Prelims and Mains focus: about the yellow rust disease and its impact on the crop productivity; remedial measures to be taken to contain it

News: The detection of yellow rust disease in the wheat crop in submountainous parts of Punjab and Haryana has raised anxiety among farmers about drop in the crop's yield even as respective agriculture departments are leaving nothing to chance to ensure the spread of the disease doesn't go beyond control.

- Wheat, the main rabi (winter) crop, is sown between late October till December while the harvesting of the crop will start from April onwards.

What is Yellow rust disease?

- Yellow rust is a fungal disease which turns the crop’s leaves into a yellowish colour and stops photosynthesis activity, which eventually could result in a drop of wheat crop productivity.

- The ideal growth conditions for yellow rust are temperatures of between 8-13 degree C for spore germination and penetration, and 12-15 degree C for further development and with free water. This makes yellow rust more of a spring disease. It should be noted, however, that whilst young plants can be susceptible, as they mature, they can develop “adult plant resistance”.

- The optimum lifecycle for yellow rust is seven days, although symptom expression is more explosive than with brown rust, since the yellow rust fungus takes less time to build colonies of a size to support sporulation.

- Yellow rust survives on late green tillers, volunteers and early sown crops. It originates as distinct ‘foci’ in crops and is spread long distances by wind.

What climatic conditions in Punjab and Haryana led to it?
The recent rains in the region coupled with slight increase in the temperature and humid conditions are favourable for yellow rust.

The minimum temperature have been hovering around 1.6 to 3.0 degree Celsius above normal at many places in parts of Punjab during the past few days.

After rain in the past few days, the minimum temperature had risen a bit, coupled with slightly humid conditions. However, in the next 34 days the minimum temperature is likely to dip.

**Level of threat and remedial measures to be taken**

- It's in a very limited area that the crop has been affected as of now, but the team of experts has hit the fields to monitor the situation. However, at this stage it's not threatening.

- It can't be ignored as it can spread quickly and can cause severe losses in crop yield if not checked in time.

- Farmers should spray their crop with insecticides as per the advisory to contain the attack.

- Yellow rust is easier to control than brown rust with fungicides. This is because it forms its “looser” elongated pustules closer to the leaf surface, whereas brown rust forms very waxy dense pustules in the middle of the leaf, making it trickier for fungicides to access.

- Yellow rust is eight times less efficient at penetrating the wheat leaf than brown rust, because it doesn’t build specialised infection structures (appressoria). This renders it an easier target for fungicides with long-lasting protectant activity.