



Cattle Identification: Freeze Branding

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Individual animal identification is essential if beef producers are to properly manage animals and their production records. Yet at present, less than 50 percent of the cattle in the United States have any form of individual identification (USDA-APHIS, 1997). This means most operations are severely hindered in their ability to make selection decisions based on animal performance. Even day-to-day operations such as pairing cows and calves or re-treating a sick animal are made more difficult by the lack of animal identification.

Beef producers have many forms of identification available, including ear tags, tattoos, and brands. Producers are often frustrated by loss of ear tags while tattoos cannot be read without catching the head of the animal. Hot or fire brands cause hide damage and decrease hide value and consequently, are not a recommended management practice in accordance with Beef Quality Assurance guidelines. Although the United States is moving towards a national animal identification system by 2005 or 2006, it still may provide only limited application for day-to-day animal identification. Many of the systems being considered use electronic identification that requires specialized readers used at a close distance. Freeze branding offers a permanent form of identification that is easy to read at a great distance, causes minimal damage to the hide, and is less painful than hot branding (Lay et al., 1992, Schwartzkopf-Genswein et al., 1997).

How does freeze branding work?

Freeze branding kills the pigment-producing cells in the hair follicle. Therefore, when the hair regrows where the brand was applied, it is white. Freeze brand-

ing is done with special copper or bronze irons cooled to -100° to -300° F. The area must be prepared so the iron touches the skin, freezing it during the branding process. The first day after branding, the skin swells producing a welt in an outline of the brand. In two to three weeks, the brand will form a scab and peel. Six to eight weeks after branding, healthy unpigmented hair (white in color) will replace the scab.

Freeze brands work best on black, dark red, or red animals. However, satisfactory results on lighter colored animals can be achieved by leaving the irons in place for a longer period of time which will completely kill the hair follicle. This results in a brand similar to a hot brand with more hide damage than normal freeze branding.

Material needed for freeze branding

Freeze-branding irons: The irons are made of heavy copper or bronze with slightly rounded faces. They should be 3 to 4 inches tall, 3/8 to 1/2 inch thick, and 1 inch deep. Sets of numbers or letters can be purchased more economically than individual irons. Currently, a set of freeze-branding irons costs \$125 to \$150 for a complete set of numbers and over \$300 for a complete set of letters. Custom irons range from \$80 to \$150. Some cattlemen's groups are buying a set of irons for use by their members.

Coolant: Dry ice and alcohol are the most commonly used coolant. The alcohol must be denatured and at least 95 percent alcohol. Less pure forms of alcohol contain too much water and will not cool the irons properly. It takes about 1/2 to 1 pound of dry ice per animal

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branded, but a minimum of 10 pounds of ice is usually needed to cool irons. It usually takes 3 to 5 gallons of alcohol to brand 20 to 30 animals. Remember, alcohol is highly flammable, so avoid smoking and open flames when freeze branding.

You also can use liquid nitrogen as a coolant, but because it is colder, you must take great care not to leave the irons on the animal too long. Leaving irons on too long will kill the hair follicles, creating a brand similar to a hot brand.

Regardless of which coolant you choose, you will need a quart or more of alcohol (per 20 head) to wet the animals' skin prior to branding.

Coolers: The coolers you use must be resistant to extreme cold and alcohol. An old 20-quart plastic cooler makes a good branding cooler. The plastic on the inside of the cooler will break with repeated use. You also can use heavy Styrofoam coolers, but they need to be placed inside another container because they often crack.

Clippers: Standard cattle clippers work well. If the cattle are particularly dirty, you may need to start with sheep heads on the clippers and reclip with cattle heads.

Brush and plastic squeeze bottle: A stiff brush, such as a rice-root brush, will remove the dirt and dander from the clipped area. A squeeze bottle is a handy way to squirt alcohol on the clipped area. A 20-ounce plastic beverage bottle with a 1/8-inch hole in the top works well.

Gloves and safety goggles: Winter gloves insulate your hands when handling the cooled irons. The handles will become cold enough to cause frostbite. Safety goggles will protect your eyes from splash, especially if you use liquid nitrogen.

Chute and headgate: A good chute with side access along with a strong headgate is needed. A squeeze chute is invaluable and is strongly recommended. Otherwise, you need to devise a method to minimize animal movement during branding.

Length of time for iron application

The length of time it takes to actually brand an animal depends on several factors. The skin-contact time to create an acceptable brand depends on the animal's age and breed and on the coolant you use. In general, younger cattle and thinner-hided breeds (i.e. Brahman breeds) need less time for a good brand, while older animals and thick-hided cattle (i.e. Hereford) require longer contact time. Table 1 shows the recommended times for applying irons. An inexpensive digital kitchen timer can help keep accurate branding times.

Table 1. Branding iron contact time for freeze branding

Age of animal	Contact time (seconds)	
	Dry Ice and Alcohol	Liquid Nitrogen
4 to 8 months	25	15
9 to 18 months	30 – 40	20
Over 18 months	45 – 50	25 – 30
Mature animal with thick hide (i.e. Hereford)	50 – 60	35

You need to be aware that branding is as much an art as a science; therefore, you may need to increase or decrease times according to your herd and technique. Trials conducted in Oklahoma indicate that a careful branding technique will result in good brands on 85 percent to 100 percent of cattle branded (Rich, T. D., Frank Bates, and Ken Apple).

Replacement heifers are the ideal females to freeze brand. They have been identified as remaining in the herd, and they are young enough for easy branding. In addition, if you brand replacement heifers each year, only a small percentage of the herd needs to be branded at one time. This makes freeze branding a less arduous task. When freeze brands are used on young animals, the brand grows with the animal and results in a larger, more readable brand on adult animals.

Steps for successful freeze branding

Step 1. Cool irons for 20 minutes before using them on the first animal. The alcohol or liquid nitrogen should cover the head of iron by at least one inch. Bubbling or boiling of the alcohol should have stopped or be minimal prior to applying the irons. Note: the frost line on handles of the irons indicates irons are ready. Re-cool irons for 2 minutes between each use.



Step 2. Restrain the animal in a headgate and squeeze chute (preferred). Clip the hair from the area to be branded. Standard cattle clippers work well; close clipping is best. On the hip between the hook and pin bones is the preferred location for freeze brands. Brush the clipped area to remove dirt and loose hair.



Step 3. Saturate the branding area with alcohol. You may need a brush to work the alcohol all the way to the skin.



Step 4. Immediately apply the freeze-branding iron on the animal. The iron must move directly from the coolant to the animal. Apply very firm pressure to the iron. Hold the iron on the area and don't let it slip. The area will quickly become numb and the animal will experience minimal discomfort. Rocking the iron gently from top to bottom and side to side will make a better brand. Have an assistant keep track of time so the branding irons are in place for the desired length of time. The application of only one iron at a time is recommended.



Step 5. Remove the iron from the animal and immediately place the iron in the coolant for re-cooling. Remember, it takes about 2 minutes to re-cool the iron to proper temperature before applying the same iron again.



A good brand will show up as an indented number on the animal immediately after branding. Within a few minutes, the area will swell creating a raised version of the brand.



The swelling will subside in a few hours. In two to four weeks the area will begin to peel. This is normal and unpigmented hair will grow back in its place.



When branding is done correctly, freeze brands will last the life of the animal. On animals with heavy winter coats, the brand may have to be clipped for easier reading. A quality branding job makes identification of animals for estrous detection or health treatment quick, easy, and accurate.



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