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CRYO–BRANDING–A MARKING TECHNIQUE FOR WHITE-TAILED DEER[1]

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INTRODUCTION

In wildlife research animals are marked for one of two basic reasons: (1) for future identification of the animal in hand and (2) for future identification, live, at some distance from the observer.

For birds, small mammals and to a lesser degree large mammals, leg banding, toe clipping, ear tagging, and tattooing have served well as marking techniques for future identification of the animal in hand. However, a completely satisfactory method of marking mammals and birds for future identification, live, and at a distance, has not yet been reported in the literature.

Problems encountered in marking the larger mammals have been particularly difficult, especially in deer. Progulske (1957) describes a leather collar covered with plastic of various colors and patterns which was used in marking white-tailed deer in Missouri. This collar could not be used on very young deer, because if buckled on loosely enough to allow for subsequent growth it could be lost over the head. It also presented a problem in adjusting to the swelling of the necks of bucks during the rutting season. Hamilton (1962) made an expansible collar for deer which solved some of the problems inherent in the non-expansible collar, but was too short-lived for use in long-range studies. Fashingbauer (1962) describes an aluminum collar for female deer and a rubber base plastic collar in concentric coils for bucks. These collars met most of the requirements of a permanent marker, but over ten percent of the collars were lost within nine months. Other authors (Duerre, 1958 and Ealey and Dunnett, 1956) have described variations of the collar which were useful in identifying animals at night.

Other marking devices such as ear streamers and ear tags (Harper and Lightfoot, 1966), and dyes (Webb, 1943) have been used to mark deer with results similar to those attained by the use of collars.

The Cooperative Wildlife Research Unit at Louisiana State University is conducting nutritional experiments with white-tailed deer in which large numbers of deer of different ages and sexes are being used. Future plans call for breeding of different individual strains of deer, at which time it will be necessary to permanently mark individual animals in such a manner that they may be readily recognized at a distance. None of the presently known methods of marking or tagging seemed to fulfill our needs.

Cryo (freeze) – branding is a new method of branding which is currently receiving much attention in the livestock industry (Farrell, 1965 and Miller, 1967).

[1] A joint contribution of the Louisiana Cooperative Wildlife Research Unit, Louisiana State University, Louisiana Wild Life and Fisheries Commission, Wildlife Management Institute and the U. S. Fish and Wildlife Service cooperating and the Cooperative Extension Service, Louisiana State University.

The junior author began working with this new marking technique on cattle in February, 1967, and has, since that time, experimented with several other species of livestock. In April, 1967, we experimentally freeze branded three of a group of ten experimental deer. Results obtained were so encouraging that we were stimulated to conduct further experimental work with this technique.

This paper will describe the freeze-branding technique used and the results obtained on white-tailed deer.

MATERIALS AND METHODS

Freeze-branding is a process whereby the melanocytes, or pigment producing cells, in dark hair follicles are killed, resulting in a regrowth of white hair. The process is relatively painless and causes very little permanent skin damage.

The process is dependent upon the rapid transfer of intense cold from a branding "iron" to an area of skin. Actually, this is the transfer of heat from the skin to the branding iron.

Materials:

In our work we have used the following equipment:

1. Round faced, cooper branding irons (85% Copper) 3/8" thick, 1 3/4" from face to back and 4" high with 18" steel handles.
2. Styrofoam ice chest.
3. Dry ice.
4. Thermometer.
5. Denatured ethyl alcohol (95%).
6. Electric clippers with extra fine (31-Q-1) blade.
7. Several young, strong, enthusiastic graduate assistants.

Methods:

Enough dry ice was crushed to make a 2" layer in the bottom of the styrofoam ice chest, about 20-25 pounds. The irons were placed face down on the dry ice, and enough alcohol was poured over the ice to cover the head of the irons, approximately 1 to 1½ gallons.

In approximately 15 minutes, when active bubbling stopped, the irons were ready to use. At this time they were cooled to $-77^{\circ}C$, the temperature at which the mixture of dry ice and alcohol stabilizes.

Deer were manually restrained and stretched prone on the ground so as to allow minimum movement, (Fig. 1).

The hair was clipped as close as possible from the area of skin where the brand was to be applied. This is essential in order to allow for rapid, uniform heat transfer.

The clipped area was then swabbed with a sponge or cloth dipped in alcohol. This aids in preventing the iron from sticking to the skin, cleans insulating material from the skin and may be additionally benefical by slightly reducing body temperature in the area to be branded.

Immediately after swabbing with alcohol, the branding iron was applied very firmly to the skin. We varied the application time at 15, 20, 25, and 30 seconds, in an effort to determine which time interval produced the best brand. After applying the brand for the allotted amount of time the iron was removed from the skin with an easy smooth motion and returned to the dry ice-alcohol bath where it was ready to be used again after about two minutes. The entire procedure, including restraint of the animal and the branding process, took less than 5 minutes. With this technique we branded three penned deer in April 1967, 17 wild deer on February 7, 1968, and 15 adult penned deer and one (1) 2 week old fawn on June 10, 1968.

RESULTS

Legible brands were produced on all penned deer. Brands were readable with the unaided eye at more than 100 yards distance. The three deer branded in April 1967, have currently undergone four (4) molts, and the brands are still in excellent condition. As a matter of fact, the white hair appears to be more dense now, after 18 months, than it has previously, (Fig. 2).

Figure 1. Method of restraint for branding.

Of the fifteen (15) adult penned deer which were branded on June 10, 1968, all have legible brands, and all except one have nearly perfect brands. We have no explanation for the poor brand on one buck; he was branded in exactly the same manner as the other deer, yet his brand is barely legible. The fawn developed a good brand, with 15 seconds application time and was beginning to lose its spots when it developed a bacterial infection in early September 1968, and died. The infection was a Corynebacterium infection of the umbilicus, totally unrelated to the brand site.

The fate of the brands on most of the wild deer is unknown. At the time of branding all of these deer were also collared with Naugahide collars fastened together with nylon parachute cord. Several of these deer, three (3) which still retained collars, were observed from a Supercub airplane about two months after branding, and only faint brands could be seen. However, on August 22, 1968, while conducting a wildlife inventory, by helicopter, on the area where these deer were branded, the senior author saw one deer (No. 3) which had a well-formed brand, and one other branded deer which carried a very faint brand. Neither of these deer were wearing collars, and although many deer were seen in the general area, no collared deer were seen. Several color slides were taken of the (No. 3) branded deer.

DISCUSSION

Legible brands were obtained with all different times of branding iron application. In all cases, white hair started growing out within 4 to 6 weeks after branding. Full white hair growth was achieved on all deer by the end of the second month after branding. Between the time of branding and white hair growth, the marking symbols could be recognized because they peeled off and where devoid of hair, (Fig. 3). More scarring of the skin was evident on those deer on which an application time of 30 seconds was used; and brands produced by 15 seconds of branding iron application were more prone to be spotty. Thus, our work indicates that a branding iron

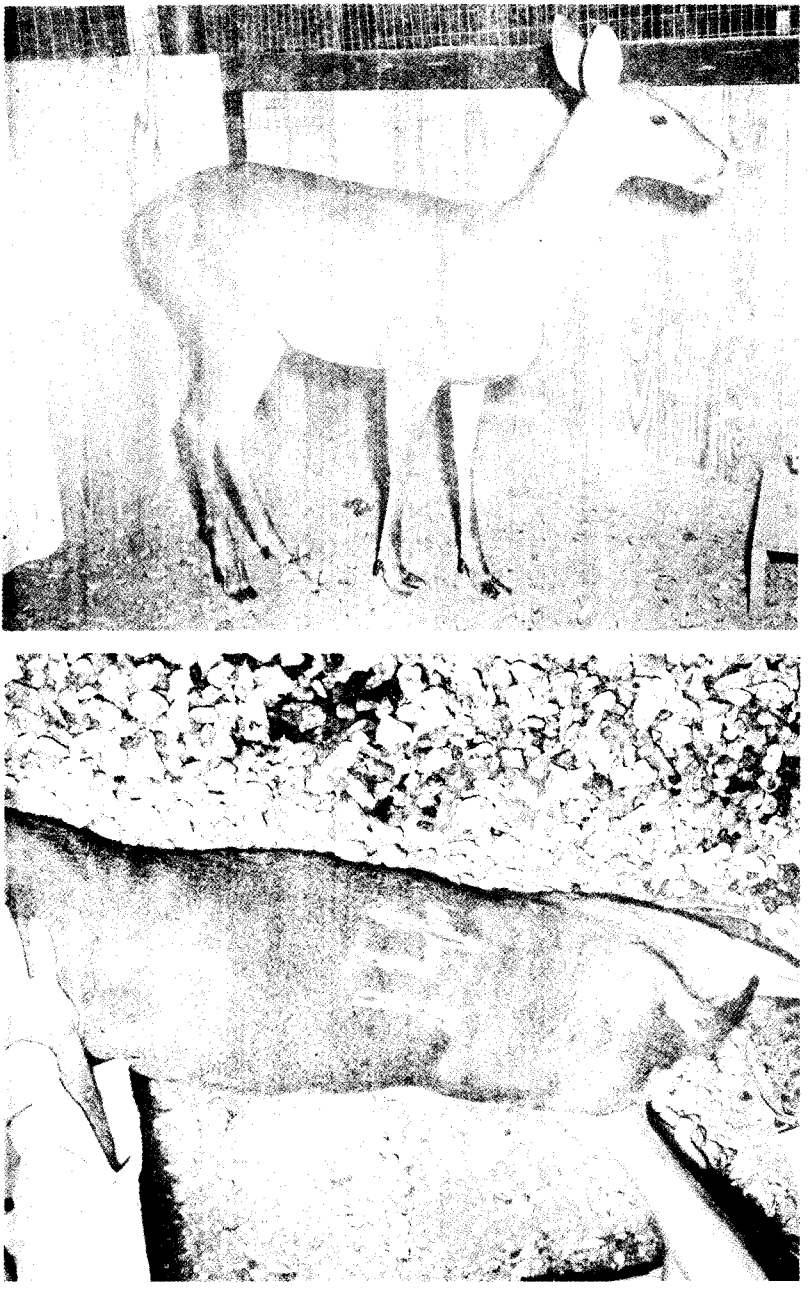

Figure 2. Top — Brand after 3 months.
Bottom — Brand after 18 months.

Figure 3. Brand at 2 weeks — note skin peeling.

application time interval of 20-25 seconds will consistently produce the best brands of white-tailed deer.

Since some of our brands have undergone four (4) molts without any sign of deterioration, we believe this is a permanent identification technique. White hair produced by the brand provides a vivid contrast, which is clearly visible, on both the summer and winter coats of white-tailed deer. This technique should be especially useful in long range studies of white-tailed deer where identification of individual animals is necessary.

In cattle branding operations, where large numbers of animals are handled the cost of branding has averaged 5-8 cents per animal, exclusive of the initial cost of the branding irons. It would run essentially the same for our penned deer, however, on wild deer under normal conditions of trapping, it would cost much more, but would not cost as much as any of the collars.

In summary, our work has indicated that this is an economical, easily applied and permanent marking technique for white-tailed deer.

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DIAZEPAM AND ALPHA-CHLORALOSE MIXTURES TO CAPTURE WATERFOWL[1,2]

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ABSTRACT

Various mixtures of diazepam and alpha-chloralose were tested on waterfowl in Florida and Maryland by oral administration on baits. A total of 3,233 waterfowl of a variety of species was anesthetized sufficiently to be captured. All mixtures which were tested reacted faster, and we believe more safely than did either of the two compounds separately. Several species were captured simultaneously at the same bait stations. Reactions to winter-spring capture versus fall capture revealed seasonal differences in physiological effects of the drugs. Local conditions may require special adaptation of the techniques in some cases.

INTRODUCTION

Animal capture techniques with oral drugs applied to bait has aroused interest among wildlife workers. The application of oral anesthetics to capture wildlife other than waterfowl has been reviewed by several writers——some of the more practical discussions are by Williams (1966) and Williams, Austin and Peoples (1966) on turkeys *(Meleagris gallopavo),* Austin and peoples (1967) on hogs *(Sus scrofa),* Martin (1967) on mourning doves *(Zenaidura macroura)* and Stafford and Williams (1968, in press) on bears *(Ursus americanus).* Alphachloralose anesthesia to capture Canada geese *(Branta canadensis)* and other water fowl species was described by Crider and McDaniel (1966), and Crider and McDaniel (1967). Capture with this compound was reported to be more effective and economical than conventional traps in situations where it was tried. However, the relatively lengthy induction period (approximately 30 minutes) has been considered a major limitation in the use of this compound.

The objectives of this study were to learn (1) if induction time could be reduced by combining a fast-acting tranquilizer with alpha-chloralose, and (2) to discover faster-acting substitutes for the latter drug. Only the work in the first phase is presented here. Progress on the second objective is discussed elsewhere in these proceedings (Crider and McDaniel, in press).

Murray and Dennett (1963) found diazepam (trade name Tranimal) to be a fast-acting tranquilizer in domestic turkeys and a variety of mammals. This prompted our initial pen tests with diazepam on mallards *(Anas platyrhynchos).*

Diazepam is a tranquilizer of the benzodiazepine class which was provided by Hoffman-LaRoche, Inc. A detailed discussion of its chemical make-up and pharmacological properties is given by Knight and Burgess (1968).

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[2]Presented at the 22nd Annual Conference of Southeastern Association of Game and Fish Commission, Baltimore, Maryland, October 21-23, 1968.