



Production Technology for CR Dhan 911 (Basudev): An Aromatic Rice

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Doubled Haploids are developed through androgenesis which has specialty in attaining 100% homozygosity in a single generation. The ICAR-National Rice Research Institute has developed a medium duration, high yielding aromatic Doubled Haploid (DH) variety, CR Dhan 911, for irrigated ecosystem. It was released and notified (No. 3-85/2023-SD'IV) during 2023 by SVRC, Odisha. It was developed through DH technique in rice hybrid BS6444G. CR Dhan 911 is semi-dwarf (95-105cm) with erect, non-lodging plant type and matures in 120-125 days. It has Long Slender (LS) fine grains, high HRR (68.2%), intermediate alkali value (4.0) and acceptable amylose content (21.03%) with good cooking and eating qualities. It is resistant to false smut; moderately resistant to leaf blast, brown spot, grain discoloration and; and moderately tolerant to leaf folder and Gall midge. It can be grown in both wet and dry seasons. It shows average yield 4.5-5.5 t/ha in Odisha. It is recommended for irrigated areas of Odisha and has also shown good performance in the states of West Bengal, Bihar and Uttar Pradesh.

This bulletin gives information on production technologies to be followed for obtaining optimum grain yield in CR Dhan 911 cultivation.

Suitable rice varieties in medium duration for Odisha

In Odisha, rice with 4.17 mha area and 8.30 mt of total production, is directly linked with the state economy (Agricultural Statistics at a glance 2015), 27.4% of the state rice area comes under irrigated ecology. Several high yielding medium duration rice varieties giving 4.5-5.0t/ha have been released in Odisha. The DH variety CR Dhan 911 has shown substantial yield superiority (>18.45% at NRRI, > 11.55% at Farmer's field over high yielding Naveen). Additionally, it has aromatic {validated by 2AP (2- acetyl 1- pyrroline) and organoleptic analysis} long slender (LS) grains, high HRR (68.2%: higher than most of the rice varieties released in India, including highly popular Swarna or Swarna-Sub1), with intermediate amylose content (21.03%). Further, it has

substantially higher yield potential (11.5% higher) than mean yield of aromatic rice varieties released in Odisha. It can replace Geetanjali as a variety. Therefore, it is found to be the most suitable to maximize rice productivity for the state of Odisha.

Nursery Bed Preparation

- About 600 m² nursery area is sufficient for transplanting of one-hectare field.
- Plough the nursery area when field is dry, then hold water in the field for 4-5 days.
- Drain excess water, puddle the field twice or thrice and finally level it by ladder.
- Prepare raised wet nursery beds of 0.15 m height and 1.0 m width with 30cm wide drains.
- Apply 100kg farmyard manure (FYM) and NPK @ 500: 500: 500 g/ 100 m² of nursery area before final preparation of the land.
- To ensure healthy seedling, sparse sowing is desirable, use 25-30 g of seeds per 1 m² of nursery area.

Selection of Seeds

- Always use faithfully labelled seeds, it should be purchased from authorized suppliers.

Seed Rate

- Per hectare cultivation of rice DH variety requires 25 to 30 kg seeds.

Seed Treatment

- To avoid the diseases and pest in nursery, seed treatment with Carbendazim (Bavistin) @2 g/kg of dry seeds after soaking in water for 24 hours is desirable.
- Keep the treated seeds under shade and cover it with wet gunny bag or straw.
- Sprinkle water 2-3 times a day, seeds will sprout in one or two days.

Time and Method of Sowing

- For wet season crop, right time of seed sowing is June to 2nd week of July and for dry season, it should be sown during 15th November to 15th December. Delayed sowing during *Rabi* season causes erratic flowering and spikelets sterility, which should be avoided.
- Ensure sprouted seed sowing on levelled wet nursery beds with no standing water.

Nursery Management

- After 02 to 03 days of sowing, light irrigation to maintain a thin film of water is desirable.
- Keep nursery bed free from weeds.
- Apply Carbofuran (Furadan 3G) @ 250 g/ 100 m² of nursery area after 15 days of sowing.

Land Preparation

- Irrigated medium and banded shallow-lowland with good drainage facility are most suited for CR Dhan 911.
- Apply FYM @ 5 t/ha during the dry ploughing.
- Before seven to ten days of transplanting, saturate the field with sufficient water and puddle it thoroughly to incorporate the weeds.
- Level the puddled field by laddering prior to the transplanting.

Transplanting

- Before uproot the seedling, a light irrigation is desirable.
- Uproot seedlings and dip it overnight in the solution of Chlorpyrifos @ 1 ml/litre of water.
- Transplant 25 to 30 days old seedlings at a shallow depth (2 to 3 cm) in well puddled and levelled land.
- Transplant @ 02to 03 seedlings/hill with a spacing of 20 cm x 15 cm or 15 cm x15 cm between the rows and plants.

Fertilizer Application

- Recommended fertilizer dose for CR Dhan 911 is 80:40:40kg/ha in Kharif and 100:50:50 kg/ha in Rabi.
- Soil test-based fertilizer application should be preferred especially for P and K.
- In basal dose, apply one fourth of total N, entire P and three fourths of K before final puddling. Top-dress the remaining N in two splits, 50% of the total at tillering stage and remaining 25% at panicle initiation stage, after 80 days from the date of sowing. Also apply remaining one fourth of K at panicle initiation stage.

Irrigation and cultural Practices

- After two days of transplanting, irrigate the field. Maintain 5-10cm water depth till grain filling stage.
- Gap filling should be done within 7-10 days of transplanting.
- Twice weeding, 1st after 21 days of transplanting (DAT) and 2nd after 42 DAT are desirable for healthy crop establishment.

Plant Protection

Rice is prone to many insect pests, diseases and other nutritional disorders, which cause great loss in production and seed quality. Therefore, preventive measures before severe damage in field should be taken to stop/eradicate such problems. Some chemical methods which are given in Table 1, may be utilized in successful management of major diseases and pest problems in rice.

Table 1: Insect pest and disease management

Name of insect	Management practice
Stem borer	<ul style="list-style-type: none"> • Apply chlorantraniliprole 0.4G @ 10kg/ ha or imidacloprid 0.3 G @15kg/ha or cartap 4G @ 25 kg/ha or fipronil 0.3 G @ 25 kg/ha. • Install pheromone traps with 5 mg lure @ 8 traps/ha for pest monitoring or 20 traps/ha for direct control through mass trapping. Replace lures at 25 to 30 days interval during the crop period. • Inundative release of egg parasitoid, <i>Trichogramma japonicum</i> @ 100,000 adults/ha for 5 to 6 times starting from 15 days after transplanting.
Brown Planthopper and White Backed Planthopper	<ul style="list-style-type: none"> • Spray triflumezopyrim 10SC@ 0.5 ml/lit, pymetrozine 50 WG @ 6 g/10 lit or flonicamide 50WG @ 3 g/10 lit or dinetofuran 20SG @3 g/10 lit or clothianidin 50WDG @ 0.4 g/10 lit or imidacloprid 200 SL @ 2.5 ml/10 lit or thiamethoxam 25WG @ 2 g/10 lit of water.
Leaf folder	<ul style="list-style-type: none"> • Spray chlorantraniliprole 18.5 SC @ 3 ml/10 lit or flubendiamide 20 WG @ 2.5 g/10 lit or cartap 50 WP @ 2 g/lit or acephate 75 WP @ 2 g/lit or fipronil 5 SC @ 1.25 ml/lit or triazophos 40 EC @ 2.5 ml/lit of water. • Inundative release of egg parasitoid, <i>Trichogramma chilonis</i> 5 to 6 times @ 100,000 adults/ha starting from 15 days after transplanting
Gundhi bug	<ul style="list-style-type: none"> • Spray carbaryl I 50 WP @ 3 g/lit of water during afternoon hours. • Dust methyl parathion2 D @ 25kg/ha or malathion or carbaryl 10DP @ 30 kg /ha
Name of diseases	Management practice
Bacterial leaf blight	<ul style="list-style-type: none"> • Spray <i>Pseudomonas fluorescens</i> @ 10 g/kg during cool hours preferably morning or evening • Spray with streptomycin sulphate 90% + tetracycline hydrochloride 10% @ 100 to 150 ppm or streptocycline @ 150 ppm and copper oxy chloride @ 2g/lit or plantomycin @ 1g/lit of water

Blast	<ul style="list-style-type: none"> Spray kasugamycin 3SL@1.3ml/ lit water carbendazim 50% WP @ 1 g/lit or isoprothiolan 40% EC @ 1.5 ml/lit or tricyclozole 75% WP @ 6 g/10 lit or tricyclazole 70% WG @ 6 g/10 lit for blast disease management Spray ground paste of botanicals like bael@25g/ lit or tulsi@ 25g/ lit of water
Sheath blight	<ul style="list-style-type: none"> Apply validamycin 3% L @ 3 ml/lit or propiconazole 25% EC @ 1.5 ml/lit or propiconazole 10.7% + tricyclazole 34.2% SE @ 1 ml/lit of water.
Brown spot	<ul style="list-style-type: none"> Spray propineb 70 WP @ 3g/ lit or propiconazole 25SC @2.5ml/ lit of water
False smut	<ul style="list-style-type: none"> One or two sprays of copper hydroxide 77WP @2.5g/lit or chlorothalonil 75WP @2 ml/lit of water
Khaira disease	<ul style="list-style-type: none"> Apply Zinc sulphate @ 20-30 kg/ ha.

Harvesting, Drying and Storage

Drain out water from rice field before 15 days of harvesting. Harvest the crop when > 80% of the grains in panicles are ripened or attained golden color. Thresh dried paddy with paddle or power thresher. Winnow the threshed grains and dry the cleaned grain under shade to reduce moisture content to around 12-13% and store the dried rice in storage bins.

Points to remember

- Apply N in three splits, 25% at basal, 50% at 21DAT and 25% at PI stages.
- Apply K in two splits 3/4th in basal and 1/4th at PI.
- Nursery sowing should be very sparse (25-30 gm/sq.m.) to get healthy seedlings.
- Transplant only 02 to 03 seedlings /hill at the spacing of 15x15 cm or 15 x20 cm.

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NRRI Technology bulettin - 221, April-2024

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Typesetting: ICAR-National Rice Research Institute, Cuttack-753006, Odisha

Published by: The Director, ICAR-National Rice Research Institute, Cuttack (Odisha) 753006

Printed at: Printtech Offset (P) Ltd., Bhubaneswar



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