CRRI Technology Bulletin No.237

Standard Operating Procedure for Truthfully Labelled Seed Production of Pureline Varieties at ICAR-CRRI

M Chakraborti, MK Kar, K Chattopadhyay, BC Marndi, RP Sah, RL Verma, SK Dash, LK Bose, J Meher, S Sarkar, Reshmi Raj KR, LK Singh, D Moharana, S Samantaray, GAK Kumar and AK Nayak

ICAR-Central Rice Research Institute
Bidyadharpur, Cuttack

Correct citation

Chakraborti M, Kar MK, Chattopadhyay K, Marndi BC, Sah RP, Verma RL, Dash SK, Bose LK, Meher J, Sarkar S, Reshmi Raj KR, Singh LK, Moharana D, Samantaray S, Kumar GAK and Nayak AK. CRRI Research Bulletin No.:237. ICAR-Central Rice Research Institute, Cuttack, Odisha, 753006, India, pp.

Published by

Director

ICAR-Central Rice Research Institute

Cuttack, Odisha, 753006, India.

@ All rights reserved ICAR-CRRI, February, 2025

Disclaimer: ICAR-Central Rice Research Institute is not liable for any loss arising due to improper interpretation of the scientific information provided in the research bulletin.

Introduction

Besides the breeder, foundation and certified seeds which are strictly monitored by designated Seed Certification Officers and produced under formal seed chain, there is another category of seed known as Truthfully Labelled seed (TL seed) which can be produced by public sector research institutes, universities and registered private sector seed producing agencies. These seeds are to be strictly used for crop production purposes or for self-saved seeds. However, it should not be used for further commercial seed production. Although not monitored by seed certification agencies, this category of seeds must meet all the quality parameters for certified seeds. The organization producing the seed themselves are responsible for quality assurance. The seeds bags should bear stitched opal green-coloured tags mentioning all the quality features of the seeds inside the bags.

The quality of the TL seeds can be tested at any point of time by a designated Seed Inspector and hence, no laxity should exist at any point of time in maintaining the seed quality. If required, the Seed Inspector is entitled to draw any random sample and sent to an officially recognized Seed Testing Laboratory to check for quality compliance. The sale of that particular seed can be halted till the test report is available. Hence, all possible care should be taken for production, processing and storage of the seeds.

ICAR-CRRI takes up production of TL-seeds of the varieties developed by the institute in its own farm besides contract production with strict quality monitoring by team of experts. This is mainly produced to demonstrate and popularize the latest released varieties among the rice farmers before the seeds come to formal seed chain. There is need for following certain standard operating procedures for this category of seeds to maintain the required standards. This technology bulletin will guide the personnel of ICAR-CRRI involved in TL-seed production to follow the SOPs in a systematic manner.

Standard Operating Procedure for Truthfully Labelled Seed Production of Pureline Varieties at ICAR-CRRI

Stages	Standard operating procedures
Variety selection	• Variety selected must be a released and notified variety of ICAR-CRRI. • Variety identified by AICRP-VIC or SVRC but yet to be notified by Central Sub-Committee for Seed Standards, Notification and Release of Varieties. However, such varieties should be produced in limited scale only.

Grower selection	Production within institute farm	• To be carried out under supervision of Farm Superintendent. • Developer/ maintenance-breeder for particular variety to be part of the production/monitoring team. • Producers also need to keep their samples from the procured breeder/foundation/ breeder-certified nucleus seeds which may be matched in future for any dispute. • The samples must be kept in a sealed packet with signature of monitoring team and producers.
	Production through outsourcing/FPO/FPC/ Contract grower	• A TL-seed production team through outsourcing will be constituted by Director, ICAR-CRRI. • The team will identify the contract-growers and submit proposal to the Director through Head, Crop Improvement Division. • For a single variety, one cluster to be selected for production with minimum 02-hectare coverage. • Grower must be trained/provided training before registration as seed producer.
Field selection	The seed production plots should have: • Irrigation facilities • Good drainage • Absence of volunteer rice, weedy or wild rice in the field • No latest record of weedy or wild rice infestation in the field in last 03 years.	
Registration of growers and plots	Production within institute farm	The plot must be entered in seed portal.
	Production through outsourcing	• Grower name with AADHAR no. to be uploaded. • GPS location of plots to be recorded and uploaded against the name of growers. • In case of FPOs/FPCs, the registration details to be uploaded. • Variety name against grower and plot number to be uploaded.
Source of seed	• TL seed should be grown only with breeder seed or foundation seed. The respective tags or certificate issued by the plant breeders must be retained by the growers till submission of produced seeds to CRRI and quality pass certificate issue. If it is a new variety, then nucleus seeds supplied by respective breeders with quality standard certificate to be used. • Growers also need to keep their samples from the procured breeder/foundation seeds which may be matched in future for any dispute. The samples must be kept in a sealed packed with signature of monitoring team and growers. • Grower need to check that authentic seeds are collected. If there is any quality issue with seeds, it must be reported immediately in writing/e-mail to designated officials of ICAR-CRRI for verification. • While supplying the seeds, a leaflet on standard package of practices for the particular variety should be provided to the growers in vernacular languages. Growers need to follow the package of practices adequately.	

Seed treatment (During sowing)	Seeds should be treated with recommended doses of fungicides/insecticides/other chemicals as mentioned in package of practices leaflet supplied with seeds against seed-borne diseases and pests.
Nursery raising	• Seed bed should be weed free with fine tilth. • After initial ploughing, the seed bed must be irrigated to allow germination of weeds and volunteer plants (stale seed-bed). • After that, again the seed bed should be thoroughly ploughed. If dry seed bed is not available, growers may also use raised and wet seed beds. • In one seed bed, only one variety should be grown. • Sufficient distance between seed beds of different varieties to be maintained to avoid contaminations. • Labeling the seed bed with name of variety is mandatory. • Prepare a well-drained nursery bed (at least 10% of the main field). • Sow seeds thinly and evenly in the nursery bed. • Irrigate regularly, control weeds, and protect seedlings from pests and diseases. • For specific queries, contact ICAR-CRRI designated officials.
Isolation in main plot	• Adequate isolation distance from other rice fields to prevent cross-pollination. • For purelines, the distance should be minimum 03 meters.
Transplanting	• **Seedling age at transplanting:** Seedlings should be transplanted at the 4-5 leaf stage, generally 20-25 days after emergence. For early maturing varieties (<120 days duration for seed to seed) the maximum age of seedling should never cross 25 days. For varieties maturing within 120-140 days, seedling age should never cross 30 days. For varieties with >140 days duration, seedling age should not cross 40 days. • **Gap filling:** Always keep some extra seedings in the seed bed as reserve with proper labelling. Gap filling, if required, must be carried out within a week to avoid asynchronous flowering. Fill gaps in the field only with healthy seedlings to ensure uniform plant population.
Package of practices	Follow standard recommended practices for the variety as per the leaflet provided during supply of breeder/foundation/ breeder-certified nucleus seeds.
Rouging	• Any plant found in the field which deviates from the true-to-type characteristics of the variety should be removed immediately from field during every growth stages. • If off-type plants can't be identified in vegetative stage, it should be removed immediately after flowering through. In exceptional circumstances, it should be removed within grain filling stage by cutting at base. However, at grain maturity stage the field should be completely free from off types. • Bunds should be cleaned and no plants of other rice variety, wild rice or weedy rice should be present anywhere near 5 m distance of the seed production plot.
Monitoring	A monitoring team will be constituted by the Head, Crop Improvement Division to monitor the seed production. For a particular variety being grown, the responsible breeder must be part of the monitoring team. The monitoring teams will submit their reports with photographs/evidences wherever required along with the checklist attached as Annexure-1.

Harvesting	• **Harvesting time:** Harvest the crop at the proper stage of maturity, when 80-85% of the grains are fully matured. • **Harvesting method:** Either manual harvesting or reaper-based harvesting may be used. But combined harvested should be avoided as it may cause admixtures. • **Threshing:** Each variety should be threshed separately and carefully to avoid mechanical admixtures and damage to the seeds. • **Cleaning and drying:** Clean the seeds to remove any impurities and dry them to the recommended moisture content (12%) for storage. The seeds of one variety should not be dried with others nearby. Clean the threshing floor completely before and after drying. • **Packaging and labelling:** Seeds should be packed in gunny/cloth bags only. Variety name should be written on the bag and one tag with variety name should also be kept inside. • **Storage:** Immediately after packing, transport the seeds to warehouse of ICAR-CRRI. In any case, don't store the seeds for >15 days. Storage should be done on elevated wooden platform in a room with proper ventilation but without any chance for entry of water through seepage or rain-splash.
Transportation	Seeds should be transported with utmost care to avoid physical damages and brought with proper covers in a bright sunny day to prevent damage from rain.
Record maintenance	Detailed records of all activities related to seed production, including field history, seed source, planting details, crop management practices, rouging, harvesting, processing, and bagging should be kept. It must be made available to monitoring teams on demand.
Seed inspection and receipt in warehouse	• Only properly labelled bags without any damage will be received at warehouse. Detailed records of all activities related to the seed lots should be kept. It must be made available to monitoring teams on demand. • Basic varietal seed characters like grain types, husk colour, special features if any etc. should be recorded and compared with standard reference sample of breeder seeds. Growers also need to keep their samples from the procured breeder/ foundation seeds which may be matched in case of any dispute. If seeds don't match the variety, the lot should not be received by warehouse staff. • Seed lots with high level of admixtures, pathogen contamination, damaged seeds, foreign materials etc. should be rejected. • If seeds require grading, the price of seeds will be paid based on seeds remaining after grading. • Moisture test of seeds is mandatory. If moisture is >14%, seeds can't be accepted for warehousing. • After accepting the seeds, the warehouse section will provide a receive copy to grower/producer, keep a copy for records purpose and send another copy to "Quality Test" team. They will also update the status in seed portal. • The acceptance in store section is provisional and final acceptance of seed lot will be based on quality test report by "Quality Test" team.

Quality analysis	• Each bag of seeds may be provided Unique Id. no. /Barcode/QR code. • Sampling and quality testing as per standard protocols. • Label the seed bags with relevant information of Quality Testing, including variety name, seed class, and germination rate with date of testing. • Final acceptance of seeds by warehouse will be based on quality test report. Once received, it should be immediately updated in seed portal and informed to growers. • If the seed lot fails in quality test, the growers may be informed immediately to take the grains back (maximum seven days). Appeal, if any, to be submitted within seven days only. For retesting, the charges should be borne by growers. If the batch pass quality requirements in repeat test, the amount will be refunded. No further appeal will be accepted if the seed lots fail in repeat quality test. If the grower doesn't lift those grains within next 14 days, CRRI will not take any further responsibility. • In case of institute farm production, the rejected batches will be shifted for consumption paddy (non-mixture category).
Seed treatment (Before bagging)	• Only quality test pass batches can be treated with chemicals, if needed. • No chemical treatment of rejected batched of seed. • If any poisonous chemical is used in seed treatment, it must be mentioned on the bag.
Storage	Storage should be as per standard guidelines of institute
Special requirements for trait-specific varieties and NILs	• In case of near isogenic lines (NILs) or varieties with known genes for specific traits, random samples should be drawn from seed batches and tested with markers. If there is deviation, the seed used for sowing should also be tested. • For herbicide tolerant (HT) verities, spraying of respective herbicides at recommended dose as mentioned in package of practices will be mandatory during seed production. • Seed samples from every pack of HT-varieties needs to be tested for herbicide tolerance through grow-out tests and certified accordingly and the signed tags should be attached in the bag in such a way that it can't be tampered. • Strict monitoring of NILs and HT varieties under supervision of respective breeders is essential.

Annexure-1: Checklist for TL-seed monitoring

Name of variety:

Grower details:

Stage	Parameters	Remarks
Seed dispatch	Which category of seed was provided/procured for growing TL seeds	
	Whether intact tag of Breeder or Foundation seed provided to grower	

Nursery	Whether breeder or foundation seeds used for seed production?	
	Is nucleus seed with purity certificate from breeder available (only for new variety)?	
	Was seed samples procured kept by growers/producers along with tags?	
	Whether seed samples sealed and signed in presence of monitoring team?	
	Is nursery bed prepared as per SOP?	
	Is the field selection (Main plot) proper and as per SOP	
	Are seedlings in nursery healthy and disease free?	
	Date of sowing recorded?	
	Specific remarks, if any?	
Transplanting	Whether isolation distance maintained?	
	Whether SOPs for transplanting followed?	
	What was the age of seedlings during transplanting?	
	Date of transplanting recorded?	
	Specific remarks, if any?	
Flowering stage	What was the flowering status in the field?	
	What percentage of off type plants were present?	
	Whether management details after transplanting recorded?	
	What is the disease and insect-pest status in the field?	
	Specific remarks, if any?	

भाकृअनुप
ICAR

Standard Operating Procedure for Truthfully Labelled Seed Production of Pureline Varieties at ICAR-CRRI

CRRI Technology Bulletin: 237

CRRI
Estd. 1946

BSCIC
ISO 9001 REGISTERED
BN10448/9364:0914

NABCB

© All Rights Reserved, ICAR-Central Rice Research Institute
Cuttack-753006, Odisha, India
(An ISO 9001: 2015 Certified Institute)
Phone: 0671-2367757, Fax: 0671-2367663
Email: director.nrri@icar.gov.in, directorcrricuttack@gmail.com
Website: http://www.icar-nrri.in