A promising high yielding variety suitable for coastal saline areas

CR Dhan 416

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Under changing climate scenarios, salinity stress, poor-quality irrigation facilities, and intermittent water stress pose major challenges to sustaining rice production in coastal and saline-prone ecosystems. In this context, a saline-tolerant variety, CR Dhan 416, has been developed through the pedigree breeding method by crossing a popular biofortified rice variety, CR Dhan 310, with Getu, a cultivar tolerant to coastal salinity**.** The variety CR Dhan 416 has been released and notified by the Central Sub-Committee on Crop Standards, Notification, and Release of Varieties for Agricultural Crops, Government of India. of India and is promising for cultivation in Zone VI (Gujarat and Maharashtra) and Zone III (West Bengal) of the country. This variety is suitable for cultivation during the kharif season and is recommended for saline conditions in coastal saline areas. The variety is semi-tall, with good vegetative vigour, mid-early maturity, and non-lodging. The grain type is long and bold with a red kernel, and the husk is golden in colour and suitable for consumption.

PACKAGE OF PRACTICES

Field/land preparation practices

To effectively eliminate weeds and insect larvae, it is advisable to conduct a ploughing session before the monsoon season. The land should be ploughed two to three times at intervals of six to seven days to achieve optimal puddling conditions at the onset of the monsoon. Subsequently, the land should be levelled using a field leveller to ensure a consistent water level across the entire area. Prior to the final ploughing, it is recommended to incorporate 5 t/ha of well-decomposed farmyard manure (FYM) uniformly into the soil.

Seedbed preparation

To achieve optimal puddling under wet seedbed conditions, it is recommended to plough the nursery bed area two to three times at intervals of 4-5 days. The nursery area was divided into subplots measuring 1 × 10 m, with drainage channels constructed around each subplot.

Seed selection and seed rate

To prepare a saline solution, 600 g of sodium chloride was dissolved in 10 liters of water, which is sufficient for treating 25-30 kilograms of seeds. Submerge the seeds in the saline solution, remove any floating debris, and subsequently rinse the selected seeds with fresh water. For transplanting, utilize a seed rate of 25-30 kilograms per hectare, whereas for direct seeding, employ a seed rate of 60-70 kilograms per hectare.

- *Dry sowing*: Before sowing, it is recommended to treat the seeds with Carbendazim (Bavistin) at a concentration of 2.0 g per kg of seed.
- *Wet sowing*: Immerse seeds for 8-10 hours in a solution of 1.5 g Tetracycline and 20 g Captan dissolved in 20 liters of water, adequate for 10 kg of seeds. Drain and dry the seeds in shade before sowing.

Sowing time

In regions with lower salinity, it is advisable to cultivate seedlings in a dry nursery during the wet season, ideally after experiencing 2-3 monsoon showers. Conversely, during the dry season, a wet nursery setup should be utilized, using the pre-germinated seeds in a raised nursery bed. To promote the growth of healthy seedlings, it is recommended to incorporate well-decomposed farmyard manure (FYM) compost at a rate of 5 tons per hectare during the land preparation phase. Furthermore, the application of 4 kilograms

each of nitrogen, phosphorus and potash per acre is suggested to enhance soil fertility.

Method of establishment

Transplant seedlings aged 25 to 30 days with a row-to-row spacing of 20 cm and a plant-to-plant spacing of 15 cm, placing 2 to 3 seedlings per hill by the end of July. In instances of delayed transplanting, utilizing a closer spacing of 15 cm by 10 cm with older seedlings can enhance crop establishment.

Fertilizer management

Apply 12 kg of nitrogen per acre, along with 16 kg per acre of phosphorus and 10 kg per acre of potassium, as an initial basal dose. The subsequent application of nitrogenous fertilizer, amounting to 08 kg per acre, should be implemented during the peak tillering stage, which occurs 30 to 35 days post-planting. The remaining 8 kg per acre of nitrogen and one-third of the potassium fertilizer should be applied at the panicle initiation stage, 55-60 days after transplanting, in accordance with the recommended fertilizer dosage of 32:16:16 kg NPK per acre. Furthermore, 4-6 kg of azolla can be applied in three equal splits at weekly intervals from the day of inoculation to achieve optimal results.

Weed control methods

Manual weeding conducted twice at intervals of 20 to 25 days post-transplantation effectively manages weed growth. The application of Pyrazosulfuron ethyl at a rate of 8 grams per acre, combined with 20 kilograms of sand, 7 days after transplantation, or the spraying of Metasulfuron-methyl and Chlorimuron-ethyl at 20 grams per hectare mixed in 200 liters of water 20 days after transplantation, effectively controls the early emergence of sedges and broadleaf weeds. It is recommended that herbicides be applied when a thin layer of water is present.

Disease and pest control

In this ecological context, several diseases including bacterial leaf blight, brown spot, sheath blight, and false smut are prevalent, with resistance to brown spot, false smut, and rice tungro disease observed. For bacterial blight leaf infection above 8-10%, apply streptomycin (150 mg) and copper oxychloride (1 g) per liter of water. Brown spot worsens with potash deficiency; apply 50% potash as basal dose and 50% at panicle initiation. Excessive nitrogen increases sheath blight incidence. Spray Propiconazole 25% EC or approved fungicide at 2 ml per liter after first top dressing. False smut severity increases with rainfall during reproduction. Treat seeds with

Carbendazim 50% WP, mercuric chloride or ethyl mercury chloride at 2 g per kg of seed during sowing. For stem borer control, apply Chlorantraniliprole 0.4% GR at 10 kg/ha, carbofuran 3G at 33 kg/ha or cartap 4G at 25 kg/ha when egg mass reaches one per square meter or 5% dead heart. Install 8-10 pheromone traps per acre or release 40,000 Trichogramma japonicum eggs per acre. When BPH reaches 10 insects per hill, apply chlorpyrifos 20 EC (2.5 lit/ha), Quinalphos 25 EC (2 lit/ha), or Imidacloprid 200 SL (0.5 lit/ha). For leaf folder control, use Quinalphos 25 EC (2 lit/ha), Phosphamidon 85 EC (0.6 lit/ha), or Cypermethrin 10 EC (1 lit/ha). Apply methyl parathion 5% or chlorpyrifos 5% at 25 kg/ha when Gundhi bug exceeds 5 per square meter.

Irrigation schedule

The implementation of intermittent irrigation to sustain a water level of ± 5 cm until the post-flowering stage is recommended. Nonetheless, particular attention should be directed towards critical growth phases such as active tillering, primordial initiation (PI), and the grain filling stage. It is advisable to drain the field prior to top dressing and to re-irrigate it after a period of 24-36 hours.

Harvesting

The crop should be harvested 25 to 30 days post-flowering. Prior to storage, it is essential to conduct threshing, winnowing, and adequate drying. The seeds must be dried to a moisture content of 12% to ensure safe storage.

Expected yield of the variety

The average yield of the variety is 5.5 t/ha, but the yield ranges from 4.8 to 8.0 t/ha based on dynamism of salinity and best agronomic management.

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