

## PRELIMINARY REPORT ON A NEW PRINCIPAL FOR PREVENTION OF CROP DAMAGE BY DEER

By VAGN FLYGER, *Natural Resources Institute University of Maryland*  
THEODORE THOERIG, *Maryland Game and Inland Fish Commission*

Deer and farmers frequently compete for the same crop. Where high deer densities exist this competition often becomes a serious economic hazard. Together with insects, drought, and plant pathogens, it may be the straw that breaks the camel's back making farming unprofitable for some individuals. Game managers and farmers have tried various measures to reduce these losses from deer but most methods are ineffective. The increasing amount of deer depredation and the inability to do much about it frequently leads to friction between farmers and hunters with the State Game Commission in the middle.

Maryland has made its share of deer problems and an estimated yearly loss of over one million dollars is caused by deer browsing, trampling and rubbing. Such devices as carbide cannons, firecrackers on burning ropes and chemical repellants have been tried with very little success. Some farmers out of desperation have taken matters into their own hands and have shot large numbers on their lands but even such strong action has not been able to eliminate the problem.

Several years ago the authors entertained the idea of laying out a mine field for the protection of crops. This idea was inspired by memories of the effectiveness of land mines during World War II in keeping troops out of large strategic areas. Several devices were tried and found either too complicated, unreliable or expensive to be practical. Last winter a simple inexpensive device was conceived and immediately tried in the field.

Our study of the use and effectiveness of booby traps has just begun. Several years may be required to gather adequate data to be able to judge the value of these devices but since they appear to be useful it might be wasteful to withhold them from those who might need them during this trial period. Furthermore it is also possible that someone else might be in a better position than we are to test their effectiveness.

The author's theories and reasoning behind the idea are as follows:

1. Deer are primarily forest inhabitants but being opportunists, they eat whatever is readily available and tasty outside of the forests especially when forest food items are scarce. If a deer comes into a particular orchard it learns that tasty food is available there and returns soon to feed. After awhile he becomes a regular visitor to the orchard. He has been "trained" to come here by being rewarded with food. Should a female come to the orchard regularly with her fawns they in turn become trained and in this way a tradition of feeding in a particular spot can be passed through many generations of deer.

2. To prevent the return of deer to an orchard the deer must be trained to stay out. Whenever they enter the orchard they must be punished. The situation is similar to training a dog to stay off a soft chair at home. Whenever the dog hops into the chair it is punished by either receiving a sharp command of "No" or a slap with a newspaper. Soon the dog learns to stay off the chair when the owner is present. Some dogs, however, will use the chair when the owner is absent and other tricks must be used. How does one punish a deer everytime it enters a field or orchard? Simply by surrounding the field with booby traps. Whenever a deer pushes against a string a large firecracker explodes punishing the deer with a deafening report which is painful to his ears. The deer runs off. If he returns the following night he detonates more firecrackers and after a few repetitions he goes elsewhere to feed.

3. How does this differ in principal from an automatic carbide cannon or a firecracker rope? These devices give off a regularly repeated explosion in one spot, which at first frightens deer. However, they soon learn that this explosion does them no harm and gradually they become bold enough to approach quite closely and when an explosion occurs the deer may not even raise their heads. One of the authors has on many occasions watched deer feeding unconcerned on a Maryland army post while cannon were firing nearby. A farmer related a somewhat similar

observation. To frighten venturesome deer he hung a smoldering rope on a tree. Firecracker fuses had been inserted at intervals in the rope so that the firecrackers would explode about every 10 to 20 minutes. On the third or fourth night he watched a herd of about 30 deer feeding in the orchard near the firecracker rope. Every time a fuse started to sputter the deer ran off a few yards but returned immediately after the explosion to resume eating tomatoes.

Deer quickly become acquainted with carbide cannons and firecracker rope and these devices are effective for a limited time only. These devices operate even when the deer are absent or far away compared to booby traps which go off only when the deer trespass. Moreover there is no warning spattering fuse. There is only a deafening unexpected blast. We believe that rather than becoming tolerant of this noise the deer become more afraid of it.

There is still another explosive device which has limited applicability. This is the cracker shell which looks like a regular shot gun shell but shoots a large firecracker rather than a charge of shot. Deer are terrified when one of these shells explodes next to them but they soon associate the noise with man and just become more timid about showing themselves. When the man leaves the deer return. One farmer who used cracker shells says that he had the deer trained to run whenever the back screen door on the house was opened.

#### *Construction and Use of Booby Traps*

These explosive devices are very dangerous and a careless mistake can cause serious injuries. The materials must be handled with care and fire and smoking should be prohibited in the vicinity of the firecrackers.

A booby trap is made as follows:

1. The fuse is pulled out of the side of an army type M80 firecracker.
2. A small Japanese pull type party exploder (the detonator) is placed over the hole in the M80 from which the fuse was removed. These pull type detonators are called party booby traps and resemble a small roll of paper 1 inch long and  $\frac{1}{8}$ th inch in diameter with a five inch string protruding from each end. When the string is pulled the device makes a sharp crack accompanied by a small flash.
3. The detonator is securely fastened to the firecracker by wrapping with a three inch piece of tape. When the detonator is set off enough spark enters the M80 to ignite the powder. The whole device explodes with one loud blast.
4. The entire booby trap is dipped into melted parafin to make it weather proof. At present we are experimenting with other waxes and plastics to make more resistant waterproof coatings.

Booby traps are relatively economical compared to other protective methods. The components of each booby trap cost about 3½ cents. The additional costs of string, tape, and parafin will bring the cost to less than five cents for twenty feet of protection. The cost of one mile of protection is about ten dollars. Naturally, some of the devices must be replaced and the cost of construction and installation must be considered. If fence posts are used, this is an additional expense.

The simplest way to erect a line of booby traps is to first drive three-foot poles ten to twelve inches into the ground at twenty foot intervals around the field. A booby trap is tied to each pole about two feet above the ground. A long string is tied to the other booby trap string and then tied to the next pole at the same height. This is repeated until the entire area is surrounded. One must be especially careful not to pull the strings too hard because even at twenty feet the plastic ends of the firecrackers strike a person with sufficient force to break the skin and leave large bruises.

These explosive devices have a great fascination for people but they are potentially serious danger because an M80 firecracker can easily remove the fingers of a man's hand. The area should be well marked with no trespassing signs and warnings of dangerous explosives. A booby trap can be made safe by tying it to a nail ten feet high on a pole or tree trunk and passing the string through a wire staple two feet above the ground and over to another pole or tree.

If the booby traps are placed only across deer trails deer will enter the field by other routes. It is important to replace expended booby

traps every night for the first week. After that they can be replaced twice a week. Deer probably return the first few nights and must learn that *every* time they trespass they experience unpleasant results. If the deer are not punished for every trespass they will not learn their lessons as well.

Occasionally a booby trap will not explode but instead will sizzle and burn with a hot flame for several seconds. Such a firecracker is a serious fire hazard and for this reason booby traps should not be set in dry forests or dry grass. However, areas to be protected are usually well cultivated and offer little danger of fire.

So far the booby traps have been tried on three occasions and in each case the results have been encouraging. The first instance of their use was in a young apple orchard in western Maryland. Deer had browsed the trees so heavily that most of them had to be replanted. The devices were set out in March 1961 around a portion of the orchard surrounded on three sides by forest. On the first night seven booby traps were exploded and were replaced. After the third night three more were replaced and after the fourth night three more were replaced. During the following two weeks none were replaced. The booby traps were left in place for a period of five weeks after which the trees within the enclosed portion and the unprotected portion of the orchard were examined. None of the 23 trees within the protected area were browsed except for one tree with a branch hanging outside the line of booby traps. Of the 28 trees adjacent to the protected area, 21 were browsed, some quite heavily.

The second instance of the booby trap application was in a strawberry patch on the Eastern Shore of Maryland in late May and early June of 1961. Upon investigating a farmer's complaint of deer damage, his one acre strawberry patch was found to have been severely browsed and his field covered with deer tracks. It was apparent that the strawberries would be a complete loss when the berries ripened if something was not done immediately. A few booby traps were put across the deer trails leading into the patch. A few exploded booby traps were replaced but two weeks later there were no signs of deer damage and only one set of deer tracks. The farmer was highly enthusiastic about the success of the experiment.

The third trial was the protection of about ten acres of peach orchard in western Maryland. A line of booby traps were put up to completely encircle the orchard in late August 1961. On the first night three booby traps were set off by deer, four were set off during the next two nights and two on the following two nights. During the following eight weeks a few traps were replaced. The periphery of the orchard was discised in late September and no deer tracks have been seen in this band of bare soil.

Booby traps are also effective for controlling cattle who will treat the booby trap lines with the same respect given to an electric fence. They follow the string looking for openings but do not push against it. Even dogs have been prevented from entering a field by placing the trip string eight to ten inches off the ground.

## DISCUSSION

Booby traps seem to be a possible deterrent to trespass by deer but there are several serious limitations to their use. The authors' enthusiasm for them has twice been dampened by people tampering with these devices. In both cases the injuries were serious and required hospitalization. The thought of children setting them off is sobering and very careful precautions must be taken to prevent access by children. However, the devices can, with a little extra effort, be made almost fool-proof by suspending them at 10 foot heights.

Some people ask whether or not we can use smaller charges. Perhaps, but we doubt that they will be effective. We believe that a smaller charge will not be loud enough to be painful to the ears of the deer. Of course, deer ear sensitivity is greater than that of man and this is all the more reason for experimentation with various sized charges. A possible modification is to use a smaller firecracker and cover it with a half inch layer of plasticine or modeling clay. When the firecracker explodes this soft clay acts as shrapnel which does not break the skin but hits hard enough to bruise human skin.

In spite of the danger to man, there seems to be many occasions when booby traps could be used to protect crops. Though pesticides such as endrin may be even more dangerous to man than booby traps, when conditions warrant, they are still used to protect crops.

**DOVE SESSION**  
**DOVE COMMITTEE, SOUTHEASTERN SECTION,**  
**WILDLIFE SOCIETY**  
**MINUTES OF MEETING**

**INTRODUCTION**

The Dove Session meeting was held in panels C & D of the Dinkler-Plaza Hotel, Atlanta, Georgia, at 4:30 P.M., October 23, 1961. The agenda dated Sept. 5, 1961 was followed. The meeting was opened by Carl Kays who introduced Bill Kiel to direct the discussions.

Several other group meetings were scheduled for this same time. Some of the committee members were not present.

1. Road Counts

Little has been done in getting info on IBM cards. Overton not present.

2. Dove Banding Data

Usable recoveries since beginning number about 19,000.

The Bureau has employed two additional men on dove banding research, analysis etc.

3. & 4. Status of Analysis of Retrap Data

Florida retracted on agreement to supply funds for analysis of data. La. still agreeable to supply their share. Gene Wallace feels that the Service should foot the bill on his work, especially since they have two extra men. Fla. has trapped over 25,000 doves at Palm Beach.

Harold Peters feels there are much too many dove records and data lying around that need to be analyzed and the findings made known—even suggested a grant be sought from some foundation to finance the work.

Ed Carlson—What work takes priority in the National Dove Research and Management Plan? This remark was made in reply to assigning the two new Service men to this job. Their present assignment has a higher priority than this—do priorities need to be reviewed and reassigned?

On Recoveries Analyses—How much money would it take? H. Peters. Answer—\$2,500 per year for 3 years. (?)

Larry Soilean—has all their data on IBM cards. They can't take it any farther. The Institute of Statistics will not give the needed assistance under the present contract for it to be completed, that is Louisiana's data only.

Service Bureau Corporation does this type work. Cost based on the number of cards.

National Science Foundation may analyze data.

No definite conclusion reached.

5. Study of Band Losses

May be able to use a smaller band—if so?

6. Kill Data and Zoning

Have gone as far as possible until banding records are analyzed.

7. Comments on Regulation

James Webb—As long as dove population shows increase, liberalize regulations, if decrease same as preceding year, is this true?

John Finley, "that's about right." Southwide, Nationwide, dove population down 7 percent.