



Multi-purpose sugarcane based farm machinery

Consolation

Annasaheb Bhavu Udgavi

Belgaum , Karnataka

Background

Annasaheb (72), an enterprising farmer, is a prolific innovator. He is also an outstanding sculptor and specializes in repairing old Buddhist statues. He has made an implement that can be attached to a tractor and can perform multiple tasks related to sugarcane cultivation.

As family, he has wife, two sons and their families apart from a daughter who is married and settled elsewhere. Though he and his wife are illiterate, their sons are graduates and look after fields. From their twenty acres, they earn a reasonable income because of their hard work and innovative farming practices.

Annasaheb did not go to school, as he had to assist his parents in work. The innovator in him started to surface when he was in late twenties and the urge to innovate has become stronger in last five decades.

In 1960, he made his first innovation, a clock, which ran on drops of water. The second's hand of the

clock moved forward when a drop of water fell on it from a dispenser, which had been timed properly. For this innovation, he received an appreciation certificate from the then Prime Minister, Mr. Jawaharlal Nehru.

In 1962, he made a horizontal charkha that was foldable and could fit into a suitcase. He displayed this at Sabarmati Ashram, which improvised on his design, and increased number of *belanis* from three to eight in conventional one, in order to increase the output.

More than twenty-five years ago, when hardly anybody knew about drip irrigation, he pondered and developed the idea in his own way. To save his betel vine orchard from acute water scarcity, he fitted PVC pipes used in electrical fittings with perforations made on them using nails. By irrigating each day for one hour, he ran the crops for seven years.

Poor prices of betel leaf made him switch to sugarcane. He believed that the best method to solve the problem of aphids and white flies was a high-pressure water spray.

It was then, during 1980s, that he innovated the rotor sprinkler system that could cover a radius of 140 feet. He named it after the goddess ChandraPrabha. Thus was born the ChandraPrabha Rotor sprinkler: the Rain Gun.

The advantages of the Chandraprabha rain gun are manifold. It can irrigate one acre in about one and half hours. Since it has a pipe of three inches and a wide nozzle, even composts such as biogas slurry can be applied to the crop through it. When water is applied with force, pests like aphids and white flies can be washed down. It does not even need additional pipelines because of its ability to cover a radius as much as 140 feet.

For this innovation, he was awarded in the First National Grassroots Technological Innovation and Traditional Knowledge Awards of NIF in 2001.

In early 1990s, Annasaheb made a foot-operated milking machine using a suction pump.

Apart from his mechanical innovations, he has also been innovating in farming by developing new varieties. He received the state award for the high

yielding “Gangavathi-6081” sugarcane variety from the University of Agricultural Sciences, Dharwad during the year 2001-02.

In 2005, he tried his hands on generating electricity from sea waves. He took his machine to seashore near Ambaghat on the Goa-Maharashtra border and successfully operated his machine by generating enough electricity through sea waves to light up four bulbs of 100 watts each. The machine worked on the principle of compression of air through the force of sea waves and thus using it to move the turbine and to generate electricity.

He has had the support of his wife and grandchildren in his long journey of innovations, and this has inspired him in all his endeavors.

Genesis

Annasaheb was involved with sugarcane cultivation. He encountered difficulty in getting farm workers in his area, particularly in peak season when he needed over fifteen people and twenty liters of diesel per acre for sowing and adding manure.

The manual methods of operations like planting, applying manure and stubble shaving takes about 30-35 man-days/hectare/day for each operation. He found that the tractor drawn rotovators available in the market would not give the shaving effect on the sugarcane ratoon crop and manual cutting did not give uniform height.

Ideally, farmers would like to have a machine that would do multiple operations such as stubble shaving, fertilizer drilling and earthing simultaneously. This would not only save time, cost and effort, by reducing number of passes, but also preserve health

of the soil (since too much of tractor movement compacts the soil).

The proposed innovation has the advantages of three simultaneous operations for better mulching in sugarcane cultivation, which is not available with existing multipurpose devices.

Innovation

It is multipurpose equipment that can be attached to a 30-40 hp tractor. This machine can simultaneously perform the farm operations like bund forming, seed sowing, manure application and harvesting in sugarcane cultivation.

The arrangements consists of cultivator for land ploughing, seed metering device for sowing and manure application, blade harrows for earthing up and cutting blade for sugarcane harvesting.

With an output of 0.4 hectare/hour, it is superior to existing multipurpose cultivators and can apply about 105 kg of fertilizer per hour. The height of the stubble shaving can be adjusted upto two inches from the ground using a nut-bolt arrangement on the side. It requires only one person to operate it and consumes less diesel thereby reducing operational costs, emissions and pollution. The current model costs Rs 40,000.

Performing the three operations simultaneously, minimizing the number of passes and time, it is superior to existing single or multiple purpose devices such as multipurpose cultivators¹ which do not have stubble shaving option or which can



only do only one operation at a time. Rotary tillers, if employed for stubble shaving end up cutting the roots of ratoon crop. This risk is eliminated in this device, which deploys the ‘Roto Slasher’ principle.

At 225 kilograms, it is one-third the weight of multipurpose cultivators and hence there is less damage to soil due to compaction when it is used.

The innovator has filed a patent for this innovation and is using it for many years.

¹ The tractor drawn multipurpose devices for sugarcane cultivation, which can perform land preparation, cane planting intercultural operation, fertilizer application, hilling and earthing up are known in the art viz. multipurpose tractor operated equipment (<http://iisr.nic.in/technology.htm>), multipurpose cultivator for sugarcane (www.pref.okinawa.jp/arc/kikai/parts/topic.htm). Specific task oriented implements are also available



in art, viz. tractor drawn sugar cane ridger plough (www.everest-industrie.com, NIF data base and text books), animal drawn ridge former, *bakhar*, etc (www.agricoop.nic.in and text books). Tractor or power tiller operated rotary tillers are usually



employed for stubble shaving of sugar cane, but they have risk of cutting the roots of ratoon and hence not as effective as roto-slasher.

