Wheat rust advisory #13 2025

Wheat rust advisory - risk assessment from surveys and forecasts in Bhutan
Summary period: 23 May - 29 May 2025

Overall risk level:

Moderate (late crops) / Caution

Key messages

Recent surveys in Bumthang detected leaf and stripe rust at low levels. With crops at flowering stage or younger. Given continued very high suitability and presence of susceptible cultivars, stripe rust may increase on these later crops. Crops in western areas are also likely to be at younger growth stages.

Suitability forecast (23 – 28 May) for leaf, stripe and stem rust indicates continued high infection efficiency across wheat growing areas. During the period 19 – 27 May, continued rain is forecast across Bhutan and this is likely to persist and increase 27 May – 4 June. Temperatures (19 – 27 May) are forecast to be mainly cooler than normal, but the Punakha/Wangdue valley and southern areas may be warmer.

Given the short term forecasts with continuing rain, conditions are likely to remain extremely suitable for continued disease development. Further development of stripe rust is considered likely on any later crops. Monitoring for any appearance of stem rust is strongly advised, especially as stem rust has now been confirmed in Nepal.

Recommendations

Very close monitoring of fields, particularly for susceptible varieties at early growth stages, is recommended. Forecast weather conditions, indicate that disease development is increasingly likely. Stripe rust is likely to increase on early growth stage crops and care should be taken to monitor for any possible appearance of stem rust.

Scouting should be undertaken, especially in early stage crops, and farmers informed to be vigilant for the emergence of rust. Risk of stem rust appearance is considered high.

- Awareness should be raised amongst stakeholders at all levels, including farmers, to be vigilant for early appearance of rusts. **Early control to stop increased spread and further build-up of disease is very important.**
- Sampling should be undertaken to determine races of rust present.

Wheat rust advisory #13 2025

Field surveys

Surveys undertaken Feb 10 2025 - May 21 2025. A total of 212 fields surveyed. No stem rust detected. Legend for severity and incidence intensity: Low: less than 20%; moderate: 20-40%; high: more than 40%.

Leaf Rust reported from 42 out of 212 fields surveyed (20%). Moderate to high incidence of leaf rust has been seen in 12 fields (29% of infected fields). Moderate to high severity of leaf rust has been seen in 1 fields (2% of infected fields).

Stripe Rust reported from 101 out of 212 fields surveyed (48%). Moderate to high incidence of stripe rust has been seen in 55 fields (54% of infected fields). Moderate to high severity of stripe rust has been seen in 26 fields (26% of infected fields).

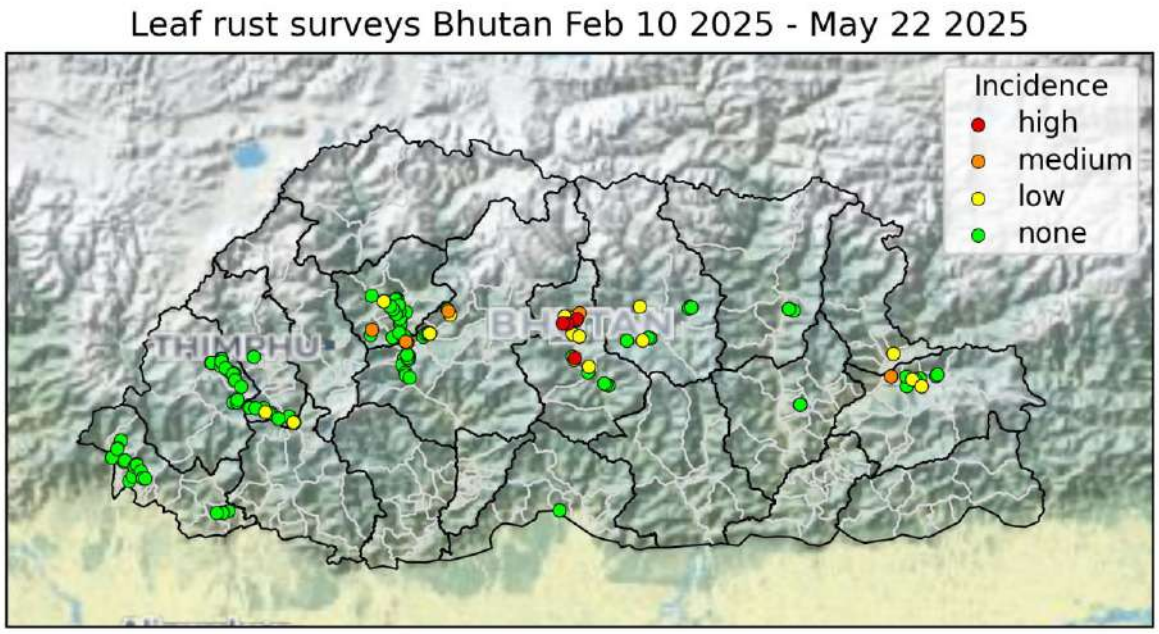
Table 1: Variety analysis of surveys.

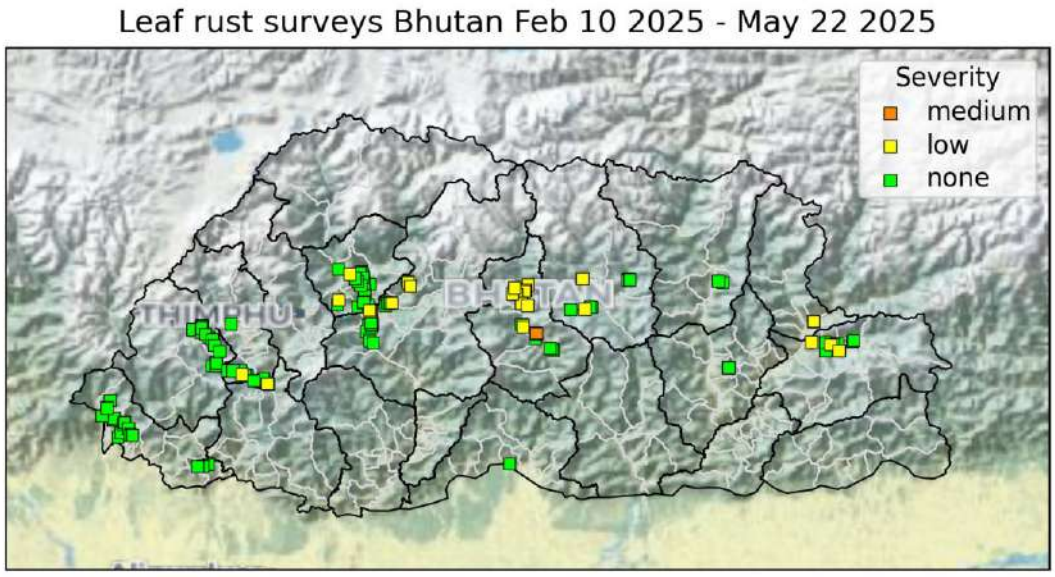
Variety	Number of surveys	Number of surveys reporting infection of		
		stem rust	stripe rust	leaf rust
Bajosokha	1	n/a	1	1
Bumthangkaa Drukchu	1	n/a	0	0
Guma Sokha	8	n/a	0	0
Indian Durum	2	n/a	2	0
Local	7	n/a	3	2
Local barley	1	n/a	0	0
Semolina	1	n/a	0	0
Unknown	191	n/a	95	39

Table 2: Growth stage analysis of surveys conducted in the last week (since May 16 2025).

Country	Number of surveys in the last week that observed wheat growth stage:									
	tillering	boot	heading	flowering	milk	dough	maturity	NA	na	n/a
Bhutan	1	1	2	8	0	0	0	0	0	0

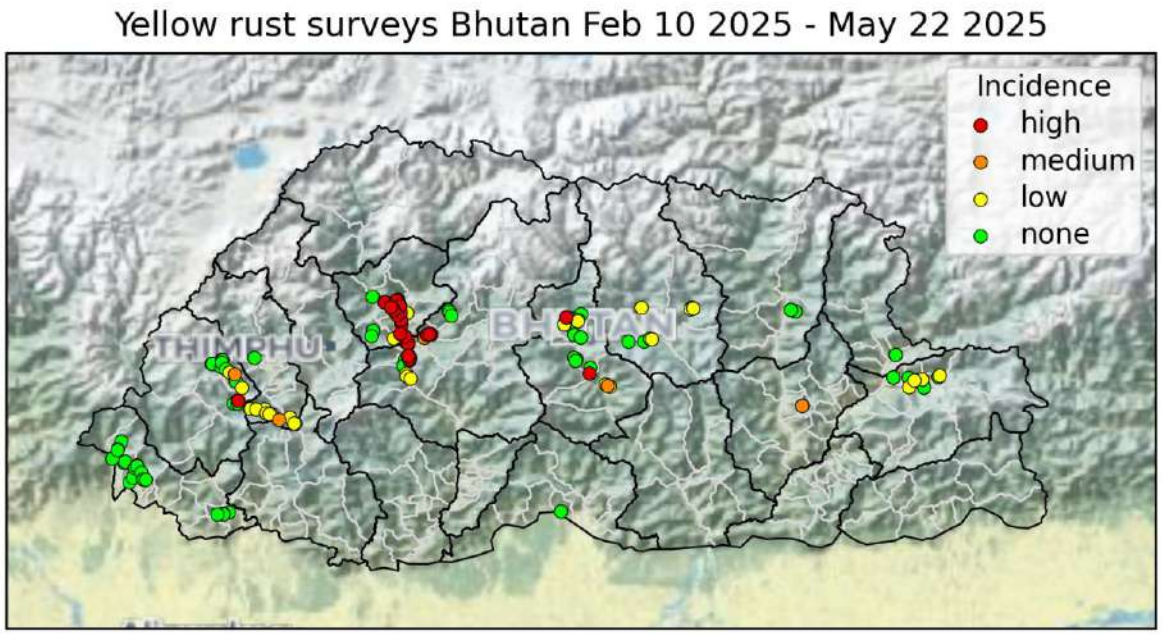
Wheat rust advisory #13 2025

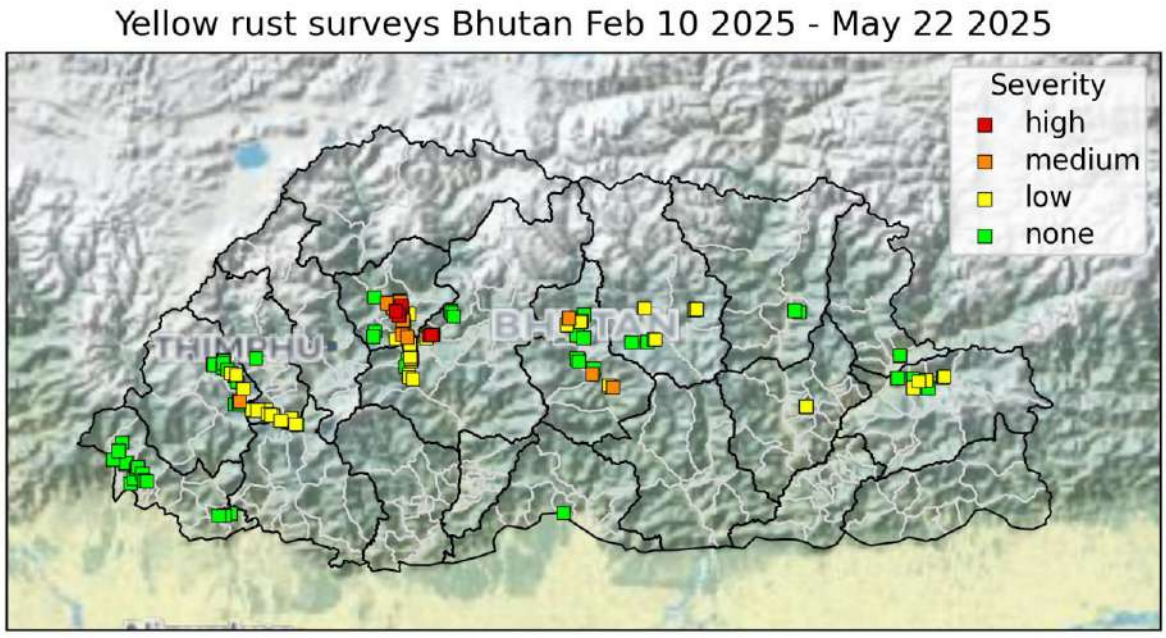




Map 1: Leaf Rust incidence (top) and severity (bottom) in Bhutan field surveys Feb 10 2025 - May 22 2025

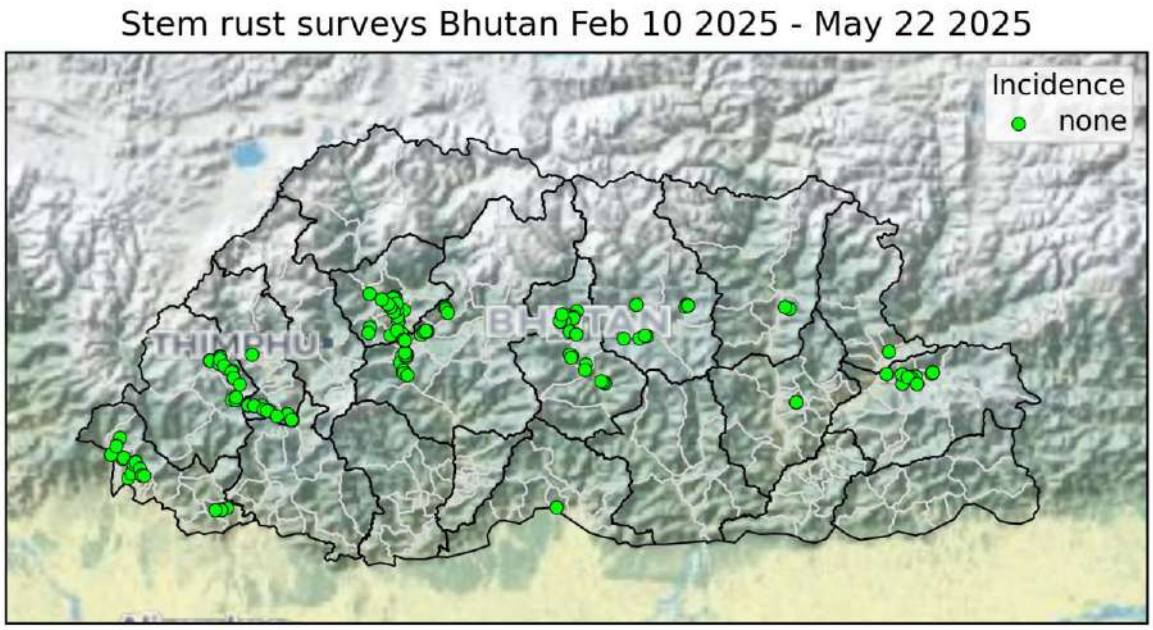
Low: less than 20%; moderate: 20-40%; high: more than 40%.

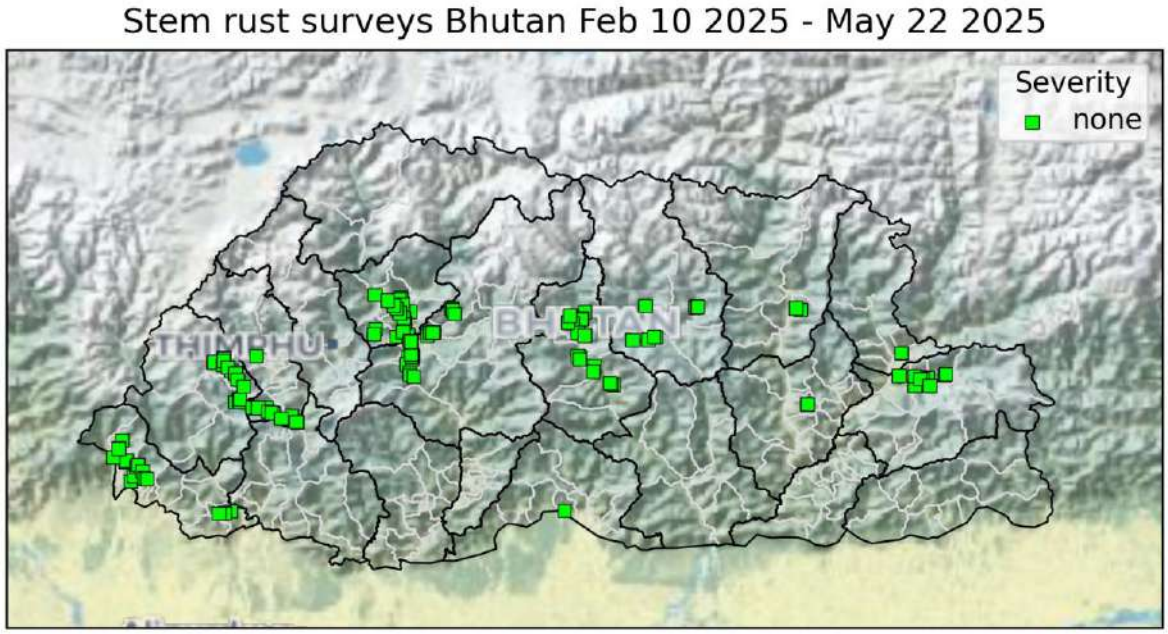




Map 2: Stripe Rust incidence (top) and severity (bottom) in Bhutan field surveys Feb 10 2025 - May 22 2025

Low: less than 20%; moderate: 20-40%; high: more than 40%.





Map 3: Stem Rust incidence (top) and severity (bottom) in Bhutan field surveys Feb 10 2025 - May 22 2025

Low: less than 20%; moderate: 20-40%; high: more than 40%.

Wheat rust advisory #13 2025

Spore dispersal forecasts

Spore dispersal forecasts run by the UK Met Office and Cambridge University are displayed for stem, stripe and leaf rusts for the forecasted period. Surveys in each district are gathered to provide a single source per administrative area for dispersal forecasts (red dots in figure).

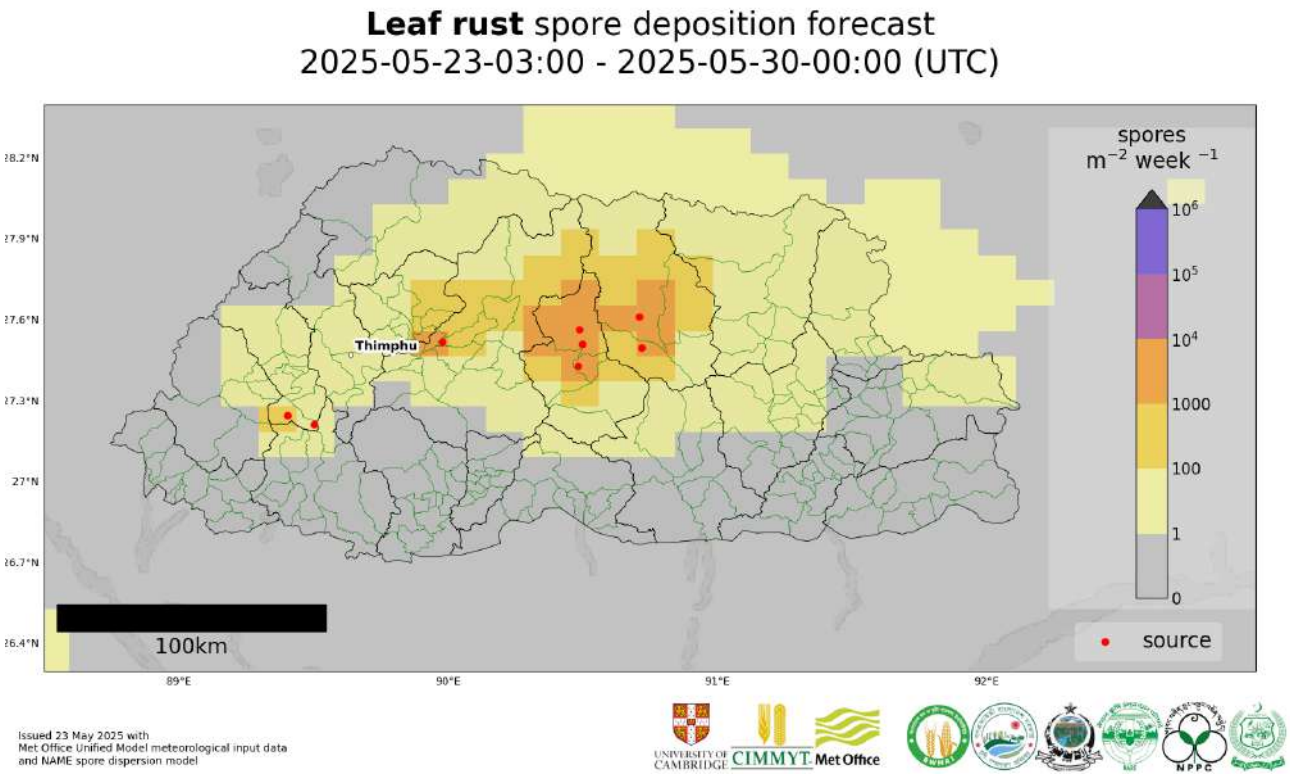
Environmental / climatic suitability for infection forecasts

These forecasts run by the UK Met Office and Cambridge University give the probability of wheat rust infection occurring based on meteorological factors. The maximum infection efficiency that can occur is 100%. This means that 100% of the spores deposited on susceptible wheat plants could complete the infection process. Therefore, a forecast Infection Efficiency of 100% indicates the highest risk of wheat rust infection occurring in susceptible wheat varieties.

Wheat rust advisory #13 2025

Leaf rust

Dispersal: Current forecast (23 May - 29 May) indicates dispersal in an easterly direction. Most spore deposition close to sources in central/western Bhutan. No indication of spore dispersal into Bhutan from other countries.



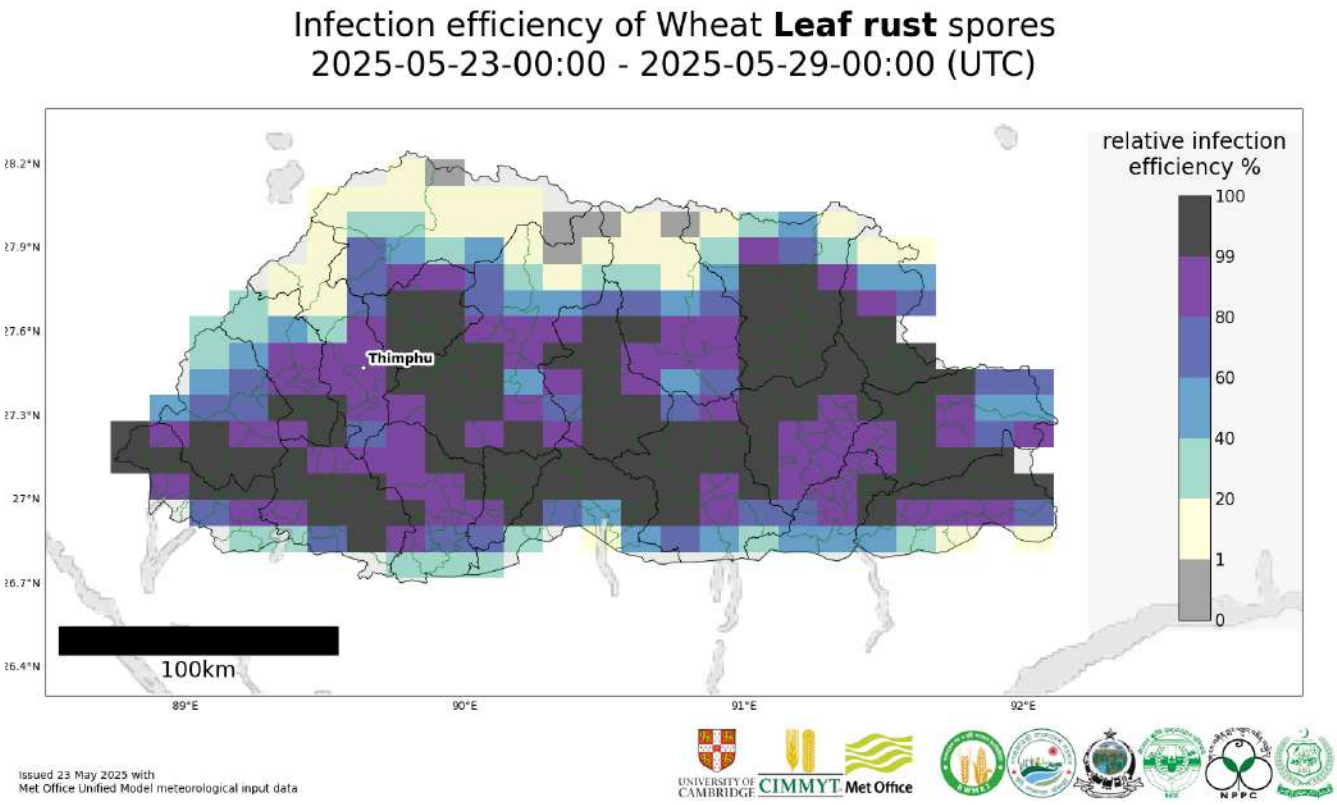
Map 4: Leaf rust spore deposition forecast Bhutan 23 May - 29 May 2025

The 20 most impacted districts (spore deposition) per country are presented in the table below.

admin2Name	admin1Name	Leaf rust spores per m^2 per week
Dragteng	Trongsa	2200
Nubi	Trongsa	2200
Tangsibji	Trongsa	1400
Dzoma	Punakha	970
Phangyuel	Wangduephodrang	970
Lingmukha	Punakha	970
Chhoekhor	Bumthang	960
Bapisa	Punakha	730
Tang	Bumthang	680
Chhume	Bumthang	620
Guma	Punakha	500
Thedtsho	Wangduephodrang	490
Nyisho	Wangduephodrang	420
Ura	Bumthang	410
Bjena	Wangduephodrang	410

Shengabjimi	Punakha	400
Nahi	Wangduephodrang	370
Sephu	Wangduephodrang	330
Ruepisa	Wangduephodrang	290
Langthil	Trongsa	270

Risk of infection: Current forecast (23 – 28 May) indicates similar high suitability to the last advisory. Very high infection efficiency forecast across all areas – especially southern areas and valleys of central-west and east.



Map 5: Leaf rust suitability for infection forecast Bhutan 23 May - 28 May 2025

The 20 most impacted districts (infection efficiency) per country are presented in the table below.

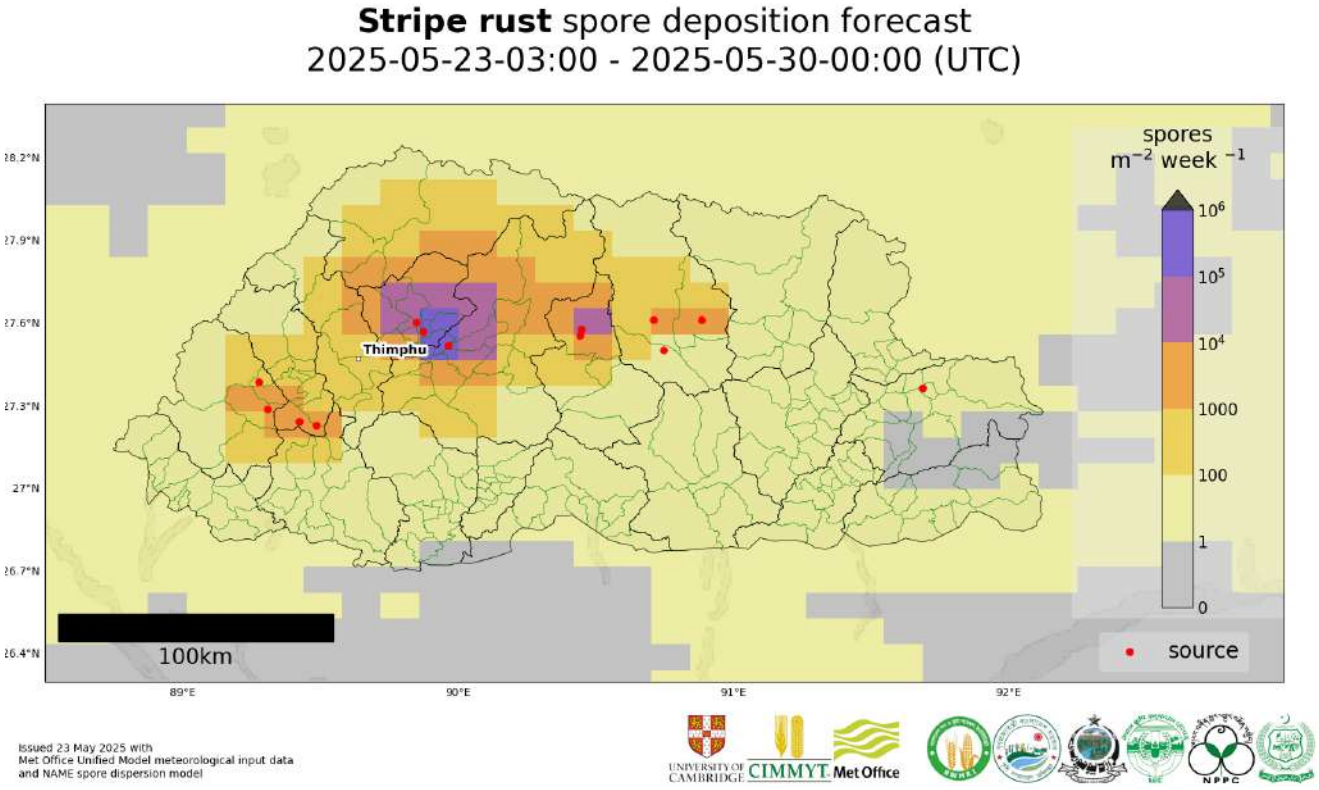
admin2Name	admin1Name	RIE_leaf_rust_%
Toetsho	Yangtse	100
Dungtoe	Samtse	100
Thedtsho	Wangduephodrang	100
Gasetsho Gom	Wangduephodrang	100
Chhubu	Punakha	100
Tsenkhar	Lhuentse	100
Nahi	Wangduephodrang	100
Tsamang	Monggar	100
Dzoma	Punakha	100
Phangyuel	Wangduephodrang	100

Lingmukha	Punakha	100
Talo	Punakha	100
Phuentenchhu	Tsirang	100
Trashiyangtse	Yangtse	100
Tomzhangtshen	Yangtse	100
Dunglegang	Tsirang	100
Jamkhar	Yangtse	100
Thrimshing	Trashigang	100
Minjay	Lhuentse	100
Drametse	Monggar	100

Wheat rust advisory #13 2025

Stripe rust

Dispersal: Current forecast (23 May - 29 May) indicates dispersal in a mainly easterly direction. Highest spore deposition close to sources in Central /western Bhutan.



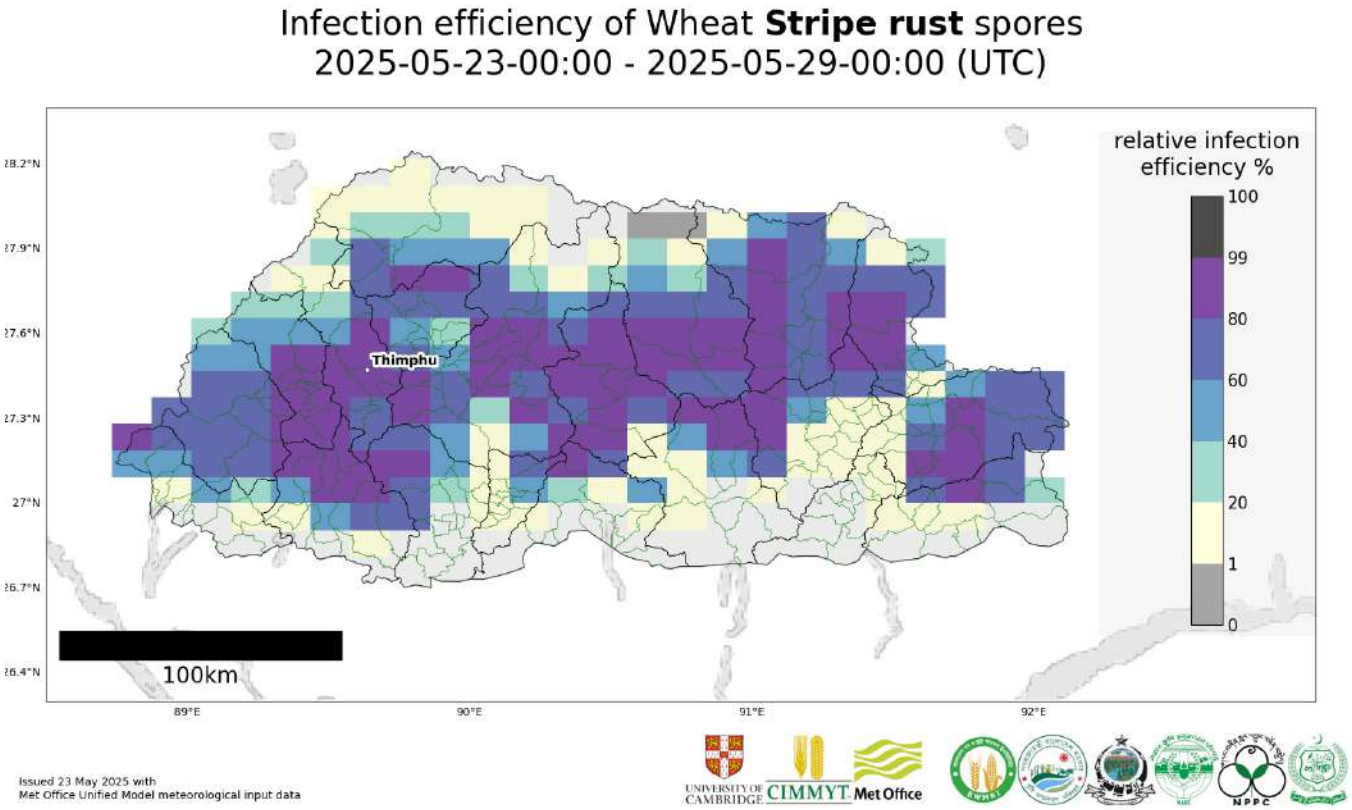
Map 6: Stripe rust spore deposition forecast Bhutan 23 May - 29 May 2025

The 20 most impacted districts (spore deposition) per country are presented in the table below.

admin2Name	admin1Name	Stripe rust spores per m^2 per week
Dzoma	Punakha	220000
Phangyuel	Wangduephodrang	220000
Lingmukha	Punakha	220000
Bapisa	Punakha	160000
Guma	Punakha	120000
Thedtsho	Wangduephodrang	110000
Shengabjimi	Punakha	87000
Bjena	Wangduephodrang	84000
Nahi	Wangduephodrang	79000
Nyisho	Wangduephodrang	74000
Ruepisa	Wangduephodrang	63000
Chhubu	Punakha	53000
Kazhi	Wangduephodrang	47000
Toewang	Punakha	26000
Talo	Punakha	17000
Dangchhu	Wangduephodrang	14000

Kabjisa	Punakha	9100
Toepisa	Punakha	8800
Goenshari	Punakha	7000
Gangte	Wangduephodrang	6000

Risk of infection: Current forecast (23 – 28 May) indicates similar high suitability since the last advisory. High infection efficiency across most/all of the wheat growing areas.



Map 7: Stripe rust suitability for infection forecast Bhutan 23 May - 28 May 2025

The 20 most impacted districts (infection efficiency) per country are presented in the table below.

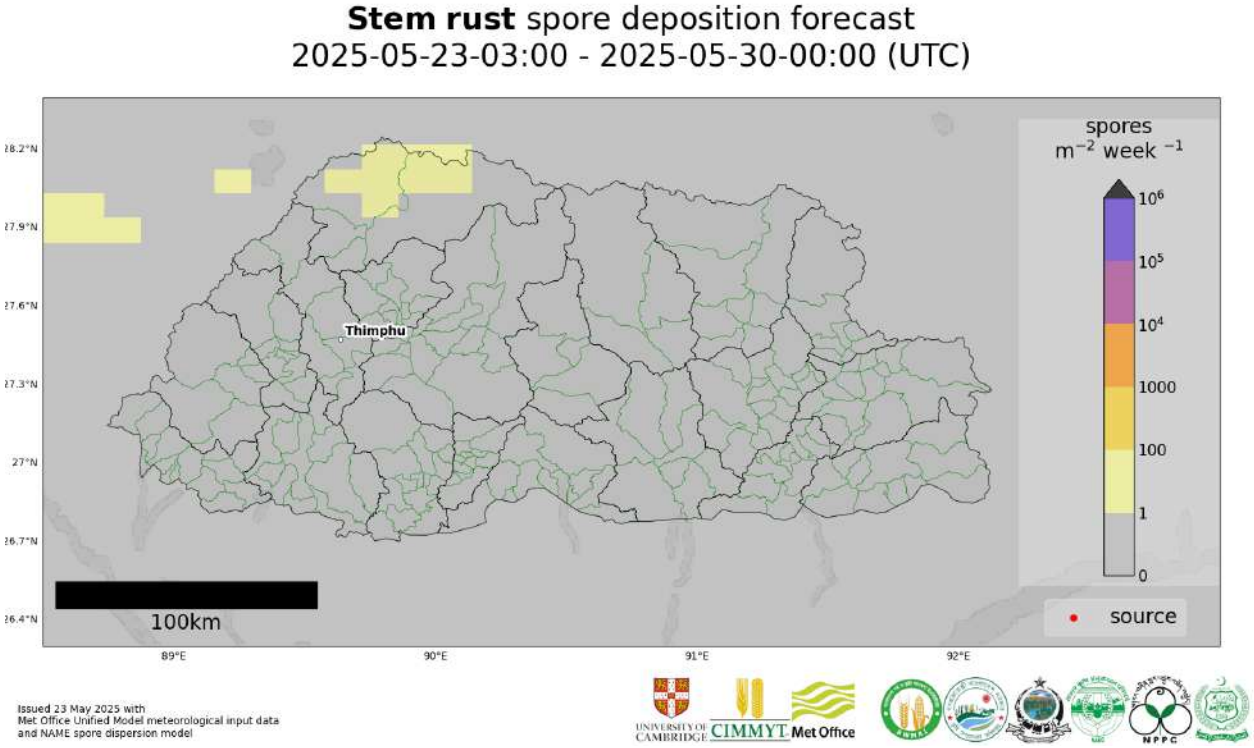
admin2Name	admin1Name	RIE_stripe_rust_%
Naja	Paro	87
Bjachho	Chhukha	87
Lamgong	Paro	86
Lungnyi	Paro	86
Doga	Paro	86
Hungrel	Paro	85
Wangchang	Paro	85
Shapa	Paro	85
Dragteng	Trongsa	84
Dopshari	Paro	84
Chapchha	Chhukha	84
Gangte	Wangduephodrang	83

Tangsibji	Trongsa	83
Metsho	Lhuentse	82
Dagala	Thimphu	82
Uesu	Haa	82
Chang	Thimphu	82
Katsho	Haa	82
Ura	Bumthang	81
Phobji	Wangduephodrang	81

Wheat rust advisory #13 2025

Stem rust

Dispersal: Current forecast (23 May - 29 May) indicates essentially no dispersal of spores into Bhutan wheat areas from infected site in Nepal.



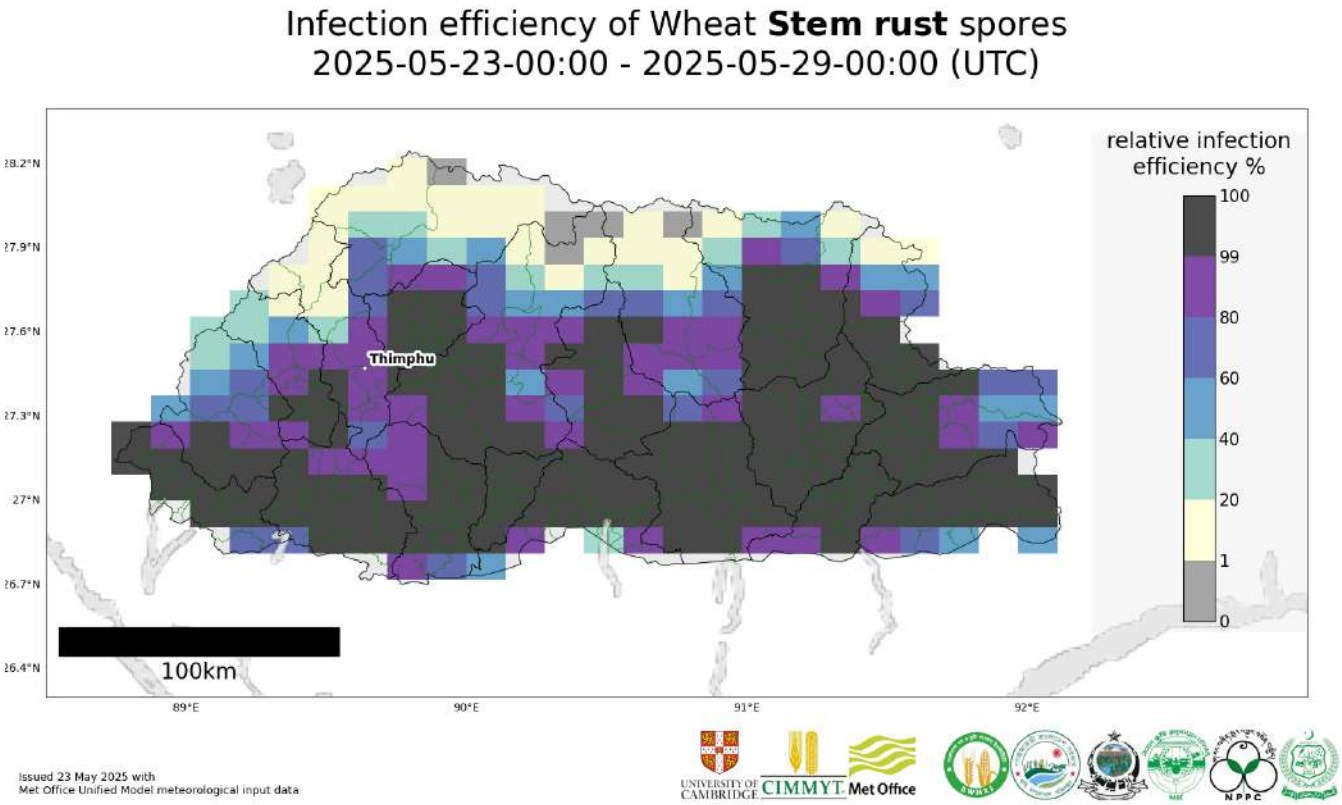
Map 8: Stem rust spore deposition forecast Bhutan 23 May - 29 May 2025

The 20 most impacted districts (spore deposition) per country are presented in the table below.

admin2Name	admin1Name	Stem rust spores per m^2 per week
Laya	Gasa	1
Lunana	Gasa	0
Goenkhatoe	Gasa	0
Lingzhi	Thimphu	0
Goenkhame	Gasa	0
Soe	Thimphu	0
Goenshari	Punakha	0
Naro	Thimphu	0
Kurtoe	Lhuentse	0
Ugentse	Samtse	0
Sombey	Haa	0
Tsento	Paro	0
Bji	Haa	0
Gakiling	Haa	0
Chengmari	Samtse	0
Yoeseltse	Samtse	0
Toewang	Punakha	0

Sephu	Wangduephodrang	0
Khoma	Lhuentse	0
Chargharay	Samtse	0

Risk of infection: Current forecast (23 - 28 May) indicates similar high suitability to the last advisory. Very high infection efficiency across southern areas, and the main valleys.



Map 9: Stem rust suitability for infection forecast Bhutan 23 May - 28 May 2025

The 20 most impacted districts (Infection efficiency) per country are presented in the table below.

admin2Name	admin1Name	RIE_stem_rust_%
Zobel	Pemagatshel	100
Gongdue	Monggar	100
Kanglung	Trashigang	100
Jurmey	Monggar	100
Trashiyangtse	Yangtse	100
Jamkhar	Yangtse	100
Samkhar	Trashigang	100
Guma	Punakha	100
Gozhing	Zhemgang	100
Gozhi	Dagana	100
Gosarling	Tsirang	100
Gomdar	Samdrupjongkhar	100
Tomzhangtshen	Yangtse	100

Tsamang	Monggar	100
Gesarling	Dagana	100
Nahi	Wangduephodrang	100
Shemjong	Tsirang	100
Gasetsho Gom	Wangduephodrang	100
Tsenkhar	Lhuentse	100
Dzoma	Punakha	100

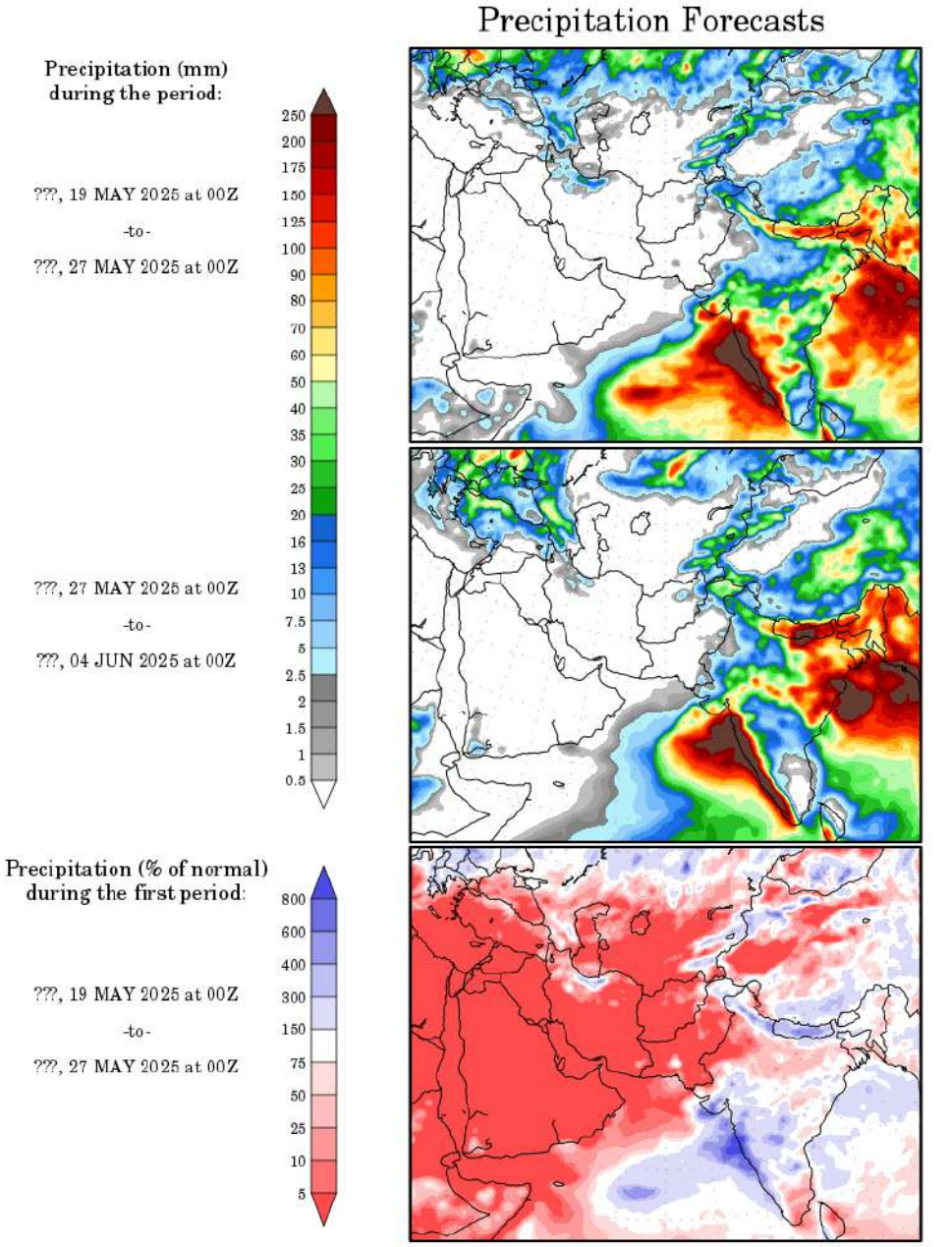
Wheat rust advisory #13 2025

Region-wide Forecasts

Forecasts from the National Centers for Environmental Prediction NCEP http://wxmaps.org/pix/clim

These indicate possible general conditions across South Asia, with likely decreasing prediction accuracy in the second forecast period.

Precipitation: During the period 19 – 27 May, rain forecast across most of region except central/south Pakistan. Forecast rain heaviest in Bhutan, eastern Bangladesh, Nepal (hills), and southern India. During 27 May – 4 June, increased and heavier rain forecast for Bangladesh, Nepal, Bhutan continued rain elsewhere except central / southern Pakistan.



Wheat rust advisory #13 2025

Temperature: During the period 19 – 27 May temperatures are warming across the entire region (especially India and Pakistan). Warmer than normal across the region (especially Pakistan, northern India), except for northern Pakistan, north west, central/southern India, high hills of Nepal, Bhutan. Temperatures forecast to remain very high during 27 May – 4 June.