



# What to know before buying a **CASSAVA PEELER**

Marcelo Precoppe



## What you need to know before buying:

# CASSAVA PEELER

### 1. Cassava peeling

Peeling is an important operation on cassava processing. Hand peeling with knives is currently the only method that can remove all the peel with minimum root losses. The main reason is that no equipment has been yet developed that can accommodate the large variations in shape and size of the cassava root plus the substantial differences in thickness, texture and adhesion strength of the peel. However, hand peeling is a tedious, labour-intensive and time-consuming operation and, in some circumstances, investing in a peeling machine can be considered.

There are mainly two kinds of peeling machines being used for cassava, one uses an abrasive surface and the other uses a cutting mechanism. Other peeling methods such as chemical and steam peeling have been tried for cassava peeling but proved to be ineffective. Enzymatic peeling is currently under development for cassava and might be a viable option in the short future. In this method, the roots would be infused in an enzymatic preparation, which will degrade the substances present in the cell walls of the peel.

### 2. Abrasion peeler

The main parts of this equipment are a rotating drum and water sprays. The drum with abrasive surface rotates and detaches peel from the roots while water is sprayed to wash it. Usually, the drum is rotated employing belts and pulleys connected to an electric motor. Depending on the shape of the roots, the abrasive surfaces of the drums cannot reach into its crevices and depressions, resulting in significant losses of the useful flesh. High losses and peel retention can also occur when peeling roots of different sizes: the large roots might remain mostly unpeeled while the small ones might be completely grated. Usually, better results are achieved if the roots are peeled after having been sorted by size.

### 3. Cylindrical knife peeler

In general, this kind of peeler consists of a cylindrical knife assembly and a solid cylinder with a rough surface, both mounted parallel. The equipment is usually driven by an electric motor. In some designs, the cylinders rotate in the opposite direction while in other designs both cylinders rotate in the same direction but at different speeds.

### 4. Performance indices

A cassava peeler should completely remove the peel without removing the useful part of the root. In addition, the peeled surface should be clean and undamaged. *Peeling efficiency* is a common performance index used. However, this index can be calculated in diverse ways and, therefore, be misleading. Buyers should not base their choices on *peeling efficiency* but on *root losses*, *peel retention* and *throughput*. *Root losses* is the percentage of the useful part that was removed with the peel. *Peel retention* is the percentage of the peel that remained at the root after passing through the machine. *Throughput* is the amount of material passing through the peeling machine. When examining *throughput* it is important to verify if the peeler operates in batch or continuous mode, and preference should be given to the continuous one.

## 5. Quality and safety

All parts that come in direct contact with the roots should be constructed with food-grade stainless steel. Do not purchase an equipment where food contact materials have been painted. In addition, all components of the belt drive should be enclosed under a safety guard. Do not purchase an equipment that has exposed belts.

## 6. Manual peeling done right

Currently, no peeling machine can achieve the same level of *root losses* and *peel retention* obtained by hand peeling. For this reason, the general recommendation is to invest in improving the hand peeling rather than investing in peeling machines. A proper working environment, plus tools and conditions for the peeling team can assure minimal *root losses* and *peel retention* plus maximum *throughput*. A well ventilated, clean and shaded area should be provided. The peeling team should use quality knives or peelers and they should wear cut-proof gloves. To reduce the drudgery of the work a slow-moving conveyor belt can be assembled, transporting the peeled roots to a washing tank.

## 7. Washers are not peelers

After peeling, cassava roots must be thoroughly washed to remove all mud, dirt, and sand. Cassava roots are often washed in tanks, with hand brushes. However, they can also be washed in machines normally called washers. For cassava, a washer that is commonly used is the spray drum washer. This washer consists of a rotating cylinder drum, water sprays and a washing tank. The drum is made of longitudinal rods or wire mesh, which retain the roots, while the debris are washed through. The rotating cylinder remains partially immersed in the water of the washing tank. As the roots move through the drum, they are washed by the water sprays and by rubbing against each other.

Sometimes those washers are confused with peeling machines. For starch production, washers can be used instead of peelers. Washers can remove the dark outer layer that covers the surface of the root, and that is sufficient for the starch industry. However, for cassava flour production, it is necessary to remove not only the dark outer layer but also the white corky layer that lies underneath it. This requires hand peeling or a peeling machine, it cannot be achieved just with a washer.

## 8. Check before you buy:

- Are there strong reasons to invest in a cassava peeling machine instead of investing in hand peeling, enhancing the peeling team working conditions?
- Using the *root losses* provided by the manufacturer, have you calculated how many kilograms of cassava you will be losing per day, by using a peeling machine? Remember, root losses from peeling machines are always higher than root losses from hand peeling. Have you considered the economic impact of those losses?
- If you are going to sort the roots by size to reduce root losses and decrease peel retention, have you considered the cost of labour for sorting the roots?
- Considering the *peel retention*, provided by the manufacturer, can you process the root directly or you will need to hire a peeling team to remove the remaining peels? Have you costed a decline in product quality if you decide to process the root without removing the remaining peels? Have you considered the cost of having a peeling team remove the remaining peels?
- Are all parts that come in contact with food made out of food-grade stainless steel?
- Are all belt drive components enclosed by a safety guard?