

Cultivation of wheat

Submitted by abhishek bhu x-1071 on Wed, 28/03/2012 - 21:05
Posted in cultivation of wheat English

Cultiv

Field preparation

one deep ploughing followed by two or three harrowing with disc or tines and your seedling from white ants and gujhia weevil mix aldrin 5% dust in soil @ seed germination.

Soil treatment

Phosphetica culture 2.5 kg + azatobacter 2.5 kg + trycoderma powder 2.5 kg

Seed rate and its treatment

- 100kg/hact. (for normal condition)
- 120kg /hact. (for coarse size grain)
- 125 kg /hact. (for late sowing)
- 2.5 kg thiram or 2.5 kg carbendazim or 5 gram trycoderma spore @ 1kg seed

Spacing and sowing time

- Row to row spacing should be 22.5 to 23 cm
- The late sown wheat should be sown in rows spaced 15-18 cm
- Last Dates up to which sowing would be economical are:

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1. up to 25th December - in North-West plain Zone
2. up to 10th December - in North-East plain & Central Zone
3. up to 30th November - in Peninsular Zone

Soaking seeds in water overnight before sowing, using higher seed rate, closer spacing can reduce loss caused by late sowing, The dwarf wheat should be sown only after germination and reduced yield.

Irrigation

- First at 20-25 day after sowing
- Second at 40-45 day after sowing
- Third at 60-65 day after sowing
- Forth at 80-85 day after sowing
- Fifth at 100-105 day after sowing
- Sixth at 115-120 day after sowing

Pre-emergence

As pre-emergence, only Stomp 30EC (Pendimethalin) is available which can be used @ 1.5 l/ha. Care must be taken to have fine tilth for better performance of pendimethalin.

Post-emergence

During the last 3-4 years a number of herbicides were found effective against even the resistant biotypes of Phalaris, two namely Sulfosulfuran and Metribuzin were effective against both grassy and non-grassy weeds. Application of Metribuzin should be done carefully as this chemical is not safe at double dose. hot and windy weather prevails and rainfall occurs immediately after its spray / application.

The herbicides that are to be applied as post emergence after first irrigation at 3035 days of sowing or 2-3 leaf stage.

Weed control

• Both Grassy and Broad Leaved

1. Sulfosulfuran @ 25.0g a.i./ha in 250-300 liters of water /ha.
2. Metribuzin @ 175 g a.i./ha in at least 500 liters of water /ha.
3. A mixture of Sulfosulfuran at 25g/ha and metsulfuron methyl @ 4 g/ha in 250-300 liters water /ha.
4. Combination of 2,4-0 and isoproturon can also be used for the control of mixed weed population in resistant biotypes.

• Only Grassy Weeds

1. Clodinafop @ 400 g/ha (60g a.i./ha) in 250-300 liters of water / ha.
2. Fenoxaprop-ethyl @ 80-120g a.i./ha in 250-300 liters of water / ha.

• Only Broadleaf Weeds

1. 2,4-0 @ 500 g a.i./ha in 250-300 liters of water /ha.
2. Metsulfuron methyl @ 4 g a.i. / ha 250-300 liters of water /ha.

Some Useful Hints

Do's

- spray the herbicides, both pre and post emergence, when there is sufficient moisture in the soil. S
- Spray the post-emergence herbicides when Phalaris minor is at 2-3 leaf stage.
- Spray on clear and sunny days only when the leaves are dry.
- Use only flat fan nozzle especially for Fenoxaprop.
- Remove Phalaris minor before seed setting and use as fodder.
- Ensure complete coverage of the field.

Don'ts

- Do not use Sulfosulfuran in mixed cropping system of wheat and mustard or other crops.
- Never apply these post emergence herbicides by mixing with sand, urea or soil.
- Do not mix Clodinafop and Fenoxaprop with 2,4-D

The major diseases of wheat in India are, three rusts - leaf, yellow and stem rust, Karnal bunt, foliar blights, and importance include head scab, foot rot and flag smut; these diseases though of lesser importance, may be important in some regions.

Improve varieties

• Northern Hills Zone (NHZ)

1. VL-832,VL-804, HS-365, HS-240 -- Irrigated/Rainfed, Medium Fertility, Timely Sown
2. VL-829,HS-277 -- Rainfed, Medium Fertility, Early Sown
3. HS-375(Himgiri),HS-207, HS-295, HS-420 (Shivalik) -- Irrigated/Rainfed, Medium Fertility, Late Sown
4. HS375 (Himgiri), HPW42 -- Very High Altitude

Noth Western Plains Zone (NWPZ)

1. HD2687,WH-147, WH-542, PBW-343, WH-896(d), PDW-233(d), UP-2338, PBW-502, Shresth (HD 2687), Aditya
2. PBW-435, UP-2425, PBW-373, Raj-3765 -- Irrigated, Medium Fertility, Late Sown

North Eastern Plain Zone (NEPZ)

1. PBW-443, PBW-502, HD-2733, K-9107, HD-2824 (Poorva), HUW-468, NW-1012, HUW-468, HP-1731, Poorva
2. Raj-3765, HD-2643, NW-1014, NW-2036, HUW-234, HW-2045, HP-1744, DBW-14 -- Irrigated, Medium Fertility
3. HDR77, K8027, K8962 -- Rainfed, Low Fertility, Late Sown
4. HD-2888 -- Rainfed, Timely Sown

Central Zone (CZ)

1. DL-803-3, GW-273, GW-190, Lok-1, Raj-1555, HI-8498(d), HI-8381(d) -- Irrigated, High Fertility, Timely Sown
2. DL-788-2, GW-173, NI-5439, MP-4010, GW-322, Urja (HD 2864) -- Irrigated, Medium Fertility, Late Sown
3. C-306, Sujata, HW-2004, HI-1500, HD-4672(d), JWS-17 -- Rainfed, Low Fertility, Timely Sown

Peninsular Zone (PZ)

1. DWR-195, HD-2189,DWR-1006(d), MACS-2846(d), DWR-2001(di), Raj-4037, DDK-1009(di) -- Irrigated, High Fertility
2. HUW-510, NIAW-34, HD-2501, HI-1977, Pusa Tripti (HD-2833) -- Irrigated, Medium Fertility, Late Sown
3. A9-30-1, K-9644,NIAW-15(d), HD-2380 -- Rainfed, Low Fertility,Timely Sown

Southern Hills Zone (SHZ)

1. HW-2044, HW-1085, NP-200(di), HW-741-- Rainfed, Low Fertility, Timely Sown
2. HUW-318, HW-741, HW-517, NP-200(di), HW-1085 -- Irrigated, High Fertility, Timely Sown

National Capital Region Delhi (NCR)

1. HD-2851(Pusa Visesh), HD-4713(i)(d) -- Irrigated, Timely Sown
2. Pusa Gold (WR-544) -- Irrigated, Late Sown

Latest Release of wheat varieties

- HD-2894 (2008) -- High yielding variety for NCR Delhi, with an average yield of 5.2 t/ha having a protein content of 12.5%. It is developed by IARI New Delhi
- HD-4713 (durum) (2008) -- High yielding durum variety for NCR Delhi, with an average yield of 4.71 t/ha having a protein content of 14.5% under both natural and artificial conditions and is suitable for pasta products.
- Pusa Gold (WR-544)(2005) -- for late sown, irrigated conditions of Delhi region, released by IARI New Delhi.

[Hemant Sharma](#)

A User from Hanumangarh,
Rajasthan,India



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- Pusa Vishes (HD-2851) (2005) & HD-4713(d)(i) (2006) -- for timely sown, irrigated conditions of Delhi region, released by IARI New Delhi
- Poorva (HD 2824) (2005) -- timely sown irrigated for NEPZ region, released by IARI New Delhi
- HD-2888 (2006) -- timely sown, Rainfed conditions for NEPZ region, released by IARI New Delhi
- Shresth (HD 2687)(2005), Aditya (HD 2781)(2005) -- timely sown, irrigated conditions of NWPZ region, released by IARI New Delhi
- Pusa Tripti (HD-2833)(2006) -- Late sown & Irrigated conditions of PZ, released by IARI New Delhi
- Urja (HD 2864) -- for late sown, irrigated conditions for CZ region, released by IARI New Delhi
- Amrta (HI 1500) -- for timely sown unirrigated for central India, released by IARI Indore
- Swarna (HI 1479) -- for timely sown irrigated condition for central India, released by IARI Indore
- PBW 502 -- timely sown, irrigated conditions of NWPZ credited with Punjab Agriculture Univ.
- DBW 14 -- late sown, irrigated conditions of NEPZ credited with Directorate of Wheat Research

Diseases

- **Leaf Rust /Brown Rust-** Puccinia recondita tritici.

Distribution: Throughout wheat growing regions of India.

Development: Pathogen over-summers in low and mid altitudes of Himalayas and Nilgiris. Primary infection occurs in eastern Indo-gangetic plains in middle of January where it multiplies and moves westwards by March. Temperature and moisture (dew) cause epidemics. Severe infection causes upto 30 percent yield losses.

Management: The presently recommended varieties in most of the wheat growing zones are rust resistant.

- **Stripe Rust /Yellow Rust-** Puccinia striiformis tritici

Distribution: Hills, foothills and plains of north western India and southern hills zone (Nilgiri hills of Tamil Nadu)

Development: Spreads through air-borne urediospores, when temperature are 10–20°C but the spread is checked at lower temperatures of hills (Himalayas and Nilgiris) and the primary infection takes places by middle of January in western India. Also, infection comes from across the western border, hence the probability of evolution of new races. Nilgiri hills cannot come out of the zone due to high temperatures in the Peninsular and Central India.

Management: Most of the presently recommended varieties are resistant. Major emphasis is on host resistance and fungicide strategy of management.

- **Stem Rust /Black Rust-** Puccinia graminis tritici

Distribution: Mainly in Peninsular and I Central India, may occur in traces in Northern India too' were the infection was reported in 1951.

Development: Develops from air-borne urediospores, needs free moisture and temperature above 20° C for sporulation. Infection is early. The pathogen perpetuates in Nilgiri hills during off season and becomes air-borne. If Peninsular and Central India then epidemics are severe. Late infections cause less damage in north India.

Management: The presently recommended varieties in most of the wheat growing zones are rust resistant, but some varieties are still susceptible.

- **Karnal Bunt-** Tilletia indica (=Neovossia indica)

Distribution: Parts of Northern Plains, especially Punjab, parts of northern Haryana, foot hills of J&K and Himachal Pradesh, Rajasthan, Bihar and UP. The states of Gujarat, Maharashtra, Karnataka and several parts of M.P. are free of Karnal bunt.

Development: Seed and soil-borne; infection occurs at flowering by means of soil-borne inoculum. The disease is more severe in wet weather conditions prevailing during spike emergence to grain filling stage of crop. If the rains occur during grain filling (disease - prone areas), the disease is likely to come with higher severity.

Management: Among the present day varieties, PBW 502 is resistant while the others show various levels of susceptibility. One spray of Propiconazole (Tilt 25EC @ 0.1 %) should be given at the time of anthesis. Integration of one seed treatment with fungicide, Trichoderma viride (0.4% suspension) gives almost cent per cent disease control. The bioagent spray growth stage 31-39 on Zadoks scale), followed by the spray of chemical at start of earhead emergence (crop stage 31-39) of T. viride, at these two critical growth stages also give non chemical control of the disease which is almost 100%. Fungicide control should be adopted mostly in seed production plots.

- **Black Point-** Alternaria alternate

Development: Disease causes blackening of embryonic region of the seed (black point), discoloration of area around the seed (black spot). (Caused by Alternaria, Curvularia lunata, Epicoccum sp., Bipolaris sorokiniana, etc.) and eye-spot symptom in grain filling or near maturity favors this disease.

Management: This disease is of minor importance. Only when the disease percentage is high, it causes concern as seeds are mostly shrivelled and they are separated out during processing.

- **Loose Smut-** Ustilago segatum (U. tritici)

Distribution: North Indian plains and northern hills zone.

Development: It is a seed borne disease; infection occurs during Loose Smut flowering through wind-borne spores. The infection remains dormant inside the otherwise healthy looking seed and manifests itself in infected inflorescence. Infection is favored by cool, humid conditions during flowering period of the host plant.

Management: Disease can be easily controlled through seed treatment with systemic fungicides hence resistance is not required. Treat the seed with fungicides like carboxin (Vitavax 75WP @ 2.5g / kg seed), carbendazim (Bavistin 50WP @ 2.5g / kg seed) if the disease level in the seed lot is high. If it is low to moderate, treat the seed with a combination of carboxin and carbendazim (recommended dose of carboxin (Vitavax 75WP @ 1.25g / kg seed).

- **Foliar Blights-** Bipolaris sorokiniana (Spot blotch), Pyrenophora tritici repens (leaf blotch or tan spot), Alternaria tritici (leaf blotch)

Distribution: Mainly in eastern India but also occurs in Peninsular and Central Foliar blights India. This disease is also reported in western India too.

Development: The disease requires high temperature and high humidity. This disease is more severe in late sown wheat through formation of shrivelled grains. Most of the varieties are susceptible or moderately susceptible. The propiconazole (Tilt 25EC @ 0.1 %).

- **Powdery Mildew-** Erysiphe graminis tritici

Distribution: Mainly in the cooler areas and hilly region; foot hills and plains of north - western India and the eastern India. **Development:** Powdery mildew can easily be diagnosed by the white, powdery patches that form on the leaves and patches turn dull dirty white and may have small black specks embedded. This disease can spread to all above ground parts of the plant, including earhead and awns. The disease infects plants during periods of high humidity and low light intensity, which accompanies dry weather and a dense crop canopy favours this disease.

Management: Present day varieties are not resistant to powdery mildew. Hence, the disease severity is more by using adequate seed. For chemical control, one spray of propi-conazole (Tilt 25EC@ 0.1 %) on disease app in northern plains) is highly effective.

- **Head Scab-** Fusarium graminearum

Distribution: Parts of Punjab, especially in the sub mountainous regions. Bread wheat suffers lesser damage proportion in some parts of Punjab during 1995-96 crop season and again during 2004-05 crop season.

Development: Disease development is favoured by cool, moist weather with high humidity. Spores are produced by rain splash or wind. Apart from ear head infection, it can cause seedling blight and foot rot leading to lodging and low-test weights. At present, it is a disease of limited importance but has the potential to emerge as a major

Management: Bread wheat are more resistant than durum. However, no resistant varieties are available. Hence

- **Cereal Cyst Nematode-** Heterodera avenae

Distribution : This nematode is found in most of the cereal growing regions of the country, especially, the dry and warmer areas of Rajasthan, Haryana and Punjab, but incidence is less in cooler climates.

Development: Larvae enter the roots near the growing point especially, at the seedling stage. Roots of infested plants become stunted and die. In infected fields, the losses can be considerably enough.

Management: Most of the wheat cultivars are susceptible but some resist cyst formation. Chemical pesticides coupled with improved cultural practices help in management of the CCN. For Rajasthan, one CCN resistant variety is available.

- **Seed Gall Nematode /Ear Cockle-** Anguina tritici

Distribution: It is found mainly in some parts of northern India especially the states of Bihar, Jharkhand, east

Development: These nematodes are spread through seed galls in the seed lots during planting and harvest. The nematode invades the crown and basal stem area, finally penetrating floral primordia. This leads to

Management: Use of clean seed (free of galls) is the only method to prevent this disease. For removal of gall solution. The galls, which float on the surface, can be easily separated and destroyed away from the fields. The water and used for planting.

- **Aphids-** Sitobion avenae, Rhopalosiphum padi and various other species

Distribution: All wheat growing areas, especially in NWPZ and Peninsular India.

Development: The aphids exist in different stages, viz., winged (alates), wingless (apterous) sexual and asexual reproduction where females give rise directly to nymphs rather than eggs. Infestation usually occurs at maturity.

Management: When feeding in sufficient numbers, they can cause considerable damage, but under normal conditions are recommended for this pest in wheat if the level of aphids per tiller crosses 10 during vegetative phase are need to keep watch on this pest. The spray of imidacloprid @ 20 g a.i. per ha initially on border rows and if necessary good protection against this pest. Generally, natural enemies present in the field help in controlling the population.

- **Brown Wheat Mite-** Petrobia lateens

Distribution: In most of the wheat growing areas, under rainfed conditions, especially in the states of Rajasthan, humid and warm conditions of irrigated areas also.

Development: They Brown wheat cause damage through mite infestation sucking mouth parts. When present in large numbers, mites cause a silvery flecking on leaves. Individual mites without effort. These can be seen by shaking the infested leaves on a white paper.

Management: Most of the times, mites do not cause any production constraint in wheat so no management is required. Keep vigil on this pest so that it may not become important in changing cropping sequence of future.

- **Army Worm-** Mythimna separate

Distribution: Mostly in the warmer climates of central India and to some extent in northern plains.

Development & Management: The larvae are found in the cracks of soil and hide during the day but feed at night. In weather, they may feed during day time also. They survive during summer on the subsequent crops like rice and wheat crop comes in the field. Recently, this pest is catching attention in the northern India under Rice-Wheat cropping system.

- **Legume Pod-borer-** Helicoverpa armigera (= Heliothis armigera)

Importance: This is a polyphagous insect that attacks various legumes as a pod borer. It is seen damaging various major hosts are not available. However, the damage is below economic threshold level.

Distribution: It is found mostly in northern and central parts of India. Wheat can serve as a bridge host for carry over

- **Termites-** Odontotermis obesus, Microtermis obesi

Distribution: Mainly in the northern and central India, but also in some pockets of peninsular India.

Early Symptoms of Damage: Termites attack the crop at various growth stages,

from seedlings to maturity. The severely damaged plants can be easily uprooted and look wilted and dried. In advanced stages, yellowing.

Management: For effective management, chemicals like endosulfan, chlorpyrifos and carbosulfan can be used in treated soil in standing crop.

Intercropping with Wheat

Submitted by vineetkt on Fri, 14/12/2012 - 23:34.

As I am new to farming and I found the terminology "Intercropping", while googling, May you or any other member help me to know what co

Confusing Do's and Don'ts

Submitted by vineetkt on Fri, 14/12/2012 - 23:15.

Thanks for a great explanation. I am a SW engineer and have never known farming of wheat. I found these details very helpful and hope to a grandfather. I got confused on following, Under Do's section there are two points that look contradictory to each other -

- Spray the herbicides, both pre and post emergence, when there is sufficient moisture in the soil.
- Spray on clear and sunny days only when the leaves are dry.

(How can leaves be dry but soil still moistured - How will we decide this condition?)

May you help me to understand what exactly is meant here(I was confused - might be my lack of no experience in farming :-))

Thanks a lot.

Active Users

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