

# Grading machine for raisins<sup>5</sup>

FARM MACHINERY-AGRI PROCESSING NATIONAL SECOND

**Ramdas Madhavrao Jagtap** (51) belongs to Jopul village, Nashik, Maharashtra. His father was a carpenter, but Ramdas was not interested in carpentry, so he set up his own welding workshop in 1969-1970. He makes farm machinery, bullock carts and other such equipment. Though educated only up to the eleventh standard, he ensured that his sons had the opportunity to pursue higher studies. His eldest son has completed his post graduation in Inorganic Chemistry and works as a school teacher. Two other sons are engineers in the Chemical and Mechanical disciplines. The youngest son is studying computer engineering.

**Genesis** Ramdas belongs to Nasik District (Maharashtra), which is a major centre of grape production. A few years ago, some farmers approached him with a request to develop a machine to separate stalks from dry grapes and also grade them into different quality raisins. Till then, this was mostly done manually.

Grading of raisins involves sorting raisins by size, mainly for exports. To produce raisins, bunches of grape are first brought from the vineyards to the raisin-manufacturing sheds. There, they are processed according to the variety of raisins to be manufactured. Two of the main grades are the green coloured raisin *Hirwa* and yellow coloured raisin *Pivla*. The *Hirwa* grade is mainly made for export and *Pivla* is for sale in the domestic market.

These raisins need further processing – cleaning, removal of debris and grading into various sizes. Conventionally, this was done manually by women who worked for minimum wages. The grading was done by them based on visual inspection. To find a solution, Ramdas spent two years

using the principle of the thresher for grading but this didn't work. The main reason was that there is a marked difference in the weight of the grain and the debris compared to the difference in weight of the raisins and the debris, which is much less. With his knowledge and experience, he developed a machine in 1993 that would cater to the grape farmers' requirements.

However, there were a number of shortcomings that took time to be rectified. One problem with the first design was that because of excessive beating in the machine, the sugar would secrete out when the raisins were kept in cold storage and thus the sugar content was reduced. This spoiled the quality of the raisins. Ramdas made a few changes and within a year came up with a modified design. Another problem he faced was that the blower was picking raisins along with the debris. So he reduced the diameter of the impeller and thus reduced the intensity of the vacuum. The raisins were now not picked along with the debris. Gradually, the grape farmers got to know of this machine. After studying it, they



## Address

Vill: Jopul, Patil Baba,  
Tal: Dindori,  
Dist.:Nashik,  
Maharashtra

## Scouted by

North Maharashtra  
University



realized that this machine was easy to use and very efficient and began placing orders with him.

### **The Innovation**

This is a single unit that removes dust and twigs and grades raisins by size. The machine consists of three motors and three sieves, blower, a belt and pulley mechanism and a rubber brush.

The grapes are dried for 15 – 20 days and then treated with chemicals to ensure proper drying and protection from pests. The dried grapes are fed into the machine



through a feeder, which has a rotor with a rubber brush. A 3 HP motor drives the mechanism. The brush hammers the dried grapes to get the small twigs off the grapes. These dried grapes are then passed through the blower, which blows the dust off them and cleans the grapes with the help of a high-pressure airflow. The blower utilizes the power of a 2 HP motor. The dried grapes are now cleaned and are graded with a vibrator connected to three sieves. The dried grapes separated over each sieve are collected in a different chamber after they are scaled in specific grades. These are then finally processed for making raisins (*kishmish*). The machine grades the raisins into three sizes – large, medium and small.

There are two models of the machine- the smaller model grades about two tons of raisins in 12 hours and the bigger one grades four tons in the same period. The machines weigh 600 kg and 1000 kg respectively. The smaller machine costs Rs.30,000 and the bigger one Rs.45,000.

### **Advantages**

This machine saves time by blowing away the dust, removing the twigs and grading the raisins by size. This simplifies the entire process for the farmer and after the raisins are graded, the farmer visually inspects the quality. With this device, the operator is safe from exposure to the dust from the blower. This machine helps in removing the tediousness involved in manually cleaning every single raisin and grading it accordingly.

The other comparable machine is imported and costs around Rs.20,00,000. It grades grapes according to their colour, size, shape etc. The cost advantage is overwhelming in the case of Jagtap's unit - it costs only about Rs.45,000 and gives satisfactory results compared to the imported machine. This could become an important factor in users' choice of equipment in future.

### **Current Status**

Ramdas Jagtap has been working on this machine for more than a decade and has been selling it to local grape farmers in the Satara, Sangli and Sholapur regions

of Maharashtra as well as in Bijapur, Karnataka. One unit has also been installed at the manufacturing unit of 'Rangoli' raisins, one of the biggest raisin exporters of the region. So far, Ramdas has sold 25-30 small units and 40-50 big units. These machines have high diffusion potential in all major grape growing regions. Many prominent grape farmers of the area have bought this grading machine from him.

Generally, farmers make some of the payment in advance when they order the machine and the balance is paid when the machine is ready. Ramdas has employed a couple of labourers. He hires more when he has sufficient orders. He manufactures the machines during November to January and sells them during February to April as the demand is seasonal.

This machine can also be adapted for grading mangoes for making pickles and other fruits. Ramdas was not keen to patent the machine as similar machines were already available in the market. Following Ramdas' innovation, three other fabricators have copied the design and are now supplying them to the major grape growing regions of Maharashtra, Andhra Pradesh and Tamil Nadu. However these manufacturers have also recognized the fact that the original machine was developed by Jagtap. His machine also incorporates additional features which farmers find useful. Once sold

a machine cannot be patented as the technology is supposed to have come in public domain.

#### **Other contributions to the grape industry and laurels earned**

Ramdas has also developed a machine that washes the dry grapes. Apart from this he has fabricated a conveyor belt for a grape packaging factory that facilitates the movement of grapes from the primary house to the packing hall for the purpose of export. This is very useful for grape exporters as the area for packaging is generally very small. By using this belt, a large number of boxes can be packed quickly and the labour charges are reduced. This has prompted several grape exporters to have the conveyor belt installed.

Jagtap was honoured by the National Research Centre for Grapes (Indian Council of Agricultural Research) for his contribution to grape production/ processing/ marketing on December 23, 2002, on the occasion of 'Kisan Diwas' organized to mark the birth centenary of Lal Bahadur Shastri, former Prime Minister of India. Maharashtra Grape Growers' Association, Pune, has also recognized his valuable contribution to grape processing in Maharashtra. Jagtap has also received awards from the local communities for his innovation.