



BASAI News Updates

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{ 205 INCIDENTS } AIR QUALITY WORSENS ACROSS NORTH INDIA

Punjab, Haryana, UP record highest farm fires this season



A farmer burns stubble in Amritsar on Sunday.

AFP

Jasjeev Gandhiok

jasjeev.gandhiok@hindustantimes.com

NEW DELHI: At 205, the breadbasket states of Punjab, Haryana and Uttar Pradesh recorded the season's highest single-day count of farm fires over the weekend, pushing the Capital's air quality into the poor category after 11 days. Delhi's Air Quality Index stood at 232 on Sunday.

Before this, the highest number of fires in the three states was 135 on October 13.

Satellite data from Nasa, collated by the Indian Agricultural Research Institute, showed Punjab recorded 169 fires on Satur-

day, while Haryana recorded 36 fires. There were no fires recorded in UP. With the harvest season progressing, experts say this number is likely to go up over the next two weeks.

"We saw Punjab and Haryana's highest count so far this season on Saturday and this number is expected to increase further over the next two weeks. The peak stubble season normally starts around October 26-27 and continues till November 10," VK Sehgal, professor and principal scientist at IARI and part of CREAMS, said, adding

that with the new measures being employed by state governments, the figures might remain low.

The Consortium for Research on Agroecosystem Monitoring and Modelling from Space (CREAMS), under IARI, began analysing satellite data from Nasa on September 15 this year.

The data in the one month since, shows Punjab, Haryana and Uttar Pradesh are all faring better than the last two years.

Till October 15, Punjab recorded a total of 1,238 fires,

down from 1,946 it recorded in the same period last year. In Haryana, 168 fires were recorded over the last month, compared to 850 last year. UP has recorded 91 fires so far, down from 460 fires at the same time last year.

Farmers in the region set fire to paddy stubble during the end of October and early November so as to not incur expenses associated with use of multiple stubble management machines, and due to lack of transportation services to ship out stubble that has been cut and baled, besides other systemic issues, including the lack of financial incentives.

→FULL REPORT ON P4



**AIR WE
BREATHE**

Tales from the farm: 'Officials don't care how their solutions hit the sowing cycle'

Jayashree Nandi
letters@hindustantimes.com

SHAHPUR BEGU, SIRSA: Hira Singh and Gural Singh, from a prosperous farming family in Sirsa's Begu village are preparing to harvest their 17-18 PUSA Basmati paddy crop towards the end of this month. They will have to then sow wheat during the 15-day window between November 1 and 15. The brothers will set fire to the paddy stubble as soon as the crop is harvested.

The brothers are among the majority of farmers in Punjab and Haryana that will set fire to paddy stubble later this month after the late sowing paddy varieties are harvested. The drive from Haryana's Hisar to Sirsa and onward to Faridkot district in Punjab is flanked by green, young paddy crop interspersed with golden fields ready to be harvested. The greens are mostly late harvesting paddy varieties, whose harvest has been delayed further by unseasonal rains in September and October.

Farmers in these districts, which record among the highest crop stubble fires every year according to the Commission for Air Quality Management (CAQM), say hundreds of farmers will set fire to the paddy stubble during the end of October and early November. They burn so as to not incur expenses associated with use of multiple stubble management machines, very short time available before the rabi (winter) crop is sown in the first week of November; the lack of transportation services to ship out stubble that has been cut and baled; and other systemic issues, including the lack of financial incentives.

The brothers own about 18 acres of farmland of which paddy grows on 12 acres; the rest is cotton. The heavy, unseasonal rain in September has helped their paddy crop. It damaged the crop elsewhere in the district where paddy was ready. But the brothers will not attempt to source seeders or balers to manage their paddy stubble.

"Some stubble management machines have reached the panchayat. But how can two-three machines help manage stubble in

the entire village? The sarpanch will make them available to a select few. We will not even attempt getting machines here because it just doesn't work for us. When you cut the stubble and bury it in the ground it leads to pest infestation. The government has only considered the stubble burning issue but not bothered about how these solutions will impact the wheat cycle. The seeders and balers come at a steep cost. The seeders for example will cost us ₹2,500 per acre for renting and balers haven't reached our village at all. The only solution with farmers like us is to set fire on the stubble," explained Gural Singh.



Hira Singh and Gural Singh in their farm in Sirsa's Begu village.

The brothers planted cotton over around 6 acres but the crop has failed. "They sold us the seeds saying these are Bt cotton seeds but they turned out to be spurious. The crop is infested now. This cannot be sold in the market," added Hira Singh.

They said there is a general perception that the Basmati stubble gets decomposed easily, adding that this is not in the case of 17-18 Basmati varieties.

"Paddy growing in this parched region involves very high costs. We are stuck in a vicious cycle of digging deeper and deeper for water and increasing the use of pesticides. Each pesticide costs around ₹2,000 per spray per acre. Totally 6-7 pesticide sprays are used which costs ₹12,000 to ₹15,000 per acre. The sprays for hopper and fungus are a must. Our condition is so pathetic that when we used the PUSA decomposer to manage stubble that also led to fungal infestation for which we had to procure more sprays otherwise our wheat crop would have failed last year. Labour costs are around ₹700 to ₹800 per day per acre. Which farmer will invest in more machines to manage paddy stubble? Debt-ridden farmers will not invest in these fixes," said Hira Singh. All the seven blocks in Sirsa district are in a critical state in terms of groundwater availability; six have been categorised as "over-exploited" by the Central Ground Water Board (CGWB). All blocks in neighbouring Fatehabad except one are also "over-exploited" which means that there is no more room for groundwater

extraction here; yet paddy agriculture continues to be dependent on tubewell water.

In Barnala, about 95km from Begu, some farmers will try to manage stubble by using machinery. Gurcharan Singh in his 70s is trying his best to follow government regulations even though it means a financial loss. "I will spend around ₹1,200 to ₹1,500 per acre to clear the stubble and then hire balers which will cost me ₹2,000 to ₹2,500 per acre. I will pay others for transporting my stubble away but I will not be paid anything in return. I have taken one acre of land for lease at the cost of ₹70,000 and then spent ₹15,000 on inputs. It doesn't make any sense for me but I am doing it to follow rules," he said.

Last year, Haryana government announced an incentive of ₹1,000 per acre for ex-situ and in-situ management of stubble.

On the ground

In many parts of Haryana, both the paddy and cotton crop has been affected this year by unseasonal rain in September leading to pest infestation. "The water has not yet drained and the paddy has decomposed in many parts of Sirsa and neighbouring districts. Insurance claims are settled for two-year-old losses and we get 25% of 10% of the loss claimed, if at all. Farmers face individual losses depending on their crop but insurance companies will compensate only if there is loss in the entire area. That's one of the main reasons for increasing debt," said Bittu Budania, another farmer in neighbouring Nezia Khara.

management. "I used the machine to cut the stubble and buried it in the ground then I had to deal with a massive pest infestation on my farm. I am not going to try that anymore," said Singh.

The policy of CAQM in NCR and adjoining areas, released in July has stipulated time-bound targets for management of stubble burning in north-western states this year.

Governments of Punjab, Haryana, NCR districts of Uttar Pradesh have been given a target of managing 60% of the total straw generated through various in-situ and ex-situ straw management options by December 31. "Already around 50% of the paddy stubble is being managed. It's a matter of 10% to 15% more which we are hoping we can achieve this year," said a senior official of CAQM who asked not to be named.

By December 31, 2024, CAQM has assigned a target of managing 80% of paddy stubble through in-situ and ex-situ options and by December 31, 2026, 100% of paddy stubble will be managed which means no stubble will be burnt.

Punjab and Haryana collectively contribute about 19 million tonnes of non-Basmati paddy annually. The most instances of stubble burning are in Sangrur, Moga, Ferozpur, Ludhiana, Patiala, Barnala, Bhatinda, Muktsar and Tarn Taran in Punjab and Karnal, Kaithal, Kurukshetra, Fatehabad, Jind and Sirsa in Haryana according to CAQM.

When asked about how CAQM will deal with stubble fires over the next one month, the senior official added: "The agriculture ministry and the governments of Punjab and Haryana are responsible for in-situ crop residue management. They will have to make sure farmers do not burn stubble."

According to this official, this year there will be more focus on ex-situ stubble management activities. There will be a push across states for utilisation of stubble for biomass power production, bio-ethanol, compressed biogas production and industrial boilers. "In-situ management includes use of bio-decomposers and mechanisation that can help deal with paddy straw such as happy seeders and super seeders; and ex-situ management options include using paddy straw as fuel for industrial boilers, thermal power plants, among others.

He pointed to Jagvir Singh, who tried following the government's recommendations on stubble

Budania has considered diversifying his crop. "At the most we can grow vegetables. For vegetables you need more labour, seeds are very expensive and the tubewell water in this region is not suitable for vegetables. We have no supply of freshwater."

Kulvinder Singh in Kotli will harvest his paddy soon. He has also considered using the baler. "Who will transport the bales even if I make them? The bales will also have to be set on fire. So, we basically make bales and set it on fire because nobody picks them up. If you leave the bales on the farm there will be a rat infestation that destroys the wheat crop."

It is very similar in Punjab. There is palpable discontent against the Centre and Aam Admi Party at the state level. "Please visit Jira where a liquor factory is polluting our groundwater. All the waste water is being discharged into the ground. No government has stopped them. They can go against farmers who are compelled to burn the stubble because of governments own policies. The government will have to face a huge backlash from Punjab farmers on this," said Inderjeet Singh, leader, Bharatiya Kisan Ekta at Bajkhanra near Bathinda. Singh said there was a direction from Punjab government to sow paddy late towards end of June so as to manage water resources for the crop effectively but this also has led to late harvesting of paddy in many areas. "Wheat will have to be sown between November 1 and 25. Where is the time?" he asked.

He pointed to Jagvir Singh, who tried following the government's recommendations on stubble

Air emergency looms as farm fires rage with rains receding

Jasjeev Gandhi
jasjeev.gandhi@hindustantimes.com

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With the harvest season progressing, experts say this number is likely to go up over the next two weeks. "We saw Punjab and Haryana's highest count so far this season on Saturday and this number is expected to increase further over the next two weeks. The peak stubble season normally starts around October 26-27 and continues till November 10," VK Sehgal, professor and principal scientist at IARI and part of CREAMS, said, adding that with the new measures being employed by state governments the figures might remain low.

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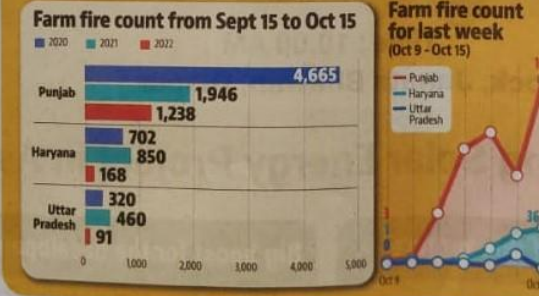
Till October 15, Punjab recorded a total of 1,238 fires, down from 1,946 that it recorded in the same period last year. In 2020, the figure was 4,665 — nearly four times the 2022 number. In neighbouring Haryana, 168 fires were recorded over the last month, compared to 850 last year, and 702 in 2020.

Uttar Pradesh, meanwhile, has recorded 91 fires so far, down from 460 fires at the same time last year and 320 in 2020. Farmers in the region set fire to paddy stubble during the end



Increase in farm fires likely

With harvest season progressing, experts say the number of fires may go up soon



of October and early November, so as to not incur expenses associated with use of multiple stubble management machines, very short time available before the rabi (winter) crop is sown in the first week of November; the lack of transportation services to ship out stubble that has been cut and baled; and other systemic issues.

This year, the two rain spells, between September 21 and 24, and between October 7 and 11, across the northern plains are also likely to have played a part in the reduced fire count so far. "We saw a reduction in fire counts during these rains spells and continuous rains would also have delayed burning. We will

have to wait for a clear trend to emerge," said Anumita Roychowdhury, executive director, research and advocacy at Centre for Science and Environment. Despite a low count of farm fires so far, Delhi recorded an air quality index of 232 on Sunday, with experts warning that the complete withdrawal of mon-

soon and a reduced windspeed will create unfavourable conditions for dispersal of pollutants. An AQI between zero and 50 is considered "good", 51 and 100 "satisfactory", 101 and 200 "moderate", 201 and 300 "poor", 301 and 400 "very poor", and 401 and 500 "severe".

"The wind speed has reduced since Saturday evening and temperatures have started falling this is why we are seeing a rise in air pollution levels. The winds are northwesterly and there are farm fires in Punjab and Haryana. In Haryana, farm fires are less compared to last year during this period. We do not expect relief from these conditions till October 19 when wind direction is expected to become easterly temporarily. The ventilation index is too low for dispersal of pollutants," said Vijay Soni, scientist at IMD's air quality early warning system for Delhi.

The ventilation index on Sunday was around 4000 m²/s. A ventilation index lower than 6000 m²/s with average wind speed less than 10 kmph is unfavourable for dispersion of pollutants.

"Fire count numbers have touched 200 overall and while the wind direction is favourable too, the wind speed at the transport level is not strong and so the impact on Delhi's air quality is negligible at present. At this rate at which the fire count is increasing and with weather conditions expected to become adverse gradually, we can see farm fires contributing to Delhi's overall PM 2.5 count from this week," Gufran Beig, founder project director at the System of Air Quality and Weather Forecasting And Research, said.

On Sunday, the wind speed was 8 kmph at Palam and 6 kmph at Safdarjung around 5.30pm.

Last year, the share of farm fires in Delhi's PM 2.5 concentration was as high as 48% on November 7 — nearly half of Delhi's pollution came from farm fires on the day.

Strengthening the agri startup ecosystem



ABHILAKSH LIKHI

ADDITIONAL SECRETARY, MINISTRY OF AGRICULTURE & FARMERS' WELFARE

FASAL is an agri startup that has helped farmer Sangamesh Talikotti install sensors and cameras on his 2.5-acre tomato farm. The startup's Bengaluru-based artificial intelligence-driven platform regularly relays information to Talikotti's smartphone on the quantum of irrigation needs, the risk of a pest attack and the use of pesticides. The data collected through readings is converted through 'Internet of Things' (IoT) into precise actionable intelligence.

On the other hand, AgNext is a Chandigarh-based agri startup that uses computer-based vision for effective post-harvest quality inspection of crops to substitute visual inspection. Agri startups such as Ninjacart, Crofarm and KrishiHub procure fruits/vegetables directly from farmers and sell them to retailers. They use myriad technologies to keep their target farmers abreast of the quantum of demand and current prices, coupled with optimised logistics and online payments.

Over 600 such agri startups are a part of a robust agriculture technology ecosystem nurtured by several

initiatives of the Government of India. The 'Digital India' initiative aims at widespread adoption of technology through digital platforms, analytics, artificial intelligence, blockchain, machine learning, Software-as-a-Service (SaaS) and IoT.

The reformed Rashtriya Krishi Vikas Yojana (RKVY) has now been innovatively designed to promote such initiatives. Herein, five national knowledge partners and 24 agri-business incubators across the country are promoting agri-preneurship through support to agri startups. The areas of 'idea' incubation are as diverse as farm inputs, precision agriculture, farm management, quality as well as traceability, supply chain/output market linkages and access to financial services.

Besides, the Atal Innovation Mission (AIM) is also a plug-in to aggressively push technological innovation with its over 1,000 Atal Tinkering Labs (ATLs) that have been set up across districts. State governments, too, under the Startup India initiative, have begun to support agri startups in partnership with the private sector. Uttar Pradesh's incubation network at the Indian Institute of Technology (IIT), Kanpur, with funding from Bill and Melinda Gates Foundation and Tata Trusts, is an example.

Experts opine that the Covid-19 pandemic has led to an increase in the number of agri startups that work across the agricultural value chain. Their key areas of innovation focus range from farm mechanisation, cold chain logistics for perishables, plant-based protein products, food biofortification, drone applications, micro-



The pandemic has led to an increase in the number of agri startups that work across the value chain. But the key hitch, experts say, is still the small farm size, coupled with low digital adoption by small and marginal farmers. They recommend a hub-and-spoke model that nurtures these agri startup initiatives.

INNOVATION: The Digital India initiative is aimed at widespread adoption of technology. *istock*

irrigation, dairying and financial services. But the key hitch, experts add, is still the small farm size, besides low digital adoption by small and marginal farmers. Hence, they recommend a hub-and-spoke model that nurtures these agri startup initiatives. To ground this model, a key role is being played by ICAR-led Krishi Vigyan Kendras (over 700) in tandem with entities such as ITC's e-Choupal 4.0 in agro-climatic regions to impart digital literacy and share best practices among farmers.

Three other steps taken by the Centre in conjunction with state governments strengthen the above model. First, making farm mechanisation equipment available to farmers through farmer group-run custom hiring, high-

tech centres and machinery banks. Second, initiating the electronic National Agriculture Market (e-NAM) in 1,000 regulated wholesale spot markets for real-time price discovery and quality assaying. e-NAM is also now a demand-driven electronic 'platform of platforms' connected to other public-private agri platforms. Third, launching of the scheme for creation of 10,000 Farmer Producer Organisations (FPOs) to bring economies of scale through aggregation of farmers and allowing FPOs to trade online.

Experts also opine that agri startups are relooking at the way food has been grown and distributed in the country. This relook is fuelled by critical factors such as climate change vulnerabilities, reduction in water availability,

tolerance of pests, decrease in quality of soil, labour shortages and the changing food basket. Therefore, they suggest an enhancement of funding for initiatives on 'on-farm' and post-harvest management. The creation of the ₹1-lakh-crore Agri Infrastructure Fund (AIF) is a step in the right direction. It provides access to credit, with interest subvention, for agri-entrepreneurs, FPOs and state governments to invest in rural community assets and post-harvest infrastructure. Recently, an umbrella-based Credit Guarantee Scheme for startups has also been announced.

Another key issue raised by experts is that while agri startup such as Samunnati, Waycool, Agrostar, Jambotail and many others do reach out to farmers in

their areas of business operation, how can such startups be scaled across the countryside? These entities have partially reformed the fragmented agricultural value chain. They also continue to co-opt the unorganised retail industry, consisting of small shops and street markets. One way to do the needful is to strengthen their partnership with the FPOs and, more importantly, food processing companies. This could be further coupled with online collaborations between buyers, sellers, incubators, accelerators and investors. In this context, the ongoing development of the government-backed Open Network for Digital Commerce (ONDC) is a welcome step. It will enable countrywide access to processes and technologies typically deployed by large e-commerce platforms.

An Ernst & Young study pitches India's agritech ecosystem at \$24 billion by 2025 with the potential for supply chain and output market-based agri startups at the highest. But this ecosystem can be effective at the last mile only when technology interventions connect with and empower small and marginal farmers in large numbers. To enable the same, the district administrative machinery in the state and, more importantly, local self-governance institutions have to be sensitised about agri value chain technology issues. They, in turn, in partnership with the private sector, have to perform the role of effective trainers and leaders in widespread dissemination of the same to small and marginal farmers in the country.

Views are personal

Uphill task for Punjab to stub out stubble fires

AMAN SOOD

DESPITE over 10,000 officials being on duty and hundreds of crores of rupees spent to tackle stubble burning, farm fires continue to plague north India, with Delhi routinely blaming Punjab and Haryana for its poor air quality in the winter.

Winters have become synonymous with high pollution levels in the National Capital Region, aggravated by crop stubble burning in Punjab, Rajasthan, Haryana and Uttar Pradesh. Law enforcement agencies attempt to curb this menace by imposing penalties, yet farmers continue to set crop residue afire in their fields.

Stubble use

Despite earnest efforts, Punjab still has a long way to go to manage its paddy stubble. In 2021, the state government wooed the industry, including distilleries and breweries, offering to promote stubble use with cumulative fiscal incentives of Rs 25 crore to certain industries.

Officials concerned confirmed that industries such as sugar mills, pulp and paper mills, besides those having boilers with steam generation capacity of more than 25 tonnes per hour, are eligible for the incentives.

According to the Punjab Pollution Control Board (PPCB), the government decided to provide cumulative fiscal incentives to the first 50 existing industries on a first-come-first-served basis.

"Concrete efforts are being made to convince farmers to consider straw as an asset. However, few industries, including brick kilns, are currently using it as a fuel. Our goal is to ensure that 50

PROMOTION OF AGRICULTURAL MECHANISATION FOR IN-SITU MANAGEMENT OF CROP RESIDUE

2019-20 to 2021-22

SOURCE: UNION MINISTRY OF AGRICULTURE AND FARMERS' WELFARE, DATA TILL DEC 2021

State	CHCs*	CRM machines	Crop residue managed**	Area***	*Custom hiring centres **in lakh tonnes ***in lakh hectares
Punjab	18,924	63,654	92.20	14.21	
Haryana	5,581	62,150	28	7	
UP	4,702	31,905	19.98	7.49	
NCT Delhi	0	202	-	0.06	



PUNJAB DOSSIER



- Paddy cultivated on 31.13 lakh hectares in 2022 in Punjab, resulting in generation of about 19.76 million tonnes of straw.
- Policy notified to promote use of paddy straw as fuel under the state policy for incentives.

- Only those bio-ethanol units eligible for incentives which shall install paddy straw-based boilers.
- First 50 existing industries in the state being provided with cumulative fiscal incentives of ₹25 crore on first-come-first-served basis for using paddy straw as fuel in boilers.

- The incentives include reimbursement of 100% net SGST for 7 years, with a cap of 75% of total investment for installation of paddy straw-fired boilers and 100% exemption/ reimbursement from stamp duty on purchase or lease of land & building to be exclusively used for storage of paddy straw.

- Land is being provided by Department of Rural Development on lease basis for 33 years to industries which propose to use paddy straw.
- Techno-feasibility studies being carried out for use of paddy straw briquettes in brick kilns.

per cent of the stubble is put to industrial use by 2025," says PPCB Member Secretary Karunesh Garg.

New and existing distillery and brewery units, proposing replacement of old boilers or expansion with installation of new boilers, are required to use paddy straw as fuel. The government is also keen to allow non-fiscal incentives to such industries in terms of availability of panchayat land for storage of paddy straw with a 33-year lease agreement.

However, brick-kiln manufacturers claim that though the initiative is good and will help save

on coal costs, it's not practical till all kilns are asked to cut down on coal and use stubble pellets. "It burns too quickly and its regular supply and storage is an issue," they say.

The short window between paddy harvesting and sowing of wheat leaves most farmers with no option but to resort to farm fires. "If we sow wheat without removing straw, the rabi crop gets infested with pests and weeds. Two years ago, I decided not to burn stubble. However, it led to a drop in the wheat yield," says Jaskaran Singh, a farmer from Doraha (Ludhiana).

Officials of the Agriculture Department say they would create greater awareness this time against

stubble burning, adding that low yield cannot be attributed to in-situ management of crop residue.

The Centre has been promoting in-situ management of crop residue, which includes incorporation in soil, mulching, baling/binding for use as domestic/industrial fuel, fodder.

The state government has rolled out a slew of subsidies and incentives. These have also failed to bring about a major change. Farmers have been red-flagging problems regarding the efficiency of the machines, their availability and high cost.

Delivery of machinery

With the paddy harvest season in full swing in Punjab, the state

Punjab has already logged around 1,000 farm fires till October 15.

Incentives for farmers

In September, Punjab Chief Minister Bhagwant Mann said the Centre had turned down the state government's proposal of contributing to the cash incentive to farmers for not burning stubble. The state had proposed to give Rs 2,500 per acre to paddy growers. It suggested that the Centre pay Rs 1,500/acre, while Rs 1,000 would be contributed by Punjab and Delhi governments. "Without financial benefits, it is impossible not to set stubble on fire," say representatives of farmer unions.

Farmers complain that the number of machines is quite less as compared to the area under paddy cultivation (30 lakh hectares). "Machines were not available last year too. It's easier to burn crop residue rather than wait for machines," says Satnam Singh Behru, president, Consortium of Indian Farmers' Associations.

According to government data, the state recorded 71,304 stubble-burning incidents in 2021, 76,590 in 2020, 55,210 in 2019 and 50,590 in 2018, with districts such as Sangrur, Mansa, Bathinda and Amritsar witnessing a large proportion of such incidents. Every season, over 15 million tonnes of paddy straw is burnt in the fields ahead of winter sowing.

"Burnt area under paddy during 2021 was estimated to be 14.17 lakh hectares up to November 20, 2021, whereas the burnt area during 2020 was 17.42 lakh hectares, showing a decline of 3.25 lakh hectares (18.65%). With continuous efforts of all stakeholders, the burnt area is expected to further decline significantly," says Karunesh Garg.

Agriculture Department has started delivering machines for in-situ (mixing in the soil) management of stubble.

Agriculture Minister Kuldeep Dhaliwal claims they would distribute 56,000 machines under in-situ management this season. With this, the total number of machines would increase to 1,46,422 from 90,422.

Officials say the delivery of machines got off to a slow start but would pick up pace once farmers completed the sale of their kharif produce and had money to pay the non-subsidised part of the cost of machines.

Even though the delivery of machines has started, farm fires continue to be reported in the state.

Send your feedback to letters@tribunemail.com