

Paddy Crop Stubble Burning in North India Crop Fires already On in Punjab & Haryana

AMIT BHATTACHARYA and JAYASHREE NANDI

Despite a ban and dire warnings from the Delhi high court, crop fires have started raging across Punjab and northern Haryana, data from NASA satellites reveal. In what could be further bad news for Delhi's air quality, the data indicates that the fires may have begun early this year, compared with 2015.

The burning of paddy stubble to clear the fields for winter sowing is a rampant practice in Punjab and Haryana, leading to severe air pollution across the region. It's one of the contributors to the sharp drop in air quality usually seen over Delhi-NCR in October-November.

An image from NASA's Earth Observing System Data and Information System (EOSDIS) website shows 'fire spots' dotting Punjab and northern Haryana. Each spot denotes thermal and fire anomalies detected by NASA's satellites.

The maps give an idea of the geographic spread of crop burning. The fire patterns have been similar from October 8 onwards.

Images from the same period last year show visibly fewer fire spots. Stubble burning usually peaks in early November.

On October 6, the Delhi high court had warned the Chief Secretaries of four states (Punjab, Haryana, U.P., and Rajasthan) that they would be held responsible if crop burning persisted in their states this year.

The fires may start impacting Delhi's air quality in the coming days.

All of this week, Delhi recorded "poor" air quality, according to Central Pollution Control Board's air quality index bulletin.

"The fires will not impact the capital's air quality immediately. The impact is dependent on meteorological factors such as wind direction, wind speed and temperature. It can take about 8-10 days to show up," said a scientist from System of Air Quality and Weather Forecasting and Research (SAFAR).

Some Delhi government officials also noticed the fires on satellite maps but said they had already written to the governments of Punjab, Haryana, and Rajasthan requesting them to strictly implement the ban on burning of agricultural waste.

Delhi government had also written to the Union environment minister on October 4, requesting the ministry to direct the three states to prevent farm fires.

"The government has already taken up the matter with them. Even the high court had directed these states to ensure there is no burning of paddy straw. Now I am not sure what else can be done," a senior environment department official said.

The Supreme Court-mandated Environment Pollution Control Authority (EPCA) had held a meeting on October 7 with chief secretaries and senior officials of Punjab and Haryana governments on crop stubble burning. Bhure Lal, head of EPCA, made a number of directions to ensure "zero crop stubble burning" this year.

"In order to ensure effective enforcement of the law, the states shall start imposing penalty and prosecution for all incidents of stubble burning through district level special teams," a note by EPCA read.

EPCA also directed state governments to launch awareness campaigns before the paddy harvesting period, and asked state remote sensing agencies to stay vigilant.

Farmers in northern Haryana said the state government had stepped up its campaign against stubble burning and had warned of imposing fines on errant farmers. However, they said there was still no viable alternative to stubble burning.

"I would have to buy equipment worth Rs 5 lakh to get rid of the paddy stubble. That's a lot of investment. The government had issued warning but I fear a lot of farmers will continue to burn their paddy residues," said Ruby Singh Sandhu, a farmer who owns around 60 acres of land in Mallekan village in northern Haryana.

Home minister of Delhi, Satyendra Jain had claimed that the higher levels of air pollution in the capital was not a local phenomenon.

"Western Uttar Pradesh, Haryana, and Punjab produce a lot of chemicals after burning the residue of crop cutting which is major source of air pollution here," he had said. He said that the odd-even traffic scheme would only be implemented in the "worst case scenario as it was needed last year." **Delhi to get the heat**

Though crop burning seems to have started in Punjab and Haryana, direct impact on Delhi's air quality will take some time to show.

Experts say it will take at least three-four days for the capital to feel impact of this annual problem because of meteorological factors such as wind speed and temperature.

About 30% of the particulate matter—particles that form in the atmosphere from gaseous pollutants such as sulphur dioxide, nitrogen oxides, ammonia, and volatile organic compounds—is believed to be caused by stubble burning.

“The situation will deteriorate as the pollutants enter Delhi in the next three to four days. But again, that depends on wind direction and speed. The air quality has been fluctuating between poor and moderate levels but it will slowly turn poor with falling temperature,” a senior weather scientist said.

“Lower wind speed leads to an increase in the concentration of pollutants while higher speed disperses the particles. A dip in temperature, too, increases concentration of particulate matters” he said.

According to pollution figures put out by monitoring agencies including the Central Pollution Control Board (CPCB), Delhi Pollution Control Committee and SAFAR, Delhi’s air quality is slowly plunging from “moderate” to “poor”.

Even *Skymet weather*, a private weather portal, claimed that the sudden chill in the air coupled with cool winds is increasing pollution in the city. “Due to establishment of the anti-cyclone over Rajasthan, dry and cool winds coming from the northwest direction are blowing over northwest and central India including Delhi and NCR.

These cool winds are being held responsible for the nippy conditions during early morning hours in the national capital.

“Minimum temperatures have been dropping continuously during the last few days. On Saturday morning it came down to 17.5° C. Such lower temperatures during morning hours and very light winds are leading to the formation of slight haze. In the absence of strong winds the dust particles are mixing with the haze, forming a blanket of smog near the surface levels. This could lead to breathing problems and other ailments,” a *Skymet* release said.

A fortnight back, the CPCB convened a meeting of all member secretaries to devise an action plan to “effectively” and “strictly” monitor any incidence of burning of crop stubble in Haryana, Uttar Pradesh and Punjab. Delhi high court had warned the chief secretaries of Punjab, Haryana, Uttar Pradesh and Rajasthan that they would be held responsible if crop burning was done in their states this year.

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Indian Spices and Herbs

Pepper: The pepper plant grows best in a warm and humid climate. Berries mature and are ready for harvest in about 180 to 200 days.

Cardamom: A cardamom plant normally starts bearing capsules from the third year of planting. The harvested capsules are rubbed on wire mesh and polished before they are graded.

Nutmeg: The nutmeg tree bears fruit throughout the year, but peak harvest season is from December to May.

Ginger: Ginger is a herb that is native to Southeast Asia and has been used as a food additive for more than 4,000 years, and for medicinal purposes for more than 2,500 years.

Turmeric: It is commonly used in curries and other South Asian cuisine. Its active ingredient is curcumin. It is a significant ingredient in most commercial curry powders.

Cinnamon: It is principally employed in cookery as a condiment and flavoring material. It is used in the preparation of chocolate.

Clove: Clove trees begin to bear flowers 7-8 years after planting. Unopened flower buds are carefully picked when they turn from green to pink.

Coffee Plant: The main varieties of coffee cultivated today are Robusta and Arabica. The elliptical leaves of the coffee tree are shiny, dark, green and waxy.

Allspice: The name “allspice” was coined as early as 1621 by the English, who thought it combined the flavour of cinnamon, nutmeg and cloves.

Cocoa: Cocoa tree, is a small tall evergreen tree in the family Malvaceae, native to the deep tropical regions of Central and South America. Its seeds, cocoa beans, are used to make cocoa mass, cocoa powder, and chocolate.

Vanilla: A tropical orchid, this requires a warm climate with frequent rains. Vanilla grows best in uncleared jungle areas where it can get filtered sunlight.

Tulsi: The name “tulsi” means “the incomparable one”. Tulsi is a venerated plant and devotees worship it in the morning and evening.

Curry Leaf: The leaves are highly valued as seasoning in South Indian and Sri Lankan cooking, much like bay leaves and especially in curries with fish or coconut milk.

Centella: This plant is good for the brain. *Centella asiatica* Urb. is the scientific name of the plant. It has been named Saraswati in Sanskrit, because of its relation to the brain.

Bird’s Eye Chilli: Bird’s eye chilli, or Thai chilli is a chilli pepper, a cultivar from the species *Capsicum annum*, commonly found in Southeast Asia. Bird’s eye chilli can also be found in India, in Meghalaya, Assam and Kerala. It is used in traditional dishes of the Kerala cuisine.