

WHEAT CROP HEALTH NEWSLETTER



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The first issue of Vol. 18 (2012-13) is being brought out this month. Wheat crop health was monitored during off season in high hills of Himachal Pradesh (Lahaul, Spiti and Kinnaur), mid hills of HP (Hamirpur and Bilaspur) and J & K (Ladakh). The Crop Protection Technology for different wheat growing zones finalized during the 51st All India Wheat Workers' Meet held at ARS, Durgapura (Jaipur) during August 24-27, 2012 are also being given here.

Off season survey

Dr. Indu Sharma, Project Director, DWR, Karnal surveyed the Bilaspur and Hamirpur area for rusts in self sown wheats and *Berberis* spp during July 18-20, 2012. Aeciospores were not observed in *Berberis* spp. in the area surveyed.

Survey was conducted to monitor the yellow rust of wheat in higher hills (Kinnaur & Lahaul Spiti) of Himachal Pradesh by the survey team, comprising of Dr. S.S. Karwasara, Dr. Madhu Meeta Jindal and Dr. Pramod Prasad during 13.08.12 to 18.08.12. In Sangla valley, in some entries of trap plot nurseries yellow rust was observed upto 30S and telial stage was also observed. Different villages viz., Rakchham, Chitkul etc. were surveyed. In this region wheat crop was not there and only barley was present in small patches and that too without rust infection. In villages around Nako and Tabo, rust free wheat crop was observed except rare loose smut infections at some locations. In villages like Kurith (Tabo) Sichling, Shego, Kaja, Hal, Kyato, Hansa and Loser were surveyed. In this area also, wheat crop was free of yellow rust infection.

Yellow rust was recorded in the range of 20S-80S severity on different cultivar/lines i.e. PBW 343 etc. in PAU Station, Keylong, its adjoining fields and DWR Regional Station, Dalang Maidan.

Wheat rusts survey was undertaken by Drs. Indu Sharma, Sushila Kundu, R P S Verma, Randhir Singh, M S Saharan and Pramod Prasad during Sept. 21-23, 2012. In the harvested crop, stripe rust uredospores were observed in local varieties grown in the area.

Training programmes

Training programme on "Prevalence of yellow, brown and black rust" was organized on 21 September 2012 at KVK Leh under the SKUAST, Srinagar. Drs. Indu Sharma, Sushila Kundu, R P S Verma, Randhir Singh, M S Saharan and Pramod Prasad from DWR and Dr Salim Mir, Additional Director, Dr Namglyal,

Coordinator, KVK, Mr Dawa, SDAO, Leh and their team alongwith farmers participated in the programme.

Dr. Indu Sharma, Project Director, DWR, Karnal and DWR scientists (Drs. S. C. Bhardwaj, Randhir Singh, M S Saharan and Selva Kumar) delivered lectures on October 8 2012 in training programme organized on yellow rust management at Mashobra (Shimla). The training cum workshop was organized jointly by Department of Agriculture, HP, SAMETI and DWR.

CROP PROTECTION TECHNOLOGIES

Crop Protection Technology for wheat in different agro-climatic zones/states is given hereunder:

A. North Western Plain Zone, NWPZ (Punjab, Haryana, Northern Rajasthan, Western U.P., foot hills and plains of J&K, H.P. and Uttra Khand)

(a) Yellow Rust Management Strategy

1. For avoiding the losses due to yellow rust of wheat in NWPZ, avoid planting of PBW 343 and other susceptible varieties like UP 2338, HD 2687, HD 2329, WH 711 and PBW 373. Varieties like DBW 621-50, HD 2967, PBW 644, WH 542, DBW 17, PBW 550, DBW 16 (late sown), WH 896, WH 1021, HD 3043, PDW 233 (d), WHD 943 (d), PDW 314 (d), etc. may be preferred. Special attention should be given to the epidemiologically important region, i.e., the foot hills and plains of Jammu and Kashmir, parts of Punjab, especially along the international border and foot hills of Himachal Pradesh.

Varieties not recommended for the zone (e.g. HD 2733, HD 2932, etc.) should not be planted, since they do not carry the resistance to yellow rust which is the most important disease of the region.

2. Since most of the varieties recommended for NWPZ do not carry high level of resistance, hence, chemical sprays are needed. Spray the crop with propiconazole (Tilt 25 EC @ 0.1 per cent), or tebuconazole (Folicur 250EC @ 0.1%) or triademefon (Bayleton 25WP @ 0.1%) at yellow rust initiation. Usually, it is required in the first half of February. This spray will also help in the control of powdery mildew and Karnal bunt diseases.
3. Vigilance should be kept for yellow rust in the foot hills through extensive monitoring starting from early December onwards. If disease is spotted, the farmers should be immediately advised by the concerned State Departments of Agriculture for taking up recommended spray schedule, since it will depend upon the first appearance of disease. Farmers should also keep monitoring their crop critically and take essential steps if disease is spotted.
Usually, it is observed that the early infection starts in the fields under the popular trees wherever these are grown having early sown crop (i.e. October). Hence, strict watch is needed by the farmers in such fields.

(b) Other diseases and pests

1. Loose smut control measures should be undertaken in view of the horizontal distribution of the seed material among the farmers and the use of the carry over seed. Seed treatment with a combination of the reduced dosage of the fungicide and *T. viride* is made. The bioagent fungus, apart from enhancing the efficacy of the fungicide, also leads to better germination, growth and protection against diseases through induced systemic resistance. For this purpose, seed treatment should be done with *T. viride* @ 4 g / Kg seed in combination with carboxin (Vitavax 75 WP) @ 1.25 g / Kg seed or tebuconazole (Raxil 2 DS) @ 1.0 g / Kg seed.
2. Karnal bunt control is required for seed crop and the produce grown for export purposes. For producing KB free wheat, farmers are advised to grow KB resistant varieties recommended for the respective area.

NWPZ: PBW 502, PDW 233 and WH 896

- In areas where Karnal bunt incidence is low, by growing durum wheat for 2-3 years, fields can become free from Karnal bunt pathogen, *Tilletia indica*.
 - Zero tillage helps in reducing Karnal bunt incidence.
 - Avoid irrigation at heading time
 - One spray of Propiconazole 25EC (Tilt 25 EC) @ 0.1 per cent or Tebuconazole 250 EC (Folicur 250 EC) @ 0.1 per cent be given in mid February to control the disease.
3. For powdery mildew control, one spray of propiconazole (Tilt 25 EC) @ 0.1 % at ear head emergence or appearance of disease (whichever is earlier) is recommended for the powdery mildew prone areas.
 4. Flag smut disease also poses problems in isolated fields in Punjab, Haryana, Rajasthan and some other parts of NWPZ. Disease management measures taken for the control of loose smut disease (as discussed above), prove to be effective against flag smut too. Hence, seed treatment with carboxin or tebuconazole may be followed in fields with flag smut history.
 5. In the termite prone areas, seed treatment with chlorpyrifos @ 0.9g a.i or endosulfan @ 2.4g a.i/kg seed, be taken up for their management. Seed treatment with thiamethoxam 70WS (Cruiser 70WS) @ 0.7 g a.i./kg seed or Fipronil (Regent 5FS @ 0.3 g a.i./kg seed) is also very effective. In the standing crop, the broadcasting of the insecticide treated soil 15 DAS be practiced. For this, endosulfan 35EC @ 2.3 Litre or chloropyrifos @ 3 Litre mixed in 50 Kg soil be used for one hectare field. Crop planted under FIRBS is more prone to termite attack in the termite-prone areas, while zero tillage shows less termite damage. Hence, proper attention should be given in crop planted under FIRBS.
 6. The IPM module developed and validated in NWPZ can be adopted in parts of north-west plain zone. This involves the seed treatment with *T.viride* (@4g/kg seed) + carboxin (75WP @1.25g/kg seed) or tebuconazole (@ 1.0g/kg seed) for the control of loose smut, followed by broadcast of insecticide treated soil (with endosulfan 35 EC @ 2.3L or chloropyrifos @ 3L/ha) at 15DAS for termites. For the management of aphids, foliar spray of imidacloprid 200SL @20g a.i./ha

on border rows at the start of the aphid colonization be given. This will help in protection of the bioagent insect, the lady bird beetle inside the field which feeds on aphids. In KB prone areas, the seed crop can be given one spray of propiconazole or two sprays of *T.viride* at tillering and ear head emergence. For the control of powdery mildew in disease prone areas, one need-based spray of propiconazole (Tilt 25 EC @ 0.1%) can be given at earhead emergence or appearance of disease on flag leaf, whichever is earlier.

7. In this zone, a blanket-recommendation on seed treatment with a combination of the reduced dosage of the fungicide and *T.viride* is made. This involves the seed treatment with *T.viride* (@4g/kg seed) + carboxin (75WP @1.25g/kg seed) or tebuconazole (Raxil 2DS @ 1.0g/kg seed). Seed treatment with *T. viride* alone also is recommended. The bioagent fungus, leads to better germination, growth and protection against diseases including Yellow rust, induced systemic resistance.

B. Northern Hill Zone, NHZ (Hills of J&K State, H.P., Uttarakhand)

1. For avoiding the losses due to yellow rust of wheat, avoid planting of susceptible varieties. Replace the susceptible varieties with resistant varieties like HS 507, HS 375, HS 490, VL 907, VL 829, VL 832, HPW 155, TL 2942 (Triticale), etc.
2. Growing susceptible varieties in the higher as well as the mid-hills should be discouraged to minimize the inoculum load and further spread to plains of Punjab and other states of NWPZ. Such varieties, if grown, should be sprayed judiciously.
3. Loose smut and hill bunt are the two important diseases of wheat in the hills. Hence, seed treatment, as recommended for NWPZ for loose smut disease, be adopted. Both these diseases will be checked through the seed treatment.
4. Powdery mildew is also important in the hills, especially the valley areas. One foliar spray of propiconazole as mentioned under NWPZ may be given in the disease prone areas.

C. North Eastern Plain Zone , NEPZ (U.P., Bihar, Jharkhand, West Bengal)

1. Foliar blight and brown rust are the main crop health problems in this zone. For effective management of the diseases, cultivation of recommended varieties, like HD 2985, HI 1563, DBW 39, CBW 38, NW 1014, NW 2036, K 9107, HD 2733 (resistant to LB), DBW 14, HD 2888, K0307, DBW39 and HUW 468 should be encouraged.
2. Loose smut is also important in this zone, hence, seed treatment should be done as mentioned under NWPZ.
3. Ear cockle is an important disease in eastern parts of India, hence proper precautions be taken, especially in eastern U.P., Bihar and Jharkhand. Wider publicity should be given by extension agencies on the use of gall-free seed, well before the sowings. Farmers should adopt floatation technique for the separation of galls from the infested seed lots. The infested seed lot should be floated in 2 percent brine solution for this purpose The galls will float on the surface. These should be separated and destroyed away from the field by

burning. The seed should be thoroughly washed to remove the salt solution before sowing.

D. Central Zone, CZ (M.P., Gujarat, Southern Rajasthan, Chhatisgarh)

1. Stem and leaf rusts are the major diseases of wheat in this zone. From rust epidemiology point of view, Central Zone has a great importance in the country. Hence, old and susceptible varieties should be discouraged. For disrupting the *Puccinia* path, rust resistant varieties are required to be grown in the Zone, especially in M.P. The varieties include NIAW 1415, HD 2987, MPO 1215 (d), HI 1500, HI 8627, HD 4672, GW 322, GW 366, HI 1531, HD 8498, HD 2864, HI 1544, MP 4010 and DL788-2, etc.
2. In parts of northern and eastern M.P., loose smut occurs occasionally. Hence, disease control measures as recommended for NWPZ, be adopted wherever the disease is a problem.
3. Ear cockle nematode occurs in some small pockets in the states of M.P. and Chhatisgarh. Hence, emphasis should be given on the use of gall-free seed in the areas with ECN history.
4. Northern and Central parts of M.P. are prone to KB infection. Congenial environment prevails during ear head emergence. Hence, sprinkler irrigation should be avoided wherever susceptible varieties are grown.

E. Peninsular Zone (Maharashtra, Karnataka)

1. Leaf and stem rusts are the main crop health problems in this zone. The rust resistant recommended varieties like, HD 2781, HD 2189, NIAW 917, PBW 596, MACS 6222, AKAW 4627, NIAW 917, HI 8663, etc. be grown. This will help in minimizing the losses due to diseases. The old, local and susceptible varieties should be avoided.

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