

## STUBBLE BURNING CRISIS

# Where are the Happy Seeders that Punjab's farmers were promised?

## Fewer straw-management machines were given out than had been sanctioned

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In Punjab most farmers have their homes right in the middle of their farms. When they clear their field in October to prepare for sowing wheat, they burn the rice stalks left in the field and their homes remain engulfed by smog for weeks. So, if there is an alternative to crop burning, farmers will only be happy to go for it.

Then, why aren't farmers opting for Turbo Happy Seeder—a tractor-mounted machine that allows planting of wheat without the need to burn the leftover straw from the previous paddy crop? Despite the Centre subsidising the cost of Happy Seeder up to 50 per cent for individual farmers and 80 per cent for co-operatives since last year, there are hardly any takers.

Despite the best efforts of the State government and the Centre,

there is no respite to stubble burning. Farmers are, naturally, being blamed for their reluctance to adopt the new technology.

A *BusinessLine* analysis, however, finds that not many farmers had an alternative but to burn the crop-stubble.

### Limited availability

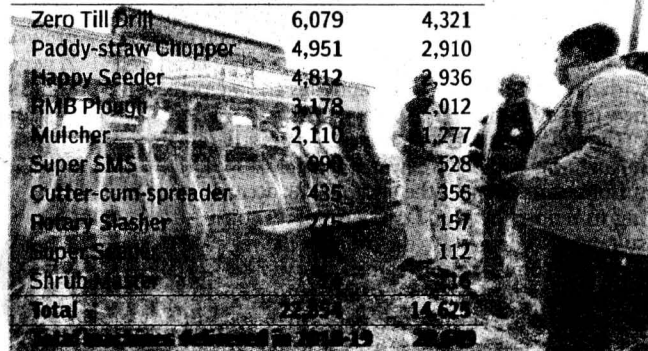
In 2018, the Centre set aside ₹1,151.8 crore for providing farm straw management equipment at a subsidised cost to farmers of Punjab, Haryana and western-UP over two years. Given that this equipment costs ₹1-3 lakh, the States can't complain about the allocation.

In 2018-19, according to government data, in Punjab, a total of 28,609 machines were given to farmers. Of these, 9,758 were Happy Seeders and 3,634 Super SMS machines. Super SMS (Super-Straw Management System) is an attach-

### Machines given under the subsidy scheme in Punjab

2019-20

	Machines sanctioned	Machines delivered
Zero Till Drill	6,079	4,321
Paddy-straw Chopper	4,951	2,910
Happy Seeder	4,812	2,936
IMB Plough	3,178	2,012
Mulcher	2,110	1,277
Super SMS	990	528
Cutter-cum-spreader	435	356
Rotary Slasher	770	157
Super SMS		112
SARU		304
<b>Total</b>	<b>22,932</b>	<b>14,625</b>



ment fitted to the harvester which ensures that the straw gets cut and spread evenly on the field so that Happy Seeder can do its work efficiently.

In 2019-20, however, only 14,625 machines have been given—which is about half last year's number. The number of machines sanctioned for the year, based on applications

received from farmers, was actually 22,872.

The number of Turbo Happy Seeders delivered to farmers was 2,936 against the sanctioned 4,812, while in the case of Super SMS, it was 528 (990). Similarly, the number of mulchers, reversible ploughs and rotavators and other equipment that help in crop residue

management and given on subsidy was also lower than last year.

This shows that many farmers who applied for buying these machines through government subsidy didn't get them. Thus, the talk of farmers not willing to buy the equipment is unfair.

Further, on breaking down the numbers, it is clear that not much relief from crop-stubble burning can be expected with the number of farm equipment given out.

Sample this: Punjab has about 75 lakh acres under paddy that goes into wheat. Given that a Happy

Seeder sows 6-8 acres a day, in about 25 days available (after the paddy harvest to sow wheat), the 12,694 machines given out in the last two years can sow about 25 lakh hectares—or, a third of the total area.

Counting also the Super SMS machine, which is a must if a farmer has to deploy the Happy Seeder, then the land where there is no stubble burning will fall further as the number of Super SMS machines given out is less.

The government empanelled several manufacturers this year to supply farm equipment at a subsidised price. While these manufacturers are equipped to handle large orders, they need time to plan out production.

Sarbjeet Singh Panesar, Managing Director, Dasmesh Mechanical Works, a large farm equipment maker in Punjab, says, "Manufacturers need at least two months to plan production. But this time we were given only 50 days to finish and supply the equipment..."

Rajdeep Singh, Manager, National Agro Industries, another large manufacturer, too complains about the little time given to manufacturers to supply the equipment this year.

If farmers should have machines by mid-October, orders to manufacturers should be given out by June-end or at least the beginning of July. But, this year, orders were sent to manufacturers only by the second week of August.

Also read p9

## GRAIN OF TRUTH:

# Happy Seeder saves costs

Every day, *chota Sidhu* wakes up by the sound of his father coughing. "At 6.30 in the morning, *abba* is already in the field..." Sidhu murmurs. As he gets up from the rope cot, rubbing his eyes, he sees his father clearing the burnt stubble in the field and coughing his lungs out.

For many farmers and others in Punjab, fresh air is not a given. In fact, in most days in October, they don't get to see the sky or the Sun because the smoke from burning of paddy stubble, and other particulates, obscure the sight of sky.

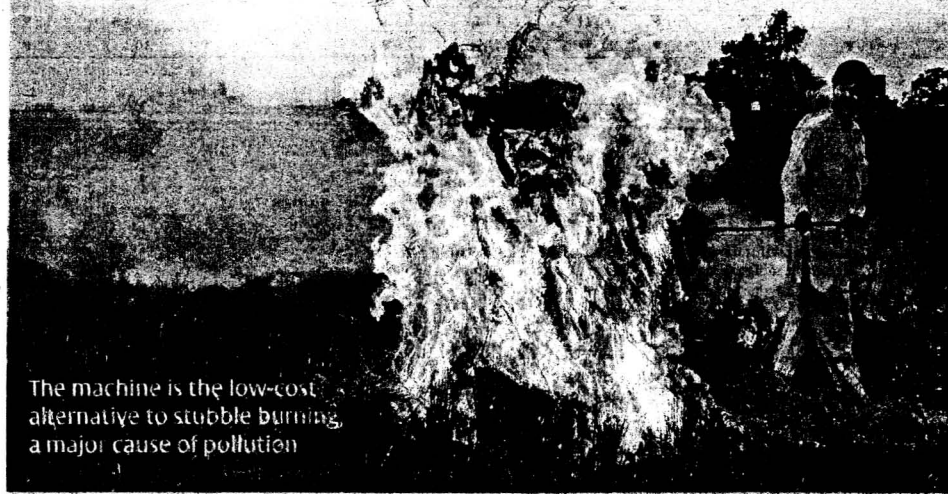
Many say burning the stubble is the easiest and the most cost-effective way for a farmer to clear the left-over paddy straws, and that's why they do it. But this is not true. This article is inspired by the findings from a survey done by Gurupreet Singh, a post-graduate scholar in IIM-Ahmedabad, who interned with the International Maize and Wheat Improvement Center (known by its Spanish acronym, CIMMYT) last year.

He interviewed a group of 120 farmers across Karnal (Haryana), Ludhiana, and Sangrur (Punjab) to understand what it takes to burn the stubble versus the cost of using Happy Seeder, a tractor-operated machine for in-situ management of paddy stubble (straw). The survey results showed that the use of Happy Seeder for wheat sowing costs ₹1,656/acre including the rental cost paid to combine harvester, cost of fuel consumed, etc. This was a 43 per cent saving in cost for farmers over the traditional method of sowing.

Here we see how Happy Seeder works and how it can save costs for farmers.

### Cost advantage

Despite government subsidy, the adoption of Happy Seeder has not been to the tune expected. But *Businessline*, after speaking to farmers who used this implement, received positive feedback.



The machine is the low-cost alternative to stubble burning, a major cause of pollution

In Karnal, Haryana, Vikas Chaudhary, a progressive farmer, who has been using Happy Seeder for sowing wheat for many years now, said: "I am happy with the implement. It saves me money. It also gives higher yield on wheat as the soil is resistant to more heat in February and March and can take more water if there are unexpected rains as the straw is in the soil acts as a mulch cover. My yield is 27-28 quintals/acre compared with the 22-24 quintals/acre of others in the neighbourhood who do not use Happy Seeder." While Happy Seeder helping improve wheat yield is a supplementary benefit, the highlight of the machine is the saving in cost of wheat sowing.

Sample this: After paddy harvest using a combine, if a farmer burns the left-over straw, he has to do some preparatory work on the field to be able to sow wheat. First, he irrigates the land. Then

he ploughs the soil using a harrow or some other implement and then levels the soil. After this, he broadcasts the seeds manually and uses a seed drill or rotavator to ensure seeds go inside the soil. The process involves use of labour and renting/buying of implements for ploughing, levelling and sowing.

The cost of the above process adds up to ₹3,500-4,000/acre. In comparison, the cost of sowing using Happy Seeder after a combine harvester fitted with Super-SMS (Straw Management System) comes to ₹1,600-1,800/acre.

In a paper published in *Science* journal, M.L. Jat, Principal Scientist at CIMMYT, and his co-authors say that Happy Seeder-based systems are more profitable than alternative farming practices. The maximum profit an average farmer can gain by switching from the common burning system to the Happy Seeder system is higher by 44 per cent.

### Advantages of zero tilling

There are two options before a farmer who does not burn the stubble. One option is, after using a combine harvester with Super-SMS (an attachment fitted into the harvester which ensures that the straw thrown out by the harvester gets cut and spread evenly), the farmer can use a Happy Seeder. This machine, which is mounted on a tractor, sows wheat seeds even as the straw remains on the soil.

The second option is, after using a combine fitted with Super-SMS, a farmer can use a mulcher, an implement which reduces the size of the straw and makes a layer on the surface of the soil, followed by a rotavator that tills the soil (mixes left-over straw pieces

into the soil), and then use a wheat-sowing drill to sow seeds.

Both the options work on different principles. In the first option, where Happy Seeder is used, there is no tilling of the soil. This goes against the age-old belief that ploughing is a necessary step before sowing. The straw from the previous paddy crop is cut into small pieces and deposited on the soil to stay as a protective layer. In the second option, however, where one uses a plough, the principle is to break the soil and turn it over to bring nutrients to the top, and in the process cut weeds, too.

Farmers who are traditionally used to tilling the soil, continue to prefer it. But there is scientific evidence to prove that zero tilling helps improve soil health, says M.L. Jat. "Zero tillage is scientifically proven to help soil and the crop in the long run. It helps prevent soil erosion, increases water absorption, and, over time, also helps crops grown in the field generate better yield."

S. Trilochan Mohapatra, Director-General, Indian Council of Agricultural Research, also believes in the effectiveness of zero tilling.

Improving awareness  
A survey done by Precision Agriculture for Development, a global NGO which works in the agriculture sector, in six States in India including Punjab and Haryana, found that out of a group of 2,000-plus farmers across seven districts of Haryana and Punjab with high rates of crop-burning, 23 per cent had not heard of Happy Seeder. There is thus lot more work that needs to be done by the State machinery in Punjab.

There is need for awareness creation through agriculture of

**Punjab: Up in smoke**  
Area under paddy that goes to wheat: **28 lakh hectares**

Number of affected districts because of crop-burning: **22**

Areas where high incidence of burning is observed: **Sangrur, Bhatinda, Firozpur, Muktsar, Mansa and Patiala**

Crop residue generated in these districts: **20.17 million tonnes**

Crop residue burnt: **9.96 million tonnes**

Crop residue managed (by cutting and spreading it on the field, left on road side or partially burnt): **10.21 million tonnes**

### Health Hazard

The burning of one tonne of paddy straw releases 3 kg of particulate matter, 60 kg CO, 1,460 kg CO<sub>2</sub>, 199 kg ash and 2 kg SO<sub>2</sub>.

### Harmful effects of crop-burning

Loss of nutrients in straw impacts soil temperature, pH, moisture, content of phosphorus and soil organic matter

Sourced from various reports

farmers on nuances of using Happy Seeder, including the right timing of irrigation of the wheat crop and the right time for weedicide spray. This aside, manufacturers need to hand-hold farmers in the initial leg of using the machine and give prompt after-sales service.

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### Burning vs Non-burning

The size of the bar reflects the estimated profits for a farmer using each option

