

WHEAT CROP HEALTH NEWSLETTER

Directorate of Wheat Research
P.B. 158, Karnal-132 001



भक्तु अनुप
ICAR
Volume: 20 (2014-2015)

November, 2014



Issue: 1

Available on website: www.dwr.res.in

The first issue of Vol. 20 (2014-15) is being brought out in the month of November. Wheat crop health was monitored during off season in high hills of Himachal Pradesh (Lahaul and Kullu). The Crop Protection Technologies for different wheat growing zones finalized in the 53rd All India Wheat Workers' Meet held at Jabalpur during August 22-25, 2014 are also being presented in this issue. Karnal bunt situation in the country during 2013-14 crop season is also presented in this issue. During off season, survey for stripe rust was conducted in Lahaul valley and Kullu valley of Himachal Pradesh. Foot hills areas of Haryana (Yamunanagar) adjoining Himachal Pradesh were surveyed for rusts observation on grasses on October 7-8, 2014 by Dr. M. S. Saharan (DWR, Karnal) and O. P. Gangwar (DWR, Flowerdale, Shimla).

Dr. S. C. Bhardwaj, Head, DWR Regional Station, Flowerdale, Shimla observed stripe rust on Sept.12,2014 in the form of a mild flecking on Agra Local bordering the off-season in Wheat Disease Monitoring Nursery (WDMN) sown at Flowerdale, Shimla on August 1, 2014. During 1st week of October, it had been observed on few more lines and samples were picked up for pathotype analyses. It is for the first time that the stripe rust was observed on off- season WDMN. Telia formation in yellow rust since Oct. 6, 2014 and simultaneous appearance of brown rust with two distinct types of pustules were observed by 2nd week of October in WDMN at Flowerdale, Shimla.

Awareness for Stripe Rust Management

Stripe rust awareness among farmers was created by organizing Farmers' Day at DWR, Karnal on October 30, 2014. Lectures related to seed borne diseases and stripe rust management were delivered by Dr. R. C. Sharma (Ex Dean, College of Horticulture, UHF, Solan) and Dr. Indu Sharma, Project Director, DWR, Karnal. Dr. M. S. Saharan (Principal Scientist-Plant Pathology, DWR, Karnal) replied the farmers questions in Kishan Goshti. Posters were also displayed to make farmers aware of the stripe rust diagnosis and management. More than 500 farmers attended the fair. Stripe rust management cards were also distributed among the farmers.

Strategy Planning Meeting

A meeting on evolving strategies for enhancing wheat production with special reference to management of wheat rusts and Karnal bunt was organized by DAC on Oct. 16, 2014 in Lucknow under the Chairmanship of Dr. J. S. Sandhu, Agriculture Commissioner, Govt. of India. From DWR, Karnal, Drs. R. Chatrath, S. C. Tripathi and M. S. Saharan participated in the meeting. Dr. M. S. Saharan presented a talk on involving strategies for enhancing wheat crop production with special emphasis on stripe rust and Karnal bunt management.

Improved varieties of wheat for different zones and production conditions

The wheat varieties recommended for different zones are given hereunder:

Zone	Production condition	Varieties
Northern Hills Zone (Western Himalayan regions of J&K (except Jammu and Kathua distt.); H.P. (except Una and Paonta Valley); Uttarakhand (except Tarai area); Sikkim and hills of West Bengal and N.E. States)	TS-IR-high fertility	HPW 349, HS 507, VL 907, VL 804* , VL 738*
	TS-RF-low fertility	HPW 349, HS 507, VL 907, SKW 196* , VL 804* , VL 738* , TL 2969 (trit), TL 2942 (trit)
	ES-RF-low fertility	VL 829, HPW 251, VL 616
	LS-RI-medium fertility	VL 892, HS 420* , HS 295* , HS 490
	High altitude areas Summer sowing	HS 365, VL 832, SKW 196* , HS 375
North Western Plains Zone (Punjab, Haryana, Delhi, Rajasthan (except Kota and Udaipur divisions), Western UP (except Jhansi division), parts of J&K (Jammu and Kathua districts), HP (Una dist. and Paonta valley) and Uttarakhand (Tarai region))	TS-IR-high fertility	Bread Wheat: DBW 88, HD 3086, WH 1105, DPW 621-50, HD 2967, DBW 17* , PBW 550* , PBW 502* . Durum Wheat: PDW 314 (d), WHD 943, PDW 291(d)
	LS-IR-medium fertility	DBW 90, DBW 71, HD 3059, WH 1124, PBW 590* , WH 1021, DBW 16, WR 544 (VLS), RAJ 3765*
	TS-RF-low fertility/RI	PBW 644 (RI), WH 1080, HD 3043(RI), PBW 396,
North Eastern Plains Zone (Eastern UP, Bihar, Jharkhand, Orissa, West Bengal, Assam and plains of NE States)	TS-IR-high fertility	NW 5054, K 1006, DBW 39, CBW 38, Raj 4120, K 307, HD 2824, HD 2733, PBW 443, HUW 468, NW 1012
	LS-IR-medium fertility	DBW 107, HD 3118, HD 2985, HI 1563, NW 2036, HW 2045, DBW 14, NW 1014, HD 2643
	TS-RF-low fertility	HD 2888, MACS 6145
	LS-RF-low fertility	K 9465, K 8962
Central Zone (MP, Chhattisgarh, Gujarat, Rajasthan(Kota and Udaipur divisions) and UP (Jhansi division))	TS-IR-high fertility	MP 3288, HI 1544, GW 366, GW 322, GW 273 HI 8713 (d), MPO 1215 (d), HI 8498(d)
	LS-IR-medium fertility	MP 3336, Raj 4238, MP 1203, HD 2932, HD 2864, MP 4010
	TS-RF-low fertility	*DBW 110, *MP 3288, *MP 3173, *HI 1531, HI 1500, HW 2004 (Amar), *HI 8627(d), ,

		HD 4672(d),
Peninsular Zone (Maharashtra, Karnataka, Andhra Pradesh, Goa, plains of Tamil Nadu)	TS-IR-high fertility	UAS 347, UAS 304, NIAW 917, MACS 6478, MACS 6222, Raj 4037, GW 322, HUW 510 UAS 446(d), UAS 428 (d), UAS 415 (d), MACS 2971(dic), HI 8663(d), DDK 1029 (dic), , DDK 1025(dic),
	LS-IR-medium fertility	HD 3090, AKAW 4627, HD 2932, Raj 4083, PBW 533, HD 2833
	TS-RF-low fertility/RI	NIAW 1415, HD 2987, PBW 596, HD 2781, K 9644, AKDW 2997-16(d)
Southern Hills Zones (Hilly areas of Tamil Nadu and Kerala comprising the Nilgiri and Palni hills of southern plateau)	TS-RI-medium fertility	HW 2044, HW 1085, COW (W) -1
	Salinity-alkalinity condition	KRL 210, KRL 213, KRL 19, KRL 1-4
	IR-Medium fertility	Raj 3765, WR 544

NIAW 1415, HD 2987, PBW 596 also suitable for restricted irrigation in PZ, (d)=durum wheat, (Dic)= dicoccum wheat, TS=Timely Sown, LS=Late Sown, ES=Early Sown, IR=Irrigated, RF=Rainfed, RI=Restricted irrigation

***Varieties underlined should not be sown in stripe rust prone areas as these are stripe rust susceptible.**

Crop Protection Technologies

The host resistance is the cheapest, effective and environmental friendly means management of disease and pests. The disease scenario of different zones varies but the problem of yellow rust disease which is prevalent in northern and southern hills, north western and north eastern plains of the country is a major cause of concern.

Rust management: In NWPZ and NHZ, stripe rust (yellow rust) is very important. Usually, it is observed that the early infection of stripe rust starts in wheat fields under the poplar trees wherever these are grown having early sown crop (i.e. October). Hence, strict watch is needed by the farmers in such fields. More over for avoiding the losses due to stripe rust of wheat in NWPZ, varieties given in table be sown. Since most of the varieties recommended for NWPZ and NHZ do not carry high level of resistance, 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 stripe rust initiation using 200 litre of water/ha. Usually, it is required in the first half of February. Stem and leaf rusts are the major diseases of wheat in CZ, PZ and SHZ. From rust epidemiology point of view, for disrupting the *Puccinia* path, rust resistant varieties given table are required to be grown in respective zone.

Loose smut: Loose smut is a seed borne disease. In view of the horizontal distribution of the seed material among the farmers and the use of the carry over seed effective control measures for loose smut should be undertaken. For this, seed treatment with Carboxin (75 WP @ 2.5 gm/kg seed) or Carbendazim (50 WP @ 2.5 gm/kg seed) or Tebuconazole (2DS @

1.25 gm/kg seed) or a combination of a reduced dosage of Carboxin (75 WP @ 1.25 gm/kg seed) and a bioagent fungus *Trichoderma viride* (@ 4 gm/kg seed) is recommended.

Integrated management of loose smut involving reduced dosage of chemical fungicide and bioagent fungus is more eco-friendly and equally effective as the chemical control measures and thus should be preferred. Use of bioagents also helps in improving the initial vigour of the crop. Seed treatment with fungicide should be done one or two days before sowing. In case of integrated management, the treatment with *T.viride* should be done 72 hrs before sowing, followed by the fungicide, 24 hours before sowing.

Karnal bunt: Karnal bunt (KB) 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.

- ✓ 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 using 200 litre of spray solution be given in mid February to control the disease.
- ✓ 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 stage.

Powdery mildew: 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 ear head emergence or appearance of disease on flag leaf, whichever is earlier.

Foliar blight: Foliar blight is the main crop health problem in NEPZ. For effective management of the diseases, cultivation of recommended (resistant) 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.

Flag smut: 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.

Termite: In the termite prone areas, seed treatment with chlorpyrifos @ 0.9g a.i /kg seed (4.5 ml product dose / kg seed), be taken up for their management. Seed treatment with thiamethoxam 70WS (Cruiser 70WS) @ 0.7 g a.i./kg seed (4.5 ml product dose / kg seed) or Fipronil (Regent 5FS @ 0.3 g a.i./kg seed or 4.5 ml product dose / kg seed) is also very effective. In the standing crop, the broadcasting of the insecticide treated soil 15 DAS be practiced. For this, chloropyriphos 20EC @ 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.

Aphids: 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.

Pink stem borer: The incidence of pink stem borer is observed more in fields of rice-wheat cropping system where wheat is sown in zero tillage fields. For its management, foliar spray of quinalphos (Ecalux) 800 ml / acre as soon as pink stem borer is seen. Irrigation also helps in reducing the pink stem borer damage.

Ear cockle: 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.

KARNAL BUNT STATUS DURING 2013-14

A total of 8900 grain samples collected from various mandies in different zones, were analyzed by DWR as well as other cooperating centers (Table 1). The number of samples analyzed by various centres were: DWR-1766, Ludhiana-1919, Hisar-960, Pantnagar-2763, Dhaulakuan-381, Vijapur-490 and Durgapura-621. From Central and Peninsular zones, 694 and 222 samples, respectively, were analyzed to know the distribution and disease situation in these zones. The Karnal bunt situation in the country has been depicted in the Table 1. The highest incidence (83.98%) was recorded from UP. In Haryana, out of 1769 samples analyzed, 47.99 per cent were found infected with KB. A total of 1919 samples were collected by Ludhiana centre from different grain markets of Punjab. The disease prevalence was higher during the current year and 39.13 per cent samples were found infected. From Rajasthan, out of 720 samples analyzed, 30.13 per cent were found infected with KB with infection range upto 2.15 per cent. In Uttarakhand, out of 2845 samples analyzed, 24.67 % were infected. In MP, out of 294 samples, 6.12 per cent samples were KB infected. Based on the overall KB occurrence, it emerged that the KB incidence this year was less than the previous year. No sample from West Bengal, Gujarat (Vijapur), Maharashtra (Pune) and Karnataka (Dharwad) was found infected with KB (Table 1).

Table 1. Karnal bunt situation in the country during 2013-14 crop season

State	Total samples	Infected samples	% infected samples	Range of infection
Punjab	1919	751	39.13	0.07-2.56
Haryana	1769	849	47.99	0-5.25
Rajasthan	720	217	30.13	0-2.15
Uttarakhand	2845	702	24.67	0-10.00
Himachal Pradesh	381	114	29.90	0.1.8
West Bengal	14	0	0	-
U.P.	256	215	83.98	0-9.3
M.P.	294	18	6.12	0-2.40
Gujarat	490	0	0	-
Maharashtra	112	0	0	-
Karnataka	100	0	0	-
Total	8900	2866	32.20	0-10.00

Issued by: Crop Protection, Directorate of Wheat Research, P.B. 158, Karnal-132 001

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