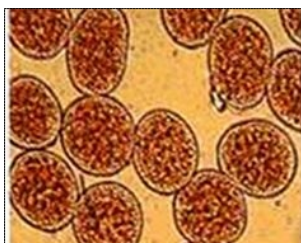


# Stripe rust on wheat

*Puccinia striiformis*



Urediospores in microscope, the only spreading form (Photo by LiuTaiguo)



Fungal surface growth (yellow spots) on leaf (Photo by Luohe PPS)



Yellow rust spreading in field (Photo by ZengJuan)

Prevention	Monitoring	Direct Control	Direct Control	Restrictions
<ul style="list-style-type: none"> <li>• Sow 7-10 days later than ordinary, to avoid the rust spores spreading period (The spores can only infect after 3 leaf-stage of seedling)</li> <li>• Crop density (about 270 plants/m<sup>2</sup>)</li> <li>• Reasonably fertilize with less nitrogen and more phosphate and potash, to make the plant less susceptible.</li> <li>• Resistance varieties in Sichuan province include Neimai No.8, Chuanmai No.32, Chuanmai No.36, Chuanmai No.39, Chuanmai No.42, Chuanqing No.16, Chuanqing No.19, Chuannong No.7, Chuannong No.11, Chuannong No.16, Chuannong No.18, Chuannong No.19, Miannong No.7, Mianyang No.3, Mianyang No.35, Mianyang No.37, Rongmai No.2</li> </ul>	<ul style="list-style-type: none"> <li>• Visit the wheat field every 7 days to observe the wheat health until milk stage or until the disease is not become a serious problem.</li> <li>• Choose five-points (2m<sup>2</sup> per point) bidiagonally in 1 piece of small wheat field (about 1/4 ha), then check 20 to 50 leaves at each point</li> <li>• Check for leaves with yellow rust spot lines; estimate coverage of rust on leaf to assess severity levels D = 1%, 5%, 10%, 20%, 40%, 60%, 80%, 100%); then, calculate the diseased leaf rate (F=diseased leaf number/ observed leaf number) = disease index (I): <math>I = F \times D \times 100</math></li> <li>• For later stages, consider control action when disease index (I) over 5.</li> <li>• At milking and ripening stage, control is too late.</li> </ul>	<ul style="list-style-type: none"> <li>• Spray plant extracts such as <i>Sophora flavescens</i> (buy in pharmacy), at a dosage of 10 mg/ml, 30 L/667m<sup>2</sup>, once a week from jointing to grouting stage of wheat.</li> <li>• Potential natural enemy, one kind of Cecidomyiidae beetles, with larvae feeding on rust spores of wheat stem rust disease. So use fewer insecticides to protect this natural enemy.</li> </ul>	<ul style="list-style-type: none"> <li>• Prevention and early eradication are most powerful measures, but chemical seed dressing and spray could prevent the disease from becoming more severe.</li> <li>• When using a pesticide or botanical, always wear protective clothing and follow the instructions on the product label.</li> <li>• Don't use one kind of fungicide in same way (seed dressing or spray) continuously more than 3-5 years, or there would be resistance.</li> <li>• Seed dressing with triadimefon – based products (2% missible oil, effective ingredient 40-80g/100kg seed) before sowing could postpone disease occurring date for 30-60 days. Alternative fungicides such as tebuconazole, paclobutrazol, propiconazole – based products could be rotated for use, but follow label instructions and regulations</li> <li>• Spraying on leaves in the disease center or all over the field with hexaconazole –based products (30% suspending agent, effective ingredient 36-54g/ha) before milking stage of wheat.</li> </ul>	<ul style="list-style-type: none"> <li>• WHO toxicity class II (moderately hazardous). Follow the suggested dosage otherwise it could reduce emergence rate of wheat seedlings. Prefer buying treated seeds than treating yourself.</li> <li>• WHO toxicity class III (slightly hazardous); don't spray after milky stage of wheat, because the temperature isn't suitable for disease developing.</li> </ul>

## China

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