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Course name :

**Crop Production Technology-II
(ASAG 2204)**

Course credit :

(2-1-0)

Lecture 2

Topic: Wheat

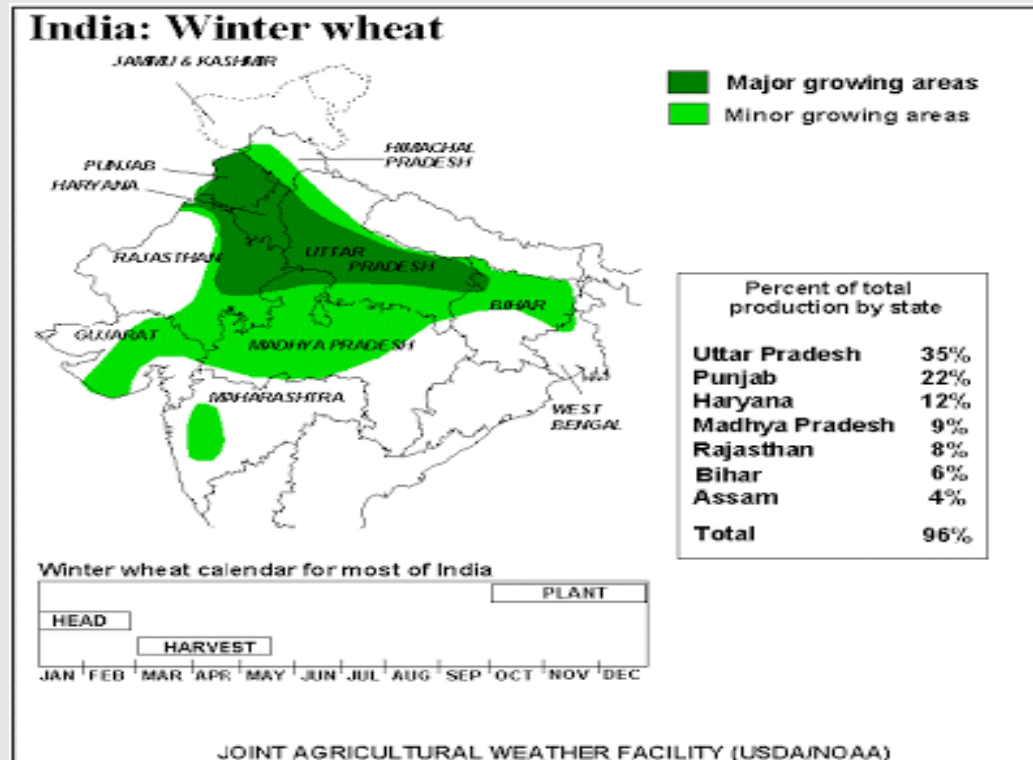


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2.1 Wheat area: 302.27 lakh ha, production: 93.5 million tonnes, productivity: 3093 kg/ha (in India). India ranks 2nd in wheat production in the world.

Countries	A (000ha)	P (000t)	Y (kg/ha)	%
World	220000	729000	3314	100.00
China	24100	157000	6515	21.54
India	30500	95900	3144	13.16





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2.2 WHEAT GROWN ZONES OF INDIA

North West Plains Zone

North East Plains Zone

North West Hills Zone

Central Zone

Southern Hill Zone

Peninsular zone

2.3 SOILS

In India, wheat is grown in different soils; but it does well on well drained loams and clay loams. Best growth is achieved in alluvial soils of Gangetic plains; but it does also well on black cotton soils of central India.

- **Gangetic alluvium of U.P and Bihar**
- **Indus alluvium of Punjab and Harayana**
- **Black soils of central and southern India**
- **Hilly soils of Himalaya**
- **Desert soils of Rajasthan**



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2.4 VARIETAL IMPROVEMENT IN INDIA

- Earlier (**Imperial now**) **Indian Agricultural Research Institute (IARI), Pusa** developed some varieties like **Sarbati, Dara, Hard Red Calcutta, Bansi and Malvi of T. aestivum and Kandwa of T. durum wheat.**
- In India, a major breakthrough in wheat production started in 1967-68 with the introduction of Mexican Dwarf Wheat Ideotype
 - Mexican dwarf wheat ideotype is having **Norin10 gene.**
 - **Norin10 gene was brought by**
 - **Important characteristics:** Dwarf in height, erect leaf, responsive to fertilizer N and irrigation, synchronous tillering and maturity, preventive to lodging, less susceptible to diseases.
 - **Introduction of dwarf wheat** provided a spurt in wheat production **in India in 1963** with the introduction of Mexican Dwarf Varieties namely, **Sonara 64 and Lerma Rojo.**



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2.5.1 RECOMMENDED VARIETIES FOR NWPZ

Timely sown IRRIGATED crop

HD 2687, HD 2428, HD 2204, CPAN 3004, Raj 307, PBW 154, WH 542, UP 2338, Raj 3765, PBW 343, DBW 17, PBW 550, PBW 502, WH 542, PDW 291(d), PDW 233(d), WH 896 (d)

Late sown IRRIGATED crop

HD 2285, HD 2688, HD 2270, PBW 226, Raj 3077, UP 2338, PBW 435, UP 2425, PBW 590, WH 1021, DBW 16, PBW 373, Raj 3765

RAINFED

C 606, IWP 72, Kundan, WL 410, PBW 175, PBW 396

2.5.2 RECOMMENDED VARIETIES FOR NEPZ

Timely sown IRRIGATED crop

Janak, PU 262, HP 1102, UP 2003, HUW 206, HD 2407, K 7410, K 9107, Vaishali, HD 2824, HD 2733, PBW 443, PBW 343, HUW 468

Late sown IRRIGATED crop

HD 2307, HD 2285, HD 2643, HP 1209, K 8020, K 8962, HW 1014, HW 2045

RAINFED

C 306, K 8027, K 8962, K 9465, HD 2888



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2.5.3 RECOMMENDED VARIETIES FOR NWHZ

Timely sown IRRIGATED crop

CPN 1796, HB 208, HD 2380, SS 240, UP 1109, BW 738, BL 804, BL 738, HS 240

For high altitude: HS 365, BL 832

Late sown IRRIGATED crop

WL 421, CPAN 1796, HB 208, HD 2380, HS 240, UP 1109, HS 420, HPW 42

RAINFED

SS 277, SS 207, HS 295, HS 240, VL 804, VL 738

2.5.4 RECOMMENDED VARIETIES FOR CENTRAL ZONE

Timely sown IRRIGATED crop

Kanchan, Raj 1555, HI 1544, HI 8381, Lok 1, GW 1139, GW 273, HD 2236

Late sown IRRIGATED crop

GW 173, Sonalika, Vidisha Lok 1, Swati, HD 2327, HD 2932

RAINFED

Narmada 4, Mukta, C 306, Meghdoot, Sujata



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2.5.5 RECOMMENDED VARIETIES FOR SZ

Timely sown IRRIGATED crop

DWR 162, SD 4502, Kirti, HD 1085, HD 2380

Late sown IRRIGATED crop

Sonalika, HD 2501, DWR 195

RAINFED

MACA 1367, NI 5439, N 59, Vjinga Yellow

2.5.6 RECOMMENDED VARIETIES FOR Peninsular Zone

Timely sown IRRIGATED crop

GW 322, DWR 162, HD 2189

Late sown IRRIGATED crop

PBW 533, HD 2932, HD 2833, Raj 4083

RAINFED

PBW 596, HD 2781, K 9644, NI 5439,



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2.6 Categories of Indian Bread Wheat (consumed as ROTI/ CHAPATI)

2.6.1 Indian Amber Wheat

Bold grain, amber, translucent, lustrous, 11% protein, popular among elite customers. **Varieties:** C 306, Sujata, HD 2781, HD 2189, HD 2833, UP 262, HW 2045, Lok 1, Raj 3077

2.6.2 Indian Sona Wheat

Medium grain, medium hard, cultivated in large area in India (NWPZ and CZ), 10% protein. **Varieties:** HD 2285, HD 2733, HD 2643, HD 2687, PBW 343, PBW 373, UP 2338, HUW 234, GW 193, GW 190

2.6.3 Indian Pissi Wheat

Grains are medium sized, less than 10% protein, produced in NEPZ, CZ and NHZ. Used to make biscuits, cake. **Varieties:** Sonalika, Pissi local, HB 208.



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2.6.4 Indian Hard Wheat

- Medium bold grains, translucent, hard with 12% protein. Cultivated in Karnataka, Gujarat, Maharashtra and parts of MP and used in Bakery bread.
- **Varieties:** HI 977, K 9107, Raj 1482, GW 496, DWR 162, DWR 195.

2.6.5 Durum Wheat

- Central and PZ, used for making of pasta, vermicelli, macaroni, spaghetti.
- **Varieties:** HI 8498, HI 8381, PDW 233, WH 896, MPO 1066



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2.7 SOILS :

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- **Gangetic alluvium of U.P and Bihar**
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2.8 Climate

Wheat is grown in all types of climatic conditions i.e. tropical, sub-tropical and temperate. In India, major Wheat area is under sub-tropical region. The cool and sunny winters are very conducive for growth of Wheat crop. The following temperature is required for optimum growth and development.

Growth stages	Temperature requirements
Germination	20 to 25°C mean daily
Accelerated growth	20 to 23°C mean daily
Proper grain filling	23 to 25°C mean daily

Source: http://dwd.dacnet.nic.in/wheat_prod/wheat_prod_tech.htm



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2.9 SEASON

- In India, wheat is grown during **rabi or winter season.**
- The high temperatures on both ends of wheat season restrict the cultivation of this crop in India.
- Hot summer during the grain ripening period hastens the maturity of the crop giving inferior quality of the crop.
- **In India, wheat is grown in areas with annual rainfall varying from 300 -1130mm. It can also be grown in high attitudes. It is grown in Kashmir at an altitude of 2000-3000 m MSL.**



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2.10 TIME OF SOWING

Zone	Optimum sowing time
North western plains	1 st fortnight of November – short duration varieties 2 nd fortnight of November – long duration varieties
North eastern plains	2 nd week of November – short duration varieties 1 st week of November – long duration varieties
Peninsular zone	October 2 nd fortnight for all varieties



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2.11 SOWING AND SEED RATE

Seeding time	Seed rate (kg/h a)	Time of sowing	Spacing cm	Seeding depth
Irrigated timely sown	100	10-25 Nov	20-22.5	5-6 cm
Late sown irrigated	125	25 Nov - 25 Dec	15-18	5-6 cm
Rainfed timely sown	100	15 Oct- 30 Nov	20-25	6-7cm