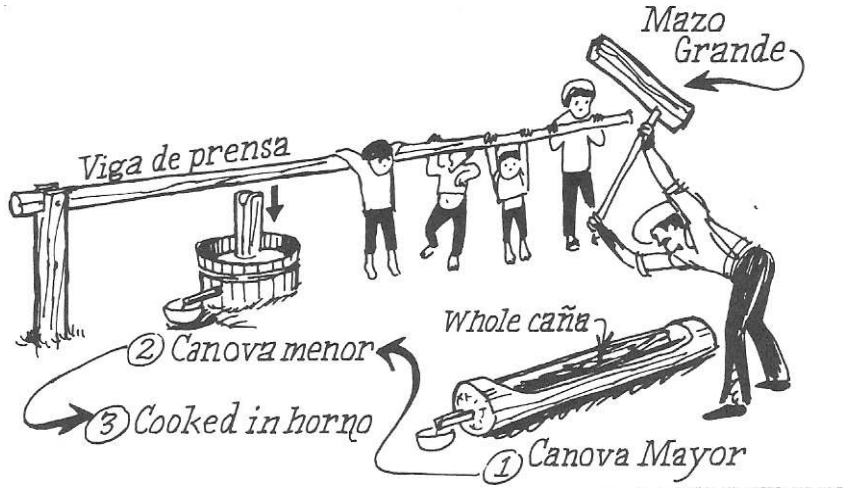
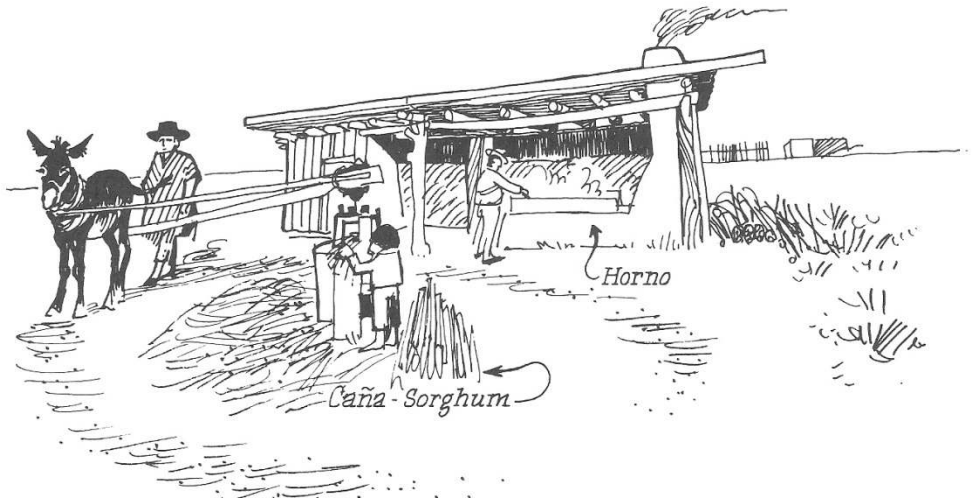
Station ID	34 – Sorghum Presses and Mill
Presentation Goals	(a) Emphasize the theme of self-reliance among the region's settlers during the colonial and territorial periods; (b) Discuss the role of sorghum in the food supply of the ranch; (c) Discuss (or illustrate and demonstrate) the extraction of juice from sorghum cane; (d) Discuss the later steps in the preparation of sorghum molasses (aka *miel*); (e) Describe the technological changes and their benefits in moving from the equipment of the old presses to the new mill.
Background	Sugar cane made its way west from Europe and Africa, first to the Madeira and Canary Islands groups in the 15th century, then to the Americas. Columbus brought sugar cane to Hispaniola in December 1493, his second voyage. It was introduced into Mexico by Cortes in 1524. Sorghum culture began in Africa more than 5,000 years ago. It spread geographically in much the same way as did sugar cane. However, it is unclear whether it made its way into the Spanish New World at the same time as sugar cane. Sorghum was not a commercially viable crop in the United States until just prior to the Civil War. It is probable, though not proved, that it made its way into what is now New Mexico from Texas, where it was extensively cultivated. Therefore, we cannot assert that New Mexicans grew and processed sorghum until the mid-19th century. Prior to that time, New Mexicans had to rely for sweeteners on fruit (perhaps mashed or pressed), honey if available, and imports of processed sugar and honey from lower Mexico and – after the opening of the Santa Fe Trail in 1821 – from the United States. Attempts to grow standard sugar cane in Nuevo México were stymied by altitude and climate. Sorghum cane, however, adapted well. At the Museum, we have examples of two styles of sorghum processing devices: (1) the so-called "mortar-and-pestle" presses, and (2) the roller mill. Of the mortar-and-pestle style (of ancient heritage) we display two variations—a simple hollowed log with pounding stick; and a more elaborate fulcrum-and-lever model, capable of exerting greater pressure on the cane. In both these types, the cane was cut into workable lengths to fit into the receiving bowl. The roller mill was turned by a horse or burro, hitched to the wooden bar, and driven usually by a boy. Roller mills were relatively expensive, such that a single mill, owned by a fairly well-to-do ranchero or townsman, served an entire community or group of ranches. Those growing sorghum in the surrounding ranches or farms brought their crops in at harvest time, receiving a portion of the resultant *miel* or molasses. (One contemporary account submits that the mill owner/operator kept one-quarter of the *miel*.) This was an occasion for feasting, dancing and catching up on local gossip. Our roller mill was distributed, but not manufactured, by Sears, Roebuck and

	Company. It carries the Sears name and the date 1895 stamped onto the top of the mill. The origin of our mill is unknown; it was not in place here prior to Las Golondrinas becoming a museum.
Caveat	*Guided tours of the Museum are usually not of sufficient length to permit demonstration of the presses and mills, although the Tour Guide should use his/her judgment. The suggestions below are intended for use mainly during Spanish Colonial Days (SCD), when large school groups find the Sorghum Mill area irresistible.*

AREA A: Las Melaseras Viejas (Old Sorghum Presses/Mortar & Pestle Presses)

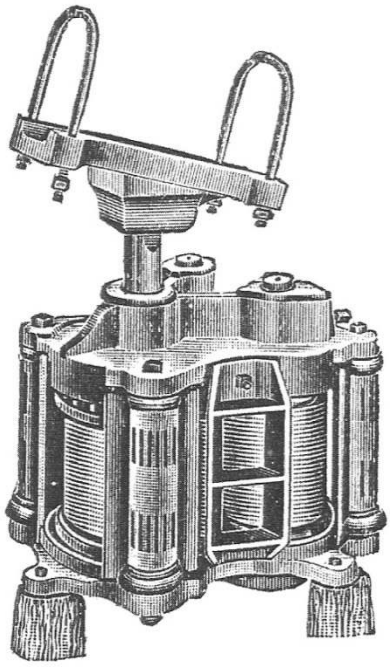
Depiction	
Preparation	• There should be pieces of sorghum cane lying about during harvest season; these may be placed into the receiving bowls (*canovas*).
Safety Concerns	• Do not let guests hang on the fulcrum-and-lever arm (you may explain that this was done to add weight) • If you have a guest pound with the *mazo grande*, make sure they do so facing away from all other guests
Interpretation	• Describe the simpler press first, then the fulcrum-and-lever press. • Emphasize that both designs were developed by civilizations and cultures thousands of years ago. • The presses could be easily constructed and were inexpensive. • If time allows, have one member of the tour group operate the pounding stick (*mazo grande*), and/or move the lever on the fulcrum-and-lever press up and down. • Point out the small hole placed at the bottom of the *canovas* to permit the extracted juice to flow out. • Mention that these devices were not as efficient as the later roller mills. Not as much juice could be extracted from the cane.

Area B Name: La Melasera Nueva (New Sorghum Mill/Roller Mill)

Depiction	
Preparation	• Arrive at the station ahead of time. Be sure that there is enough cut sorghum cane to get you through the demonstration period (usually 4 hours for SCD). If not, contact the Curator of Historical Interpretation and request additional cane. • At the beginning of the day, it will take a couple of passes pressing the cane before the extracted juice begins making its way out of the mill and into the jar; the docents should do this prior to the arrival of the first visitors. • Recommended items to bring to the station: o Garden shears, to remove the sorghum cane heads (do this before visitors arrive) o work gloves, for use when employing the shears and stripping leaves from the cane o a quart (or larger) glass jar or tin can, for collecting the cane juice o a rope of sufficient length to demarcate the area swept by the rotating mill arm o pegs to secure the corners of the rope – or large rocks for the same purpose
Safety Concerns	• Guests not assisting in operating the mill, along with their gear, must stay outside the work area (*i.e.*, outside the roped-off square) • No one except a Docent is to place anything in or near the mill mechanism • Because the extracted cane juice attracts wasps and bees, guests are not to touch the collection vessel (glass jar or other)
Interpretation	• It is highly recommended that the demonstration be conducted by two docents: o **Docent 1** to supervise the visitors (youngsters) in operating the mill, and o **Docent 2** to maintain order (have the visitors line up in the order of

	their arrival, keep them and their belongings behind the rope and out of the mill operating area) and give a brief explanation of what sorghum is and what the mill accomplishes . **Docent 2** also is responsible for feeding cane stalks into the mill. • **Docent 1 i**nvites the visitors to operate the mill. Usually four children may be placed along the wooden bar, tallest toward the end of the bar. You may be able to squeeze five in if the youngsters are small enough. No child should be permitted to participate who cannot comfortably place both hands on the bar and push (exception: you may invite parents or teachers to hold a too-small child up to the bar and walk around with the others – this keeps everybody happy). • **Docent 1** makes sure the visitors have both hands on the wooden bar, ready to lift and push. **Docent 2** feeds cane stalks into the mill. With **Docent 1** at the end of the bar, the participants make one pass around the mill, counter-clockwise. Either docent then points out the collecting vessel, into which sorghum juice will be flowing. When the jar or can is almost full, pour it into the weeds away from the mill. The juice attracts insects, including wasps and bees, so should be disposed of away from the operating area. • The pressed cane stalks will pile up at the base of the mill. From time to time, remove them to the side of the cooking shed for later removal. • The tops, or heads, of the sorghum stalks are popular "show-and-tell" items. There are usually not enough of these to give one to each youngster. Instead, give one to the attending teacher or parent and suggest that it be taken to class for discussion. • If time permits, ask the youngsters questions about their experience (see next section).
Clean-up	• At the end of the day, empty the juice jar. • Take any pressed cane stalks to the side of the cooking shed. • If it is the final day of Spanish Colonial Days, or any day of an event other than SCD, remove and store the rope.
Questions and Answers	Whether giving a guided tour, or demonstrating the presses/mill during Spanish Colonial days, asking questions of your audience will help reinforce their experience at this station. Whenever possible, cast the questions in such a manner that the visitors are prompted to relate what you have shown or described to them to their own lives. Remember to frame your questions with the audience's ages in mind. **Q:** Name some kinds of sweeteners you use at home. Were these all available to the settlers in this part of New Mexico? **A:** White sugar, brown sugar, molasses, honey, fruit juice, artificial sweeteners. Artificial sweeteners are fairly recent introductions to the American food supply. White and brown sugars might have been purchased from merchants bringing these up El Camino Real de Tierra Adentro, or along the Santa Fe Trail after 1821, but would have been costly. Honey might rarely be found locally. Fruit juice was a ready source, but did not serve all the requirements for an intense sweetener. Molasses could be produced at home.

	Q: Why didn't the early settlers just buy their sugar at a local store? **A:** Processed sugar was not generally available. There were no local markets in the early days, although much later general stores might be found serving a village or ranching community. **Q:** Did the farmers and ranchers in Northern New Mexico grow sugar cane? If not, why not, and what did they grow instead? **A:** They did not grow sugar cane, because that plant did not do well in Northern New Mexico. Instead, they grew sorghum cane, which is related to sugar cane but is hardier at these altitudes and in this climate. **Q:** Do you think that *miel*, or molasses, was a precious item to the folks who lived around here? Why? **A:** Yes, since it was an important part of the diet, and was obtained only after a lengthy and labor-intensive process. **Q:** What do you bring home from the grocery store that has sweetener in or on it? Where does the sweetener come from? **A:** Sugar, candy, syrup, honey, sweetened cereal, among many others. Sources are sugar cane, sugar beets, and corn [as in high-fructose corn syrup, found in many products]. **Q:** Did the early settlers here invent the Old Melaseras (sorghum presses)? **A:** No. Representations of these or similar cane presses can be found among the artifacts of cultures which flourished thousands of years ago (Assyrian, Egyptian). **Q:** Would it have been easy work, or hard work, to operate the sorghum presses? Why? Could you use a horse or burro to operate them? **A:** Working these presses required strength and a good deal of time. Since both presses require an up-and-down motion of the "mortar" log, horses or burros cannot be used. There must have been plenty of aching muscles at the end of the pressing. **Q:** Which is more efficient in producing cane juice, the presses or the roller mill? **A:** The roller mill, because less juice is lost or wasted. **Q:** Can you list the steps the farmers and ranchers followed to obtain sorghum molasses? What was the very first thing they had to do? **A:** To make sorghum molasses, they had to: • plant the sorghum seed [from the cane head or tassel] • tend the sorghum cane through the summer, weeding and watering • harvest the cane, cutting the stalks at the base • extract the juice, in either the presses or the roller mill • strain the juice to remove impurities (such as BUGS!!) • boil the juice in large vats for several hours until it is thick • place the molasses in jars or crocks for storage

The Roller Mill	 Sears Champion vertical roller mill
Additional information	 Here we see the major sub-activities in the processing of sorghum into molasses, in a photograph taken in West Virginia in 1938.