

# QUALITY TESTING OF BT-COTTON SEEDS

A Training Report submitted  
for the partial fulfilment of the Degree of Master of Science

By

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## **CERTIFICATE**

This is to certify that this training report of “QUALITY TESTING OF BT-COTTON SEEDS” was successfully carried out by Mr. Meet M. Charoliya towards the partial fulfilment of requirements for the degree of Master of Science in Biotechnology of Atmiya University, Rajkot. It is an authentic record of his own work, carried out by him under the guidance of Name of Supervisor for a period of 3 months during the academic year of 2022-23. The content of this report, in full or in parts, has not been submitted for the award of any other degree or certificate in this or any other University.

Signature

Name of the Head of the Department

Signature

Name of the Supervisor

## *DECLARATION*

I hereby declare that the work incorporated in the present dissertation report entitled “**Quality testing of bt-cotton seeds**” is my own work and is original. This work (in part or in full) has not been submitted to any University for the award of any Degree or a Diploma.

Date

(Name and signature of Student)

# INDEX

No.	Test name
1.	Seed germination test
2.	Sandwich Elisa

# ABSTRACT

Attaining seedling in cotton is the important objective of researchers and producers. Seed testing is determining the standards of a seed lot, physical purity, moisture, germination thereby enabling the farming community to get quality seeds.

The Seed Testing Laboratory is the hub of seed quality control. Seed testing services are required from time to time to gain information regarding planting value of seed lots. Seed testing is possible for all those who produce, sell and use seeds.

We test for the germination process of seed, also test for the important gene that are present in it or not. We have done the sandwich ELISA test performed for the cry1ac-cry2ab. there are a different variety of criteria/range for the testing the various types of seed that contain the range of seed that can be acceptable for the better quality. After that testing of germination and Elisa test the seed that pass the quality test will go for the packaging.

Before the packaging the seed will be coated by the polymer for to prevent it from the fungicide and the insecticide.

After the product has been packed and it will be checked for the quality. it will be distributed to the dealers. by performing these test on the cotton seed we will be identifying the quality of the seeds.

# INTRODUCTION OF COMPANY

## SOLAR AGRO TECH PRIVATE LIMITED

Solar Agrotech Private Limited was founded by an agricultural technocrat Dr. Thobhan Dholaria, has a degree in M.Sc. (Agri.) & Ph.D. degree in Plant Breeding and Genetics.

The company was incorporated in 1994 aiming to fulfil the needs of farming community to provide the High-tech and High Yielding Quality Seeds of various crops under the registered trade brand of "DOCTOR SEEDS".

We have worked in the Rajkot lab of Dr. seeds. There was different department based on the seed process.

Dr. Dholaria provides needful information for increasing crop production and protect the crop under varying climatic condition through Dr. Dholaria Agricultural Foundation which was established for providing service to the farming community.

'Doctor Seeds' sees is good future business using the biotechnology and strengthening R&D company's young Director, Denish Dholaria, who is MSc. degreed in Plant biotechnology for advancement in biotech crop breeding to support the breeding work of team headed by company's Director of Research, Dr. J. M. Kamani, who is having PhD in Plant Breeding & Genetics along with Mr. Rahul Kothiya, MSc. Plant Biotechnology and Dr. M. K. Bhalala (ex-University Registrar) as an advisor to the company in the of government matters.

# REPORT

First of there we have to separate the seeds from the cotton mixed with. That have done with Seeds treatment: Acid (Pure H<sub>2</sub>SO<sub>4</sub>) & Base (Lime) treatment, washing, drying. After that we have to the germination process of seed and also gene test for Cry1Ac-Cry2AB Sandwich ELISA Qualitative Test.

After that the seed that pass from the quality test can be transferred to the coating area. After the coating of seed, the quality of seed will be tested and it will be transferred to the packaging area. Where the packed seeds will be distributed to the dealers.

## 1. Germination Testing

Germination steps - seedling • On cellulose paper, count 100 seeds and band this cellulose paper in prescribed pattern. This method is called “Paper method” of seeds germination test.

Spray water (daily, twice in a day) and fungicide (one-time) on these cellulose papers during the germination incubation period (15-20 days). Incubation temperature should be room temperature.

The most common test is a warm germination test because it is required by seed laws to appear on the label. Usually 400 seed from each seed lot are placed under moist conditions on blotters, rolled towels, or sand and maintained about 75to 85 degrees F for about seven days in most of the cases.

At the end of this period the seedlings are categorized normal, abnormal, or diseased, and dead or hard seeds.

The percentage germination is calculated from the number of normal seedlings from the total number of seeds evaluated. The method of testing germination is discussed below.

To obtain a random sample for testing it is always best to take samples from different parts of the bag or container. If the seed to be tested is from a seed lot that contains more than one bag, samples must be taken from several bags. A good rule of thumb for determining how many bags to sample is to take samples from a number of bags that represents the square root of the lot size. For example, if the lot contains 100 bags, the sample at least three bags. If the lot contains 100 bags, the sample at least 10bags.

## **2. SANDWICH ELISA TEST**

In the sandwich ELISA test, samples were prepared by grinding the seeds into a fine powder and extracting proteins in a buffer solution.

The protein concentration was then determined using the Bradford assay. The samples were incubated with specific antibodies against Cry proteins and then with a secondary antibody conjugated to an enzyme.

The enzyme catalyzed a colorimetric reaction when a substrate was added, which resulted in the detection of Cry proteins in the sample.

The assay was optimized for sensitivity and specificity, and the results were analyzed to determine the presence or absence of Cry genes in the Bt cotton seeds.

This internship led to the successful detection of Cry proteins in the Bt cotton seeds using sandwich ELISA.

The results showed that the seeds contained varying levels of Cry proteins, depending on the specific variety of Bt cotton.

Additionally, the germination test revealed that the Bt cotton seeds had high rates of germination, indicating their overall viability.



These finding of gene will be useful for the quality of the seed that can be determined by this test. it will ensure that the gene is present in the seed. This study of the cotton seed crop adds to the knowledge and we had to know the more about the bt cotton crops process for the quality. Overall this internship has provided the valuable opportunity to gain the experience in the biotechnology and agriculture field. Also contribute to research efforts aimed at improving crop protection various strategies.

