental feeding may be provided. An average productive life of 10 to 15 years is expected for guard donkeys.

Donkeys can be used with relative safety in conjunction with snares, traps, M-44s, and Livestock Protection Collars whereas these devices pose a hazard to dogs, especially the latter 2 which use toxicants. In particular, donkeys can aid in effective targeting of coyotes with Livestock Protection Collars by providing a deterrent to attack on a main flock of sheep or goats in one pasture while a small target flock with collars is left unguarded in a nearby pasture. Dogs should not be used in the vicinity of collars due to the extreme toxicity of Compound 1080 to dogs and the propensity of guard dogs to lick sheep and goats. Some dog users, however, have not needed to use any other methods of predator control to achieve desired results. Also, more than one dog can be used effectively in a single pasture to achieve a greater degree of protection.

## SUMMARY AND CONCLUSIONS

Guard donkeys are receiving extensive use in Texas to protect sheep and goats from coyotes with an estimated 1800 ranchers using guard donkeys.. Low costs and compatibility with other predator control methods contribute to popularity of guard donkeys. Reported effectiveness of guard donkeys is highly variable. Improper management practices contribute to poor results experienced by many ranchers. In addition to routine veterinary care, worming, and supplemental feeding if needed, the husbandry practices which contribute to effective guard donkey performance are as follows:

1. Guard donkeys should be selected from medium to large size stock. Do not use extremely small or miniature donkeys.
2. Do not acquire a donkey which can not be culled or sold if it fails to perform properly.
3. Use jennies and geldings. Do not use jacks as guard animals.
4. Test a new donkey's guarding response by challenging the donkey with a dog in a corral or small pasture.
5. Use only one donkey or jenny and foal per pasture.
6. Isolate guard donkeys from horses, mules, and other donkeys.
7. To increase probability of bonding, donkeys should be raised from birth or placed at weaning with sheep or goats.
8. Raise guard donkeys away from dogs. Avoid or limit the use of herding dogs around donkeys.
10. Monitor the use of guard donkeys at lambing or kidding as some donkeys may be aggressive to newborns or overly possessive. Remove donkeys temporarily if necessary.
11. Use donkeys in small (<600 acres) open pastures with not more than 200 head of sheep or goats for best results. Large



pastures, rough terrain, dense brush, too large a herd, and sheep or goats that are scattered all lessen effectiveness of guard donkeys.

12. Do not allow donkeys access to feed containing Rumensin, urea, or other products intended only for ruminants.

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