In March 2012, then President Pratibha Patil presented the Sixth National Grassroots Innovation Awards to 47 innovators of India. Among the top three honorees was Gurmail Singh Dhonsi of Ganganagar, Rajasthan, winner of the National First Award. To call Dhonsi a serial innovator would not be wrong. Since childhood when he first heard the word “workshop” mentioned by his uncle, Dhonsi was fascinated by it. He had made up his mind then that he would work in one. What surprises though is Dhonsi, the man himself. He is no city-bred, university educated white collar innovator. On the contrary, he is a farmer-mechanic whose inventions are as practical as the inspirations that drive them.

Rapid Compost Aerator and Tractor Mounted Tree Pruner, innovations that fetched him the national recognition, are prime examples of what drives Dhonsi. As he says of his will to achieve and his never say die spirit: “Even if it takes months and costs a lot, I don’t give up. There is always a feeling that I will achieve success at the end of the toil.” The compost aerator, in fact, was a follow up of the tree pruner. It was a remark by Surender Kumar Jakhad of Maujgarh, a Punjab village bordering Rajasthan, that set him thinking. Says Dhonsi, “Jakhad said why don’t I make a machine for him that could use all the leaves and fruits wasted in pruning?” That was the lead for Dhonsi to start drawing for his next invention.

Dhonsi says his mind is his drawing board. He clearly conceives an image and then draws it on paper before giving it concrete shape. So it was with the compost aerator. Jakhad had shown him the vermicomposting being done with cattle dung at his farm. What Dhonsi’s sharp vision saw was a process that could well be imitated by a machine. He studied vermicomposts and the action of the earthworms. What did they do? Eat waste and excrete, in the process breaking down waste into compost. This was his eureka moment. He could simulate the process. Dhonsi recalls, “I studied earthworms. How are they making such good fertiliser? And it came to my mind that whatever is waste should be collected and processed. I started designing.” From October 2006 to January 2007, Dhonsi worked single-mindedly on perfecting the rapid compost aerator. The machine that he finally delivered to Jakhad could process 1-1.5 tonne of waste daily, and cost approximately ₹1,60,000 (US$ 3040). Its benefits are immense, as enumerated by Dhonsi: “There is massive increase in production even as the manure/compost production time is reduced from six months to 25-30 days. The best part is that all the waste that is used in the rapid compost aerator is available in the farmers’ own backyard at little or no extra cost. And above all, no pesticides are used in this compost.”

National Innovation Foundation (NIF) has filed a patent for the Rapid Compost Aerator in its innovator’s name. Though technologies for rapid composting are available abroad, the provision for providing moisture while turning biomass is new. Dhonsi’s invention is also a first in India. The compost created by Dhonsi’s machine has been tested in national laboratories and found to be superior to other samples tested. His aerator also allows the addition of sugarcane waste—a first in India. The machine itself is a simple yet ingenious innovation with a rotor...
Dhonsi’s Innovations

1. Machinery to separate water from biogas plant waste, and use it to irrigate fields. The water, he says, is a very good fertiliser, and the dry waste left can be used as a source of fuel.

2. Machinery to sow the fine seeds of carrot, currently manually done in India—a painstakingly laborious and time consuming process. In 1984-85, Dhonsi modified the wheat thresher to work on mustard crops as well. The first adapted version was developed with a reduction gear that allowed reducing the speed of the threshing drum by adding a blower/ aspirator fan to the machine. His next innovation was the modification of a combine harvester. In fact, Dhonsi acquired the ability to modify many such machines to suit different purposes and continued doing this till 1997. He also invented a machine that could irrigate undulating fields—a problem for farmers. This machine could lift more water and used less diesel. He sold it to the farmers for ₹700 (US$ 13.29). Since the days when Dhonsi’s reward was usually a cup of tea and the blessings of his patrons, he has come a long way, tasting commercial success and now the award.

3. A machine to sow plant saplings

4. A machine for cutting juliflora which has hard thorns and is difficult to cut; it has the potential to be used as biomass for green energy

5. A machine for transporting mustard plants from fields which is currently cumbersome for farmers

Inveterate Innovator: Gurmail Singh Dhonsi with then President Pratibha Patil receiving the National Innovation Award (right) for his invention Rapid Compost Aerator (left) on March 9, 2012.

Dhonsi, the amateur-enthusiast inventor, has a series of innovations to his credit. His penchant for all things mechanical goes a long way back. As a child, the first time he heard ‘workshop’ mentioned in an adult conversation, the word sounded quite grand. The little boy decided that he would work in a workshop and not join the rest of the family in farming. He wanted to drop out of school in Class V, but his father convinced him otherwise. He managed to get through Class V but failed his Class VI exam and refused to study further. So at the age of 13, Dhonsi landed up at a tractor workshop which proved to be his alma mater for later innovations. He was subsequently joined by his father and the duo opened their own fabrication shop at Sri Karanpur before relocating to Padampur in Ganganagar district in 1984.

Dhonsi’s first brush with innovative craft came in 1972 when he repaired the broken down genset of a passing army vehicle using locally available parts. Later, he repaired a German tractor using indigenous parts. But Dhonsi was much more creative than just another workshop mechanic, and was all this time engaged in designing and developing something or the other. One of these inventions was a petrol motorbike in 1976.

The pains of mustard farmers in Ganganagar set the inventor in him thinking again. Threshing mustard was a problem as many a time the tractor would overturn, killing people. Separating mustard manually was a tedious and time consuming process. In 1984-85, Dhonsi modified the wheat thresher to work on mustard crops as well. The first adapted version was developed with a reduction gear that allowed reducing the speed of the threshing drum by adding a blower/aspirator fan to the machine. His next innovation was the modification of a combine harvester. In fact, Dhonsi acquired the ability to modify many such machines to suit different purposes and continued doing this till 1997. He also invented a machine that could irrigate undulating fields—a problem for farmers. This machine could lift more water and used less diesel. He sold it to the farmers for ₹700 (US$ 13.29). Since the days when Dhonsi’s reward was usually a cup of tea and the blessings of his patrons, he has come a long way, tasting commercial success and now the award.

But this 53-year-old inveterate innovator is not ready to hang up his boots yet. He is currently in the process of perfecting a ridge-maker. There are other machines on his agenda—all of them inspired by the grassroots problems of farmers and aimed at easing their workload. He wishes to produce these on a large scale for economy of scale benefits and hopes for subsidies on raw material for himself and for farmers on finished goods. “If farmers get subsidy, it will be good,” he says. Given Dhonsi’s sincere pursuits, more inventions are sure to come out of his ‘workshop’.

DHONSI’S INNOVATION AGENDA

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