

RABI CAMPAIGN 2006

WHEAT

TARGET AREA: Punjab, Haryana, Western U.P. Rajasthan, Bihar, West Bengal, Uttaranchal

- Avoid burning of rice straw after combine harvest and use rotavator to incorporate crop residue into soil
- Sowing in time. 25th October to 10th November for rainfed conditions 10-25th November for irrigated timely sown and 25th November to 25th December for irrigated late sown.
- Zero tillage to be followed especially in late sown situation. The zero till machine has an inverted T-shaped chisel as tine, which splits the wet soil surface about 2-3 cm deep, making a 1 to 1.5 cm wide channel for placing both seed and fertilizer.
- Adopt furrow irrigated raised bed planting system to save irrigation water. Sow three rows of wheat on top of the ridge along with fertilizer. Apply irrigation in furrow.
- Balanced use of NPK to get maximum benefits of applied nutrients.
- Farmers are advised to apply micronutrient in deficient areas. Apply ZnSO₄ (Zinc sulphate) at the rate of 25 kg. per ha. before sowing if not applied to previous crop.
- Use only certified/quality seed of varieties recommended for the area. The detailed list of important varieties is given in Annexure-I.
- Irrigate the crop at critical stages particularly at crown root imitation stage (21 days after sowing).
- Follow Integrated Pest Management, grow resistant varieties, treat seed with fungicides and Trichoderma.
- Use disease free seeds. Seed borne inoculums can be killed by treating seed with fungicide at the rate of 2.5 gram. per kg. seed. For control of loose smut, treat seed with Vitavax 75 WP or Bavistin 50 WP @ 2.5 gm/kg. seed; Remove infected plants and grow resistant varieties.

- For the control of termites apply Endosulfan 35 EC @ one litre/acre with irrigation water in standing crop. This treatment is also effective against root aphids.
- Integrated management of Phalaris minor and Rumax be done with existing recommended technologies. Leader (Sulphasulfuran) @ 33.3 gm. Per /ha (25 gm ai/ha) in 250-300 litres water/ha or Seneor 70WP (Metribuzine) @ 250gm/ha) 175 gm ai/ha) in 500 litres of water. Mechanical and cultural methods should be adopted to prevent weeds.

RABI CAMPAIGN: BORO RICE

Potential Areas: Bihar, West Bengal, Assam, Eastern, U.P., Orissa

- Promotion of shallow tube-well, lift irrigation, dug well and use of pump sets.
- Use certified seed of varieties recommended for boro cultivation such as Saroj, Dhanlaxmi, Prabhat, Gautam, Joymati and CNHR 3; Joymati and CR 898 for Assam, Gautam for Bihar, Gotra-1 for West Bengal and Prabhat for U.P.
- Follow cropping system such as, Boro – Deep Water Rice (DWR); Boro+ Deep Water rice as Utera; Boro + DWR + Fish. The traditional system of Fallow DWR has to be replaced by Mustard Boro Fallow; Fallow; Winter Vegetable-Fallow Late Rice.
- In areas where water recedes early, use Madagascar system of rice for water saving in Rabi.
- Follow critical recommendations for nursery management and INM and IPM modules for each State.
- Additional rice varieties and hybrids suited for cultivation in boro season in different states is given in Annexure-II.

RABI SORGHUM

Grow high yielding varieties

- i) Shallow soils: Early maturing Sel-3, Maulee (RSLG 262) for Maharashtra.
- ii) Medium soils: (Maharashtra and Karnataka)
 1. CVS 14R, CSV 21R (Phule Yashoda), CSV 18R (SPV 1595) and M 35-1.
 2. State release DSV 4 and DSV 5 for Karnataka.

3. CSH 15R, CSH 19R (Maharashtra and Karnataka) and DSH 4R for Karnataka.
- iii) Deep Soils: All above and DSV 4 and DSV 5 for Karnataka.
- iv) Irrigated Soils: All above and Swati for Maharashtra.
- v) Use only certified and treated quality seeds.
- In areas where land is kept fallow during kharif, sowing of crop early in September is recommended. In sequential cropping the sowing may be done upto mid October.
 - Seeding in rows of 45-60 cm apart with 15 cm spacing between plants (plant population of about 1,35,000/ha in rainfed areas and 1,50,000 to 1,80,000 plants/ha in irrigated conditions).
 - Apply 60 kg N and 30 kg. P₂ O₅ /ha. in rainfed conditions, and 80 kg N and 40 kg P₂ O₅ /ha. in irrigated conditions. Reduce the quantity of fertilizers if significant amount of FYM or vermi compost is applied.
 - Shoot fly and stem borer are the major insect pests occurring during the rabi season.

1. Shoot fly (Atherigona soccata (Rondani):

Economic threshold level (ETL) is 10% dead hearts.

Control: Planting by September end to first week of October is ideal to escape from shoot fly. Another important practice is to increase seed rate and destroy the dead heart seedlings after removal. Furrow application of Carbofuran 3G @ 2 grams per row or spray Cypermethrin 10 EC @ 0.02% coinciding with Shoot fly oviposition (7-14 days after germination) only for late sown crop.

2. Stem Borer (Chilo partellus):

The economic threshold level (ETL) is 10% plants showing symptoms of damage.

Control: Destroy thrashed sorghum ear heads before the onset of monsoon; use high seed rate and thin out the infected plants after 10-12 days of sowing; apply Endosulfan 4G/Carbonfurn 2 gm @ 8-10 kg. per ha. in plant rows at 20th and 35th days after germination.

Disease management:

Charcoal rot: Charcoal rot is the significant rabi sorghum disease, which is serious in the shallow soils in dry areas of Maharashtra and Karnataka.

Control: Grow resistant cultivars: apply minimum dose of nitrogenous fertilizers with low plant density in infected soils; adopt inter-cropping rather than sole

cropping in the infected soils; resort to moisture conservation practices like mulching with wheat straw; and soil treatment with Thiram @ 4.5 kg/ha at the time of sowing.

Irrigation management:

Critical stages of irrigation are 30-45 days (seedling elongation stage); 60-65 days (reproductive or heading stages); 70-75 days (panicle emergence); and 90-95 (grain development stage). However, if only one irrigation is available, this should be applied just before booting (40-50 days).

RABI CAMPAIGN: GENERAL ATTENTION

- Rainfed Rabi Cropping in Rice Fallows is suggested in Chattisgarh, Orissa, West Bengal, Eastern U.P. and Bihar.
- Soil profile remain well charged with rice harvest and residual moisture sustain short duration crops such as green gram, black gram in coastal area of Andhra Pradesh, Karnataka, Tamil Nadu, Orissa, West Bengal and lentil, pea, and Lathyrus in Chattisgarh, U.P., Assam and Bihar.
- For rapid minimum tillage after rice harvest use zero tillage machine.
- Seed priming for 4-6 hrs. with sodium molybdate @ 0.05 gm per ha seed and Rhizobium inoculum @ 5 g per litre of water (per kg seed).
- Application of manure and SSP to impoverished soil.
- Add tiny amounts of molybdenum (Mo) which improves Rhizobium, chickpea, mungbean, urdbean. About 1200 gm Mo per hectare is required.
- Acidic soils exists in Assam (15.0 lakh ha), Orissa (40 lakh ha.), Jharkhand (6 lakh ha.) HP (0.75 lakh ha.), Kerala (10.0 lakh ha.) and Maharashtra. Agriculturally important districts having acid soils (pH 5.5) are given.

TABLE 1: Agriculturally important districts having acid soils (pH 5.5)

STATE	AREA (Lakh. Ha.)	DISTRICTS
Assam	15.39	Dibrugarh, Sibsagar, Lakhimpur, Nagaon, Kamrup, Darang, Golpara, Orissa, Golaghat, Tinsukia, Sonitpur etc.
NEH Region	13.00	States of Arunachal Pradesh, Manipur, Nagaland, Tripura, Mizoram, Sikkim

West Bengal	15.00	Bankura, Midnapur, Purulia, Dinajpur, Jalpaiguri, Murshidabad, Cooch Behar, Malda, Dinajpur
Orissa	40.00	Cuttack, Kendrapara, Jagarsingh, Dhenkanal, Anugul, Koraput, Nawrangpura, Nayagarh, Puri, Mayurbhanj
Jharkhand	6.00	Dumka, Jamtara, East Singhbhum, Garhwa
Himachal Pradesh	0.75	Kangra, Kullu, Mandi, Simla, Solan
Kerala	10.00	Trivandrum, Alleppey, Ernakulam, Palghat, Cannanore
Maharashtra	0.20	Ratnagiri, Thane
TOTAL	98.34	

- Application of micronutrients: 200 g copper sulphate + 150 g zinc sulphate dissolved in 200 litres of water to get better fruiting and fruit quality (approx. for 10 plants)
- Spray of Bavistin (0.2%) during November to avoid incidence of fungal diseases.
- Spray of Karathane (0.05% or wettable sulphur power to control powdery mildew at bud burst during the month of February – March and repeat after.
- At least two sprays of Malathion or Metasystok (0.2%) in June soon after flower initiation. Avoid spraying of chemicals during peak flowering.

RABI CAMPAIGN: SUGARCANE

TARGET AREA: U.P., Maharashtra, Tamil Nadu, Andhra Pradesh, Karnataka, Punjab, Uttaranchal, Gujarat, Haryana.

- There are three sugarcane crops in the fields in RABI:
 - a) Plant Crop
 - b) Ratoon Crop
 - c) Autumn Sown Crop
- Encourage early maturing high sugar varieties in North Zone.
- Use healthy and treated setts at recommended rate per hectare.
- Use recommended dose of fertilizers and nutrients.
- Promote companion crops in autumn sown sugarcane.
- Irrigate standing plant and ratoon crop till harvesting regularly.
- Harvest early for higher ratoon yield in following season.

- Focus on wooly aphid management in Maharashtra, Karnataka., Andhra Pradesh & Tamil Nadu through IPM technology.
- Lining materials are Basic slag from Steel Industries; Lime Sludge from Paper Mills: Calcite, Dolomite, Phosphogypsum; Press mud etc., which are available locally. Materials should preferably have 25% CaO and ground to less than 80 mesh, should be used.

Annexure-I

**WHEAT VARIETIES RECOMMENDED FOR RELEASE/NOTIFICATION
(CENTRAL RELEASE & STATE RELEASE) DURING 2002-2004**

WHEAT

Name of variety	Duration	Recommended Zone
Kaushambi (HW-2045)	Early	Central and Eastern U.P., Bihar, Jharkhand, West Bengal and Part of Assam
Aditya (HD-2781)	Medium Early	Karnataka, Maharashtra, Part of Andhra Pradesh, Goa, Plains of Tamil Nadu
GW-322	Medium	Madhya Pradesh, Chattisgarh, Gujarat, Southern and Western Rajasthan, Bundelkhand areas of U.P.
VL-804	Medium	Jammu & Kashmir, Himachal Pradesh and Uttaranchal
Himgiri (HS-375)	Early	Himachal Pradesh, Uttaranchal & J&K
Amrita (HI-1500)	Early	Madhya Pradesh, Chhattisgarh, Gujarat, Rajasthan, Uttar Pradesh
DBW-14	Early	UP, Bihar, West Bengal, Jharkhand
Narendra Wheat-2036	Early	UP, Bihar, Jharkhand, West Bengal
MP-4010	Early	MP, Chhattisgarh, Gujarat, South and Western parts of Rajasthan, Bundelkhand area of UP

VL Gehun-829	Late	J&K, Himachal Pradesh & Uttaranchal
Shivalik (HS-420)	Early	Himachal Pradesh, Uttaranchal, J&K
PBW 502	Medium	Punjab, Haryana, Western Uttar Pradesh, Part of Rajasthan
Poorva (HD 2824)	Medium early	Eastern Uttar Pradesh, Bihar, West Bengal, Jharkhand, Orissa, Assam
Raj 4037	Early	Pennisular Zone, Karnataka, Maharashtra
VL Gehun 832	Late	J&K, Himachal Pradesh, Hill district of Uttaranchal
URJA (HD 2864)	Early	Gujarat, Madhya Pradesh and Chattisgarh
MACS 6145	Medium	Jharkhand, West Bengal, Bihar and Bundelkhand region of Uttar Pradesh
NIAW-301 (Trimbak)	Medium	Maharashtra
WH-912	Medium	Haryana
WH-711	Medium	Haryana
PDW 274 (Durum)	Medium Late	Punjab
MACS-3125	Medium	Maharashtra
Sudha (MPO-1160)	Medium	Madhya Pradesh
Raj-3777	Early	Rajasthan
Swarna (HI-1479)	Early	Madhya Pradesh
Narendra Wheat-1076	Early	Uttar Pradesh
NIDW-15 (Panchavati)	Medium	Maharashtra
NAINA (K-9533)	Early	Uttar Pradesh
Palam (HPW-147)	Medium	Himachal Pradesh
HPW-184 (Chandrika)	Medium	Himachal Pradesh
VL Gehun-802	Medium	Uttaranchal

ANNEXURE – II

List of rice varieties/Hybrids suitable for Rabi Season for different states

State	Region/Season	Name of Variety
Andhra Pradesh	North coastal & Delta	Rasi, Vikas, IR-64, Krishnahamsa, Triguna, Satya, Vijetha Tulasi, Abhaya, Ravi, DRRH-2.
	South Coastal	Rasi, Vikas, IR-64, Krishnahamsa, Triguna, Tellahamsa, Swarnamukhi, Swathi, Vijetha, Deepti, Sravani, NLR 33358, Satya, DRRH-2.
Assam	Boro (Nov.-May)	Rasi, IR-64, Krishnahamsa, Kalinga-III, Kalyani-II, Luit, TRC Borodhan-I, NEH Borodhan-2, Megha Rice-1, Megha Rice-2, Chelari, Rangdoi, Kapelee.
Bihar	Boro (Nov.-April)	Rasi, IR64, Krishnahamsa, Vikas, Madhu, Pushpa, IR 20, Tellahamsa, Mukti, Amrut, Red Annapurna, Mahaveer.
Karnataka	Rabi (Jan-May)	Rasi, IR64, Krishnahamsa, Vikas, Madhu, Pushpa, IR 20, Tellahamsa, Mukti, Amrut, Red Annapurna, Mahaveer.
Kerala	Punja (Dec.-March)	Jyothi, Triguna, Onum, Kanchana, Triveni, Pavizham, Athira, Aiswarya
Meghalaya	Boro (Nov.-April)	NEH Megha Rice-1, NEH Megha Rice-2, Heera
Orissa	Dalwa/Rabi (Dec.-April)	Neela, Sarasa, Daya, Heera, Kumar, Kalinga-III, Sravani, Lalat, Vanaprabha, Nilagiri, Khandagiri, Serathi, Shankar, Rujdra, Tara, Ghanteswari, Parijat.
Tamil Nadu	Navarai (Dec.-Jan.)	Rasi, IR-64, Vikas, Tulasi, Sasyasree, Kanchi, Vaigai, CO29, Nidhi, IR 20, ADT 37, TPS-3, ASD-18, ADT37, ADT39, ADT39, MDU-3,

		Paramakudi-1, PKU-2
Tripura	Boro (Dec.-April)	TRC Borodhan-1, Rasi, IR-36, NEH Megha Rice-1, NEH Megha Rice-2, Krishnahamsa.
Uttar Pradesh	Boro (Spring)	Rasi, Vikas, Govind, Gautam, Krishnahamsa, Pusa-44-33, Saket-4, Prasad, Panthdhan-6, Manhar, Renu, Panthdhan-12.
West Bengal	Boro (Nov.-June)	Rasi, Vikas, IR-64, Krishnahamsa, Kitish, Sasyasree, IR36, Kiron, Kunti, Munal, Lalat, DRRH-2.
Pondicherry	Rabi	Bharatidasan, Punithavaathi, Arvinder