

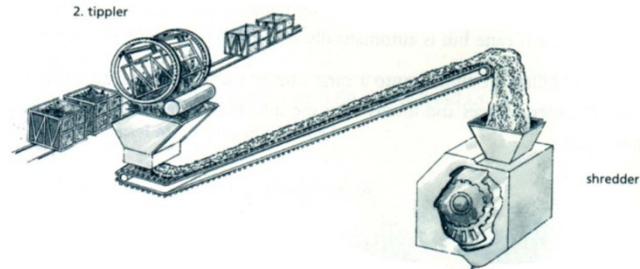
SUGAR PRODUCTION PROCESS:

In Australia the sugar miller is mostly responsible for transport of sugarcane. This is mainly achieved through a substantial cane railway network and rolling stock. Australian mills operate over 4,000km of narrow-gauge railway and almost 95% of the cane crop is transported to sugar mills using railways. There are however some mills that use only road transport and most mills use a combination of a small amount of road and a large amount of rail transport.

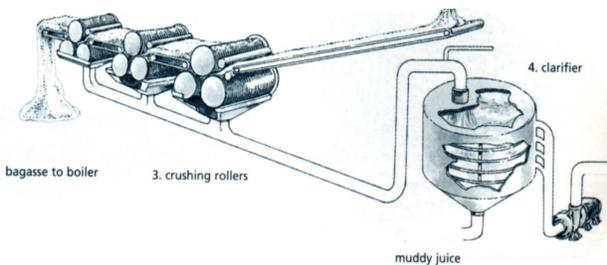


After harvesting, cane is transported to the mill where it is weighed and processed at automated cane receiving stations. At this time the producer of the cane and the weight is recorded.

The cane billets are tipped onto a cane carrier and transported to a shredder. The shredder reduces and shreds the cane into fibrous material and ruptures the juice cells.



Pairs of rollers feed the cane through a series of mills. Each mill consists of three large rollers arranged in a triangular formation, normally coupled with pressure feeders. This process separates the sugar juice from the fibrous material, called bagasse. The sugar juice is pumped away for processing into raw sugar and the bagasse is recycled as a fuel for the mill boiler furnaces.

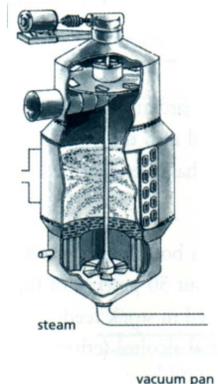


Juice extracted from the crushing mills contains impurities which are removed by adding lime and heating the limed juice. The lime neutralises acids and precipitates impurities which "settle out" in large specially designed vessels called clarifiers. The clear sugar juice is run off from the top of each clarifier.

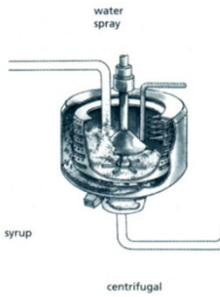
Muddy juice extracted from the bottom of the clarifiers is mixed with fine bagasse and then filtered using cylindrical rotating vacuum filters to recover the sugar. The mud and bagasse mix (filter mud) extracted by the filters is used as a soil treatment on cane farms. This recycles much of the phosphorous taken up from the soil by the cane plant.

The clear juice from the clarifiers is concentrated by boiling it under vacuum in a series of connected vessels called effets or evaporators. The concentrated juice is called syrup.

The syrup (about 65-70 percent sugar) is concentrated by boiling in a vacuum pan and is seeded with small sugar crystals in a process called crystallisation.



The sugar crystals are grown to the required size by adding more syrup while boiling continues. When the crystals reach the required size (approximately 1.0mm), the mixture of syrup and crystals called massecuite is discharged from the pan.



Syrup is separated from the raw sugar crystals in centrifugals which contain perforated baskets which spin at high speed in a casing (similar to a household washing machine). The dark syrup surrounding the crystals is "thrown off" and passes through the perforations. The spun-off syrup is boiled again and more raw sugar crystals are recovered. This procedure is repeated until the amount of sugar obtained is too small to make further extractions economical. Molasses is the syrup left over from the final centrifuging. This is stored for later sale.

The raw sugar from the centrifugals is dried by tumbling through a stream of air in a rotating drum.



The raw sugar is then transferred for short-term storage in bulk bins at the mills.

