



Wheat rust advisory - risk assessment from surveys and forecasts in Bhutan

Summary period: 12 May - 18 May 2026

Overall risk level:

Caution / Low

Key messages

Extensive surveys have been undertaken and are continuing, with 157 fields surveyed. Yellow rust and leaf rust are being detected in Punakha and Wangdue. Yellow rust has recently been detected in Haa. Most fields have low incidence / severity, but around 20% of fields are showing moderate/high incidence / severity. Overall, disease pressure is relatively low. Crops are at a range of growth stages, from heading to maturity.

Forecasts indicate increased and very high suitability for all rusts across Bhutan. Notably in southern areas, mid hills, central valleys (Punakha/Wangdue) and eastern areas. Current forecasts indicate highest spore deposition in Punakha/Wangdue and a continued northerly dispersal of spores. This dispersal may provide inoculum for early crops in the higher hills (e.g., Gasa).

Given high suitability for disease development, it is likely that disease (both yellow and leaf rust) may increase. Attention should be given to the appearance of any stem rust, as conditions are extremely suitable.

Recommendations

Close monitoring of fields, particularly for susceptible varieties and areas with younger crops, is recommended. Emerging crops (especially in the west/south/Punakha Valley and parts of the east) should be checked for any disease presence. Crops in the higher hills may be at risk from disease.

Scouting should be undertaken and farmers informed to be vigilant for the emergence of rust (especially stripe rust). In addition, particular attention should be paid to any appearance of stem rust, as conditions for infection are forecast to be extremely suitable.

- 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.

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Field surveys

Looking at surveys in the period since Jan 01 2026. Surveys undertaken Feb 16 2026 - May 06 2026. A total of 157 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 35 out of 157 fields surveyed (22%). Moderate to high incidence of leaf rust has been seen in 7 fields (20% of infected fields). Moderate to high severity of leaf rust has been seen in 6 fields (17% of infected fields).

Stripe Rust reported from 44 out of 157 fields surveyed (28%). Moderate to high incidence of stripe rust has been seen in 10 fields (23% of infected fields). Moderate to high severity of stripe rust has been seen in 12 fields (27% of infected fields).

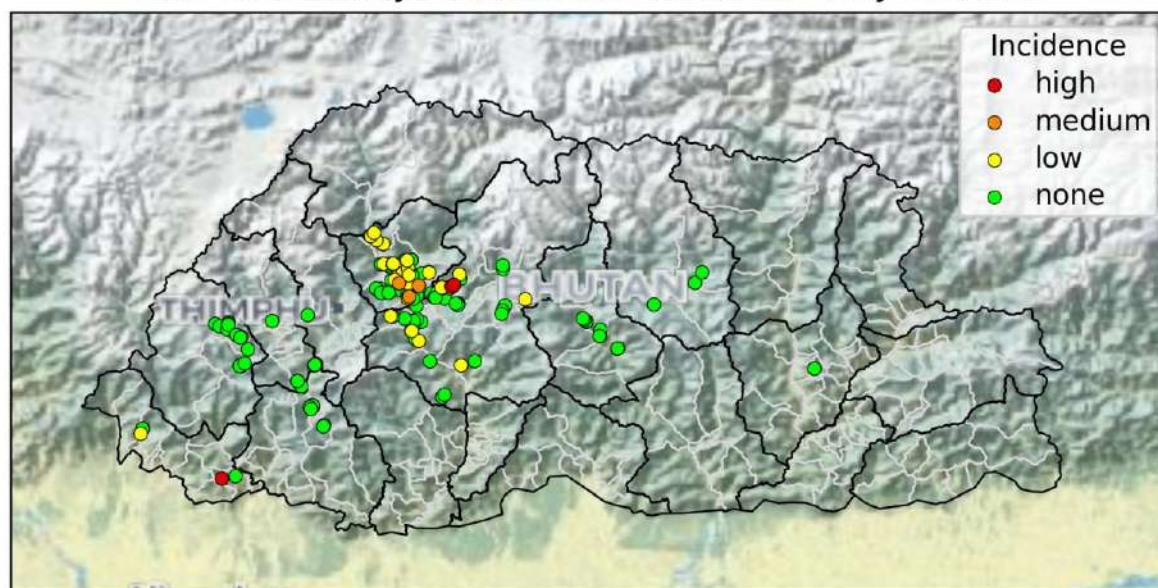
Table 1: Variety analysis of surveys.

Variety	Number of surveys	Number of surveys reporting infection of		
		stem rust	stripe rust	leaf rust
Bajokaa 3	1	n/a	0	0
Bumthangkaa Drukchu	6	n/a	0	0
Guma Sokha	36	n/a	21	8
Unknown	114	n/a	23	27

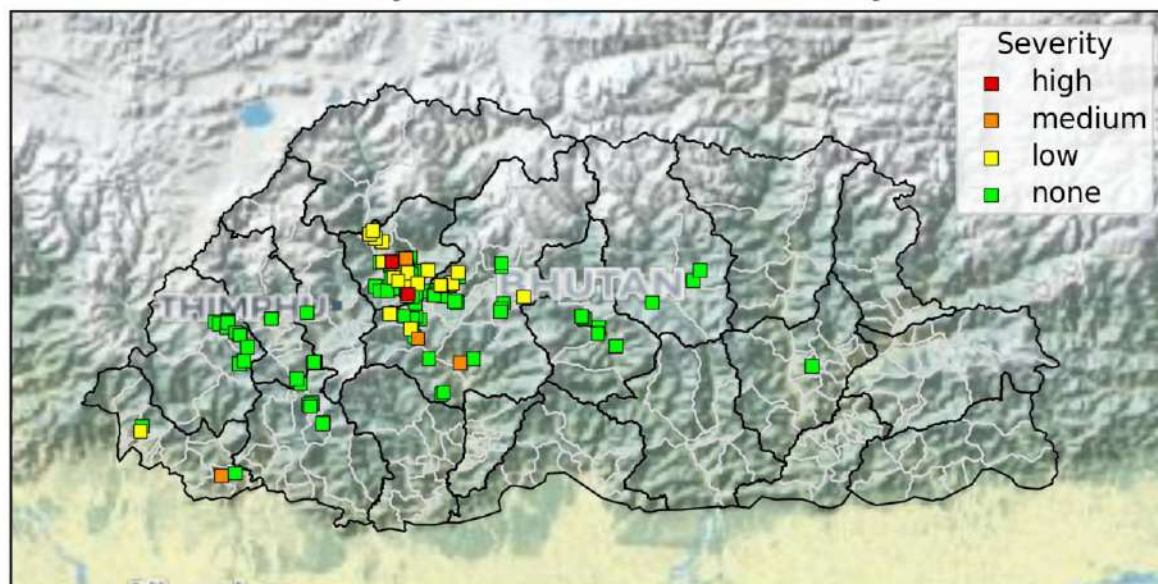
Table 2: Growth stage analysis of surveys conducted in the last week (since May 05 2026).

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	0	0	1	0	1	0	0	0	0	0

Leaf rust surveys Bhutan Feb 16 2026 - May 11 2026

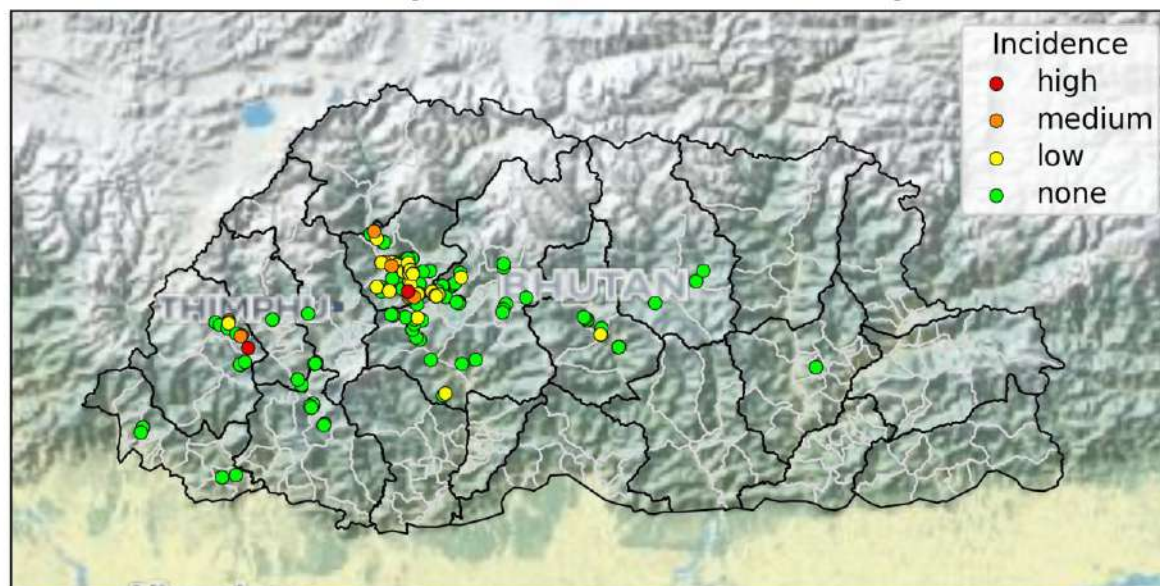


Leaf rust surveys Bhutan Feb 16 2026 - May 11 2026

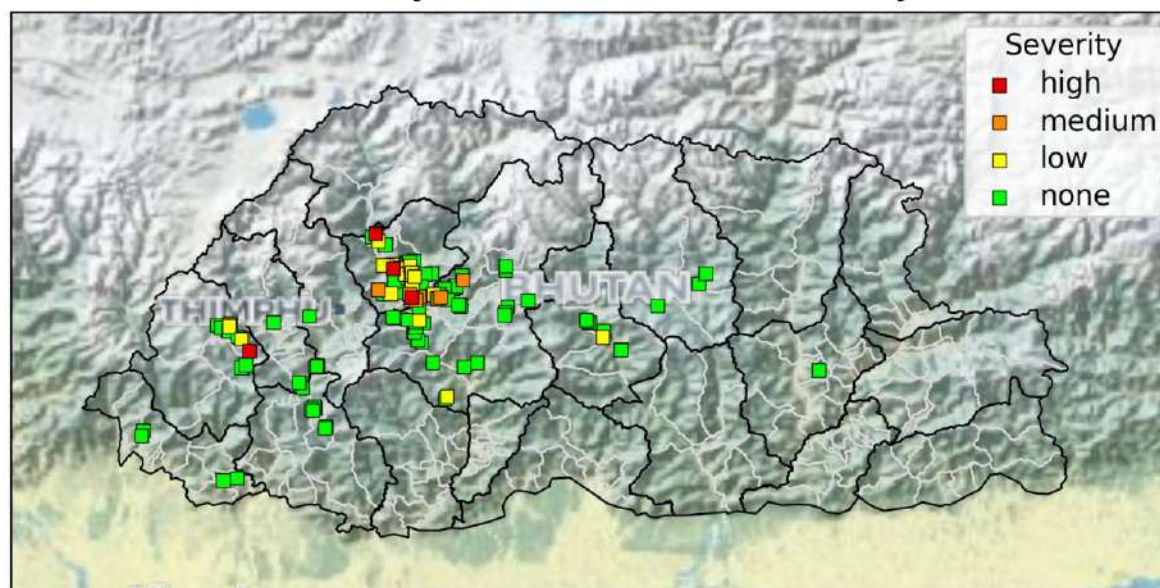


Map 1: Leaf Rust incidence (top) and severity (bottom) in Bhutan field surveys Feb 16 2026 - May 11 2026

Yellow rust surveys Bhutan Feb 16 2026 - May 11 2026

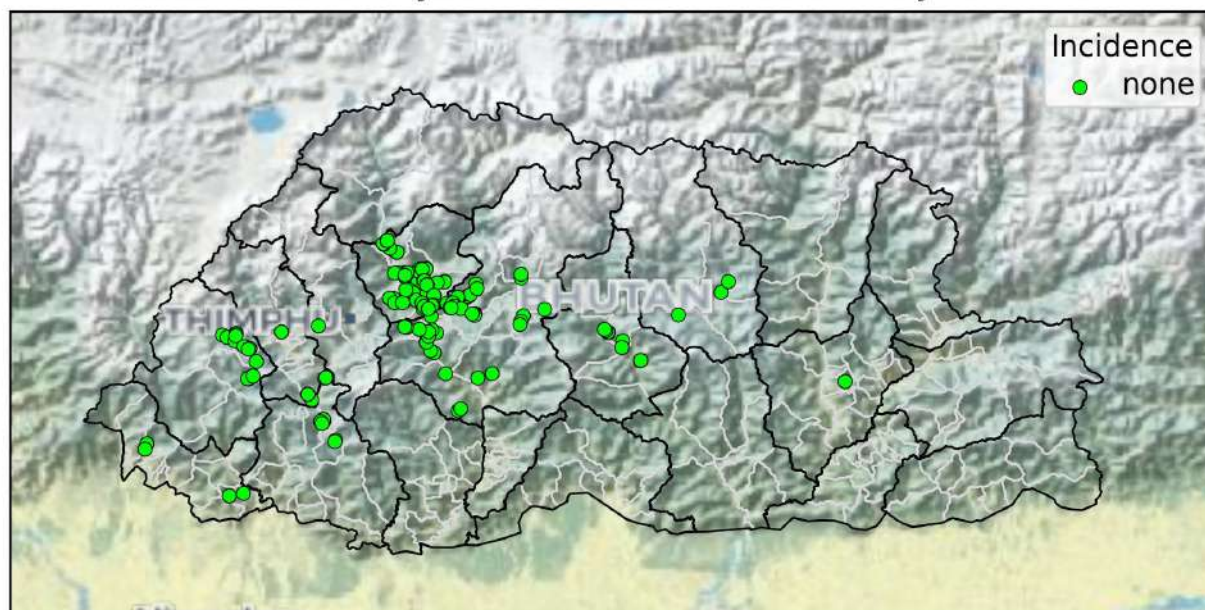


Yellow rust surveys Bhutan Feb 16 2026 - May 11 2026

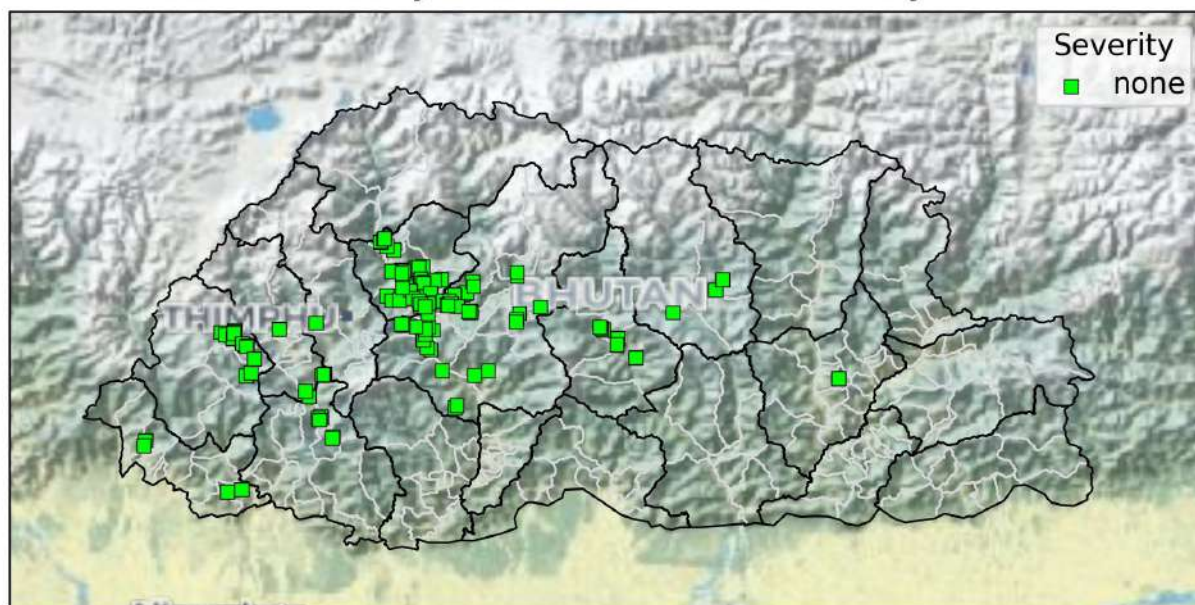


Map 2: Stripe Rust incidence (top) and severity (bottom) in Bhutan field surveys Feb 16 2026 - May 11 2026

Stem rust surveys Bhutan Feb 16 2026 - May 11 2026



Stem rust surveys Bhutan Feb 16 2026 - May 11 2026



Map 3: Stem Rust incidence (top) and severity (bottom) in Bhutan field surveys Feb 16 2026 - May 11 2026

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

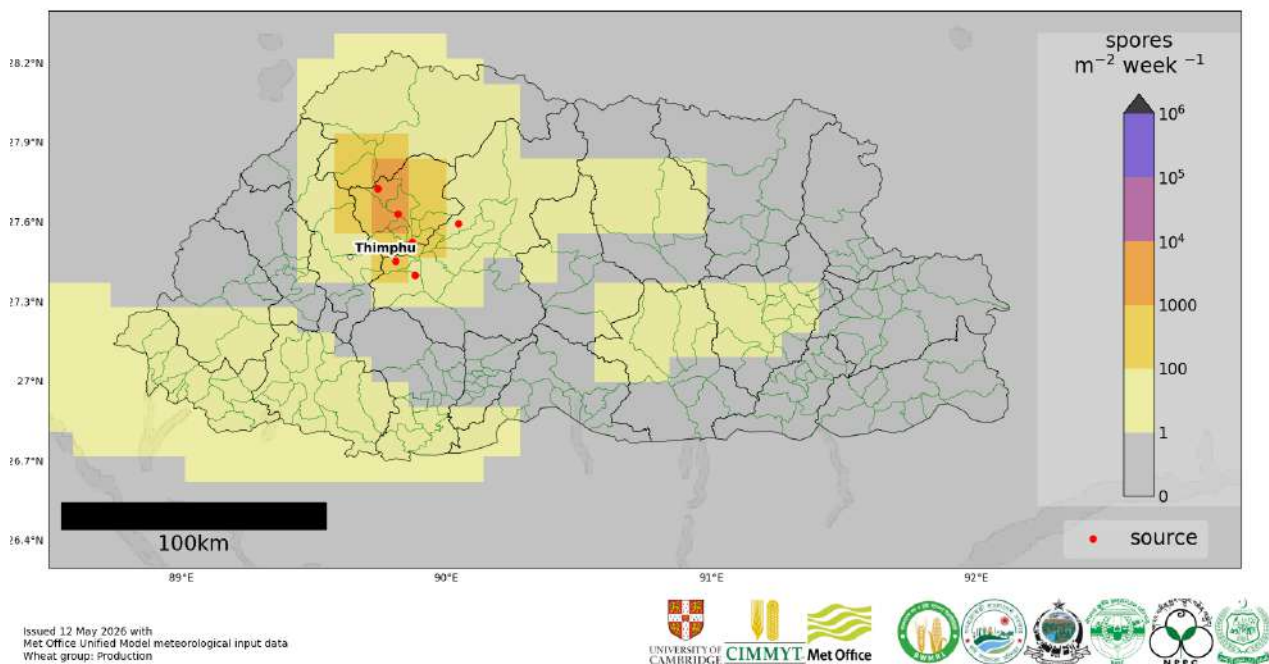
These forecasts give the probability of wheat rust infection occurring based on meteorological factors. The maximum infection efficiency that can occur is 100%. This means that 100% of the spores deposited on susceptible wheat plants could complete the infection process. Therefore, a forecast Infection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

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Leaf rust

Dispersal: Current forecast (12 May - 18 May) indicates dispersal in a northerly direction. Most spore deposition in Punakha. Low probability of spores moving into Bhutan from infected sites in Nepal.

Leaf rust spore deposition forecast 2026-05-12-03:00 - 2026-05-19-00:00 (UTC)



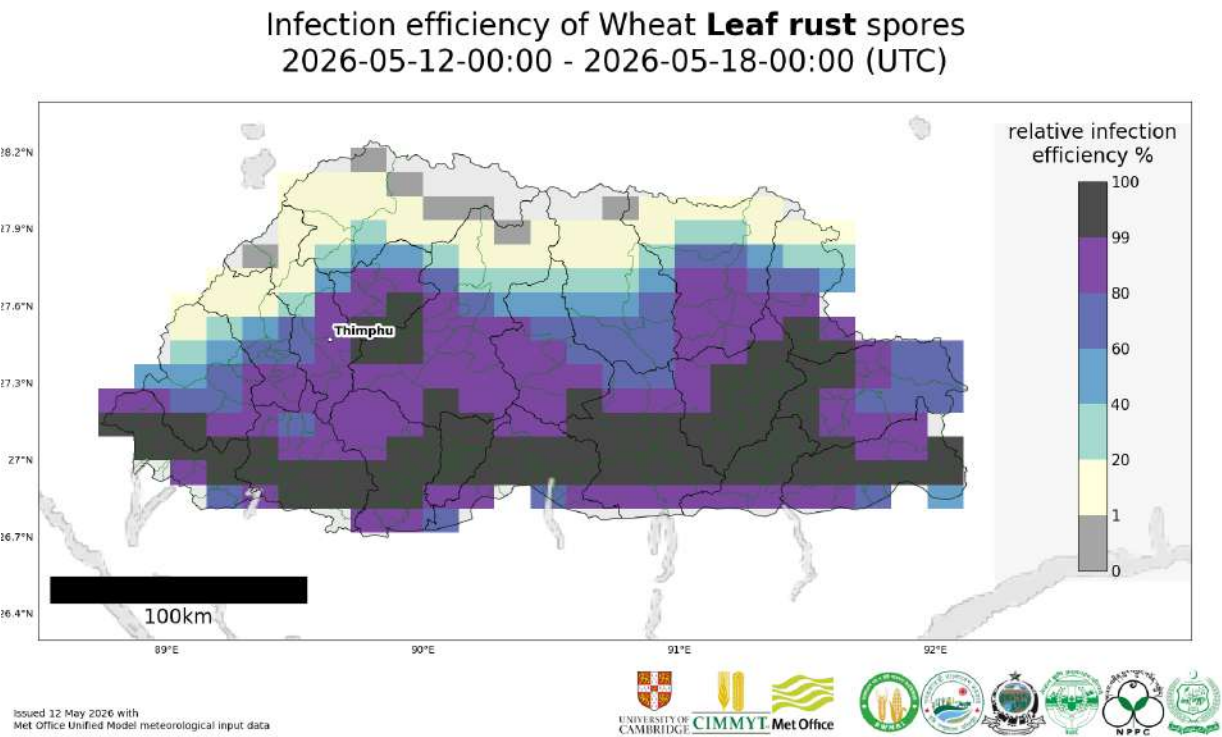
Map 4: Leaf rust spore deposition forecast Bhutan 12 May - 18 May 2026

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
Talo	Punakha	4800
Chhubu	Punakha	4000
Goenshari	Punakha	2700
Kabjisa	Punakha	2700
Guma	Punakha	2600
Toepisa	Punakha	2500
Goenkhame	Gasa	1300
Toewang	Punakha	890
Phangyuel	Wangduephodrang	430
Dzoma	Punakha	430
Lingmukha	Punakha	430
Shengabjimi	Punakha	350
Bapisa	Punakha	310
Thedtsho	Wangduephodrang	230
Nahi	Wangduephodrang	210
Naro	Thimphu	200
Kawang	Thimphu	200
Goenkhatoe	Gasa	180
Gasetsho Gom	Wangduephodrang	120
Kazhi	Wangduephodrang	100

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Risk of infection: Current forecast (12 – 17 May) indicates increased infection efficiency. High infection efficiency across most of Bhutan. Highest in southern areas, central valleys (Punakha) and eastern areas.



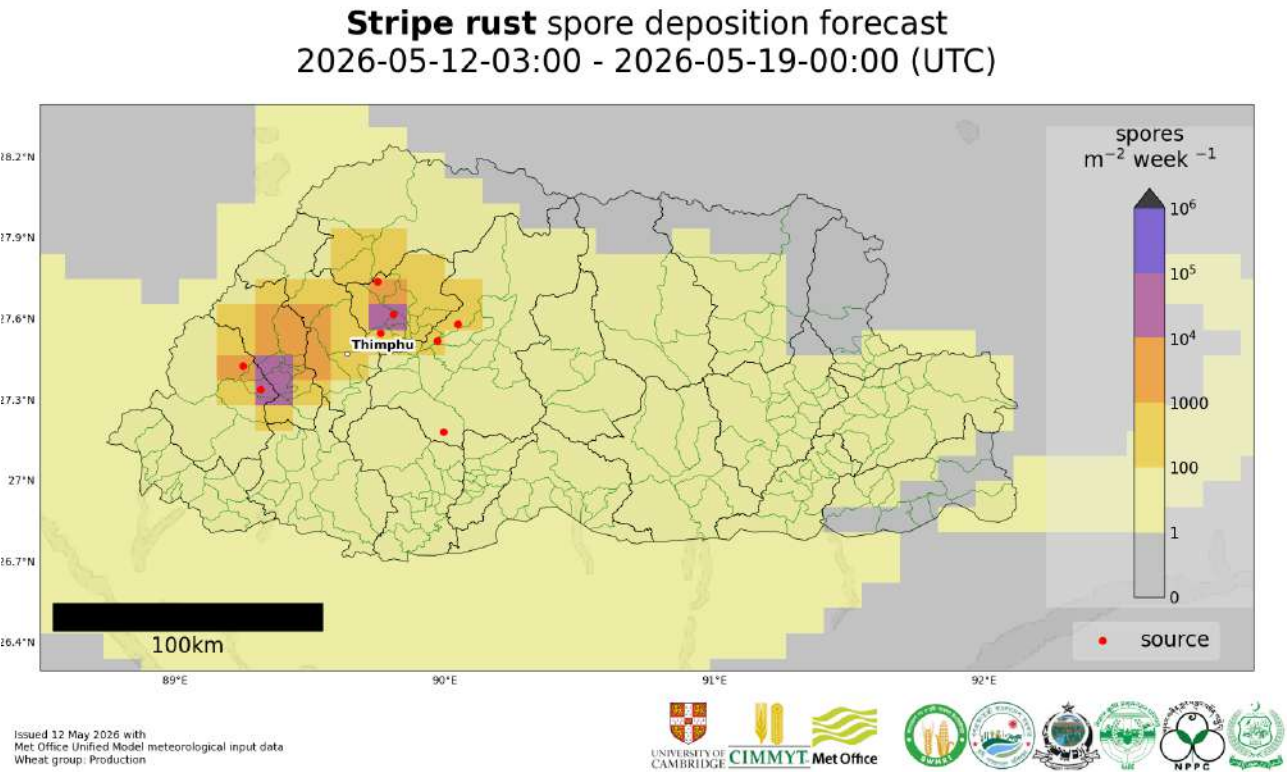
Map 5: Leaf rust suitability for infection forecast Bhutan 12 May - 17 May 2026

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

admin2Name	admin1Name	RIE_leaf_rust_%
Zobel	Pemagatshel	100
Denchhukha	Samtse	100
Ramjar	Yangtse	100
Rangthangling	Tsirang	100
Gesarling	Dagana	100
Shemjong	Tsirang	100
Gasetsho Gom	Wangduephodrang	100
Dzoma	Punakha	100
Dungtoe	Samtse	100
Shumer	Pemagatshel	100
Balam	Monggar	100
Dunglegang	Tsirang	100
Drugyelgang	Dagana	100
Drepung	Monggar	100
Drametse	Monggar	100
Sipsu	Samtse	100
Thangrong	Monggar	100
Gomdar	Samdrupjongkhar	100
Gongdue	Monggar	100
Gosarling	Tsirang	100

Stripe rust

Dispersal: Current forecast (12 May - 18 May) indicates dispersal in a generally northerly direction. Most spore deposition forecast in Paro, Haa and Punakha valleys.



Map 6: Stripe rust spore deposition forecast Bhutan 12 May - 18 May 2026

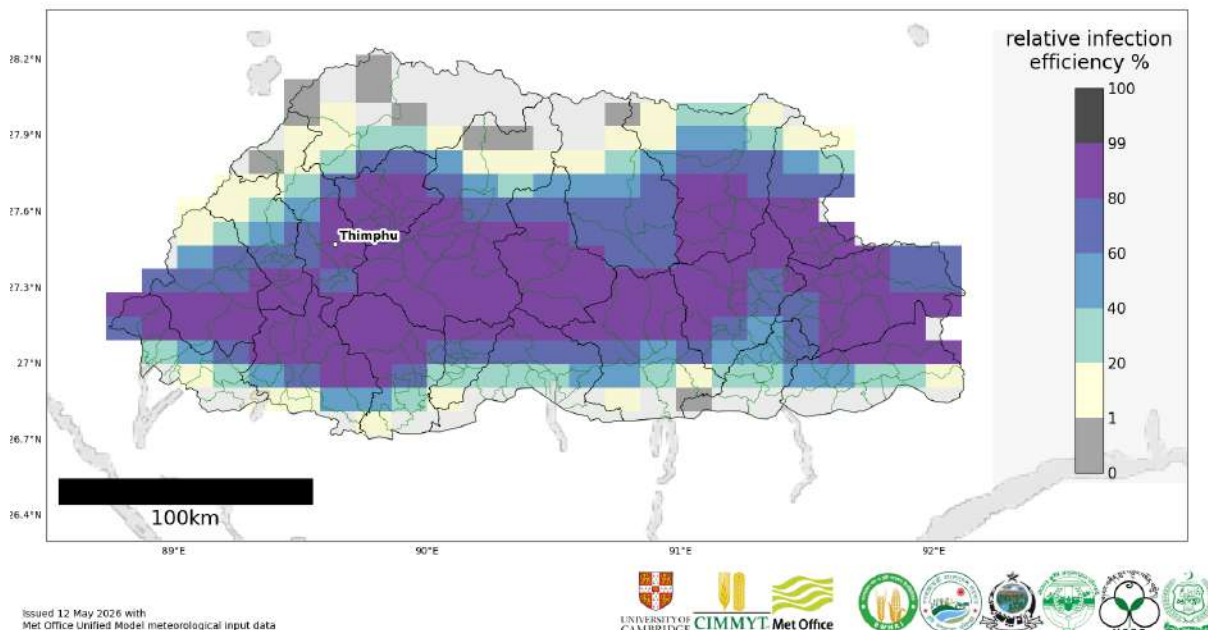
The 20 most impacted districts (infection efficiency) per country are presented in the table below.

admin2Name	admin1Name	Stripe rust spores per m ² per week
Lungnyi	Paro	11000
Shapa	Paro	8400
Lamgong	Paro	8400
Uesu	Haa	8200
Katsho	Haa	8200
Wangchang	Paro	7400
Hungrel	Paro	7400
Naja	Paro	6300
Dopshari	Paro	5900
Talo	Punakha	5400
Doga	Paro	4800
Doteng	Paro	4600
Chhubu	Punakha	3800
Sama	Haa	3500
Guma	Punakha	3100
Kabjisa	Punakha	2900
Toepisa	Punakha	2900
Goenshari	Punakha	1900
Kawang	Thimphu	1900
Tsento	Paro	1700

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Risk of infection: Current forecast (12 – 17 May) indicates increased suitability. High infection efficiency across all mid hill areas of Bhutan and central valleys (Punakha) and eastern areas.

Infection efficiency of Wheat **Stripe rust** spores 2026-05-12-00:00 - 2026-05-18-00:00 (UTC)



Map 7: Stripe rust suitability for infection forecast Bhutan 12 May - 17 May 2026

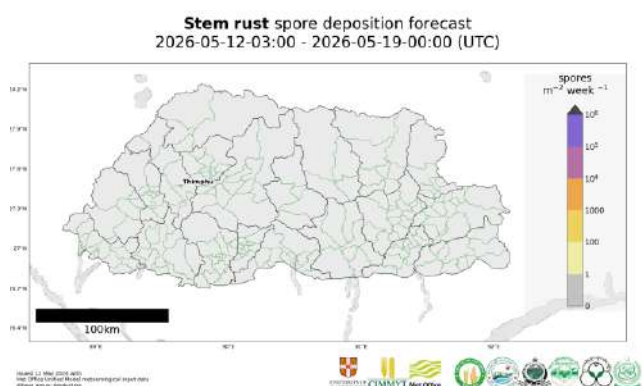
The 20 most impacted districts (infection efficiency) per country are presented in the table below.

admin2Name	admin1Name	RIE_stripe_rust_%
Tomzhangtshen	Yangtse	90
Trashiyangtse	Yangtse	90
Toetsho	Yangtse	90
Bartsham	Trashigang	90
Yalang	Yangtse	90
Khamdang	Yangtse	90
Ruepisa	Wangduephodrang	90
Ramjar	Yangtse	90
Tsamang	Monggar	89
Thedtsho	Wangduephodrang	89
Tsenkhar	Lhuentse	89
Talo	Punakha	89
Gasetsho Gom	Wangduephodrang	89
Bjena	Wangduephodrang	89
Jamkhar	Yangtse	89
Bidung	Trashigang	89
Nahi	Wangduephodrang	89
Minjay	Lhuentse	89
Guma	Punakha	88
Phongme	Trashigang	88

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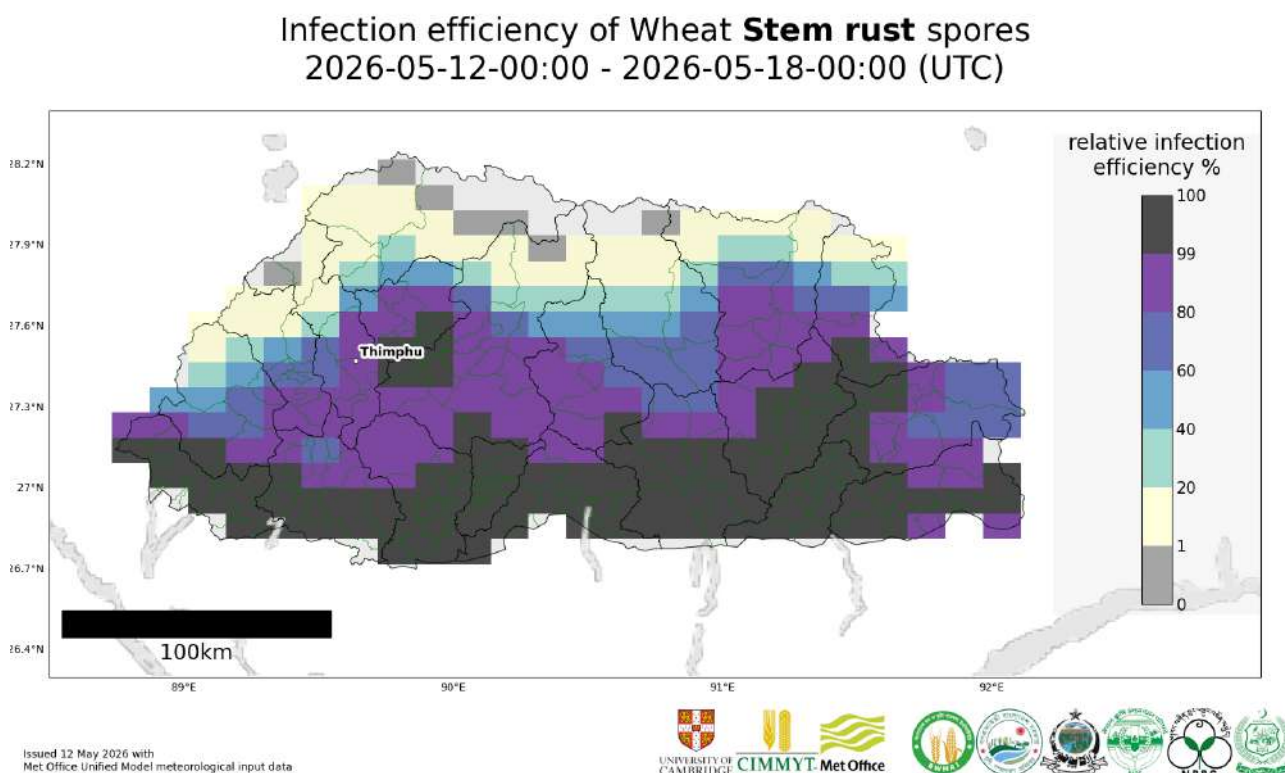
Stem rust

Dispersal: Current forecast (12 May - 18 May) indicates no dispersal as no reports of stem rust.



Map 8: Stem rust spore deposition forecast Bhutan 12 May - 18 May 2026

Risk of infection: Current forecast (6 – 11 May) indicates increased suitability. High suitability across all southern areas, central valleys (Punakha) and eastern areas.



Map 9: Stem rust suitability for infection forecast Bhutan 12 May - 17 May 2026

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

admin2Name	admin1Name	RIE_stem_rust_%
Lhamoizingkha	Dagana	100
Lingmukha	Punakha	100

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Pagli	Samtse	100
Norbugang	Pemagatshel	100
Nichula	Dagana	100
Ngatshang	Monggar	100
Ngangla	Zhemgang	100
Narang	Monggar	100
Nanong	Pemagatshel	100
Namgyel Chhoeling	Samtse	100
Nahi	Wangduephodrang	100
Mongar	Monggar	100
Mendrelgang	Tsirang	100
Logchina	Chhukha	100
Balam	Monggar	100
Patakla	Tsirang	100
Kikorthang	Tsirang	100
Khar	Pemagatshel	100
Kengkhar	Monggar	100
Jurmey	Monggar	100