

Evaluation of Freeze-branding as a Marking Technique for Wild Swine

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Abstract: Adult and immature wild swine (*Sus scrofa*) were marked using freeze-branding. Irons were applied for various durations to determine the most appropriate branding time. Light-colored skin and a permanent hair loss were produced by iron application times of 100 to 120 sec for adults and 20 to 24 sec for immature animals. Marks were permanent and readable up to 100 m.

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Permanently marking wild swine has been a problem for researchers and managers working with this animal. Currently, no marking technique is totally satisfactory since all types of ear tags and ear notches are susceptible to loss or damage from frequent fighting. Freeze-branding was originally developed for domestic animals (Farrell 1966) and has been used as a permanent marking technique for some wildlife species (Newsom and Sullivan 1968, Hadow 1972). For wildlife, freeze-branding has proven to be superior to hot brands because there is little chance for infection (Day et al. 1980) and it is assumed to be less painful. However, no information exists on applicability of this technique for marking wild swine.

Extremely cold copper irons are used to kill only the pigment-producing melanocyte cells in the hair and skin. Hair follicles are not destroyed, and, as a result, white hair and skin appears in the branded spot (Hegreberg 1966). However, the freeze-branding iron must be applied for an appropriate amount of time to produce white hair and skin. If the iron is applied for too short or too long a time either the skin remains the original color (or even darkens), or a total hair loss results and the skin in the branded site turns very white (Hegreberg 1966). Application time is influenced by age of the individual. A young animal's hide is thinner than an adult's, so less time is required. Objectives of this study were to determine if freeze-branding could be used to permanently mark wild swine and to provide guidelines on duration of iron application in 3-month-old and adult swine.

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Methods

Sixteen solid black wild swine from Ossabaw Island, Georgia, were freeze-branded in October 1984. Animals used in this study were part of the Pennsylvania State University's captive wild swine herd. This herd was composed of 95% female and all were of known age. Eight immature females (3 months old) were branded using application times of 14 through 24 sec at 2 sec intervals. Eight adult sows were branded using application times of 60, 70, 80, 100, 110, 120 sec. Although freeze-branding is assumed to be painless, some restraint was needed to prevent the animal from moving during brand application. Immature females (about 10 kg) were manually restrained on a table, whereas the adults (≥ 75 kg) were restrained using a rostral snare while being pushed against a fence.

Each of the 6 branding sites was located 15 to 20 cm off either side of the thoracic dorsal midline. This region of the body is the last to be soiled, so identification brands in this area should be most visible. All hair on the branding site (15 x 30 cm) was clipped and the area cleaned of debris using a stiff bristle brush. Numbered freeze-branding irons 5 and 10 cm high (Nasco Band and Tag Co.) made of a copper-brass alloy were used to brand immature and adult females, respectively. Liquid nitrogen used for coolant was stored in a stainless steel insulated container large enough to hold 3 irons at one time. Irons were cooled in liquid nitrogen for 5 minutes before each branding. Immediately before each iron was applied, the brand area was drenched with 95% ethyl alcohol as an antifreeze to prevent the supercooled iron from sticking to skin.

Results and Discussion

When a freeze-brand is correctly applied, the branding site should have the following characteristics (Hunsley and Jones 1969): (1) the area immediately under the iron should be depressed about 5 mm and frozen about 1 cm outside the numeral, (2) as the area thaws (3 to 5 min) red swollen tissue should be evident where the iron touched the skin, (3) within 24 hours swelling should decrease and the area should begin to scab over, and (4) new hair should begin to grow in the branded area from 6 weeks to 3 months after branding (if branding times were not too long).

All of the branding durations in this study failed to produce the characteristic white hair even though the branding sites were similar to the above description. H. W. Jones (H. W. Jones, pers. comm.), working with domestic swine (Durocs, Hampshires, and Poland Chinas) found that domestic breeds with stiff or bristly coats did not produce white hair when freeze-branded. He also found that, while young animals with smoother coats would grow white hair after freeze-branding, this white hair faded as the stiffer adult bristles replaced softer juvenile coats. Even the younger animals used in this study had stiff hairs in their coats and, even initially, did not produce white hair when freeze-branded. This study indicated that because wild swine (feral swine and ferals with Eurasian wild boar ancestry) pos-

sess the stiffer type pelage, white hair would not be expected to result from freeze-branding.

However, a readable brand was produced when the freeze-branding iron was left on long enough to cause hair loss and non-pigmented skin to occur. Time required to produce permanent hair loss in 100% of the animals tested was 100 to 120 sec for the adult females and 20 to 24 sec for immature females. These marks showed up well on the black animals used in this evaluation because the light colored bare areas contrasted nicely with their dark coats. The hair of the wild swine tested was relatively short and did not grow over and conceal the brand. Numerals on the adult animals could be discerned at 100 m using binoculars and those on the immatures up to 50 m. These marks were assumed to be permanent since they persisted for 1 year.

Even though the freeze branding technique cannot produce white hair on wild swine, as it does on other species, it is still an excellent technique for marking wild swine. It produces a permanent mark that cannot be lost or confused with other marks that these animals acquire naturally.

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