

# **All India Co-ordinated Wheat & Barley Improvement Project**

**1. Name of the centre :** TCB College of Agriculture & Research Station,  
Indira Gandhi Krishi Vishavidayala, Sarkanda  
Bilaspur (CG) 495001

**2. Year of Start:** 1984

**3. University/Department:** Indira Gandhi Krishi Vishavidayala, Raipur

**4. Importance of centre and mandate:** Bilaspur is the only wheat research station in Chhattisgarh state located at latitude: 22<sup>0</sup>9'N; longitude; 82<sup>0</sup>12'E with an altitude of 292.3 m MSL comes under central zone. Chhattisgarh plane zone is having short winter with early rise of temperature from last week of January to first week of February, favourable temperature (less than 21<sup>0</sup>C mean temperature) for wheat growing is 8 weeks (2008-09 & 2010-11) to 13 weeks (2007-08) starting from 47 SMW to 7 SMW in different years. Hence the centre is good for screening the wheat varieties for early heat tolerance as well as terminal heat tolerance.

**5. Mandate:**

1. Breeding of wheat varieties for timely sown under restricted irrigation/ irrigated conditions (Suitable up to 25<sup>th</sup> of November)
2. Breeding of wheat varieties for late sown under irrigated conditions (Suitable Up to 15<sup>th</sup> December)
3. Breeding for terminal Heat Tolerance with leaf blight resistance

**6. Wheat scenario in the State:** Chhattisgarh is divided in three agro-climatic zones, *i.e.* Chhattisgarh Plane Zone, Bastar Plateau and Northern Hill Region. The plateau and hill region are tribal dominated areas. Bilaspur is the only wheat research station in Chhattisgarh state located at latitude: 22<sup>0</sup>9'N; longitude; 82<sup>0</sup>12'E with an altitude of 292.3 m MSL. Wheat is cultivated in 1.70 lakh ha area with production of 2.12 lakh tone and the productivity is 1250 kg/ha which is quite less than half of the national productivity. The main reasons of low productivity are..

- i.. Cultivation of medium to long duration paddy and delayed sowing of wheat after paddy
- ii.. Lack of mechanization for harvesting of paddy followed by land preparation/sowing of wheat.
- iii.. Late sowing of wheat with inadequate technical know-how of package and practices, including choice of varieties. Seed availability of wheat varieties recommended for late sown conditions is less and wheat cultivating farmers cultivated the varieties available with Seed Corporation. Some time it has been observed that varieties not recommended for central zone are available with the state agencies. Farmers are using higher seed rate 150-200 kg/ha. under late sown conditions. More than 70 % wheat cultivated under broadcasting and very less percentage under line sowing in the state.

- iv.. Limited irrigation facilities: BPZ and NHR have better climatic conditions for wheat cultivation i.e. cool and long winter as compare to CPZ, but the lack of irrigation facilities compelled the farmer to grow wheat under rainfed / restricted irrigation conditions. Wheat area is more under CPZ as compare to BPZ & NHZ due to irrigation facilities available. Tube well is the chief source of irrigation for wheat cultivation. Dam water is used for cultivation of summer paddy due to lack of field channel system for rabi crops.
- v. . Short winter: Chhattisgarh plane zone is having short winter with early rise of temperature from last week of January to first week of February, favourable temperature (less than 21<sup>0</sup>C mean temperature) for wheat growing is 8 weeks (2008-09 & 2010-11) to 13 weeks (2007-08) starting from 47 SMW to 7 SMW in different years. Hence the centre is good for screening the wheat varieties for early heat tolerance as well as terminal heat tolerance. The temperature ranges in different year are given in annex- I

## ACHIEVEMENTS OF PROJECT

### A. Crop Improvement

#### 1. Varieties developed:





S. No.	Variety Name & Parentage	Production Condition	Grain Yield (qt/ha)*		Notification details	Special Feature
			Average	Potential		
1	Chhattisgarh Amber Wheat (CG 1018) HW2004 X PBN 1666-1	Timely (November) sown, Restricted Irrigated	41.6	47.4	Notified in 81 <sup>st</sup> meeting of CVRC	Excellent Chapatti making quality
2	Chhattisgarh Genhu-3 (CG 1013) GW 322/KYZ0285	Timely (November) sown, Irrigated	59.3	77.6	SO 1379 (E) 28.3.18	Resistance to brown and black rust
3	Chhattisgarh Genhu-4 (CG 1015) NI 908/BL 1986	Late (December) sown, Irrigated	53.3	68.8	SO 1007 (E) 30.3.17	Resistance to brown and black rust
4	Ratan (CG 5016) HUW325/DL 230-7	Timely (November) sown, Restricted Irrigated	34.8	41.4	SO 2187 (E) 27.08.09	Resistance to brown and black rust

\* Mean yield of central zone

#### 2 Varieties in pipeline:









1. CG 1023: This variety recorded chapatti making quality score more than 8.0 with lowest value of phenol test. It has highest bread quality score, bread loaf volume and bread loaf volume mg/dough weight and lowest yellow pigment unit. The zinc content in this variety is 40.4 PPM, which is categorized under high content. This variety was tested in AVT-I (RI) in NWPZ (2016-17) recorded the average yield of 47.2 qt/ha (Fourth rank) and comes in the first non-significant group but have *at par* with the best check WH 1080 (46.8 qt/ha) with CD of 1.0 qt/ha. The PPSN data is acceptable for brown and yellow rust. In Chhattisgarh state it recorded higher seed yield than the Sujata, MP 3288 and Ratan.

2. CG 1029: This variety promoted in AVT-I under late sown conditions in Central zone for testing in rabi 2018-19. The average productivity of this genotype is 44.4 qt/ha which is significantly superior to the check HD 2932 (41.4 qt/ha) and HD 2864 (40.7 qt/ha) in NIVT-3B during Rabi 2017-18. This variety is recorded resistant against black and brown rust. The average test weight of CG 1029 is 46.0 grams with average plant height of 91 cm.

	
Chhattisgarh Genhu-3	Chhattisgarh Amber Wheat
	
Chhattisgarh Genhu-4	Ratan



B. Resource management

SN	Title	Recommendation	Photograph	
01.	Closer row spacing in wheat cultivation.	<b>Closer spacing</b> (20 cm) recorded significantly higher yield (42.94 q/ha) than wider spacing 22.5cm (35.67 q/ha.), which was 16.93 percent higher than recommended spacing (22.5 cm).		
			20cm row spa.	22.5 cm row spa.
02.	Effect of different date of sowing on yield of wheat under irrigated condition.	November second week sowing ( <b>Timely sown</b> ) produced higher yield (39.96 q/ha) which was 13.33 percent higher than sowing of December first week ( <b>late sown</b> ) (34.63 q\ha), with net return of Rs.44,928 and B: C ratio of 1.66.  Moreover, December first week sowing recorded 22.79 percent higher yield (35.41 q\ha) as compared to December last week sowing (27.55 q\ha).		
03.	Management of lodging and yield maximization in wheat.	<b>150% RDF + 15 t FYM/ha</b> recorded 15.70 per cent higher yield (45.83 q/ha) than RDF (120:60:40 kg NPK/ha) (39.93 q/ha) with net return of Rs.49,994 and B: C ratio of 1.53. Two sprays of Chloromequat chloride (0.2% Lihocin) + tebuconazole (0.1% Folicure) of commercial product dose at first node (Around 45 DAS) and flag leaf (Around 80 DAS) using 400 lit water/ha. produced 18.40 per cent higher than control. higher yield (40.07 q/ha) with net return of Rs./ha 42,626 and B: C ratio of 1.44.		
04.	Comparative performance of line versus dibbling in wheat.	The highest yield was obtained in seeding method, <b>dibbling 15x15 cm.</b> (41.71q/ha), which was 23.01 percent higher than line sowing at 20 cm with seed rate 100 kg/ha (32.11 q/ha).		
05.	Evaluation of herbicides for control of broadleaved weeds in timely sown wheat.	Halauxifen methyl + florasulam + carfentrazone +surfactant (Product dose 24.99+50+750 ml/ha) producing 31.93 per cent higher yield (45.87 q/ha) as compared to weedy check (31.22 q/ha).		
06	Effect of different Nitrogen levels (kg/ha) on yield of wheat under rainfed.	Highest yield was recorded in <b>80 kg N\ha</b> , (22.10 q/ha) which was significantly higher than 40 kg N\ha (17.64 q/ha) under rain fed condition.		
07	Effect of different irrigation levels on yield of wheat under restricted irrigation.	Two irrigation at CRI (18-20 DAS) and boot leaf (50-55 DAS), producing 29.25 per cent higher yield (28.30 q/ha) than No Irrigation (20.02 q/ha).		

## SCIENTIST ENGAGED IN RESEARCH



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### **Dr. Ajay Prakash Agrawal**

#### **Designation**

Pr. Scientist (Plant Breeding & Genetics)

#### **Present place of Posting**

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**Bilaspur-495 001, Chhattisgarh, India**

#### **Degree**

M. Sc. (Ag.) Plant Breeding & Genetics (Gold Medal)

Ph. D. Genetics & Plant Breeding (Gold Medal)

**Field of Specialization : Development of crop varieties**

**Ad-hoc Project completed: Six**

#### **Publications-**

No. of Research Papers – 28

Bulletins – 20

Practical manual -02

Popular Articles - 27

#### **Experience (No. of Years)**

Research & Extension – 22 Years

Teaching (2001-12) - 12 Years



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**Degree: M. Sc. (Ag.), Agronomy**

Ph. D. Bio-Science

**Field of Specialization: Resource Management.**

**Publications:**

No. of Research Papers – 45

Bulletins – 09

Practical manual -02

Popular Articles - 57

**Experience ( No. of Years)**

Research & Extension - 09 Years

Teaching (2001-09) - 02 Years

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**Degree**

M. Sc. (Ag.) Genetics & Plant Breeding

**Publications-**

No. of Research Papers – 2

Popular Articles – 5

**Experience ( No. of Years)**

Research - 1 Year