



**CHEMICAL FREE SEEDS
FOR QUICK GERMINATION
AND HIGH YIELD**

ABOUT US

Synergistic Seeds Pvt Ltd is a leading team of high quality seed experts striving to improve the overall health of the seeds by providing novel and innovative seed priming solutions, with a vision to help farmers and seeds manufacturing companies.

We are trendsetters in chemical-free, green, and innovative seed-friendly priming for the development of our high quality seeds to inhibit the problems associated with seed germination, the pathogenesis of seeds, seed preservation, seed spoilage, and low yield through the patented technology.

OUR VISION

To accelerate the world's transition to environmentally friendly high quality seed based sustainable agriculture that will create a world free of hunger.

OUR MISSION

- To create the most compelling seed priming entity of the 21st century by revolutionizing the world's transition to high quality seed based sustainable agriculture.
- We shall adopt consequential values of the nature for production of high quality seeds
- We shall inculcate sustainable business practices for transfer of knowledge and solutions for high yield farming.
- Earn trust and respect via technological innovations for sustainable agriculture practices.

MAJOR GOALS

Our major goal is to make India first by means of highly productive and sustainable agriculture. Our objective is to improve the surface properties of seeds, high water uptake, pathogens free seedlings, high germination rate and larger yield. With seventeen years of tireless research, our priority is to provide continued support to our associates in seed industry and farmers to successfully achieve good germination with relatively larger yield and disease free farming. Due to our innovative seed priming improved disease resistance, excellent yields, enhanced seed vigor, toxic chemicals and pesticides free seeds, and cost-effective solutions to farmers and seed industry, Synergistic Seeds Pvt Ltd is simplifying the farming process while strengthening global health and this can disrupt the new era of sustainable agriculture. We are open to collaborate for chemical free seed priming and processing. We are willing to offer cost-effective services to individual farmers, APMCs and seed industry for small to very large quantity of seeds. We provide solutions for any types and quantity of seeds to improve germination, yield and pathogen free seedling.

OUR MOTIVE

Our Motive is to achieve Zero Hunger

Synergistic Seeds Pvt Ltd is highly determined to produce high quality seeds for sustainable agriculture in India and overseas to achieve larger yields in the farms for fulfilment of our noble and global motive of zero hunger worldwide.



PROBLEM

- Planted seeds require the highest survival and plants need to grow efficiently to help support improved productivity to meet the increasing demands of society for both food and fiber.
- For seeds, poor germination, emergence, low early seedling vigor, and pathogenic conditions usually lead to reductions in yield by means of the unsuccessful establishment of vital crops.
- The current standard of approaches including chemical sensitization, acid treatment, and antibiotics are not proven efficient due to their toxicity and lack of efficacy.
- These treatment methods are also very expensive for farmers and not less environmentally friendly.

MECHANISM OF GREEN TECHNOLOGY FOR SEED PRIMING

The beneficial role of reactive oxygen species (ROS) in the regulation of seed germination is increasingly well established. This relationship is not always easy to address since ROS can either favor or repress germination. ROS production in the embryonic axis of imbibed seeds controls the ability to germinate (Figure 1). The 3 steps model presented in Fig. 1 suggests that sensing of environmental conditions is detected in the meristem region and that controlled production of ROS triggers germination mechanisms, i.e. activation of GA signaling pathway and oxidation of negative regulators of germination. At this early timepoint, ROS homeostasis mostly depends upon production sources. The localized increase in ROS generates an unknown signal that can propagate along the embryonic axis and trigger cell elongation in the hypocotyl area, at the onset of radicle protrusion. At the time of late imbibition, antioxidant systems participate to the control of ROS homeostasis and ROS are generated within the apoplast to participate in cell wall loosening. The environmental factors can fine tune ROS production, how the oxidative signal is translated at the subcellular level and how it can propagate from cell to cell are the key signaling for seed germination. It is clear that ROS and hormones act in concert to regulate seed germination but the bases of this cross-talk are very important. Superoxide dismutase (SOD), catalase (CAT) and glutathione reductase (GR) are activated to prevent excessive ROS accumulation. Germination can then proceed. Moreover, our innovative technology improves seed germination (Figure 2) through ROS mediated signaling.

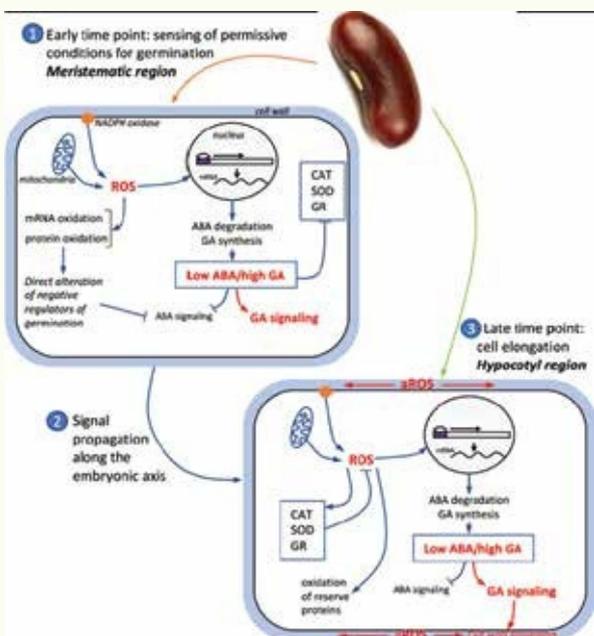


Fig. 1 Signaling role of ROS in seed germination



Fig. 2 Improvement in seed germination



ROS MEDIATED REGULATION OF SEED DORMANCY AND GERMINATION

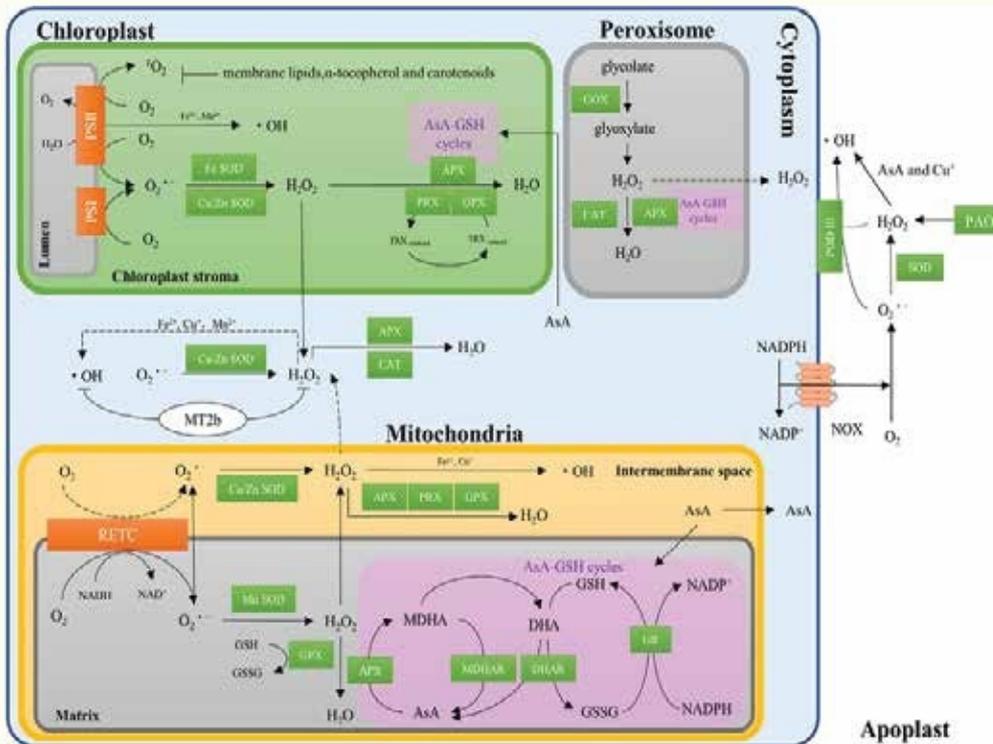


FIGURE 3. Regulation of reactive oxygen species (ROS) homeostasis in crop seeds. NADP⁺, nicotinamide adenine dinucleotide-phosphate; NADPH, reduced form of NADP⁺; NAD⁺, nicotinamide adenine dinucleotide phosphate; NADH, nicotinamide adenine dinucleotide; NOXs, transmembrane NADPH oxidases; RETC, the respiratory electron transport chain; SOD, superoxide dismutase; GPX, glutathione peroxidase; AsA, ascorbate; GSH, glutathione; AsA-GSH cycles, the ascorbate-glutathione cycles; APX, ascorbate peroxidase; MDHAR, monodehydroascorbate reductase; DHAR, dehydroascorbate reductase; GR, glutathione reductase; MDHA, monodehydroascorbate; DHA, dehydroascorbate; GSSG, oxidized glutathione; PRX, peroxiredoxins; PSI/II, photosystem I/II; TRX, thioredoxin; MT2b, type 2 metallothioneins; CAT, catalase; GOX, glycolate oxidase; PAO, polyamine oxidase; POD III, secreted class III heme-containing peroxidases

In dry seeds, the ROS are generated by the non-enzymatic reaction, mainly the autooxidation of lipids. Lipids are easily oxidized as the main source of free radicals under low humidity conditions in seeds during dry storage, while a weakening lipid oxidation occurs with the increase in humidity. When seed imbibition with the water content increased from 8–10 to 50% or more, the production of ROS begins to switch from non-enzymatic system to the enzymatic system in seeds. The mitochondrion is an important site for the main source of cellular ROS in seeds. In the matrix of mitochondria, the oxygen consumed during electron transport is reduced to superoxide through the respiratory electron transport chain (RETC), and then the produced superoxide is converted to H_2O_2 by Mn superoxide dismutase (Mn-SOD) or Cu/Zn-SOD. Chloroplasts are another vital source of ROS in photosynthesizing cells. Illumination of photosystem I (PSI) and photosystem II (PS II) generates O_2^- , $\cdot OH$, and $1O_2$, and the O_2^- is converted into H_2O_2 by Fe-SOD or Cu/Zn-SOD in chloroplasts. Meanwhile, the glycolates derived from chloroplast are converted into glyoxylate and H_2O_2 by glycolate oxidase (GOX) in peroxisomes.



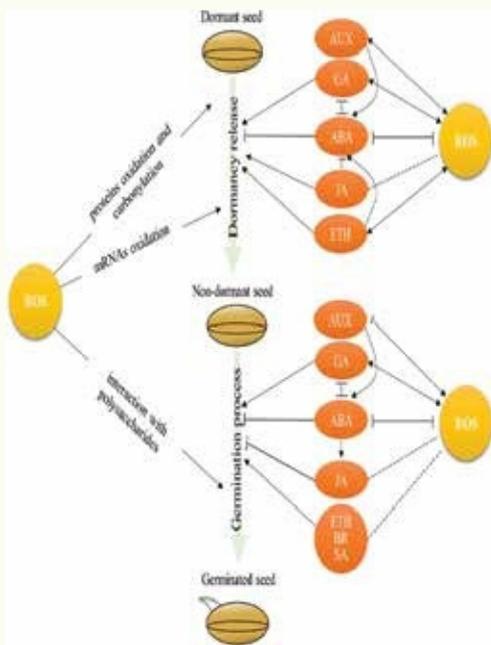


FIGURE 4. The crosstalk between ROS and hormones in regulation of seed dormancy and germination in crops. ABA, abscisic acid; GA, gibberellins; ETH, Ethylene; AUX, auxins; JA, jasmonates; SA, salicylic acid; BR, brassinosteroids. Arrows and lines with slanted dashes indicate positive and negative effects, respectively, and the dot lines indicate the putative effects.

The regulatory roles of ROS in dormancy release and seed germination in crops have been reported. For example, the non-enzymatic ROS generation frequently occurs in seeds contributing to dormancy release during desiccated seed storage. The accumulation of H₂O₂, OHs, and superoxide radicals has been widely observed during seed. Rice PAO OsPAO5 oxidizes PAs and releases H₂O₂, which is involved in coleorhiza-limited seed germination. The ROS produced by NOXs are involved in radical and root elongation during rice seed germination. It has been reported that ROS-regulated dormancy release might be involved in mRNA oxidation, protein carbonylation, and oxidation in plants (Figure 4). For example, the oxidation of a specific subset of seed-stored mRNAs has been observed during dormancy alleviation by dryafter-ripening. A total of 24 stored mRNAs, such as protein phosphatase 2C PPH1, mitogen-activated protein kinase phosphatase 1, and phenyl ammonia lyase 1, became highly oxidized during after-ripening in sunflower. When seed germination, ROS can directly interact with polysaccharides of the cell wall that might promote cell elongation of the radical. A suitable ROS level will alleviate seed dormancy and trigger seed germination; however, the threshold of ROS level induced seed dormancy to germination, and its molecular mechanisms are understood poorly in most crops. The involvement of ROS in seed dormancy and germination might be through the regulation of ABA and GA metabolisms in seeds. In conclusion, our innovative ROS delivery to the seeds improves germination, root and shoot length, inhibit seed dormancy and pathogenesis. The significant improvement in the yield of the crops produced from the Synergistic Seeds Pvt Ltd primed seeds are noticed.

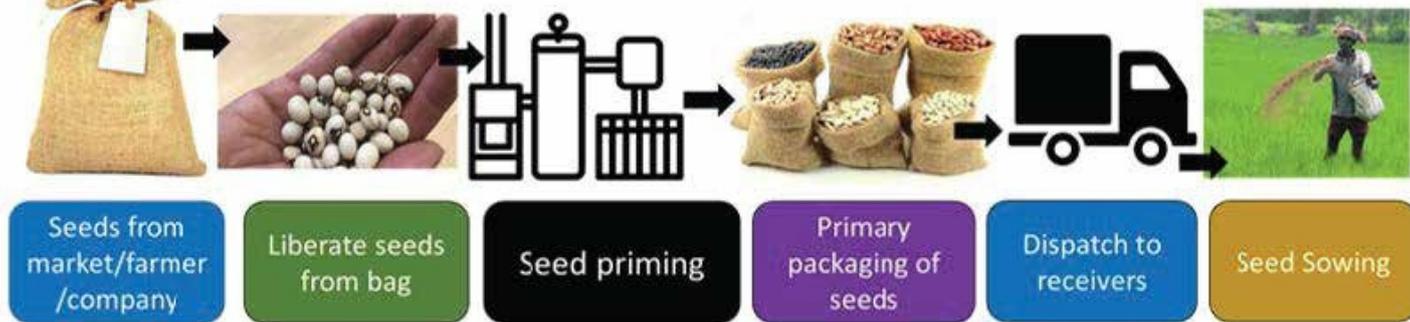
SOLUTION BEING IMPLEMENTED BY SYNERGISTIC SEEDS PVT LTD



Our unique and research based activation of seeds prior to planting for quick and efficient stimulation of germination, high water up takes, large shoot and root length, and seedlings growth. In addition, our pre-treatment to the seeds reduces microbial load effectively therefore the improved crop health.



Synergistic Seed Priming



Our workflow for Synergistic Seed Priming is very simple.

- Seeds received from the market/ farmers/ company
- Seeds removed from the bags
- Seeds undergo a Synergistic seed-priming process
- Packaging of seeds
- Dispatch to receivers
- Seed Sowing

OUR ATTRACTIVE FEATURES

- Faster Germination time of Seeds
- Quick Start Photosynthesis in Seedlings
- Pathogen Free Seeds
- High Water Uptake
- Improve Seed Immunity
- Seed Survival in Different Soils
- All types and quality of seeds can be primed
- Larger Yield (approx.1-2 folds)
- Chemical Free and Cost-effective
- Improve seed health
- Time efficient approach
- Free from harmful Chemicals
- Environmentally friendly
- No pathogenesis of seeds



“better seeds
for
better nation”

SEED PRESERVATION BY SYNERGISTIC SEEDS PVT LTD



Field trial on Maize seed storage		
	Untreated	Synergistic
Seed	Malze	Malze
Treatment	No	Yes
Storage at ambient conditions	Completely spoiled in 60 days	No spoilage after 1 year
Pathogen	Present	Absent
Color	Changed	Unchanged
Germination	NO	93%

- Cost-effective seed preservation treatment for long-term storage at seed friendly conditions (as per supplier)
- Pathogen free seeds to avoid seed spoilage and cross contamination in the storage places
- Effectively reduce microbial load for easy preservation
- Highly efficient, chemical free process for seed preservation
- No ETO, steam and formaldehyde vapors
- No aeration & No drying
- Export friendly
- Highly useful for export, super markets, departmental stores and household applications

SEED STORAGE

Roberts (1973) classified seeds based on physiological behaviour during storing

ORTHODOX SEED

Seeds dried to low moisture of 5% (wet basis) and stored at low or Sub-freezing temperature for long period. Example: Cereals, pulses and oil seeds.

RECALCITRANT SEED

Seeds dried to high moisture of 20 - 50% (wet basis) and which cannot be successfully stored for long period. Example: Mango, Jack fruit, Coconut etc

SEED STORAGE

Ewart (1908) classified seeds into 3 categories based on life span or longevity

Micro biotic:

Seed life span not exceeding 3 years.

Mesobiotic:

Seed life span not exceeding from 3 to 15 years.

Macrobiotic:

Seed life span not exceeding from 15 years to over 1000 years.

Three Main Categories of Seed Storage Behavior

Orthodox Seed

Desiccation and cold storage tolerant

Long term storage common place



Examples include cereals, such as wheat, oat, and white rice, beans, tomatoes

Intermediate Seed

Partially desiccation tolerant Limited/no cold tolerance

Long term storage may or may not be possible



Examples include wild rice, papaya, coffee bean, and the macadamia nut

Recalcitrant Seed

Desiccation sensitive No cold tolerance

Long term storage often not possible



Examples include many tropical fruit trees including avocado, mango, cocoa, and rubber trees

- In general, there are various seed preservation methods from storing seeds at ambient conditions to Cryopreservation which are widely used for seed storage.
- However, none of the seed storage techniques are unable of completely eradicating seed borne microorganisms which is the major cause for seeds spoilage.
- Synergistic Seeds PVT Ltd is committed to provide solution & service for pathogen free seed storage for long term preservation, export and seed bank.



गुजरात का असली बीज
Moti Seeds Pvt. Ltd.

Date: 10th November, 2023

TO WHOM SO EVER IT MAY CONCERN

We are the Moti Seeds Pvt Ltd. (MSPL) Gujarat, India, established in 1978, is a leading producer and marketer of high-quality seeds of improved varieties / hybrids of agricultural and horticultural crops with the noble objective producing good quality seeds for farmers.

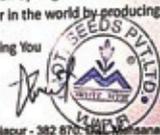
This is to certify that Synergistic Seeds Pvt Ltd, Mehsana, Gujarat, India is a leading research and development based innovative seed priming company. Under the active guidance of Moti Seeds Pvt Ltd, Synergistic Seeds Pvt Ltd has primed our high-quality seeds with their innovative technology and stored for more than a year at our site under ambient conditions without any specialized antiparasitic/antimicrobial/pesticides treatment to the seeds and no specialized packaging or care was taken. The humidity of seed storage varies from 30% to 80%. On 7th July, 2022, the seed priming is done by Synergistic Seeds Pvt Ltd and deliver it to Moti Seeds Pvt Ltd for storage and testing. The following results are obtained and we kindly certify it.

Sr No	Seed Type	Seed Priming at Synergistic Seeds Pvt Ltd	Seed Storage at Moti Seeds Pvt Ltd	Germination %		Appearance		Remarks
				Before Storage	After Storage	Before Storage	After Storage	
1	Cummin (UT)	07-07-2022	10-11-2023 (492 days)	90%	0%	Good	Spoiled and soiled	Long term seed storage is highly improved following Synergistic Seeds treatment.
2	Cummin (T)			92%	92%	Good	Good	
3	Maize (UT)			87%	0%	Good	Spoiled and soiled	
4	Maize (T)			94%	94%	Good	Good	

Following 492 days of storage under ambient conditions, the survival, germination, and vigour of treated seeds are highly improved as compared to the untreated seeds.

We wish Synergistic Seeds Pvt Ltd all success in their future endeavour in mission to achieve zero hunger in the world by producing very high-quality seeds and therefore the better yield.

Thanking You



Kanakpura, Vijapur - 382 870, Dist. Mehsana, Gujarat, India. | Ph : +91 2763-220293
e-mail : priresh6570@gmail.com, web : www.motiseeds.com



गुजरात का असली बीज
Moti Seeds Pvt. Ltd.

Date: 28/05/2024

To,
Synergistic Seeds Pvt. Ltd.
Mehsana (Gujarat)

Subject: Regarding trial of Paddy and Wheat seed treated by Synergistic Seeds Pvt. Ltd.

This is to certify that we have conducted paddy trial at Karij (Mahedabad, Gujarat) during Kharif-2023 treated by Synergistic Seeds Pvt. Ltd. Results are mentioned below.

Sr. NO.	VARIETY	YIELD (Kg/plot) (TREATED)	YIELD (Kg/plot) (NON-TREATED)	DIFFERENCE (kg)
1	Suryamoti	4.04	3.54	0.5
2	Suryamoti Gold	4.04	3.82	0.22

Also, we have conducted one trial for wheat seed treated by Synergistic Seeds Pvt. Ltd. With non-treated seeds of same variety of same lot in Rabi-2024 at Vijapur (Mehsana, Gujarat). Results are mentioned below.

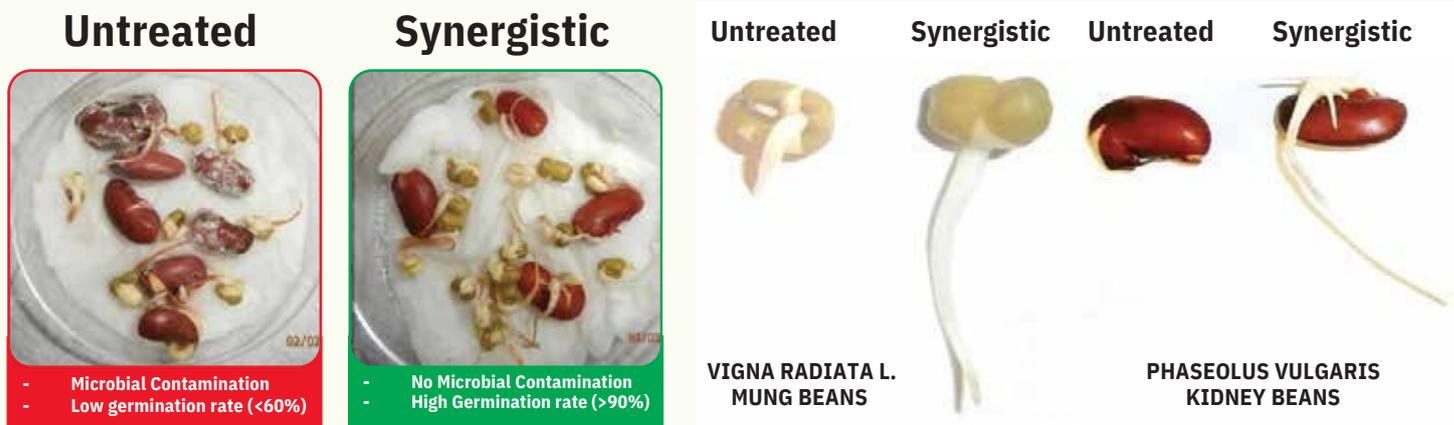
Sr. NO.	VARIETY	YIELD (Kg/plot) (TREATED)	YIELD (Kg/plot) (NON-TREATED)	DIFFERENCE (kg)
1	MRW-09 (LOT-2)	56	45	11
2	MRW-09 (LOT-3)	72	63	9
3	MBW-10	65	56	9

Also, seeds treated by Synergistic Seeds Pvt. Ltd. Were very well in vigour, morphology and other yield attributing traits, grain quality and grain storage life etc.



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e-mail : priresh6570@gmail.com, web : www.motiseeds.com

- Our treatment improves seed germination
- Emerging radicals in Synergistic activated seeds
- As compared to untreated, the seed coat breaks much quicker following our treatment
- Our treatment can be applied regardless of seed types and shapes
- Cost-effective, quick, one step and chemical free, highly efficacious treatment



Technical details of Synergistic Primed Seeds for Sustainable Agriculture

Parameters	Routinely Available Seeds	Synergistic Seeds Pvt Ltd
Chemical Free	NO	YES
Pesticides Free	NO	YES
Shelf life of seeds	LOW	HIGH
Toxin Free	NO	YES
Polymer coating of seeds	YES	NO
Cattle friendly seeds	NO	YES
Soil damage	YES	NO
Average Seed Germination	POOR	VERY HIGH
Average Yield	NORMAL	HIGH
Cost per Kgs of seeds	HIGH	MODERATE



Seed Testing Laboratory
Integrated Coating and Seed Technology India Pvt. Ltd. (INCOTEC)
 47, Mahagujarat Industrial Estate, Opp. Pharamlab, Sarkhej - Bavla Highway, At. Moraiya, Ta. Sanand,
 Dist. Ahmedabad - 382 213, Gujarat, India, Tel No. +91-99989 80829, E-mail : sheshdhar.pandey@incotec.com



GERMINATION TEST REPORT

Name and Address of Customer:
 Patel Himanshukumar Manibhai.

ULR : TC85832200000398F
 Discipline : Biological, Group : Seed Testing

- ❖ Sample(s) receiving date: 21-Oct-2022
- ❖ Condition of sample(s) during receipt: Satisfactory
- ❖ Location of test performance: Laboratory
- ❖ Reference test method: ISTA 2021, Section 5

Issue No. 01
 Date of Issue: 17-Nov-2022
 Order No. 4602787/16/22-23/761
 Report No. Germ/Test/11-2022/1071

Sr. No.	Crop	Variety / Hybrid	Lot No.	Batch No.	Labref No.	Testing Start	Testing End	Method	Temp. (°C)	A	B	C	D	E	Germ (%)
1.	Mustard		SSC-BLK-22151-T-20922	-	4602787-28189	03-Nov-22	10-Nov-22	BP	20-30	99	0	0	0	1	99
2.	Mustard		SSC-BLK-22151-TT-20922	-	4602787-28190	03-Nov-22	10-Nov-22	BP	20-30	91	0	4	5	0	91
3.	Mustard		M-20920	-	4602787-28191	03-Nov-22	10-Nov-22	BP	20-30	99	0	1	0	0	99
4.	Mustard		M-20920	-	4602787-28192	03-Nov-22	10-Nov-22	BP	20-30	98	0	2	0	0	98
5.	Cumin	-	Jeera Untreated	-	4602787-28193	03-Nov-22	17-Nov-22	BP	20-30	86	1	2	11	0	87
6.	Cumin	-	Jeera Treated	-	4602787-28194	03-Nov-22	17-Nov-22	BP	20-30	94	0	2	4	0	94
7.	Cumin	-	T-Jeera	-	4602787-28195	03-Nov-22	17-Nov-22	BP	20-30	97	0	3	0	0	97

Reviewed & Approved by
 Mr. Sheshdhar Pandey, Quality Manager

Limited Liability: The above results are based on the seeds submitted by the customer and represent only the sample received by INCOTEC. The tests are done as required by the customer on request. Variety name and lot number are provided by the customer. As the selection of these seeds from larger lot or sample is wholly the responsibility of the customer and as the performance changes over time and under varying conditions, customer assumes all risk and liability to any person if customer utilizes the above results to represent the condition, or predict the performance, of any other seeds. INCOTEC makes no warranty, express or implied, regarding the testing services. This report shall not be reproduced except in full, without the approval of Quality Manager / Technical Manager. Opinion and interpretation not provided, and decision rule not given in test report.

☎ : (02762) 255306

Mayur Industrial Testing & Analytical Laboratory

Testing Facilities For all Kinds of Materials ♦ A Govt. Approved Testing House
36, Shankarnagar Society, Opp. Dudhsagar Dairy, MEHSANA - 384 002

Ref. No: 0360/A Date: 02-03-2023

Himanshubhai Patel,
Mehsana.

Sub: Analytical report of Castor Seed.
Sample supplied by the party in unsealed Plastic bag.

Sample Mark: AVN-UT

Sr. No.	Test	Results
1	Oil Content	48.35 %

(Analysis on as is basis on sample.)

*Results listed refer only to the submitted sample.

Contents of this report are meant for your guidance and should not be used for litigation in part of full.

Test carried by,


UNTREATED CASTOR

☎ : (02762) 255306

Mayur Industrial Testing & Analytical Laboratory

Testing Facilities For all Kinds of Materials ♦ A Govt. Approved Testing House
36, Shankarnagar Society, Opp. Dudhsagar Dairy, MEHSANA - 384 002

Ref. No: 0360/B Date: 02-03-2023

Himanshubhai Patel,
Mehsana.

Sub: Analytical report of Castor Seed.
Sample supplied by the party in unsealed Plastic bag.

Sample Mark: SAT-T

Sr. No.	Test	Results
1	Oil Content	50.11 %

(Analysis on as is basis on sample.)

*Results listed refer only to the submitted sample.

Contents of this report are meant for your guidance and should not be used for litigation in part of full.

Test carried by,


TREATED CASTOR

Cumin
अजंठा

Cumin Yield (Kg/acre)*

Farmer Seeds	350-450
Synergetic Seeds (Farmer Seeds)	450-650
Company Seeds	400-550
Synergetic Seeds (Company Seeds)	520-850



* Subject to seed quality, soil, environmental conditions and field care.

Mustard
(सरसप/राई)

Mustard Yield (Kg/acre)*

Farmer Seeds	500-750
Synergetic Seeds (Farmer Seeds)	650-950
Company Seeds	900-1050
Synergetic Seeds (Company Seeds)	1150-1450



* Subject to seed quality, soil, environmental conditions and field care.

Cotton
કાંચણ

Cotton Yield (Kg/acre)*

Farmer Seeds	500-750
Synergetic Seeds (Farmer Seeds)	650-950
Company Seeds	850-1250
Synergetic Seeds (Company Seeds)	1000-1500



* Subject to seed quality, soil, environmental conditions and field care.

Castor
કાંચણ

Yield (Kg/acre)*

Farmer Seeds	1000-1250
Synergetic Seeds (Farmer Seeds)	1400-1550
Company Seeds	1250-1550
Synergetic Seeds (Company Seeds)	1750-2100



* Subject to seed quality, soil, environmental conditions and field care.

GERMINATION TEST



Cotton



UNTREATED



TREATED



FARMER SPEAKS

Harvest and Farming Life in Great World

“Following Synergistic Seeds” treatment, the germination of castor seeds is 10 days earlier and plants are much healthier as compared to the untreated seeds.

Crop: Castor

Farmer: Rajnikant Pandya

Village: Sikka, Ta. Dhansura, Dist. Arravali



“We got around a 1.2 fold increase in the yield. Sustainable against substantial changes in weather and Significant ability of seeds to sustain against pest and pathogens”

Crop: Cumin

Farmer: Rajgo Lalitbhai Somanthbhai

Village: Sarval, Ta. Harij, Dist. Patan



Field Photos





Optimizing Seed Exporation

Leveraging Prime Techniques for Success

- Our technology for priming seeds is an innovative, chemical free, environmentally friendly, one step physical approach to increase crop yield by means of high water up taking and pathogens free environment for vitality of the plants.
- It is fully Made in India under Atma Nirbhara Bharat.
- It will be scaled up for treatment of 100-150 tons seeds/day.

