



## Bulletin No. 27

Events Date:  
11-Oct-2022

Issued on:  
11-Oct-2022



# MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2022



Prepared by:

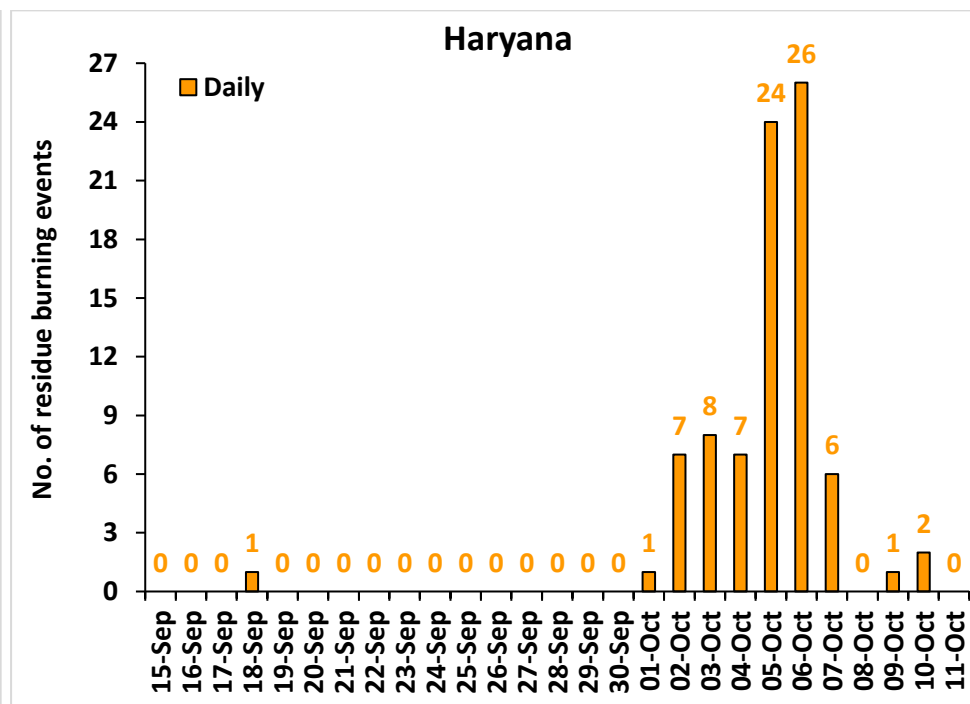
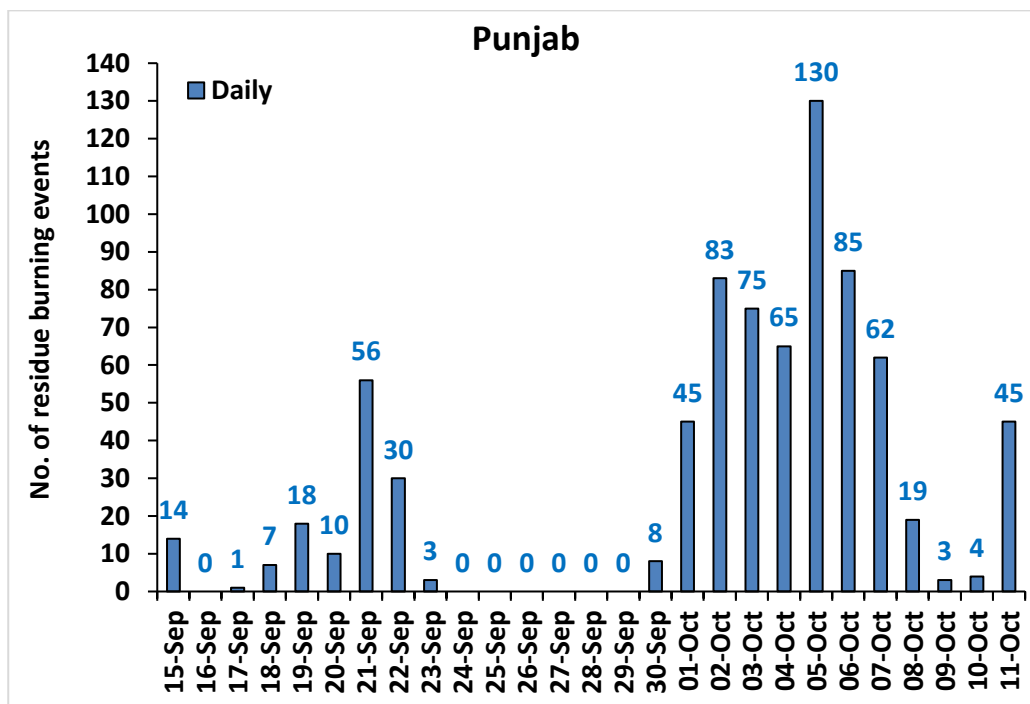
Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,  
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012

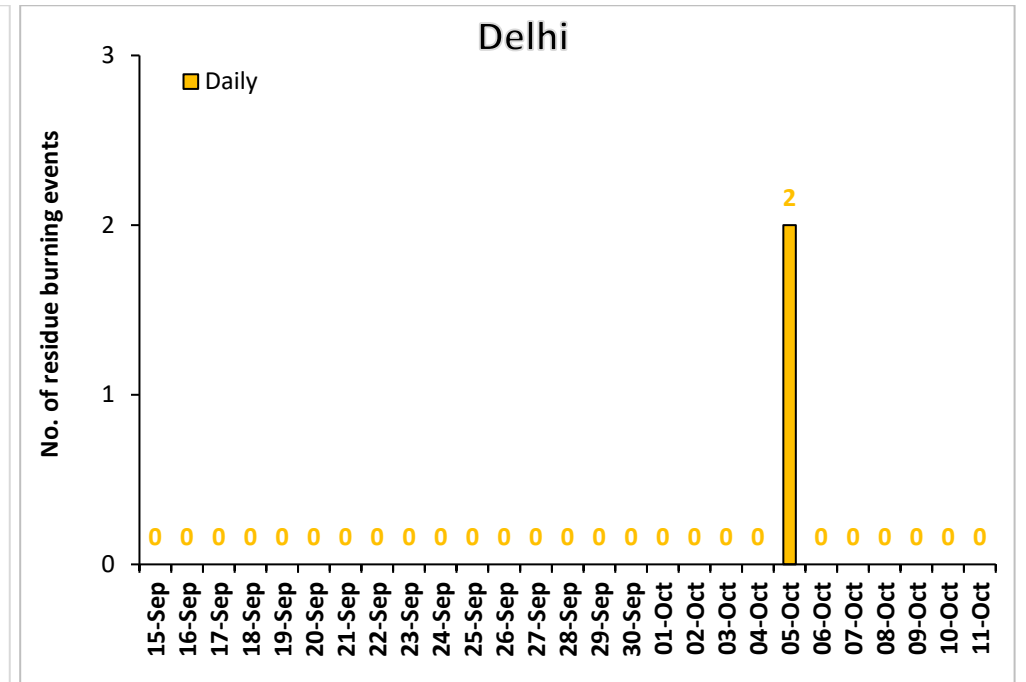
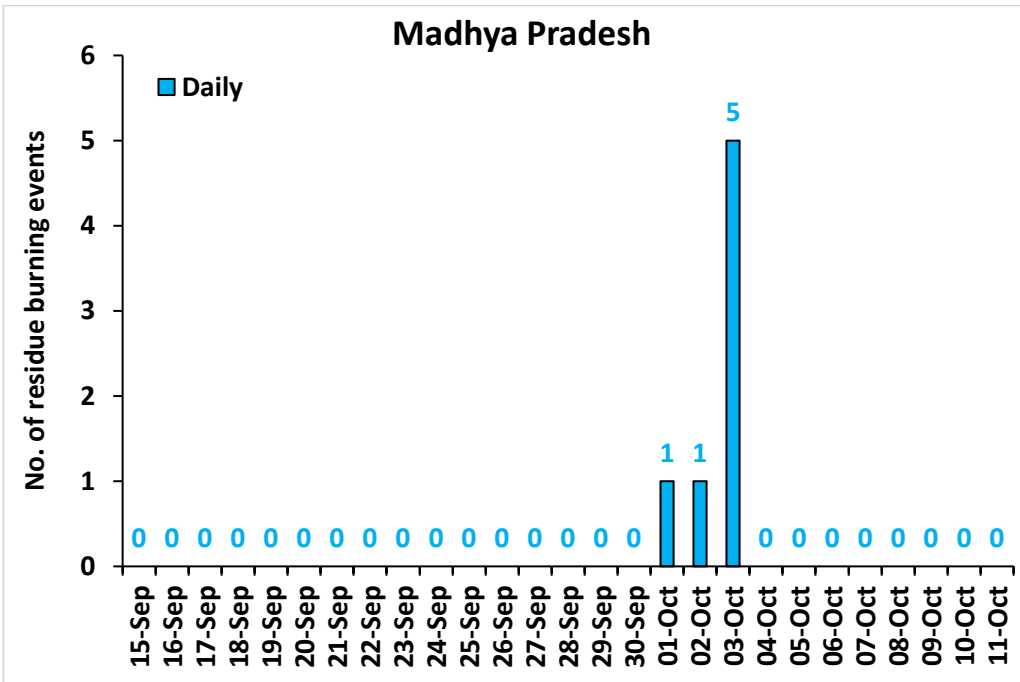
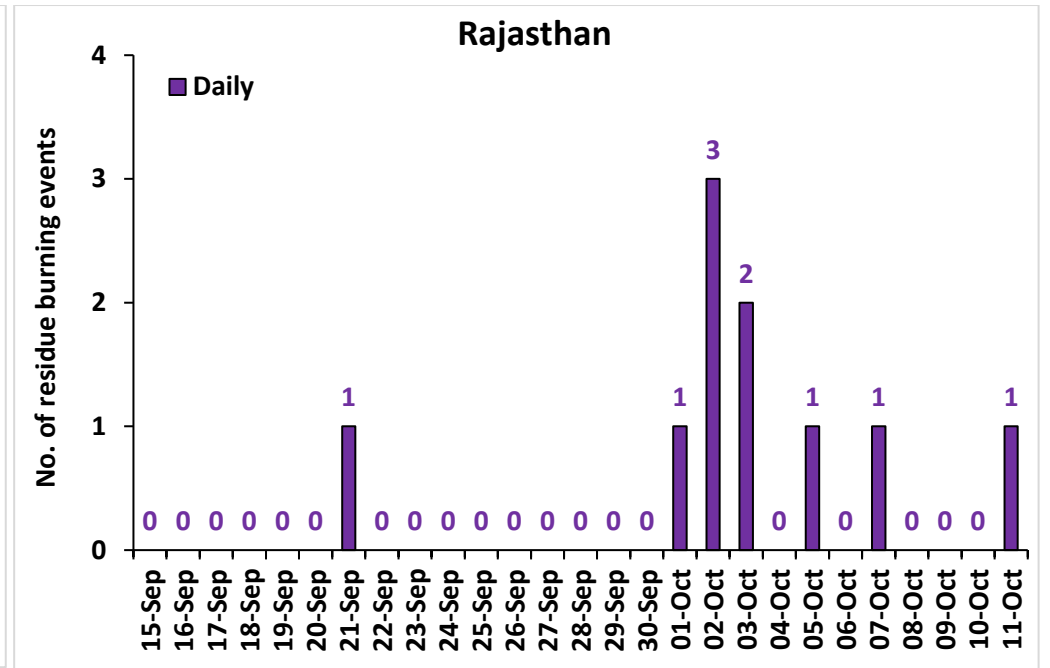
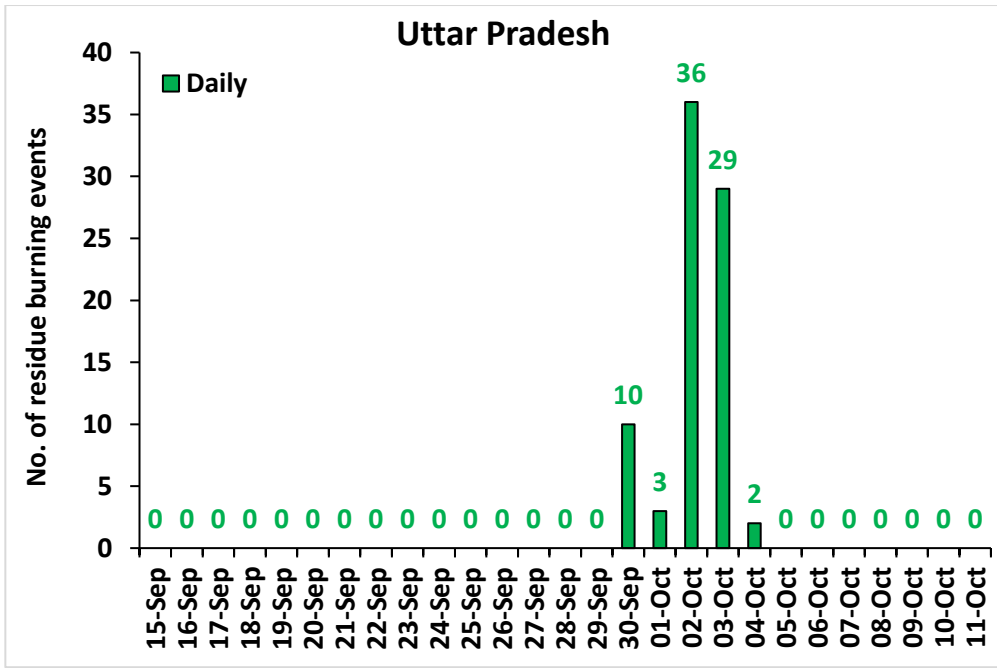
<http://creams.iari.res.in>

## Highlights for 11-Oct-2022

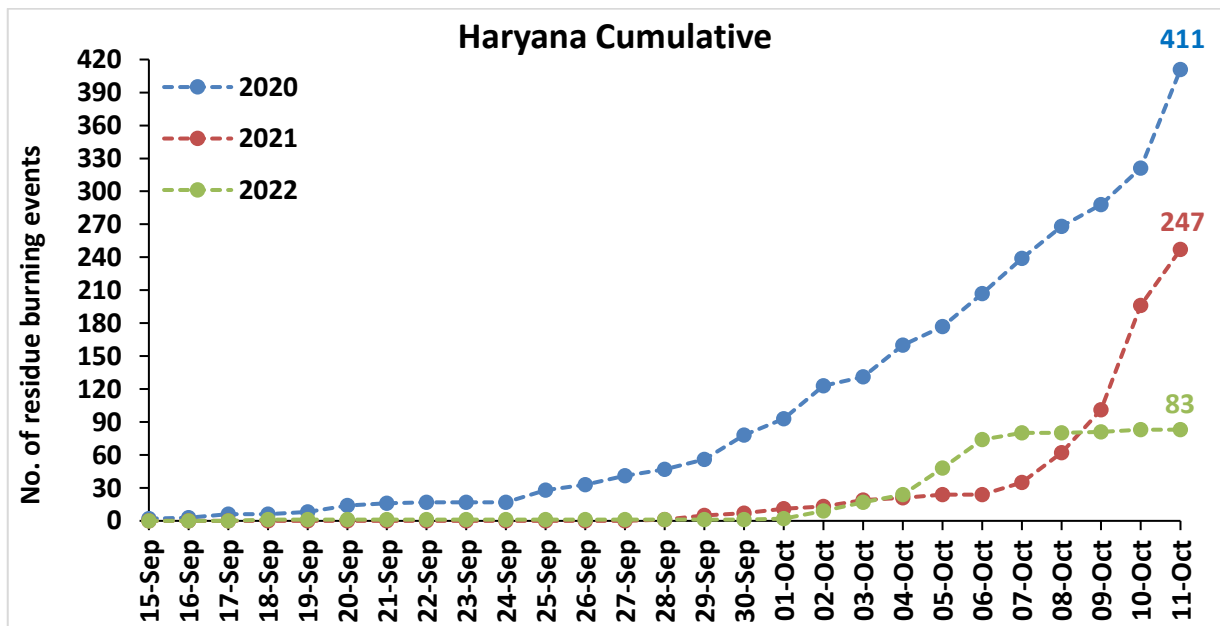
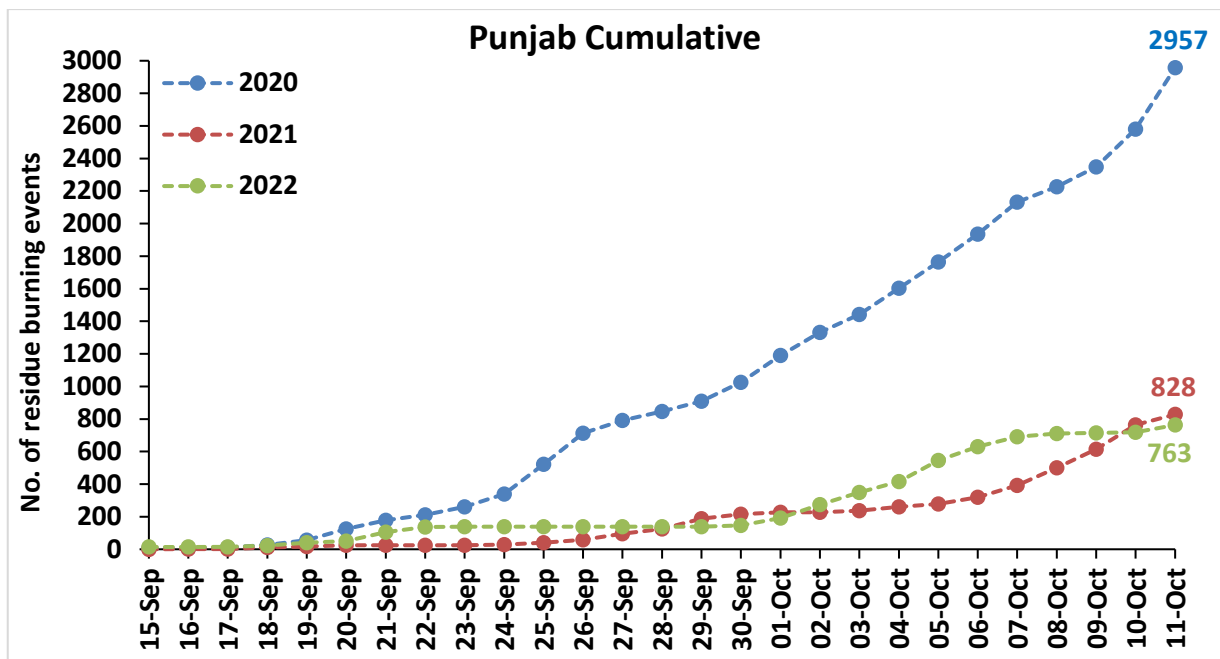
- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **46** residue burning events in the six study States on 11-Oct-2022.
- The state wise events detected on 11-Oct-2022 were **45** in Punjab, **0** in Haryana, **0** in UP, **0** in Delhi, **1** in Rajasthan and **0** in MP.
- Total **945** burning events were detected in the six states between 15-Sept-2022 and 11-Oct-2022, which are distributed as **763**, **83**, **80**, **2**, **10** and **7** in Punjab, Haryana, UP, Delhi, Rajasthan and MP, respectively.
- Detection of residue burning events was hampered by the presence of clouds over northern Haryana, Delhi, Uttar Pradesh and Madhya Pradesh.

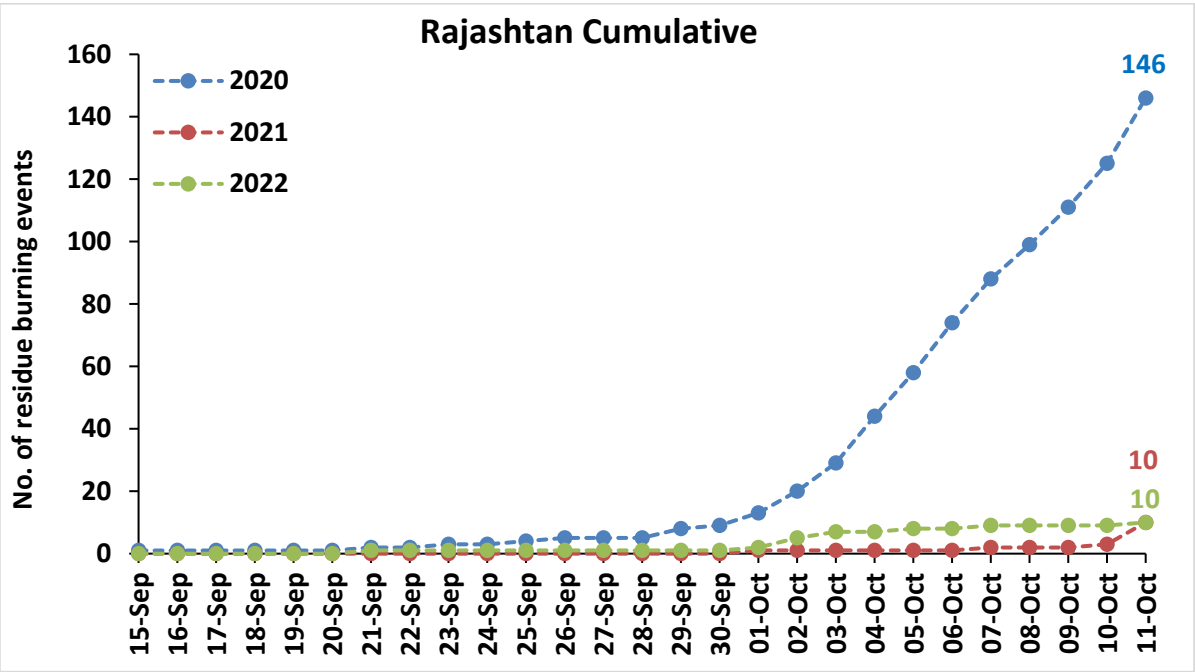
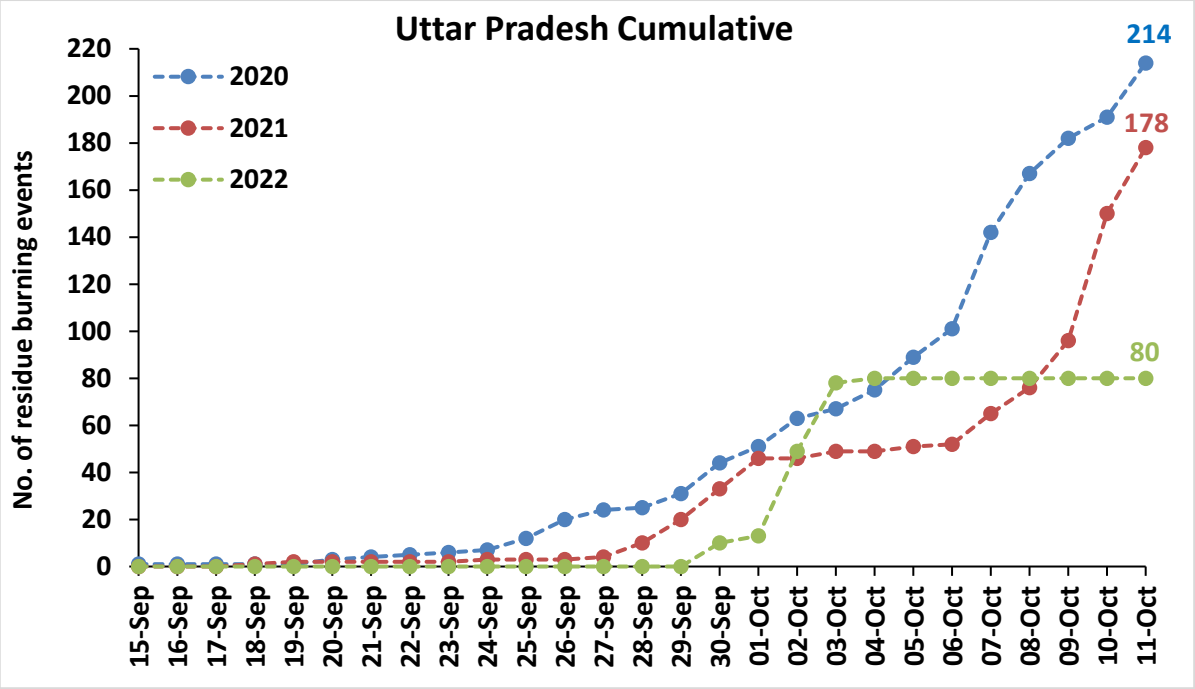
### Temporal distribution of rice residue burning events for the study States in 2022

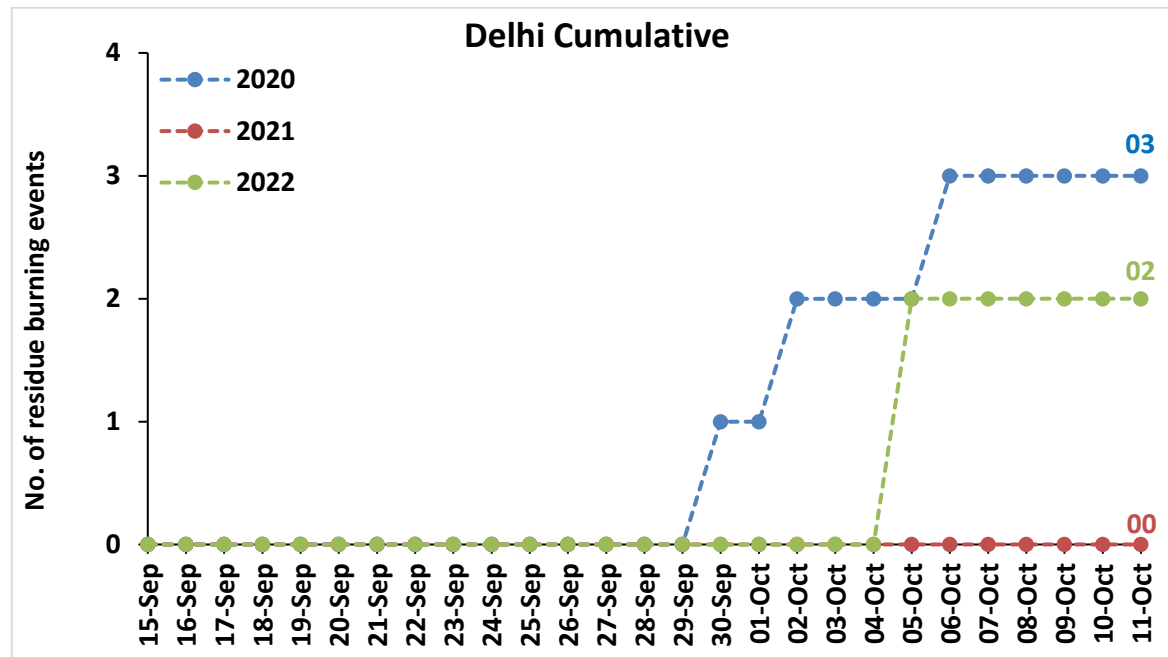
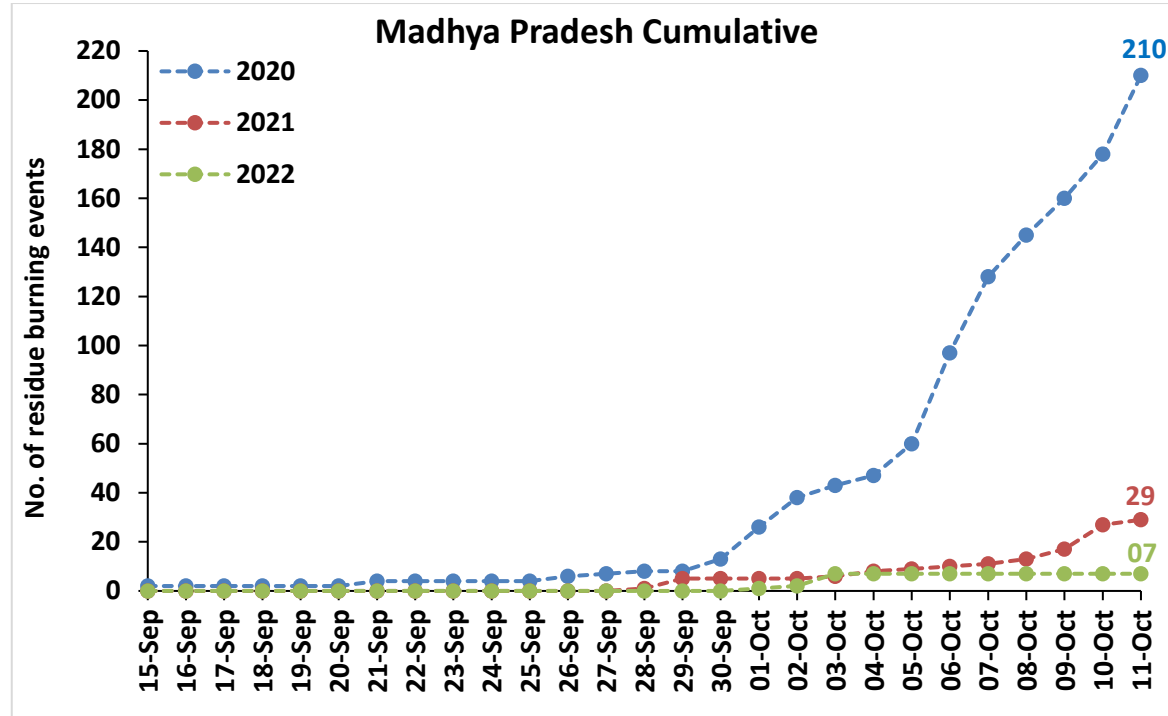




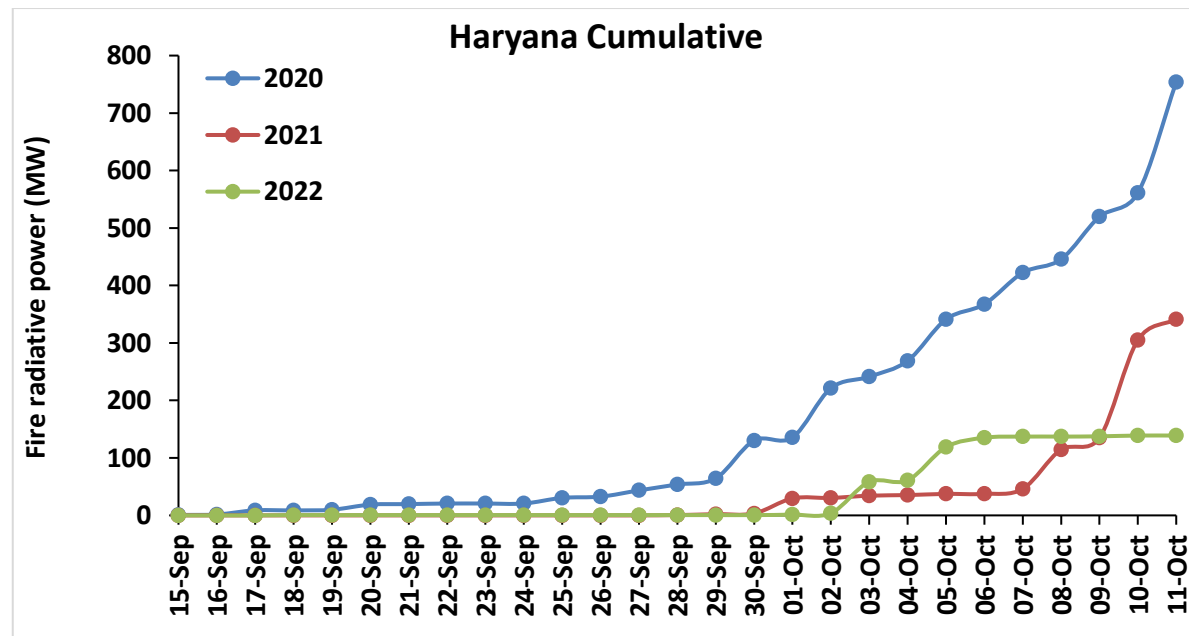
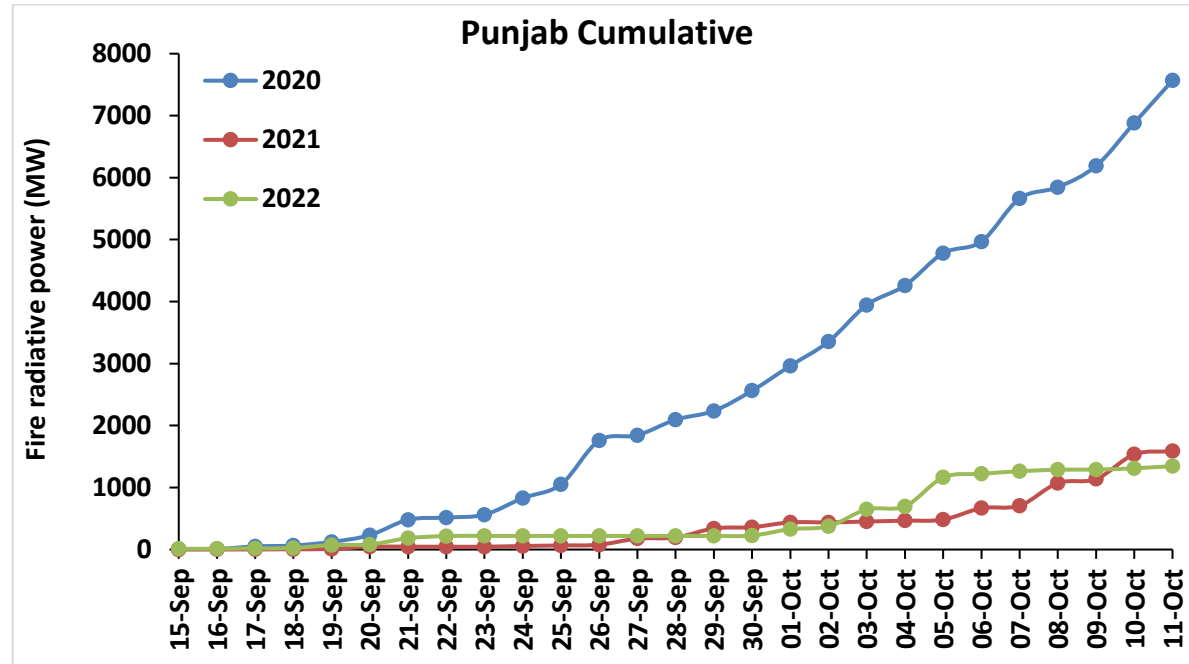
**Comparison of residue burning events in current year (2022) with previous years (2020 and 2021) for the study States**

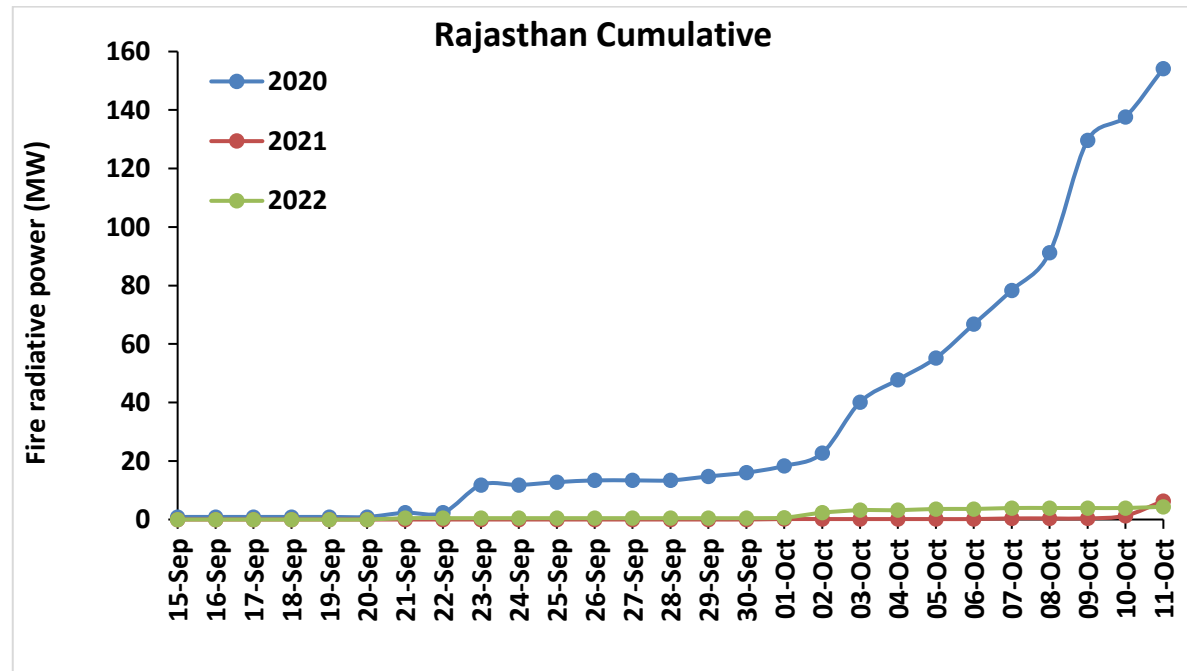
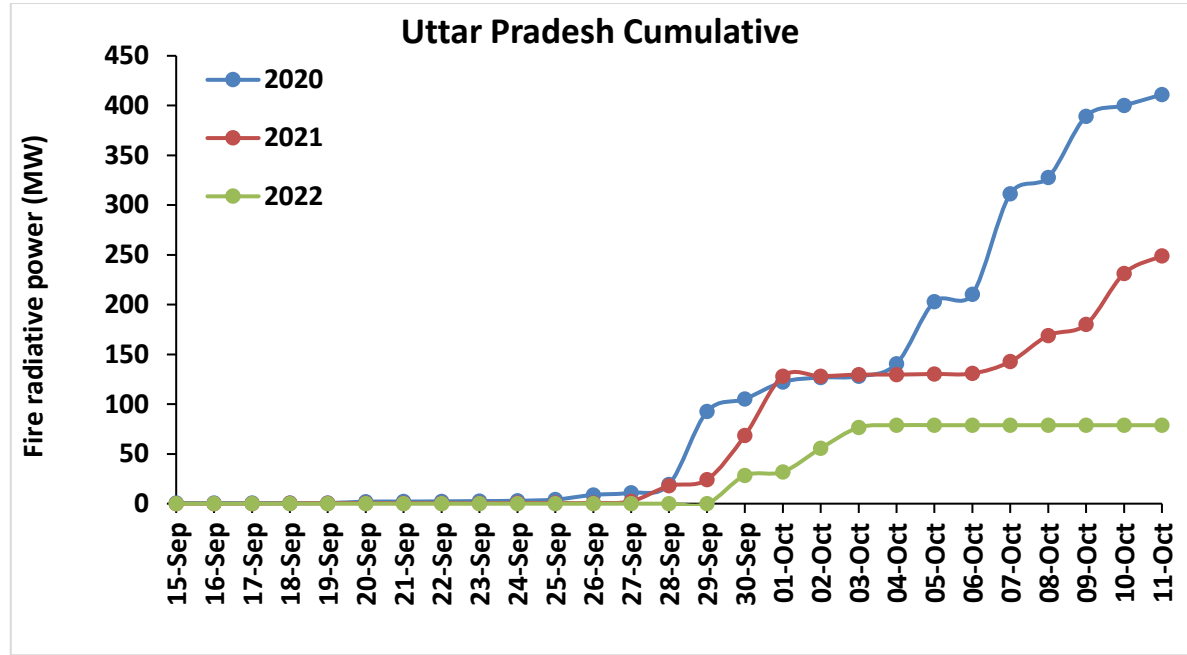




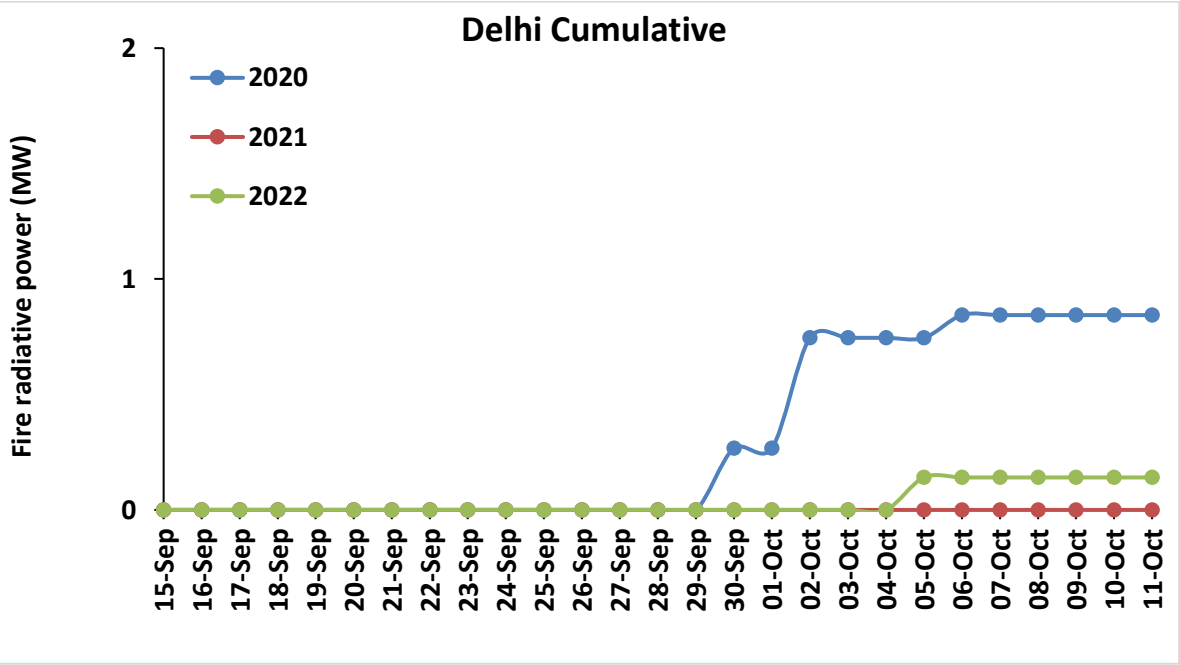
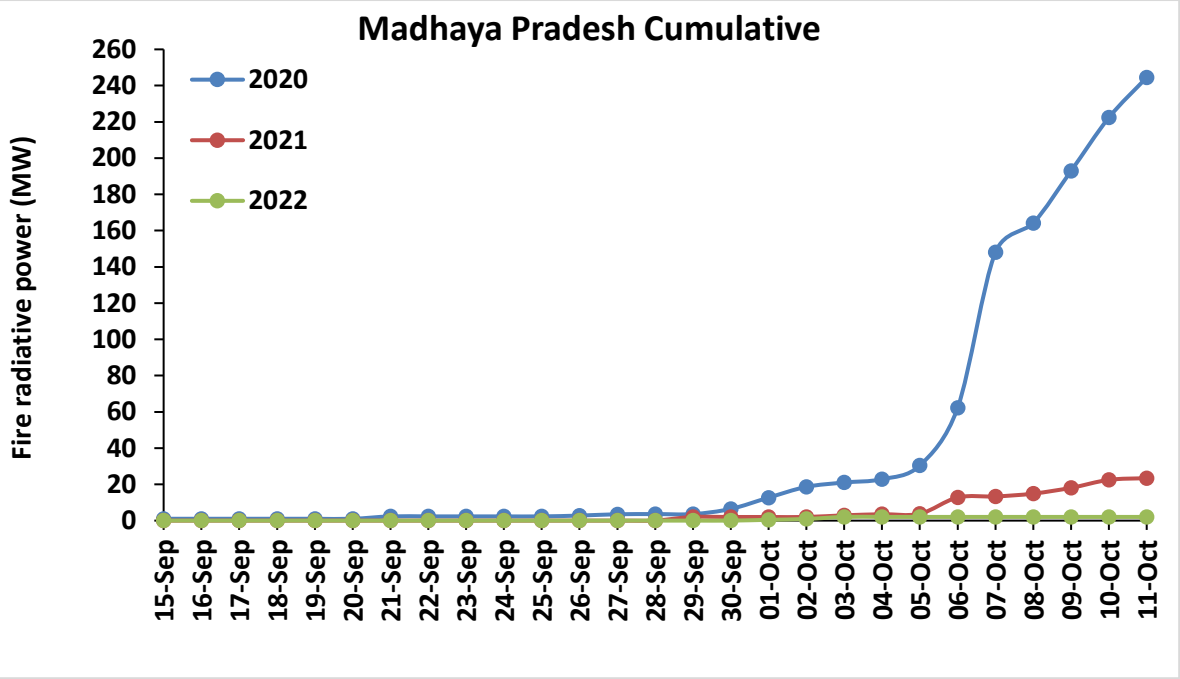


**Comparison of residue burning fire power in current year (2022) with previous years (2021 and 2020) for the study States**



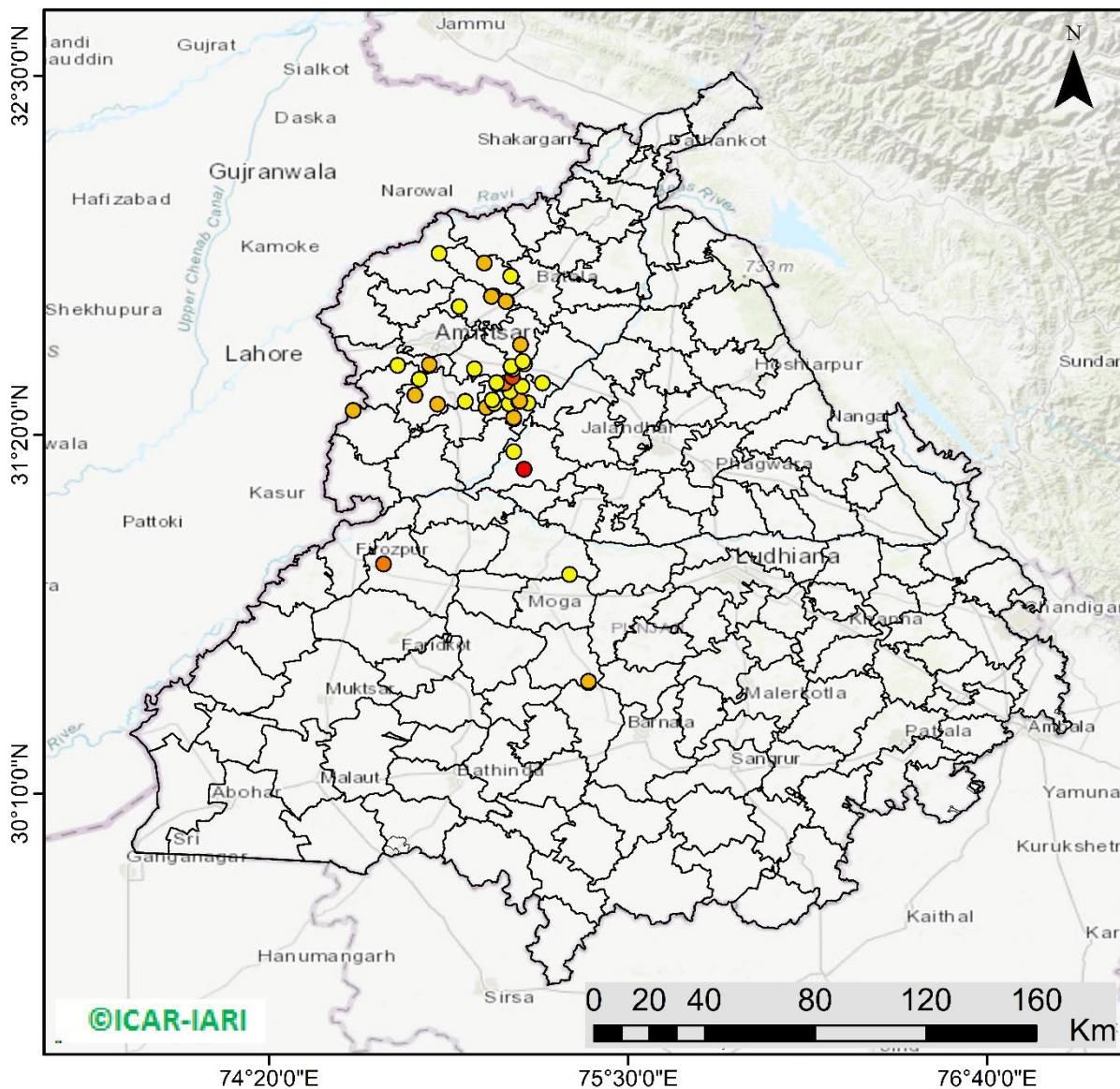






# Punjab

## RICE RESIDUE BURNING IN PUNJAB



**45** burning events detected in Punjab during (11th Oct 2022)

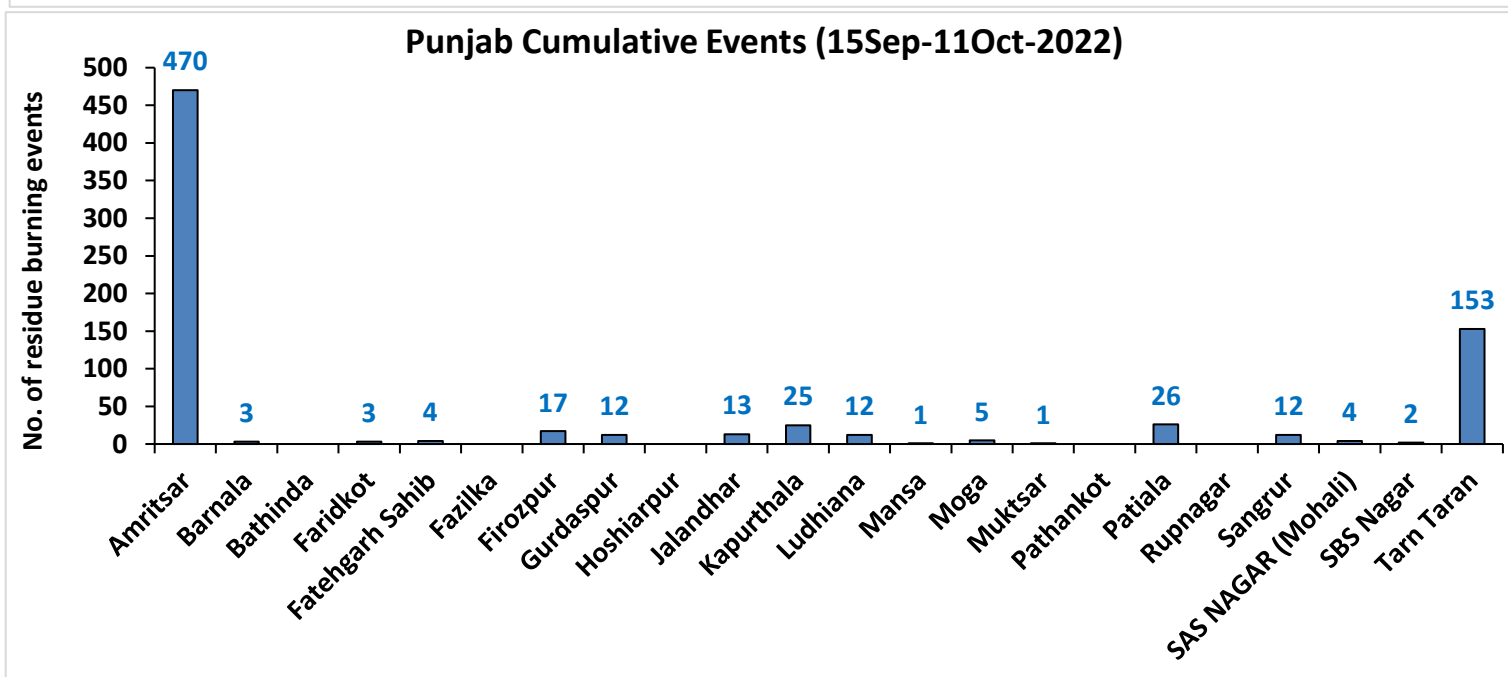
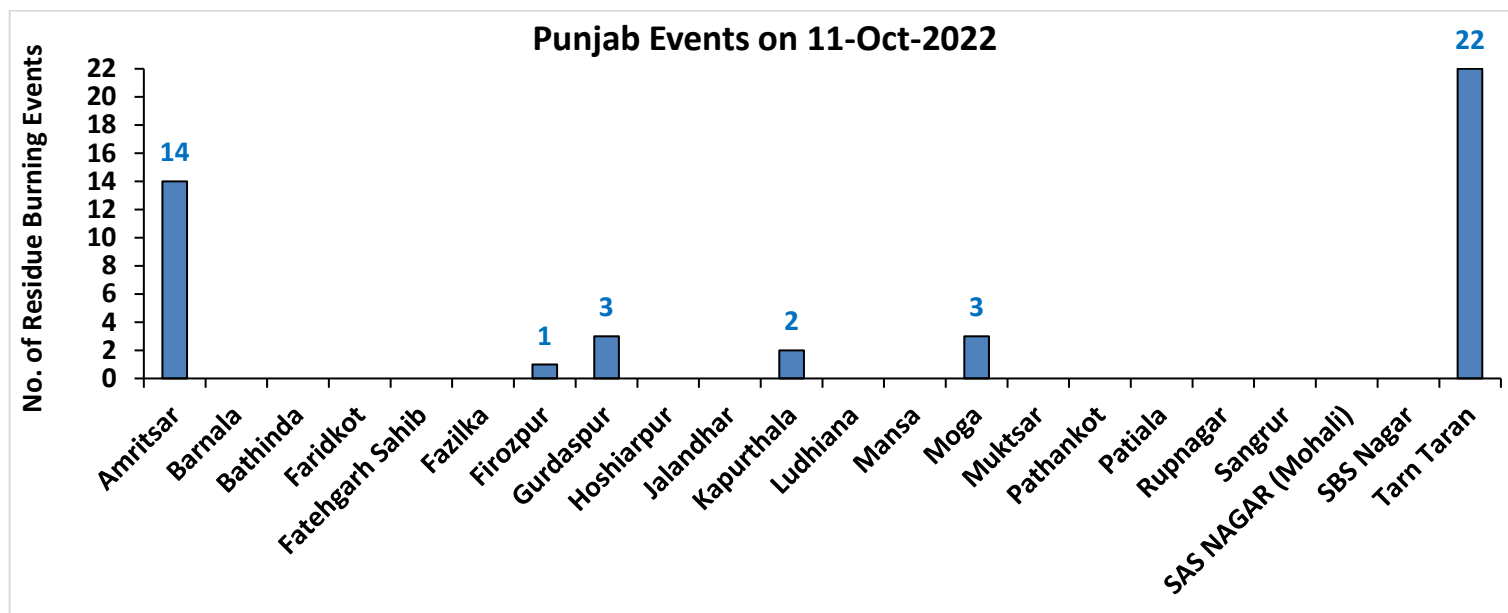
### Fire Intensity (W/m<sup>2</sup>)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20



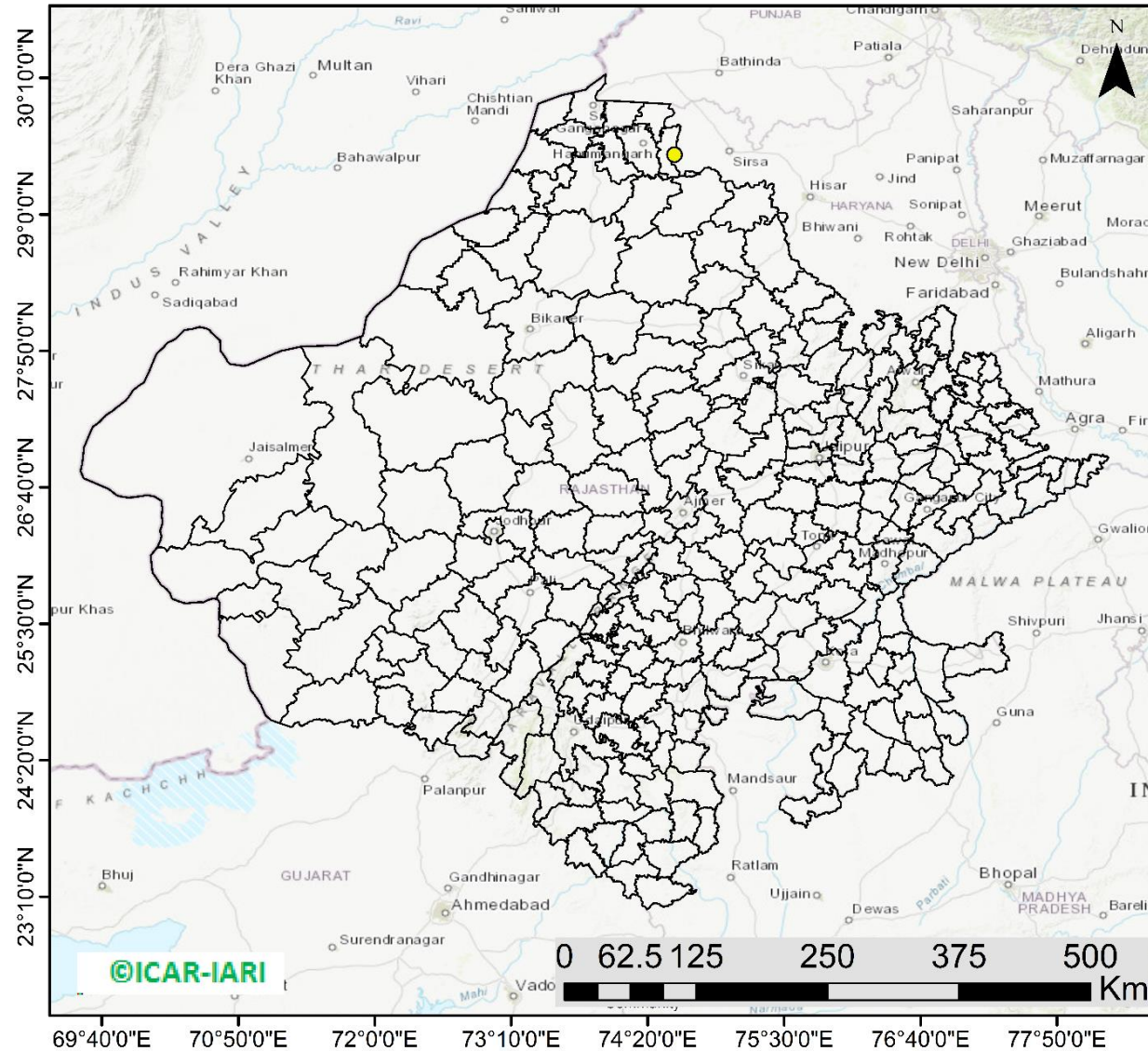
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

## District-wise cumulative number of residues burning events in Punjab (15Sep- 11Oct-2022)



# Rajasthan

## RICE RESIDUE BURNING IN RAJASTHAN



**01** burning events detected in Rajasthan on (11th Oct 2022)

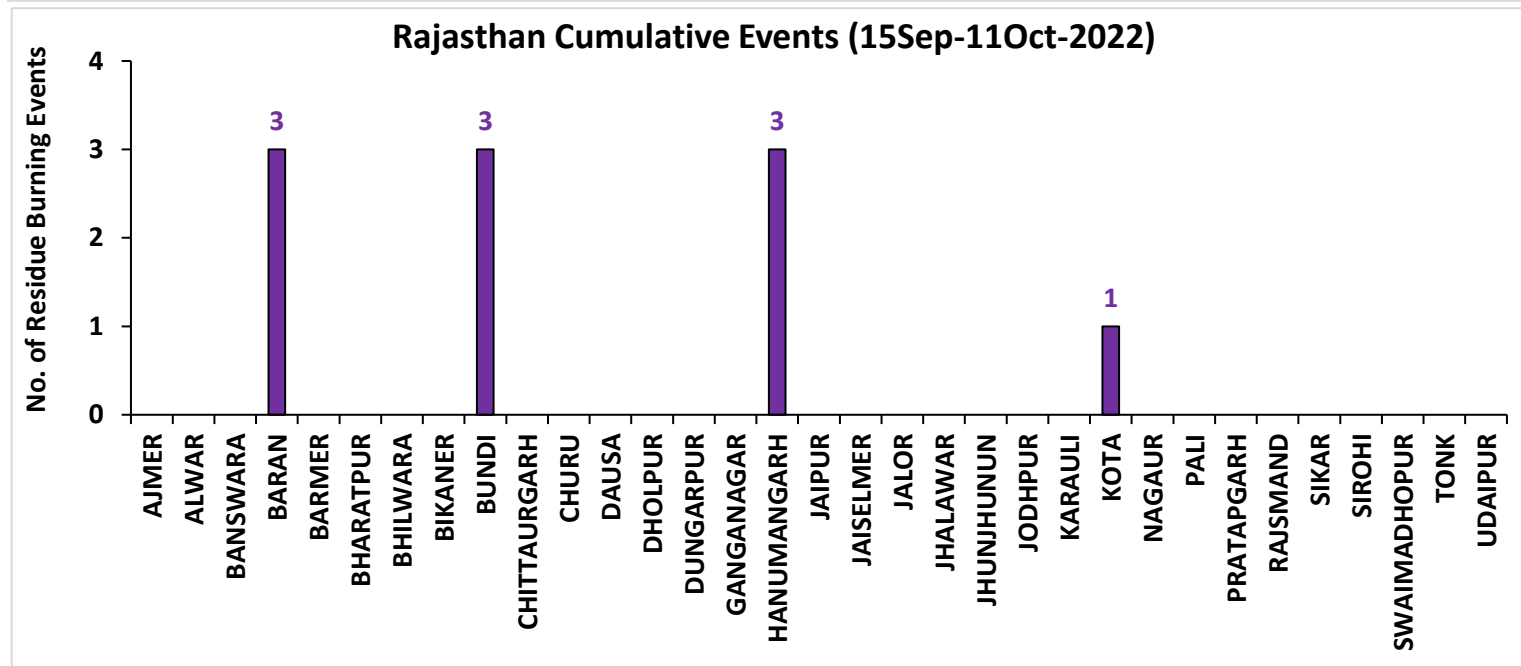
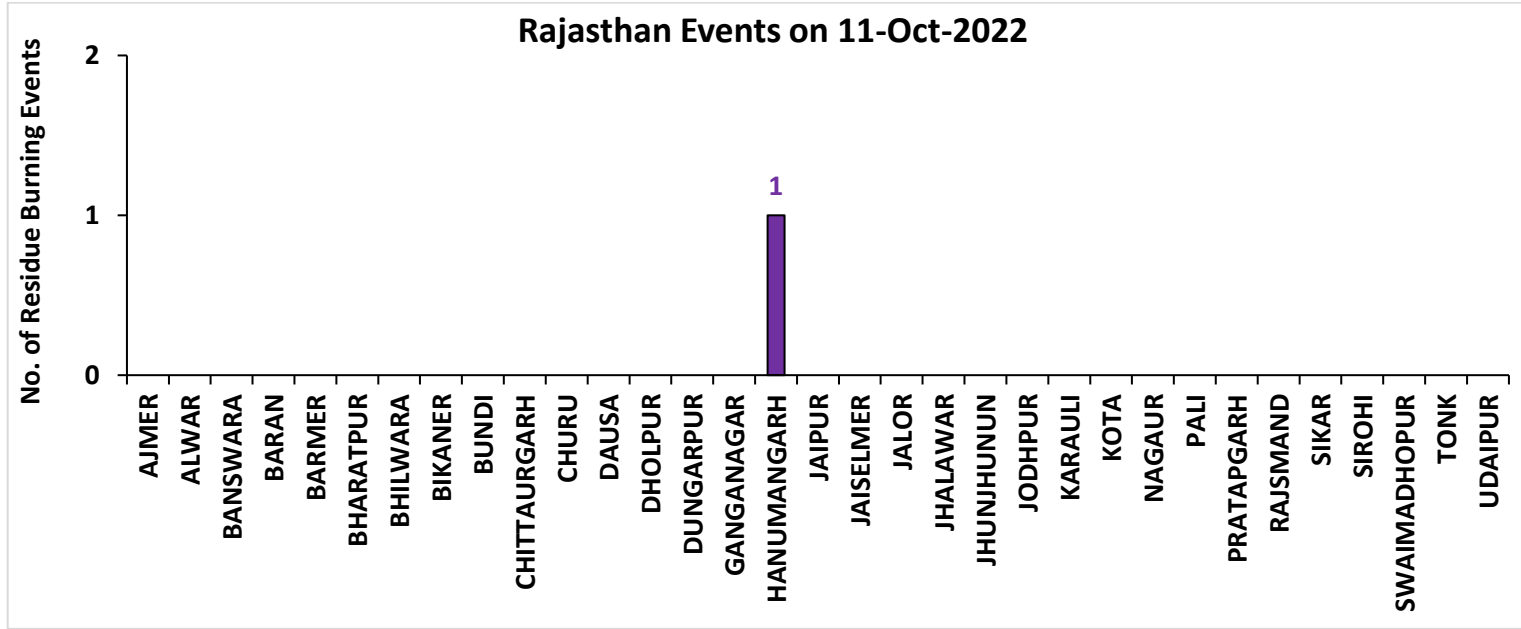
### Fire Intensity (W/m<sup>2</sup>)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20



<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Rajasthan (15Sep- 11Oct -2022)



**District-wise cumulative number of residues burning events detected in 2020 ,2021 and 2022**  
**(Period: 15 September-11 October)**

**(a) Punjab**

District	15 Sep-11 Oct 2022		
	2020	2021	2022
Amritsar	1426	343	470
Barnala	6	5	3
Bathinda	10	0	0
Faridkot	27	20	3
Fatehgarh Sahib	45	28	4
Fazilka	7	7	0
Firozpur	98	25	17
Gurdaspur	155	27	12
Hoshiarpur	6	1	0
Jalandhar	40	19	13
Kapurthala	63	26	25
Ludhiana	85	61	12
Mansa	8	1	1
Moga	22	8	5
Muktsar	4	2	1
Pathankot	0	0	0
Patiala	209	67	26
Rupnagar	10	4	0
Sangrur	70	11	12
SAS NAGAR (Mohali)	17	11	4
SBS Nagar	9	2	2
Tarn Taran	640	160	153
<b>Total</b>	<b>2957</b>	<b>828</b>	<b>763</b>

**(b) Haryana**

District	15 Sep-11 Oct 2022		
	2020	2021	2022
AMBALA	57	13	10
BHIWANI	0	0	0
CHARKHI DADRI	0	0	0
FARIDABAD	0	1	0
FATEHABAD	29	9	3
GURGAON	0	0	0
HISAR	4	0	0
JHAJJAR	1	0	0
JIND	9	9	8
KAITHAL	65	50	9
KARNAL	116	94	20
KURUKSHETRA	81	49	27
MAHENDRAGARH	0	0	0
MEWAT	0	0	0
PALWAL	5	7	0
PANCHKULA	0	0	0
PANIPAT	6	3	1
REWARI	0	0	0
ROHTAK	0	0	0
SIRSA	3	0	0
SONIPAT	6	1	2
YAMUNANAGAR	29	11	3
<b>Total</b>	<b>411</b>	<b>247</b>	<b>83</b>

(c) Uttar Pradesh

District	15 Sep-11 Oct 2022										
	2020	2021	2022	GAUTAMBUDHNAGAR	1	4	0	MUZAFARNAGAR	2	0	0
AGRA	1	0	0	GAZIPUR	0	0	0	PILHIBHIT	4	7	2
ALIGARH	17	3	1	GHAZIABAD	1	2	1	PRATAPGARH	0	0	0
ALLAHABAD	0	0	0	GONDA	0	0	0	RAIBEARELI	1	0	0
AMBEDKARNAGAR	0	0	0	GORAKHPUR	0	0	0	RAMPUR	8	16	0
AMETHI	0	1	0	HAMIRPUR	0	0	0	SAMBHAL	6	1	4
AMROHA	1	0	0	HAPUR	3	0	0	SANTKABIRNAGAR	0	0	0
AURAIYA	12	1	4	HARDOI	2	4	0	SANTRAVIDASNAGAR	0	0	0
AZAMGARH	0	0	0	HATHRAS	0	0	0	SHAHJAHANPUR	16	87	53
BADAUN	0	0	0	JALAUN	0	0	0	SHAMLI	17	5	2
BAGHPAT	1	0	0	JAUNPUR	0	0	0	SHARANPUR	15	0	0
BAHRAICH	2	2	0	JHANSI	5	0	0	SHRAWASTI	0	0	0
BALLIA	0	0	0	KANNAUJ	2	0	0	SIDDHARTHANAGAR	0	0	0
BALRAMPUR	0	0	0	KANPUR	0	1	0	SITAPUR	8	1	0
BANDA	0	0	0	KANPUR DEHAT	2	0	0	SONBHADRA	0	0	0
BARABANKI	10	0	0	KASGANJ	1	0	0	SULTANPUR	0	0	0
BAREILLY	7	4	0	KAUSHAMBI	7	1	0	UNNAO	2	0	0
BASTI	2	0	0	KHERI	16	16	8	VARANASI	0	0	0
BIJNOR	3	1	1	KUSHINAGAR	0	0	0	<b>Total</b>	<b>214</b>	<b>178</b>	<b>80</b>
BULANDSAHAR	3	1	2	LALITPUR	0	1	2				
CHANDAULI	0	0	0	LUCKNOW	2	0	0				
CHITRAKOOT	0	0	0	MAHARAJGANJ	0	0	0				
DEORIA	0	0	0	MAHOBA	0	0	0				
ETAH	4	2	0	MAINPURI	0	2	0				
ETAWAH	2	3	0	MATHURA	5	6	0				
FAIZABAD	0	0	0	MAU	0	0	0				
FARRUKHABAD	0	0	0	MEERUT	9	0	0				
FATEHPUR	7	0	0	MIRZAPUR	5	5	0				
FIROZABAD	1	0	0	MORADABAD	1	1	0				

**(d) Delhi**

District	15 Sep-11 Oct 2022		
	2020	2021	2022
CENTRAL	0	0	0
EAST	0	0	0
NEW DELHI	0	0	0
NORTH	2	0	2
NORTH EAST	0	0	0
NORTH WEST DELHI	0	0	0
SHAHADRA	0	0	0
SOUTH	1	0	0
SOUTH EAST	0	0	0
SOUTH WEST DELHI	0	0	0
WEST DELHI	0	0	0
<b>Total</b>	<b>3</b>	<b>0</b>	<b>2</b>

**(e) Rajasthan**

District	15 Sep-11 Oct 2022		
	2020	2021	2022
AJMER	0	0	0
ALWAR	1	0	0
BANSWARA	0	0	0
BARAN	67	0	3
BARMER	2	0	0
BHARATPUR	0	0	0
BHILWARA	2	0	0
BIKANER	0	0	0
BUNDI	3	0	3
CHITTAURGARH	0	1	0
CHURU	0	0	0
DAUSA	0	0	0
DHOLPUR	0	0	0
DUNGARPUR	0	0	0
GANGANAGAR	2	0	0
HANUMANGARH	40	9	3
JAIPUR	0	0	0
JAISELMER	2	0	0
JALOR	0	0	0
JHALAWAR	0	0	0
JHUNJHUNUN	1	0	0
JODHPUR	1	0	0
KARAULI	1	0	0
KOTA	19	0	1
NAGAUR	0	0	0
PALI	1	0	0
PRATAPGARH	0	0	0
RAJSMAND	0	0	0
SIKAR	0	0	0
SIROHI	1	0	0
SWAIMADHOPUR	2	0	0
TONK	1	0	0
UDAIPUR	0	0	0
<b>Total</b>	<b>146</b>	<b>10</b>	<b>10</b>



(f) Madhya Pradesh

District	15 Sep-11 Oct 2022						
	2020	2021	2022				
				PANNA	1	0	0
ALIRAJPUR	0	0	0	RAISEN	3	0	0
ANUPPUR	0	0	0	RAJGARH	6	1	2
ASHOKNAGAR	7	0	0	RATLAM	0	0	0
BALAGHAT	0	0	0	REWA	2	0	0
BARWANI	0	0	0	SAGAR	10	3	1
BETUL	0	0	0	SATNA	3	0	0
BHIND	0	0	0	SEHORE	4	0	1
BHOPAL	3	2	0	SEONI	2	2	0
BURHANPUR	0	0	0	SHAHDOL	0	0	0
CHHATARPUR	3	0	0	SHAJAPUR	4	0	0
CHHINDWARA	0	0	0	SHEOPUR	5	0	0
DAMOH	11	1	0	SHIVPURI	3	0	0
DATIA	17	2	0	SIDHI	0	0	0
DEWAS	3	0	0	SINGRAULI	0	0	0
DHAR	16	0	0	TIKAMGARH	1	0	0
DINDORI	0	0	0	UJJAIN	5	0	0
EAST NIMAR	1	1	0	UMARIA	0	0	0
GUNA	9	1	1	VIDESHA	42	5	1
GWALIOR	18	0	1	WEST NIMAR	2	0	0
HARDA	8	7	0	<b>Total</b>	<b>210</b>	<b>29</b>	<b>7</b>
HOSHANGABAD	7	0	0				
INDORE	2	0	0				
JABALPUR	6	1	0				
JHABUA	0	0	0				
KATNI	0	0	0				
MANDLA	0	0	0				
MANDSAUR	0	0	0				
MORENA	5	2	0				
NARSHIMAPURA	1	1	0				
NIMACH	0	0	0				

**State-wise and date-wise number of paddy residue burning events detected in 2020, 2021 and 2022**  
**(Period: 15 September - 11 October 2022)**

**Number of Paddy Residue Burning Events Detected**

	Punjab			Haryana			Uttar Pradesh			Delhi			Rajasthan			Madhya Pradesh		
	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022
15-Sep	5	0	14	2	0	0	1	0	0	0	0	0	1	0	0	2	0	0
16-Sep	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-Sep	5	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Sep	17	9	7	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
19-Sep	30	5	18	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0
20-Sep	67	8	10	6	0	0	2	0	0	0	0	0	0	0	0	0	0	0
21-Sep	54	0	56	2	0	0	1	0	0	0	0	0	1	0	1	2	0	0
22-Sep	34	0	30	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
23-Sep	49	0	3	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
24-Sep	78	5	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
25-Sep	184	11	0	11	0	0	5	0	0	0	0	0	1	0	0	0	0	0
26-Sep	190	19	0	5	0	0	8	0	0	0	0	0	1	0	0	2	0	0
27-Sep	78	37	0	8	0	0	4	1	0	0	0	0	0	0	0	1	0	0
28-Sep	55	28	0	6	1	0	1	6	0	0	0	0	0	0	0	1	1	0
29-Sep	63	64	0	9	4	0	6	10	0	0	0	0	3	0	0	0	4	0
30-Sep	116	27	8	22	2	0	13	13	10	1	0	0	1	0	0	5	0	0
01-Oct	165	13	45	15	4	1	7	13	3	0	0	0	4	1	1	13	0	1
02-Oct	141	0	83	30	2	7	12	0	36	1	0	0	7	0	3	12	0	1
03-Oct	110	9	75	8	6	8	4	3	29	0	0	0	9	0	2	5	1	5
04-Oct	162	23	65	29	2	7	8	0	2	0	0	0	15	0	0	4	2	0
05-Oct	161	18	130	17	3	24	14	2	0	0	0	2	14	0	1	13	1	0
06-Oct	171	42	85	30	0	26	12	1	0	1	0	0	16	0	0	37	1	0
07-Oct	197	72	62	32	11	6	41	13	0	0	0	0	14	1	1	31	1	0
08-Oct	95	108	19	29	27	0	25	11	0	0	0	0	11	0	0	17	2	0

<b>09-Oct</b>	121	114	3	20	39	1	15	20	0	0	0	0	12	0	0	15	4	0
<b>10-Oct</b>	232	150	4	33	95	2	9	54	0	0	0	0	14	1	0	18	10	0
<b>11-Oct</b>	377	64	45	90	51	0	23	28	0	0	0	0	21	7	1	32	2	0
<b>Total</b>	<b>2957</b>	<b>828</b>	<b>763</b>	<b>411</b>	<b>247</b>	<b>83</b>	<b>214</b>	<b>178</b>	<b>80</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>146</b>	<b>10</b>	<b>10</b>	<b>210</b>	<b>29</b>	<b>7</b>

### Details of residue burning events in Punjab on 11-Oct-2022

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMRITSAR	AJNALA	S-NPP	31.92230	74.88590	13:54:17	D	3.30
2	AMRITSAR	ATTARI	S-NPP	31.56100	74.85420	13:54:17	D	5.60
3	AMRITSAR	JANDIALA GURU	S-NPP	31.54600	75.12500	13:54:17	D	3.40
4	AMRITSAR	JANDIALA GURU	S-NPP	31.54680	75.00070	13:54:17	D	1.50
5	AMRITSAR	JANDIALA GURU	S-NPP	31.55390	75.11940	13:54:17	D	2.30
6	AMRITSAR	JANDIALA GURU	S-NPP	31.55470	75.11990	13:54:17	D	1.60
7	AMRITSAR	MAJITHA	S-NPP	31.74950	74.95130	13:54:17	D	4.30
8	AMRITSAR	MAJITHA	S-NPP	31.76610	75.10300	13:54:17	D	6.20
9	AMRITSAR	MAJITHA	S-NPP	31.78250	75.05570	13:54:17	D	6.30
10	AMRITSAR	RAYYA	S-NPP	31.50090	75.22140	13:54:17	D	2.20
11	AMRITSAR	RAYYA	S-NPP	31.52050	75.12400	13:54:17	D	17.50
12	AMRITSAR	RAYYA	S-NPP	31.56330	75.16380	13:54:17	D	2.60
13	AMRITSAR	TARSIKKA	S-NPP	31.57120	75.15810	13:54:17	D	4.40
14	AMRITSAR	TARSIKKA	S-NPP	31.62560	75.15060	13:54:17	D	7.40
15	FIROZPUR	GHALL KHURD	S-NPP	30.91250	74.70540	13:54:17	D	12.50
16	GURDASPUR	BATALA	S-NPP	31.76600	75.10540	13:54:17	D	4.70
17	GURDASPUR	FATEHGARH CHURIAN	S-NPP	31.84840	75.11880	13:54:17	D	2.60
18	GURDASPUR	FATEHGARH CHURIAN	S-NPP	31.89110	75.03280	13:54:17	D	5.60
19	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.22080	75.16200	13:54:17	D	20.10
20	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.27780	75.12830	13:54:17	D	4.40
21	MOGA	KOT ISE KHAN AT DHARAMKOT	S-NPP	30.87870	75.30960	13:54:17	D	3.70
22	MOGA	NIHAL SINGH	S-NPP	30.52670	75.37190	13:54:17	D	6.00
23	MOGA	NIHAL SINGH	S-NPP	30.53080	75.37130	13:54:17	D	6.10
24	TARN TARAN	BHIKHIWIND	S-NPP	31.41170	74.60660	13:54:17	D	5.20

25	TARN TARAN	GANDIWIND TATLA	S-NPP	31.55850	74.75100	13:54:17	D	2.30
26	TARN TARAN	KHADUR SAHIB	S-NPP	31.38440	75.12840	13:54:17	D	8.80
27	TARN TARAN	KHADUR SAHIB	S-NPP	31.38850	75.12790	13:54:17	D	8.80
28	TARN TARAN	KHADUR SAHIB	S-NPP	31.42140	75.03890	13:54:17	D	5.50
29	TARN TARAN	KHADUR SAHIB	S-NPP	31.43340	75.11270	13:54:17	D	3.40
30	TARN TARAN	KHADUR SAHIB	S-NPP	31.43420	75.06470	13:54:17	D	1.80
31	TARN TARAN	KHADUR SAHIB	S-NPP	31.43580	75.17510	13:54:17	D	3.60
32	TARN TARAN	KHADUR SAHIB	S-NPP	31.44140	75.14740	13:54:17	D	8.90
33	TARN TARAN	KHADUR SAHIB	S-NPP	31.44210	75.14390	13:54:17	D	5.40
34	TARN TARAN	KHADUR SAHIB	S-NPP	31.44260	75.14830	13:54:17	D	5.40
35	TARN TARAN	KHADUR SAHIB	S-NPP	31.44620	75.05860	13:54:17	D	4.20
36	TARN TARAN	KHADUR SAHIB	S-NPP	31.47330	75.11710	13:54:17	D	2.70
37	TARN TARAN	KHADUR SAHIB	S-NPP	31.48990	75.15520	13:54:17	D	1.70
38	TARN TARAN	KHADUR SAHIB	S-NPP	31.49830	75.07350	13:54:17	D	4.50
39	TARN TARAN	KHADUR SAHIB	S-NPP	31.49930	75.08230	13:54:17	D	2.40
40	TARN TARAN	KHADUR SAHIB	S-NPP	31.50110	75.09990	13:54:17	D	14.80
41	TARN TARAN	KHADUR SAHIB	S-NPP	31.50250	75.07290	13:54:17	D	1.70
42	TARN TARAN	TARN TARAN	S-NPP	31.43210	74.88070	13:54:17	D	7.00
43	TARN TARAN	TARN TARAN	S-NPP	31.44140	74.97100	13:54:17	D	2.20
44	TARN TARAN	TARN TARAN	S-NPP	31.46200	74.80740	13:54:17	D	5.50
45	TARN TARAN	TARN TARAN	S-NPP	31.51340	74.82160	13:54:17	D	4.10

**Details of residue burning events in Rajasthan on 11-Oct-2022**

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	HANUMANGARH	TIBI	S-NPP	29.51050	74.56310	13:54:17	D	3.10

**The study used data received from following Satellites at NRSC Ground Station**

S. No.	Satellite Name	Sensor	Resolution (meter)	Day / Night Passes
1.	Suomi NPP	VIIRS	375 / 750	Both
2.	Terra	MODIS	1000	Both
3.	Aqua	MODIS	1000	Both

**The rice mask for the Punjab and Haryana were provided by MNCFC, MoA&FW, Govt of India  
The kharif crop mask for Delhi, Uttar Pradesh, Rajasthan and Madhya Pradesh were provided by NRSC**

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GIS Maps of fire events can be visualized online on ICAR KRISHI Geoportal website: <http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

(Part of KRISHI Portal: <https://krishi.icar.gov.in> initiative)

and on IARI CREAMS website (<http://creams.iari.res.in/cms2/index.php>)

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