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Guidelines and Manual
For Maize Seed Certification
For NASC
Authorized Agents
In Nigeria

NOVEMBER, 2023

COLLABORATIVE SEED PROGRAMME
Nigeria-Netherlands

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GUIDELINES AND MANUAL FOR MAIZE SEED CERTIFICATION FOR NASC AUTHORIZED AGENTS IN NIGERIA

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PREFACE

It gives me extreme joy to be part of this great history in the Nigerian Seed Industry. In the last five years, our seed industry had undergone tremendous growth and has also been identified with changes in the global seed industry. The global seed industry is shifting to a decentralized seed certification system from the current sole responsibility of the government.

At inception of the National Seed Service (NSS) in the early 80s, it was just five (5) seed companies operating in the country compared to 441 seed companies operating as of 2023. I am more inundated by the number of entities seeking approval to be accredited seed companies on a regular basis compared to the 82 official seed inspectors in Nigeria, which is grossly inadequate to ensure planting materials sold to Nigerian farmers meet the requisite quality standards.

With the growing investment in our seed industry, we are not only joining the global seed regulators to further high-level of efficiency in the seed industry but also creating a platform to strengthen the West African Seed Industry, which is increasingly depending on the Nigerian seed industry. With this decentralized seed certification in West Africa and other innovative solutions deployed by NASC, Nigeria will continue to play significant roles in West Africa and across the continent.

This guideline is developed with the authorization of private certification entities' under the Organization for Economic Cooperation and Development (OECD) Seed Schemes, and it is strictly binding on all entities seeking authorization to perform seed certification in Nigeria.

Also, this guideline will be updated as changes evolve in the seed industry.

I wish to commend the committee that developed this guide and the contributions from staff, management, and developmental partners of NASC.

Dr. Ishiak Khalid
Acting Director General,
2nd November 2023

LIST OF ACRONYMS AND ABBREVIATIONS

ASCC	Authorized Seed Certification Company
ASTL	Authorized Seed Testing Laboratory
ASCRC	Authorized Seed Certification Regulation Committee
ASCAC	Authorized Seed Certification Appeals Committee
ISTA	International Seed Testing Association
LSI	Licensed Seed Inspector
LSA	Licensed Seed Analyst
NASC	National Agricultural Seed Council
NST	National Seed Tracker
OECD	Organization for Economic Cooperation and Development

1.0 DEFINITION OF TERMS

Entity: A private institution registered with CAC and NASC seeking to carry out or officially permitted to conduct seed certification tasks on behalf of NASC.

Authorized: An entity having a formal approval of NASC that is recognized as competent to perform seed certification activities on its behalf.

National Seed Tracker: A web app for seed value chain management, monitoring, evaluation, and learning. It is an app that organizes seed information for certification activities, tracking production status, barcoding certification tags, seed source verification, etc.

Authorized *Seed Certification* Company (ASCC): An entity that is licensed by NASC to carry out certification leveraging Licensed Seed Inspectors/Licensed Seed Analysts.

Licensed Seed Inspector (LSI): A person employed by ASCC that authorized by NASC, and proficient in carrying out crop-specific inspection for a particular ecological zone and can also draw seed samples for laboratory certification.

Licensed Seed Analyst (LSA): A person employed by ASCC or an independent laboratory that has NASC authorization to carry out laboratory analysis for all classes and types of seeds.

Authorized Company Laboratory (ACL): A seed laboratory owned by ASCC that has been certified by NASC to carry out various types of seed tests for all types of seed.

Authorized Seed Testing Laboratory (ASTL): A seed laboratory owned by an independent person(s) holding NASC Authorization to carry out various types of seed tests for all types of seed.

Certificate of Authorization: A document issued by NASC to ASCC/ASTL indicating that the named entity fulfills all requirements for accreditation, and is authorized to perform seed certification/ seed testing.

Powers of Authorization: A document issued to LSI/LSA indicating that the named person under ASCC/ASTL has been authorized to perform seed inspection for a particular ecology or seed testing for all classes and types of seeds.

Ecological Zone: A land resource unified in terms of climate landforms and soils where an LSI can carry out his/her certification activity.

Spot-checking: A method of control used by NASC through its seed inspectors to independently verify the activities of LSIs.

Check-testing: A method of control used by NASC through its seed analysts to independently verify the activities of LSAs.

Seed Inspector: Official seed inspection officer employed by NASC under section 28 sub-section 1 of the 2019 Seed Act.

Seed Analyst: Official seed testing officer employed by NASC under section 28 sub-section 1 of the 2019 Seed Act.

Inspection: Examination of crop characteristics, seed health and weed status, or other aspects and comparing the results with the stipulated requirements in order to establish compliance. This will be carried out by LSIs.

Seed Sampling: A defined procedure to get a uniform and representative sample from a seed lot.

Testing: Laboratory examination of a sample of seed-lot to determine the standards of the seed lot. This will be carried out by LSAs.

Surveillance: A system of monitoring deployed by NASC to ensure that only quality and certified seeds are traded in the Nigerian seed market.

Audit: Systematic and documented process for obtaining evidence to determine the degree of compliance with documented seed certification procedures/methods.

Corrective Actions: Action taken to eliminate the causes of a potential non-compliance, defect, or other undesirable situation in order to prevent re-occurrence.
Non-Compliance: Non-fulfilment of a specified requirement.
National Seed Catalogue: List of all crop varieties that are released by National Varieties Release Committee and are eligible for commercialization seed certification.

PART I

2.0 INTRODUCTION

2.1 Background Information

The National Agricultural Seeds Council (NASC) is the government agency charged with the overall development and regulation of the Nigerian seed industry and the council has been discharging this responsibility in line with international best practices such as the adoption of the Organization for Economic Cooperation and Development (OECD) Seed Schemes Standards for seed field inspections and the International Seed Testing Association's (ISTA) standards/ procedures for seed sampling and testing.

The Seed Industry in Nigeria has evolved into a central force in the West Africa Seed Industry accounting for about 70 percent of the seeds used in the region. The Nigerian Seed Industry metamorphosed from a public sector-dominated industry in 1975 to a private sector-driven industry of over 441 seed companies as of 2023. Presently, more companies are awaiting registration approvals of the governing board of NASC- a trend that is likely to be sustained over the foreseeable future because of the increasing awareness of the benefits of quality seeds. . The rapid growth of seed companies in Nigeria continues to put strains on the available seed certification infrastructure (seed field inspection, supervision of post-harvest operations such as seed processing, drawing of samples for laboratory testing etc.).

Seed certification is a primary responsibility of NASC and entrenched the National Agricultural Seed Act 2019. The Act empowers NASC amongst others, to explore options of maintaining top=class seed certification, including outsourcing, and or decentralizing seed certification.

Relying on Seed Act 2019, the country commenced the decentralization of seed certification by authorizing highly vetted private entities to complement the NASC's certification operations. This guideline is prepared in line with OECD guidelines to streamline the process of Authorization of Third-Party Seed Inspection Organization (ATPSIO)

These guidelines define the process of Decentralized Certification, and the conditions for authorization of entities seeking registration as Authorized Seed Certification Company (ASCC)/ Licensed Seed Inspector (LSI)/Licensed Seed Analyst (LSA), Seed testing, surveillance and audit procedures. Also, it specifies the conditions for the re-examination of LSI/LSA, and withdrawal of authorization of ASCC/LSI/LSA, etc.

2.2 Objective of Private Seed Certification

The general objective of Decentralized Seed Certification is to further strengthen the Nigerian Seed System through a partnership with the governmental, non-governmental, and private sector to build an enabling environment for effective participation of both public, NGO, and private sector in the certification of planting materials.
Specific Objectives shall be:

- To offer efficient and cost -effective seed quality assurance and seed certification services to promote the seed sector in Nigeria.

- To ensure that planting materials sold to farmers meet minimum set quality standards (both field and laboratory standards) so as to maximize their crop production.
- To ensure genetic identity, purity, and health.
- To complement NASC officers in meeting quality certification duties.
- To create career development opportunities for qualified persons outside the government for seed certification activities.

2.3 Framework of the Guideline

2.3.1 The guidelines are the charter for authorizing third-party certification in Nigeria. NASC shall have two committees: (a) **Authorized Seed Certification Regulation Committee (ASCRC)** domiciled in the Department of Seed Certification and Quality Control to deal with all issues of authorization, audit, and suspension; and (b) the **Authorized Seed Certification Appeals Committee** (**ASCAC)** domiciled in Seed Inspectorate Department that to deal with issues of appeals. The two committees shall be chaired by a Deputy Director.

2.3.2 NASC shall train prospective LSI and staff of LSA on standard operating protocols and provide access (to information and advice) to its services to all entities/persons seeking to be authorized. However, all data generated in the course of carrying out any duty under the program is a restricted NASC document and cannot be shared, duplicated, transmitted, or transferred without permission of NASC

2.3.3 Confidentiality of the information obtained during NASC's authorization of entities/persons shall be maintained.

2.3.4 The ASCC/ASTL/LSI/LSA shall be free from pressure that might adversely affect the quality of their work, independence of judgment, and maintenance of integrity when undertaking seed certification activities.

2.3.5 ASCC/ASTL/LSI/LSA should be familiar with the Nigerian Minimum Certification Standards implementation, OECD Seed Schemes, ISTA standards, National Varietal Catalogue, and Seed Act 21 of 2019.

2.3.6 NASC shall make available a system for the control of all documentation relating to the authorization and shall include:
a) Current issues of the appropriate documents.
b) A process to ensure that changes or amendments to documents are authorized, processed, and implemented in a quick and efficient manner;
c) An effective process to ensure that ASCC/ASTL/LSI/LSA are notified of changes.

2.3.7 The NASC shall;
a) Carry out training for ASCC/ASTL/LSI/LSA. On protocol for operation.
b) Carry out official assessments of competence for authorization of ASCC/ASTL/LSI/LSA.
c) Provide rules, methods, and procedures for inspection, sampling, and testing and ensure that they are applied.
d)Provide access to the National Seed tracker for ASCC/ASTL/LSI/LSA.
e) Provide seed certification labels to ASCC/LSIs.

2.3.8 NASC reserves the right to make changes to any part of the guideline it may deem necessary to enhance certification service quality in accordance with the Seed Act 21 of 2019 without prior notice.

2.3.9 The procedures applicable for authorization are;
a) Procedure for vetting applications (Annex ;)
b) Procedure for auditing authorized entities (Annex);
c) Procedure for monitoring of authorized ASCC/ASTL/LSI/LSA (Annex);
d) Procedure for withdrawal of authorization (Annex);
e) Procedure for appeals (Annex).

2.4 General Information

2.4.1 All entities applying for "ASTL" authorization **MUST have** been registered with Corporate Affairs Commission (CAC).

2.4.2 ASCC shall be licensed by the NASC to carry out field inspection for **only certified seeds** but can carry out laboratory testing for all classes of seeds.

2.4.3 Certification of nucleus, breeder, and foundation seed classes shall be the sole responsibility of NASC. ASTL shall also be licensed by NASC to carry out seed testing for all classes of seeds.

2.4.4 LSIs shall only be licensed to certify a seed crop, while LSAs shall be licensed to carry out seed testing for a maximum of three crops.

2.4.5 The entity after being accredited by NASC shall be called an **AUTHORISED *SEED CERTIFICATION* COMPANY (ASCC) or AUTHORISED SEED TESTING LABORATORY (ASTL)** and must have a qualified and trained private inspectors and seed analyst who will be called **LICENSED SEED INSPECTORs (LSIs) and LICENSED SEED ANALYSTs (LSAs)** as the case may be**.**

2.4.6 **The LSIs/LSAs will be** trained by NASC, ASCC, and ASTL (where applicable) and they shall possess the same powers as official seed inspectors and analysts. The training sessions will be a combination of classroom and practical field training for individuals seeking to serve LSI/LSA.

2.4.7 After the training, LSIs/LSAs must pass written and practical evaluations prior to to qualify for licensing by NASC, must demonstrate their competence to inspect seed fields, and ability to carry out seed sampling and seed tests.

2.4.8 ASCC/ASTL shall apply for **renewal of its operating license** and shall also apply for **powers of authorization** for its inspectors and seed analysts every two years.

2.4.9 LSIs/LSAs shall have the necessary qualifications which must be at least an Ordinary National Diploma (OND) in any field of agriculture.

2.4.10 Where crops are inspected by LSIs, a proportion of these crops must be spot-checked by official inspectors. The level of check inspections will be set by the NASC to adequately assess the performance of the LSIs.

2.4.11 All LSIs/LSAs are required to be re-examined by NASC every **two years** to maintain their license.

2.4.12 NASC will conduct all relevant examinations and run training courses to help inspectors/analysts sitting for the examinations.

2.4.13 All applications for certification shall be submitted officially to the NASC for the authorized entities. ASCC shall designate an LSI/LSA to handle the certification processes. The applicant shall indicate the preferred authorized entity to offer the service.

2.4.14 ASCC/ASTL shall collect and remit prescribed service charges from clients on behalf of NASC and shall remit the same based on approved rates/ percentages.

2.4.15 ASCC/ASTL shall pay an administrative fee to NASC for every application received and shall be responsible for the remuneration of the LSI under its employ.

2.4.16 **Private seed certification shall be fully digital** and NASC will provide access for ASCC/ASTL/LSI/LSA to the National Seed Tracker (NST). Each entity/person shall have a unique Personal Identification Number (PIN) on the tracker.

2.4.17 NASC reserves final authority on all matters on approvals, renewal, accreditation, or withdrawal of the license of ASCC/LSI/LSA

3.0 GENERAL GUIDELINES FOR AUTHORIZATION

3.1 Areas Covered Under the Guideline

ASCC/LSI/shall be authorized to:

3.1.1 Carry out seed field inspection and certification for "certified seeds" only.

3.1.2 Supervise seed processing and conditioning for certified seeds only.

3.1.3 Carry out seed sampling on certified seed lots.

3.1.4 Supervise certified seed packaging, labelling, and sealing

ASTL/LSA shall be authorized to:

3.1.5 Carry out any seed test for all the classes of seed.

3.2 Scope of Authorization

3.2.1 Field Inspection

LSI shall carry out inspections as per the NASC procedure for a given crop, which generally includes at least a minimum of three inspections at the following stages (a) Pre-planting stage, (b) Vegetative Stage, and (d) pre-harvest stage. The NASC shall make available specific crop inspection guidelines and reporting booklets to ASCC/LSIs.

3.2.2 Seed Processing Inspection.

LSI shall inspect the seed lot and supervise seed processing and conditioning of seed companies under their purview.

3.2.3 Seed Sampling/Re-sampling

LSI may be assigned toshall draw, document and store seed samples before dispatch to the laboratory for seed testing under strict supervision of the NASC officer.

3.2.4 Seed Testing

LSA shall receive seed samples from NASC official or authorised LSI and carry out seed tests at an ASCC/ASTL or NASC laboratory before issuance of the seed testing certificate. The following tests will be carried out on any seed sample; (a) Purity testanalysis (b) seed moisture (c) Germination analysis (d) Vigour (e) Seed health (f) Genetic purity analysis.

3.2.5 Labelling and Sealing

LSI shall apply to NASC through ASCC for certification labels which will be affixed to seed packs from passed seed lots (seed lots that have passed field and laboratory standards). LSI will supervise labeling on seed packs, sealing, and tagging.

The NASC shall provide specific procedures and methods for handling certification. labels.

4.0 ELIGIBLE ENTITIES

4.1 Authorized inspection, sampling, and testing shall be approved only for entities registered with Corporate Affairs Commission (CAC). NASC shall carry out due diligence of the entity and upon satisfactory report, shall issue a **Certificate of Authorization** to the entity. The authorized entity shall be referred to **Authorised *Seed Certification* Company (ASCC) or AUTHORISED SEED TESTING LABORATORY (for seed testing only)**

4.2 ASCC/ASTL shall employ persons of good character to undertake field inspection/seed testing and apply to NASC for **Powers of Authorization** for its inspectors/analysts. Authorized inspectors shall be called **Licensed Seed Inspectors (LSIs)** and authorized analysts shall be referred to as **Licensed Seed Analysts (LSAs).**

4.3 LSIs/LSAs shall be employable persons who have natural or legal status in Nigeria and can only undertake authorized certification activities under their employer entity. In case LSI/LSA wishes to change ASCC/ASTL to which they are employed, they shall notify NASC through their employer and provide proof of employment to their new ASCC/ASTL.

4.4 ASCC/ASTL should keep NASC regularly updated on recruitment, resignation or withdrawal of LSI/LSA immediately such action is taken for better tracking.

5.0 CONDITIONS FOR AUTHORIZATION OF LSI/LSA

5.1 Minimum Qualifications

5.1.1 Academic

The minimum qualification for LSI/LSA shall be at least Ordinary National Diploma (OND) in Agriculture from a recognized higher institution in Nigeria or its equivalent from a foreign academic institution. Persons with certificates in Agriculture or related discipline from a recognized institution and ten year's experience in seed-related activity may also be considered.

5.1.2 Technical and professional

Intending LSI/LSA shall possess at least one (1) year of experience in any area of the seed industry or related field.

5.1.3 Integrity

All intending LSI/LSA through their respective ASCC/ASTL shall submit a current certificate of Good Conduct from the Nigerian Police or recognized notary publicpublic figure/Cleric to NASC.

5.2 Training on Seed Inspection/Sampling/Testing

NASC shall collate the names of all intending LSIs/LSAs and shall train them on the crop which they have been designated by their employer to certify. The training shall be conducted within four weeks after NASC receives names of intending LSIs/LSAs from ASCC or ASTL.

NASC may also delegate competent entities to undertake the training on its behalf.

5.2.1 Examinations/Assessment.

After the training, all intending LSIs/LSAs shall satisfy NASC of their competence to become authorized through examinations. The following parts of the examination shall be used:

a) A written examination to test knowledge of principles and procedures.

b) A practical examination to test field inspection/sampling/seed testing skills and operations of the National Seed Tracker. The overall pass mark shall be 80% (for both theory and practical)

In the case of ASCC/ASTL, an assessment shall be done to confirm if the general requirements are fulfilled as per the guidelines and criteria in annex……

5.2.2 Attachment

Qualifying LSIs/LSAs shall undergo three (3) a month attachment under the official seed inspector/analyst. The attachment shall be undertaken within One (1) month after successful completion of the examination.

6.0 AUTHORIZATION

6.1 LSIs/LSAs who meet the requirement shall be authorized through gazette by the NASC which shall be done within a period of not more than 60 days after successful completion of attachment.

6.2 ASCC/ASTL or LSI/LSA shall be issued with a **Certificate of Authorization and Powers of Authorization respectively. Powers of Authorization of LSI/LSA** shall specify the scope and aspects of authorized certification and accompanying conditions. The certificate shall have a validity period of two years and shall be renewable every two (2) years.

7.0 MAINTENANCE OF KNOWLEDGE AND SKILLS

LSI/LSA shall maintain their knowledge and skills by:

a) Undertaking regular (not more than one year break) certification,

b) Participating in periodic refresher training and keeping up to date with applicable seed inspection/Sampling/testing standards, rules, regulations and procedures.

8.0 SURVEILLANCE AND AUDIT PROCEDURES

8.1 Documentation check

8.1.1 All documentations for authorized inspections/sampling/testing shall be done on the National Seed Tracker (NST). NASC shall access all information received on NST for documentation, checking and monitoring purposes.

8.1.2 NASC shall provide certification labels to ASCC and shall track proper use of labels.

8.2 Spot inspections

A proportion of crops inspected by LSI shall be spot inspected by official inspectors. The exact method used shall be as per **13.1.6(a).**

8.3 Check Sampling

Check-sampling shall be done as provided **13.1.6(b).**

8.4 Check testing

Check testing shall be done as provided in **13.3.6 (a)**

8.5 Proficiency laboratory test

Proficiency test shall be done every two years to authorized seed testing laboratory before issuance of renewal license. NASC shall administer the proficiency tests.

8.6 Pre and Post control

NASC establish pre and post control tests for all the seeds certified by LSIs in the regional offices closer to ASCC/LSI. The results of these pre- and post control plot assessment shall be an indicator of performance of LSIs.

8.7 Audits

Audit procedure shall include checks on documentation and adherence to documented procedures and standards.

ASCC/ASTL/LSI/LSA shall be audited annually by NASC during inspection/sampling and testing following the procedure in Annex...

9.0 RE-EXAMINATION

NASC shall require LSI/LSA to undertake re-examinations after two (2) years or **after recommendation following audit or spot-inspection/testing.**

10.0 SUSPENSION/WITHDRAWAL OF AUTHORIZATION

NASC shall withdraw authorization on the following grounds;

10.1 If an ASCC/ASTL provide false information in the application for Authorization.

10.2 If an LSI/LSA provide misleading information/false documents in the application for Authorization.

10.3 If ASCC/ASTL/LSI/LSA provides false or misleading information in a report.

10.4 If LSI/LSA did not follow procedures for field inspection and seed testing.

10.5 If ASCC/ASTL/LSI/LSA gives his access information on the NST to a third party which compromises the privacy of information and integrity of the tracker.

10.6 If seeds certified by LSI fail pre-control tests three (3) consecutive times.

10.7 If there is evidence from surveillance activities that the ASCC/ASTL/LSI/LSA has compromised standards.

10.8 Failure to renew Certificate of authorization/powers of authorization.

10.9 In case of voluntary withdrawal of authorization

10.10 LSI/LSA morbidity or permanent disability

10.11 In case of de-registration by CAC.

In case of any violations above, ASCC/LSI/LSA may be given a maximum of two warnings after which the authorization will be withdrawn. For violations **10.1, 10.2, 10.3, 10.5, 10.6,** and **10.7,** no warnings shall be given.

In the case of **10.4,** LSI/LSA shall be suspended and required to undergo refresher training.

11.0 APPEALS

The NASC shall operate an appeals procedure to enable a review of the decision not to authorize, suspend, or withdraw authorization.

Any person aggrieved by the decision of the Authorized Seed Certification Regulation Committee may appeal to Authorized Seed Certification Appeal Committee. The appeals procedure is as detailed in Annex 1(6).

12.0 ABSOLUTION FROM LIABILITY

NASC shall not take liability for injuries, claims, suits, losses, or damages arising from the actions of ASCC/ASTL/LSI/LSA.

ASCC/ASTL is an independent body and shall be held responsible for any actions or inactions by the company or its employees .and shall oversee allocation of fields to LSIs in areas under the jurisdiction of the affiliated ASCC/ASTL.

13.0 SPECIFIC GUIDELINES

13.1 Criteria for Authorizing LSI

13.1.1 Training

LSI shall undergo training appropriate to the crops which they have been licensed to inspect.

13.1.2 Knowledge and skills required

LSI shall have the following knowledge and skills.

13.1.2.1 Knowledge of:

a) the OECD Seed Schemes.
b) Nigerian Minimum Certification Standards and other NASC statutory books
c) the methods of field inspection and field standards appropriate for the crop species for which authorization is sought.
d) the varietal characteristics of the varieties to be inspected.
e) taking seed samples for seed certification purposes;

13.1.2.2 Skills in:

a) use of varietal characteristics to confirm the varietal identity of seed crops;
b) detection, characterization, and quantification of varietal impurities in seed crops.
c) Identification of noxious weeds, pests, and seed-borne diseases.
d) Computer/ Smartphone usage

13.1.2.3 Sampling equipment

LSI shall be trained and competent in taking seed samples for seed certification and shall have access to appropriate sampling equipment.

13.1.3 Examinations and competence assessment

LSI shall demonstrate their competence to become authorized inspectors through examinations. The following examinations shall be used in assessing competence:
a) A written examination to test knowledge of principles and procedures.
b) A practical examination to test seed field inspection and seed sampling skills.

13.1.4 Field attachment

LSI shall undergo field attachment under an official inspector for a period of three (3) months.

13.1.5 Maintenance of Knowledge and Skills

LSI shall maintain their knowledge and skills by:
a) Undertaking regular (not more than one-year break) inspection of crops and sampling,
b) Participating in periodic retraining and,
c) Being conversant with Nigerian Seed Certification Statutory books, certification schemes, and crop inspection procedures and being familiar with any changes.

13.1.6 Surveillance and Audit Procedures

a) Spot Inspections

A proportion of seed crops inspected by LSI shall be check-inspected by NASC certification officers. The exact method will follow the following options on a case-by-case basis. NASC shall;

13.1.6.1 Check-inspect a proportion of crops certified by LSI;

13.1.6.2 Check-inspect a proportion of crops selected randomly from all crops which are inspected by LSIs.

13.1.6.3 check-inspect a proportion of crops selected randomly from all LSIs and additional monitoring of LSIs with a higher risk of non-compliance.

b) Check sampling

A proportion of seed lots sampled by LSI must be check-sampled by official seed inspectors and check-tested in the NASC laboratory.

c) Inspection Audits

LSI may be audited by official certification officers during field inspections.

d) Re-examination

The NASC shall require LSIs to re-qualify for authorization every two (2) years.

e) Documentation

The NASC shall examine LSI inspection records periodically to monitor adherence to Standard Operating Procedures on Field Reporting and adherence to proper inspection documentation.

f) Use of pre- and post-control plot assessment results

NASC shall establish control plots for crops certified by LSIs and compare results with LSIs field inspection reports as an indicator of performance.

13.1.7 Withdrawal of authorization

NASC shall withdraw authorization as provided in section 10.

13.2 Criteria for Authorizing Seed Testing Laboratories

13.2.1 Training

NASC shall be satisfied that the staff of an ASCC/ASTL have been sufficiently trained and are competent.

13.2.2 Knowledge and skill requirements

Seed testing laboratories shall;

a) be licensed to carry out all types of seed testing and must have a qualified laboratory manager (analyst in charge);

b) have enough qualified LSA in relation to the volume of tests carried out, with the appropriate technical qualifications in accordance with the rules and methods as provided by NASC and ISTA and confirmed by official examinations;

c) be situated in appropriate premises and have appropriate calibrated and well-maintained equipment which fulfills the requirements of the methods and rules for the tests the lab is authorized to conduct.
d) test according to methods and rules for seed testing approved by NASC and ISTA.

(NASC shall make available seed testing procedures approved by ISTA to ASCC/ASTL)

The staff working in the laboratory shall have the following knowledge and skills;
a) Seed testing
b) Application of seed testing methods and procedures approved by the NASC
c) Nigerian Seed Industry

13.2.3 Competence assessment

The following methods shall be used to assess the competence of applicants:
a) **Laboratory management examination for the seed analyst in charge:** The head of an ASCC laboratory/ASTL shall be assessed on laboratory management skills, particularly control of testing conditions and documentation, in addition to passing the LSA examination. The assessment shall be conducted concurrently with his/her LSA examination.

b) **Seed testing examination for LSAs**: After completion of training, a practical examination relating to seed testing with respect to the crops which an LSI is designated to certify shall be tested. A written examination to test knowledge of principles and procedures of seed testing according to international rules and methods shall be carried out.

13.2.4 Attachment

Upon successful examination, LSAs shall undergo attachment in NASC regional Laboratories/NASC Central Seed Testing Laboratory for a period of three (3) months.

13.2.5 Maintenance of knowledge and skills

a) ASCC/ASTL shall ensure that their staff maintain knowledge and skills by;
i. Undertaking regular seed testing work
ii. Keeping up to date the documentation and being familiar with the seed testing rules and methods as approved by NASC.
iii. Participating in re-training as the need arises.
b) Premises and equipment used for seed testing shall meet the specifications of the rules and methods approved by NASC
iv. LSAs shall be re-examined every two years before the issuance of a renewal license.

13.2.6 Surveillance and audit procedures

a) Check-testing

Check testing involves taking the reference sample from ASCC or ASTL and testing at NASC Seed Testing Laboratory.

i. Newly authorized laboratories shall be checked and tested 2 times a year.
ii. NASC shall develop Check testing tolerances standards.

iii. ASCC/ASTL that do not meet minimum check testing tolerances set by NASC for two subsequent checks shall be suspended and required to be retrained and re-examined.

iv. ASCC/ASTL that fails to check inspection for three consecutive times shall have their authorization withdrawn.

b) Proficiency Laboratory Test

ASCC/ASTL shall participate in proficiency tests once a year.

c) Audits of seed test laboratories

Audits shall examine adherence to laboratory management principles and the appropriate testing procedures and methods and shall include checks on documentation, tools, and equipment as well as the examination of laboratory records.

13.2.7 Withdrawal of Authorization

NASC shall withdraw authorization as provided in

13.3 Criteria for Authorization of ASCC

13.3.1 Independence

NASC must be satisfied that ASCC has independence in its operations.

13.3.2 Personnel

NASC shall be satisfied that ASCC has sufficiently trained and competent staff to undertake certification activities.

13.3.3 Knowledge and skill requirements

ASCC shall;

Have a qualified manager who is technically competent in seed certification requirements.

a) Have enough qualified LSIs and LSAs in relation to the volume of inspections, sampling, and seed testing.

b) Be situated in a physical location and shall have appropriate premises, tools, and equipment which fulfill the requirements provided by NASC.

c) Work according to the procedures and methods provided by NASC

d) Have an internal system of quality control and audit.

13.3.4 Competence assessment

The following methods may be used by NASC to assess the competence of applicants.

a) The ASCC manager(s) shall be assessed on management and technical skills particularly control of seed certification activities, and associated documentation.

b) Technical staff shall be assessed on the relevant rules and pr ocedures including process flow and documentation.

13.3.5 Maintenance of knowledge and skills

ASCC/ASTL shall ensure that the staff maintain their knowledge and skills

13.3.6 Surveillance and Audit Procedures

NASC shall ensure the requirements of authorization guidelines are fulfilled through audits as per the audit procedure in

13.3.7 Withdrawal of authorization

NASC shall withdraw authorization as provided for in section 11 following the procedure in Annex 1(5).

14.0. POWERS OF LSI

14.1 LSI shall draw representative samples of any seed of any notified kind or variety from the seed lots of any person offering to sell or deliver seeds. If the container from which the sample is to be drawn is intact, he may also draw samples after the delivery of such seed to a purchaser or consignee.

14.2 LSI shall send such samples, for analysis, to the LSA/official seed analyst for the region within which the sample has been drawn.

14.3 LSI may enter and search at all reasonable times with or without assistance any place in which he has reason to believe that an offence under the Act has been or is being committed. If the offense is such that it can be corrected, he may issue a stop sale order, ordering the possessor of such seed not to dispose of the concerned seed lot for a specific period. During this period, the possessor of seed may correct the defect(s) and intimate such action to the LSI who, on being satisfied with the removal of the defect(s) shall revoke the stop sale order.

14.4 He may break open the door of any premises where any seed of any notified kind or variety may be kept for sale in case the owner or any person in the premises, in spite of the presence of the LSI, refuses to open the door.

14.5 He may break open any container in which any seed of any notified kind or variety may be present.

14.6 He shall detain imported containers of seeds, which contravene the provisions of the Act.

14.7 He shall inspect as frequently as may be necessary all places used for storage or sale of any seed of notified kind or variety.

14.8 He shall maintain a record of all inspections made and action taken by him in the performance of his duties, including the taking of samples and the seizure of stocks.

14.9 He may examine any record, register, document, or any other material object found in any place If he has reason to believe that the records, etc., may furnish evidence of the commission of an offense punishable under the Act.

14.10 He shall investigate any complaint, which may be made to him in writing in respect of any contravention of the provisions of the Act.

14.11 In the case of persistent defaults, or flagrant contravention of the provisions of the Act and the Rules, he shall promptly notify NASC through his employer who will in turn institute prosecution.

PART II

MINIMUM MAIZE SEED CERTIFICATION STANDARD

15.0 ELIGIBILITY OF CROP VARIETIES FOR CERTIFICATION

Seed of only those crop/varieties which are registered in the national catalogue as per Section 14 of the National Agricultural Seeds Act shall be eligible.

16.0 CLASSES AND SOURCES OF SEED

16.1 Breeder Seed

Seed or vegetatively propagating material directly controlled by the originating or sponsored plant breeder of the breeding programme or institution or seed which is produced under the personal supervision of a qualified plant breeder, and which provides the source for the initial and recurring increase of foundation seed. Breeder seed shall be genetically so pure that in the subsequent generation (i.e) the Foundation seed class shall conform to the prescribed standard of genetic purity specified. The other quality factors of breeder seed such as physical purity, germination etc. shall be indicated on the label on actual basis.

16.2 Foundation Seed

Foundation seed shall be the progeny of breeder seed or be produced from foundation seed which can directly and clearly be traced to breeder seed. Foundation seed can be produced for two generations from breeder seed. During production of certified foundation seed the following guideline should be observed:

(a) Certified foundation seed produced from the breeder seed shall be designated as "Foundation Seed Stage 1", and certified foundation seed produced from Foundation Seed Stage 1 shall be designated as Foundation Seed Stage II". The certified foundation seed stage II shall not be used for further increase of foundation seed and shall be used for the production of certified seed class.

(b) Minimum seed certification standards and colour of the tag shall be the same for both the stages of foundation seed classes unless otherwise prescribed.

(c) Production of foundation stage II shall be allowed to be produced in respect of the following crops/varieties, which it is expressly felt by the *NASC* that the breeder seed is in short supply:

- ✓ Vegetatively propagated crops;
- ✓ Apomictically reproduced crops;
- ✓ Self-pollinated crops;
- ✓ Often cross pollinated/cross pollinated crops (with adequate measures/safeguards to maintain varietal identity and purity);
- ✓ Composites and synthetics;

- ✓ Parental line increase of hybrids.

16.3 Certified Seed

Certified seed shall be the progeny of foundation seed and its production shall be so handled as to maintain specific genetic identity and purity according to standards prescribed for the crop being certified. Certified seed may also be the progeny of certified seed provided this reproduction does not exceed three generations beyond foundation seed stage I, and it is determined by the *NASC* that (a) genetic identity and purity will not be significantly altered and (b) when there is genuine shortage of foundation seed.

17.0 PHASES OF CERTIFICATION

Certification shall be completed in the following six broad phases:

i) Receipt and scrutiny of applications for certification from the seed growers/producers.

ii) Verification of seed source: class and other requirements of the seed being used for raising the seed crop.

iii) Field inspection to verify conformity to the prescribed field standards.

iv) Supervision at post-harvest stages including processing and packaging.

v) Seed sampling and testing including genetic purity/health testing, if necessary, in order to verify the prescribed standards.

vi) Grant of certificate to a seed lot and affixing of certification tag and seal to the containers. (**SEE ANNEX II for detail instruction necessary for general seed**)

17.1 Certification Tag Colour

For Breeder Seed, it is white with diagonal purple stripe tag, For Foundation Seed white colour tag and for Certified Seed blue colour tag (shade azure blue) is prescribed.

Certified seed produced from Certified Seed shall not be eligible for further seed increase under certification programme. Certification tags for such production shall be super scribed with *'not eligible for further seed increase under certification'.*

18.0 APPLICATION AND AMPLIFICATION OF MAIZE *(Zea mays L)* HYBRIDS SEED CERTIFICATION STANDARDS

The General Seed Certification Standards are basic and, together with the following specific standards constitute, the standards for certification of maize seeds of different types of hybrids.

18.1 Eligibility Requirement for Certification

A hybrid is one to be planted for any use except seed production. It may be any one of the following:

Single Cross - the first generation resulting from the controlled crossing of two approved inbred lines.

Double Cross - the first generation resulting from the controlled crossing of two certified single crosses.

Three Way Cross - the first generation resulting from the controlled crossing of an approved inbred line (male) and a certified single cross (female).

Top Cross -the first generation resulting from the controlled crossing of an approved inbred line (male) and a certified open pollinated variety (female).

Double Top Cross -the first generation resulting from the controlled crossing of a certified single cross (male) and a certified open pollinated variety (female).

18.2 Land Requirements

Land to be used for seed production of hybrid maize seed shall be free of volunteer plants.

18.3 Field Inspections

For the production of hybrid seeds a minimum of four inspections shall be conducted in such a way that one is made one before flowering, two during flowering (when the crop has apparently 5% or more receptive silks in the seed parent rows) and one just before the harvests.

18.4 Isolation Requirements

Contaminants	Minimum distance (metres)
a) Fields of any maize with same kernel colour and texture.	200
b) Fields of any maize with different kernel colour and texture	300
c) Seeds of same hybrid not conforming to varietal requirements for certification.	200
d) Fields of other hybrids having common male parent and conforming to varietal requirements for certification.	5
e) Fields of other hybrids having common male parent but not conforming to varietal requirement for certification.	200

In the case of hybrid seed production distances less than 200 metres may be modified by planting border rows of male parents, if the kernel colour and texture of the contaminant are the same as that of the seed parent. The number of border rows to be planted all round the seed field to modify isolation distance less than 200 meters shall be determined by the size of the field and its distance from the contaminant as shown in the table below:

When the field area (ha.) growing the concerned seed parent is:									Then the minimum number of border rows required is:
More than	4	6	8	10	12	14	16	Or over	
Up to	4	6	8	10	12	14	16	or over	
the distance (metres) of the seed parent from other maize with kernel colour and texture the same as that of the seed parent is at least,									
	200.0	195.0	190.0	185.0	180.0	175.0	170.0	165.0	1
	187.5	182.5	177.5	172.5	167.5	162.5	157.5	152.5	2
	175.0	170.0	165.0	160.0	155.0	150.0	145.0	140.0	3
	162.5	157.5	152.5	147.5	142.5	137.5	132.5	127.5	4
	150.0	145.0	140.0	135.0	130.0	125.0	120.0	115.0	5
	137.5	132.5	127.5	122.5	117.5	112.5	107.5	102.5	6
	125.0	120.0	115.0	110.0	105.0	100.0	95.0	90.0	7
	112.5	107.5	102.5	97.5	92.5	87.5	82.5	77.5	8
	100.0	95.0	90.0	85.0	80.0	75.0	70.0	65.0	9
	87.5	82.5	77.5	72.5	67.5	62.5	57.5	52.5	10
	75.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	11
	62.5	57.5	52.5	47.5	42.5	37.5	32.5	27.5	12
	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	13

a) The above table applies to all sides of the seed field exposed to contamination, whether located directly opposite or diagonally.

b) Border rows must be planted in the seed field or adjacent to it, but in no case separated by more than five metres from the seed field.

c) Border rows must be planted at the same time as rest of the seed field so that the flowering time of both is the same; i.e., border rows should be shedding pollens when the silks in the seed parent are receptive.

d) Border rows must be planted all along and opposite to the contaminating maize.

e) There should be a reasonable stand of the border rows; i.e., there must not be gaps in the border rows. Border rows must have been planted using the seed rate and spacing adopted for the seed crop.

f) The area planted under the border rows is taken into consideration while modifying the isolation distance.

g) Seed fields having diagonal exposure to contaminating fields are to be planted with border rows in both directions of exposure.

h) If two hybrid seed fields with different pollinator are within the isolation distance of one another, border rows are necessary for each of them in order to avoid contamination of the respective seed parent.

i) Natural barriers such as tall thick trees, buildings etc., between the seed and the contaminating fields shall not be a substitute to border rows.

j) Border rows must be planted with seed used for planting male rows in the seed field. Seed saved from male rows of the previous production of the same cross cannot be used for planting of border rows or for the planting within the isolation distance

k) The isolation continues to be 300 meters if the kernel colour of texture of the contaminating maize is different from that of the seed parent or if the contaminating field is planted with sweet corn, or popcorn. In this case modification of isolation distance by planting border rows will not be permitted.

l) Differential flowering dates are permitted for modifying isolation distances provided 5.0% of the plants in the field(s) within the isolation distance are shedding pollen.

18.5 Specific Field Standards

Factor	Maximum permitted (%)
a) Off-types plants that have shed or shedding pollen in male parent at any one inspection during flowering when 5.0% or more of the plants in the seed parent have apparently receptive silks.	0.50
b) Tassels of plants that have shed or are shedding pollen in seed parent at any one inspection during flowering when 5.0% or more of the plants in the seed parent have apparently receptive silks.	1.00
c) Total of pollen shedding tassels that have shed pollen for all three inspections conducted during flowering on different dates.	2.00
d) Off-types plants in seed parent at final inspection.	0.50

The sucker tassels, portion of tassels, and tassel branches on main plants will be counted as shedding pollen only when 5 cm or more of the central spike, the side branches, or a combination of the two have the anthers exerted from the glumes and are shedding pollen. Before undertaking shelling the ears shall not contain in excess of 0.50% of off-type ears with off coloured kernels.

18.6 Seed Standards

Factor	Standards
a) Pure Seeds (minimum).	98.0%
b) Inert matter (maximum).	2.0%
c) Other crop seeds (maximum)	5/kg
d) Other distinguishable variety based on kernel colour and texture (maximum).	5/kg
e) Weed seed (maximum)	None
f) Germination (minimum)	95.0%
g) Moisture (maximum).	12.0%
h) Moisture for vapour proof containers (maximum)	8.0%

19.0 APPLICATION AND AMPLICATION OF *MAIZE (Zea mays L.)* OPEN-POLLINATED VARIETIES SEED CERTIFICATION STANDARDS

The General Seed Certification Standards are basic and, together with the following specific standards constitute, the standards for certification of maize seed of open pollinated varieties.

19.1 Land Requirements

Land to be used for seed production of maize seed of open pollinated varieties shall be free of volunteer plants.

19.2 Classes and Source of Seed

In the case of open-pollinated varieties of maize, the ears shall be selected after maturity. The source of seed used for the production of any of the class of seed must be approved by Certification Authority.

19.3 Field Inspections

For the production of seeds of open pollinated varieties, a minimum of three inspections shall be conducted in such a way that the inspection is made before flowering, the second during flowering and the third just before the harvest.

19.4 Isolation Requirements

Contaminants	Minimum distance (metres)	
	Foundation	Certified
Fields of other varieties/same variety not conforming to varietal purity requirements for certification.	400	200

19.5 Specific Field Standards

Contaminants	Maximum distance (metres)	
	Foundation	Certified
Off-type plants that have shed or shedding pollen at any inspection during flowering when 5% or more of the plants in the seed field have receptive silks.	1.0	1.0

19.6 Seed Standards

Factor	Standards for each class	
	Foundation	Certified
a) Pure Seeds (minimum).	98.0%	98.0%
b) Inert matter (maximum).	2.0%	2.0%
c) Other crop seeds (maximum)	5/kg	5/kg
d) Other distinguishable variety based on kernel colour and texture (maximum).	5/kg	5/kg
e) Weed seed (maximum)	None	None
f) Germination (minimum)	90.0%	90.0%
g) Moisture (maximum).	12.0%	12.0%
h) Moisture for vapour proof containers (maximum)	8.0%	8.0%

20.0 APPLICATION AND AMPLIFICATION OF MAIZE (Zea mays L) INBRED LINES SEED CERTIFICATION STANDARDS

The General Seed Certification Standards are basic and, together with the following standards constitute the standards for certification of maize *INBRED LINES.*

20.1 Land Requirements

Land to be used for seed production of maize inbred lines shall be free of volunteer plants.

20.2 Classes and Source Of Seed

The class and source of seed for the production and the increase of inbred line shall be from the selected ears. The source of seed used for the production of inbred lines must be approved by the certification Authority.

20.3 Field Inspections

For the production of inbred line, a minimum of four inspections shall be conducted in such a way that one is made one before flowering, two during flowering (when the crop has apparently 5% or more receptive silks) and one just before the harvest.

20.4 Isolation Requirements

Contaminants	Minimum distance (metres)
a) Fields of any other maize with same kernel colour and texture	500
b) Fields of any maize with different kernel colour and texture.	600
c) Seed of same inbred line not conforming to varietal requirements for certification.	500

Differential flowering date will be permitted for modifying isolation distances with any type of maize provided 5% or more of the plants in the seed parent do not have receptive silks when more than 0.20% of plants in the adjacent field(s) within the isolation distance are shedding pollens.

20.5 Specific Field Standards

Factor	Maximum permitted (%)*
a) Off-type plants that have shed or are shedding pollen when 5.0% or more of the plants in the seed field have apparently receptive silks. (**)	0.20

* Maximum permitted at any one inspection conducted during flowering.

** Portions of tassels, and tassel branches on main plants will be counted as shedding pollen only when 2 inches or more of the centre spike, the side branches, or a combination of the two have the anthers exerted from the glumes and are shedding pollen.

20.6 Seed Standards

Seed ears inspected after harvest shall not contain in excess of 0.20% of off-type ears including ears with off-coloured kernels. Shelling of the seed will be made only after obtaining the consent of the *NASC*.

Factor	Standards
a) Pure Seeds (minimum).	98.0%
b) Inert matter (maximum).	2.0%
c) Other crop seeds (maximum)	5/kg
d) Other distinguishable variety based on kernel colour and texture (maximum).	5/kg
e) Weed seed (maximum)	None
f) Germination (minimum)	95.0%
g) Moisture (maximum).	12.0%
h) Moisture for vapour proof containers (maximum)	8.0%

21.0 APPLICATION AND AMPLIFICATION OF MAIZE *(Zea may L)* FOUNDATION SINGLE CROSS HYBRIDS SEED CERTIFICATION STANDARDS

The General Seed Certification Standards are basic and, together with the following specific standards constitute, the standards for certification of maize foundation single crosses.

21.2 Land Requirements

Land to be used for seed production of maize single cross seed shall be free of volunteer plants.

21.3 Classes and Source of Seed

The class and source of seed for the production of foundation single cross shall consist of first generation hybrid resulting from the controlled crossing of the two approved inbred lines. Such foundation single cross shall be used in the production of double, three way, top or double top cross certified seed generation. The source of inbred lines used for the production of single cross must be approved by the Certification Authority.

21.4 Field Inspections

For the production of single crosses, a minimum of four inspections shall be conducted in such a way that one is made one before flowering, two during flowering (when the crop has apparently 5% or more receptive silks in the seed parent rows) and one just before the harvest.

21.5 Isolation Requirements

Contaminants	Minimum distance (metres)
a) Fields of any other maize with same kernel colour and texture.	500
b) Fields of any maize with different kernel colour and texture	600
c) Seeds of same single cross not conforming to varietal requirements for certification.	500
d) Fields of other single cross having common male parent and conforming to varietal requirements for certification.	5
e) Fields of other single cross having common male parent but not conforming to varietal requirement for certification.	500

Differential flowering date will be permitted for modifying isolation distances with any type of maize provided 5% or more of the plants in the seed parent do not have receptive silks when more than 0.20% of plants in the adjacent field(s) within the isolation distances are shedding pollens.

21.6 Specific Field Standards

Factor	Maximum permitted (%)
a) Off-type plants that have shed or are shedding pollen in male parent at any one inspection during flowering when 5.0% or more of the plants in the seed parent have apparently receptive silks.	0.20
b) Tassels of plants that have shed or shedding pollen in seed parent at any one inspection during flowering when 5.0% or more of the plants in the seed parent have apparently receptive silks.	0.50
c) Total of pollen shedding tassels that have shed pollens for all three inspections conducted during flowering on different dates.	1.00
d) Off-type plants in seed parent at final inspection.	0.20

The sucker tassels, portion of tassels, and tassel branches on main plants will be counted as shedding pollen only when two inches or more of the central spike, the side branches, or a combination of the two have the anthers exerted from the glumes and are shedding pollen.
Before undertaking shelling, the ears shall not contain in excess of 0.20% of offtype ears with off coloured kernels.

21.7 Seed Standards

Factor	Standards
a) Pure Seeds (minimum).	98.0%
b) Inert matter (maximum).	2.0%
c) Other crop seeds (maximum)	5/kg
d) Other distinguishable variety based on kernel colour and texture (maximum).	5/kg
e) Weed seed (maximum)	None
f) Germination (minimum)	95.0%
g) Moisture (maximum).	12.0%
h) Moisture for vapour proof containers (maximum)	8.0%

ANNEX I: PROCEDURES FOR AUTHORIZATION

1. PROCEDURE FOR AUTHORIZING ASCC/ASTL

I. Intending entities will send an application for authorization with supporting documents to Director General, NASC for authorization. Supporting documents shall include copy of the Corporate Affairs Commission certificate, copy of the memorandum of association, a copy of the article of association, a Tax Identification Number (TIN) and a company profile.

II. Intending entities shall fill out an online registration form which must be submitted with the appropriate registration fee.

III. All applications shall be duly documented for authorization.

IV. In case of incomplete supporting documents, entities shall be informed and advised appropriately to take corrective measures, otherwise the application shall be rejected.

V. Complete applications shall be vetted against the requirements in the guidelines. NASC shall visit the corporate office of ASCC/ASTL to verify claims in registration forms. NASC will assess the technical personnel and equipment available for certification.

VI. Successful entities shall be issued operating license renewal every two) years and shall also be given access to National Seed Tracker for certification purposes.

2. PROCEDURE FOR AUTHORIZING LSI/LSA

I. Accredited ASCC/ASTL shall forward the names, credentials (primary to higher institution), and statement of good conduct of intending LSIs/LSAs to NASC within one (1) month of authorization.

II. NASC shall verify all documents submitted and issue registration forms to qualifying candidates. All completed forms must be accompanied by registration fees.

III. All complete applications shall be entered in the register for authorization.

IV. In case of incomplete documents, NASC shall require ASCC/ASTL to inform applicants to take corrective measures, otherwise the application shall be rejected.

V. Qualifying applicants shall be invited for training and advised on training requirements including payment of fees.

VI. Qualifying applicants will undergo training followed by examination as provided in the guidelines to assess their competence.

VII. Successful applicants meeting the examination and assessment requirements shall be granted Power of authorization and gazetted.

VIII. Qualifying LSIs/LSAs shall be entered into the authorization register and granted access to National Seed Tracker.

3. PROCEDURE FOR AUDIT OF ASCC/ASTL/LSI/LSA

a. NASC shall audit entities and persons authorized for seed certification. NASC shall audit the following:

I. Tools, equipment, and environment: The audit will cover all work tools, equipment, and operating environment of ASCC/ASTL/LSI/LSA.

II. Staff competence; the audit will assess the professional competence and ability of LSI/LSA staff in to carry out their duties efficiently and to ascertain areas where LSI/LSA may require further training or to determine grounds that will require withdrawal of authorization.

III. Environment; NASC will determine the suitability of the entity's organizational structure for certification activities. ASCC must have regional offices in zones where their certification covers

IV. Inspection: NASC shall check whether there is independence and integrity in field inspection and sampling as carried out by LSI and also assess whether LSI follows procedures for inspection as provided by NASC.

V. Testing: NASC shall examine if ASCC laboratory/ASTL follows standard testing procedures as provided by NASC and the competence of the LSAs.

b. Frequency: The auditing of ASCC/ASTL/LSI/LSA shall be done annually.

c. Audit Report: audit reports shall be submitted to the department of seed certification and quality control within **one (1)** week.

d. Corrective Actions;

Corrective Actions shall be taken by NASC within one (1) month of receiving the audit report. ASCC/ASTL/LSI/LSA requiring warning/suspension/withdrawal of authorization shall be informed of NASC's actions.

e. Appeals

in case of suspension/withdrawal of authorization, ASCC/ASTL/LSI/LSA/ shall direct their appeals to the head of the Authorized Seed Certification Appeals Committee (ASCAC)

4. PROCEDURE FOR MONITORING LSI/LSA

I. The NASC shall regularly monitor LSI/LSA by undertaking NST access checks, spot inspections and sampling, check-testing, proficiency laboratory tests, and pre/post control tests as provided in these guidelines.

II. NASC shall designate official seed inspectors to spot inspect LSI unannounced. Official inspectors shall draw samples from seed lots passed by LSI for check testing. Check testing shall be carried out in the NASC laboratory or other laboratories other than the LSI's employer laboratory.

III. The monitoring records of LSIs/LSAs shall be maintained by NASC.

IV. Monitoring findings/decisions shall be shared with ASCC/ASTL/LSI/LSA

5. PROCEDURE FOR WITHDRAWAL OF AUTHORIZATION

a) Voluntary withdrawal.

I. ASCC/ASTL/LSI/LSA wishing to voluntarily relinquish his authorization shall forward a written application to the Director General, NASC.

II. NASC shall acknowledge the notification.

III. NASC shall withdraw authorization and notify the public through a gazette notice.

b) Withdrawal due to non-compliance;

For non-compliance where corrective action is applicable

I. NASC shall notify ASCC/ASTL/LSI/LSA in writing of non-compliance/violation finding(s) and demands corrective action.

II. If ASCC/ASTL/LSI/LSA are unable to satisfactorily address the non-compliance within a specified period given by NASC, the council shall withdraw authorization as provided in the guidelines and notify the public through a gazette notice.

For violations where corrective actions do not apply

I. NASC shall withdraw authorization and inform the ASCC/ASTL/LSI/LSA in writing within seven working days and notify the public through a gazette notice.

II. For cases requiring investigation, ASCC/ASTL/LSI/LSA shall be suspended for a period not exceeding six months during which all official materials shall be surrendered to NASC while awaiting the findings of the investigation

6. PROCEDURE FOR APPEAL

I. ASCC/ASTL/LSI/LSA shall appeal to the Head, ASCAC through the Director General, NASC stating the basis for the appeal and must attach necessary evidence. The appeal letter should reach NASC within seven (7) working days following the decision of ASCRC.

II. The head, of ASCAC shall acknowledge receipt of the appeal letter within 72 hours.

III. ASCAC shall invite the entity/person for a hearing within fourteen (14) working days after receipt of the appeal

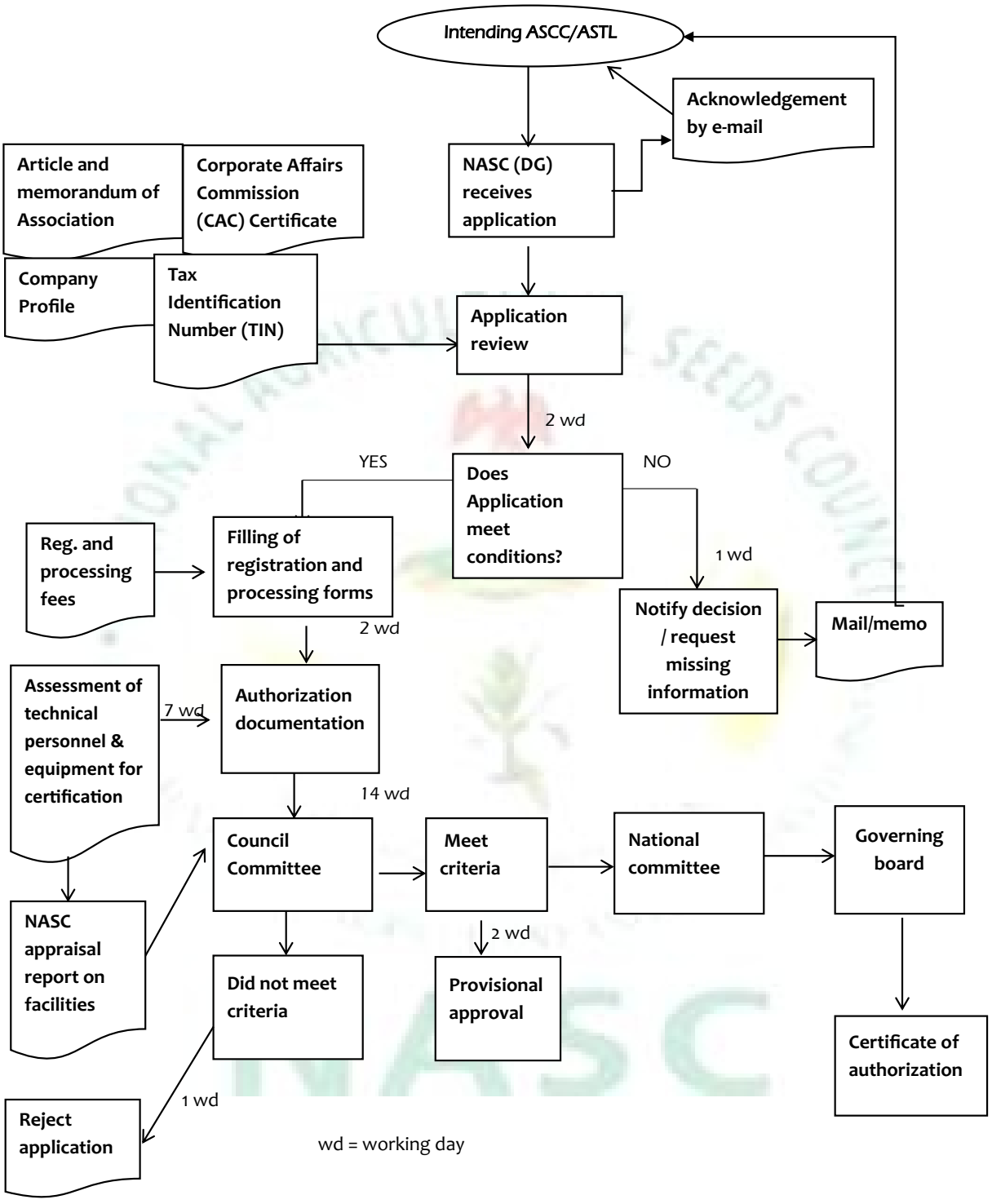
IV. ASCAC shall pass the decision reached after the hearing to the Director General for ratification.

V. ASCAC shall communicate a decision to the entity/person within 48 hours after Director General's ratification.

VI. If the entity/person is not satisfied with the decision of ASCAC, the entity/person he/she may apply to the governing board of NASC for review.

VII. The governing board of NASC evaluates the appeal and makes a final decision, which is communicated to the applicant. The governing board has the final decision.

STANDARD OPERATING PROCEDURE FOR AUTHORIZING ASCC/ASTL



ANNEX II: PHASES OF CERTIFICATION

1.0 Application For Certification

1.1 According to Section 12(1) of the Seeds Decree (No.72 of 1992) any person intending to produce certified seed may apply to the NASC as per Rule 15 in the prescribed SC Form No.1 and shall be accompanied by a certification fee as prescribed. Separate application form shall be used for each Crop/Variety of seed offered for certification. However, if the NASC rejects an application for some reasons such as late receipt, incomplete information, use of seed from unapproved source, extremely remote and inaccessible location etc. shall refund the certification fee. Similarly in the event of seed crop loss/failure the NASC shall refund the certification fee provided the applicant intimates it to that effect before the first inspection. Rejection of seed crop/lot does not entitle refund.

1.2 The NASC shall immediately on receipt of application (in duplicate) stamp the date of receipt on it, allot the application number and satisfy themselves that:

- it has been received within the prescribed time limit,
- the variety is eligible for certification,
- the seed used or proposed to be used for sowing has been obtained from the approved sources,
- the class of seed/stage in generation chain satisfy the prescribed provisions,
- the application and certification fee have been remitted.

1.3 The NASC shall complete the above formalities within 10 days from the date of receipt of application and record its decision on both the copies. It shall retain the original one and return the second copy to the applicant.

2.0 Establishing Seed Source

The individual intending to produce seed under certification shall submit to the *NASC* one or more relevant evidence such as certification tag, seals, labels seed containers, purchase/sale records etc., as may be demanded by the certification Authority during submission of application or its scrutiny and/or during first inspection of the seed crop, in order to confirm if the seed used for raising the crop has been obtained from the source approved by it. This requirement also applies to both the parents in seed production involving two parental lines.

2.1 The NASC shall maintain a list of recognized breeders of seeds and verify that the seed source used for sowing was authenticated. To facilitate the NASC in developing the list of recognized breeders, the following procedure is suggested:

(a) For all varieties developed by the NARI's the originating breeder/breeding institution or the breeder/breeding institution duly sponsored by them shall be the source of breeder seed.

(b) For all varieties developed by International Research institution(s), university etc. outside the NARIs, the concerned breeder/institution shall be the source of breeder seed.

(c) The NASC shall ensure that breeder seed only from the recognized sources is used for the production of foundation seed, and once the foundation seed is certified by

the NASC, it is eligible for use for further seed increase as certified seed under certification programme.

2.2 Verification of seed source used for increase under a certification programme is an essential step in the technical process of certification. This shall be accomplished as follows:

(a) One receipt of application for certification the NASC shall verify from the applicant whether:

i) the source of seed quoted is an approved or recognized one.

ii) the class of seed mentioned and its stage in the generation chain satisfy the prescribed provision; and

iii) the other information such as tag number, purchase and sale details etc. mentioned in the application adequately prove the above.

(b) When seed from a container is required to be distributed to or shared by more than one producer for raising seed crops under certification, the individual who possesses the seed shall inform the NASC at least 7 days in advance. The NASC may if deemed necessary arrange for supervising the opening of the container and distribution of seed. The producers concerned may proceed ahead with opening and seed distribution after waiting for 7 days.

(c) When any material or documentary evidence is examined by the NASC to prevent its re-use for establishing the source, the official shall stamp on it as "used for establishing source" and affix his signature, of course to the extent the material submitted permits such action.

3.0 Field Inspection

3.1 Objective of Field Inspection

(a) Raise from seed whose source is approved and which satisfies the requirements as prescribed.

(b) Growth on a field which satisfies the prescribed land requirements as to previous crop(s), to prevent contamination by volunteer plants and disease spread by pathogens.

(c) Provided with the specified isolation, and number of border rows where applicable and recommended.

(d) Planted in the recommended ratio of female and male parents in seed production involving two parents.

(e) Properly rogue to remove contaminating factors such as pollen shedders, or shedding tassels as the case may be, offtypes, plants/ear heads affected by designated seed borne diseases, objectionable weed plants, and inseparable other crop plants at appropriate stages as to conform to the standards prescribed for these factors.

(f) True to the varietal characteristics descriptive for the variety.

(g) Harvested properly to avoid admixture, and

(h) Grown in compliance with other special seed production requirements for the crop concerned.

The field observations made for these are compared with the prescribed standards as to previous crop, isolation, varietal purity, freedom from other crop plants, objectionable weed plants and the designated seed borne diseases.

3.2 Stages of Inspection

(a) Normally verification of all the factors affecting seed quality in the field may neither be possible nor necessary in a single inspection. All the contaminating factors may not be apparent or may not occur at the same time in the field, or all of them may not be capable of affecting seed quality at a particular stage of growth. Hence in most crops more than one inspection, phased to cover all the important stages of crop growth is required. The number of inspection and stages of crop growth at which they should be conducted vary from crop to crop depending upon the crop duration, nature of pollination, susceptibility to and type of contamination, disease susceptible stage(s), nature of contaminating factor(s), usual seed production procedure etc.

(b) The number of inspections as given in the field certification standards are the only minimum, any additional inspection will be beneficial. For convenience, the stages of crop growth at which the inspection are generally made in sexually propagated crops are classified as follows:

(i) Pre-Flowering Stage: The entire period preceding flowering is obviously the pre flowering stage. However, for inspection, this may be identified into seedling, filtering, growing, flower bud initiation or flag leaf stage, and all such growth phases are recognized before 5 percent or more of panicles, inflorescence or flower(s) have emerged.

(ii) Flowering Stage: At this stage, the flowers have opened, the stigma is receptive, and anther is shedding pollen. For example, a seed crop with 5 percent or more of the plants in flower can be considered to have attained this stage.

(iii) The receptivity of stigma and pollen shedding of anthers have ended, and the fertilized ovule starts to develop into a seed. This included both the milk stage when the contents of the fertilized ovule are in the form of white milky fluid and the dough stage when the contents are transformed into more solid substance which yields to pressure.

(iv) Pre-Harvest Stage: The seed become structurally grown to its size and approaches physiological maturity. The seed is fully filled but is high in moisture content and must dry further to permit easy harvesting, threshing and transport for sale pre-processing storage, either with or without post harvest drying.

(v) The seed has reached field maturity, is sufficiently dry to permit safe and easy harvesting and threshing and with some drying can be fit for relatively safe storage. The crop is ready for harvest.

(c) In vegetatively or asexually propagated crops, stages such as pre flowering, flowering and post flowering are not relevant. For instance in seed potato, these stages are referred to as sprouting, seedling, tuberization, bulking, tuber hardening etc. In root and bulb crops the enlarged root bulb formation stage precedes

flowering, lifting and re-planting are done after complete root/bulb formation. In these crops inspection at lifting and replanting stage is essential.

(d) In cross pollinating crops, inspections during flowering are essential during flowering to verify freedom from genetic contamination; in self-pollinating crops, inspections during flowering may help in identifying off types.

(e) If inspection, for instance Seed Borne disease or cross-pollinated crops in flowering stage are to be most effective, they must be made without prior intimation to the seed producer. With the self-pollinated crop where there is no problem of designated seed borne diseases, vegetatively propagated crops, and for lifting and re-planting inspection in root and bulb crops, advance intimation can help in undertaking removal of the contaminating factors and also to reduce subsequently the number of inspections/re-inspections required.

(f) Inspection of the same field twice on the same day should not be done unless the second inspection on the same day is re-inspection to confirm removal of rectifiable contaminating factors pointed out in the earlier inspection, however a separate supervisory inspection can be made on the same day. This cannot substitute for the routine inspections, but is in addition to them. At least one full night should intervene between two routine inspections of the same seed field. The Certification Inspector is at liberty to conduct inspection of a seed field at any time of the day and during any stage of the crop.

TABLE 3.1 Requirement of Minimum Number of Field Inspection

Crop	**Minimum Number of Inspection Required**	**Crop stage for Inspection**
CEREALS – Maize		
Inbred lines Single crosses hybrids	**4**	One before flowering and three during flowering
Open pollinating varieties	**2**	One before flowering and other during flowering

3.3 Observations During Field Inspections

(a) Factors to be observed during field inspection vary among crops and their growth stages. Basically, sources of genetical and physical contamination must be observed and the extent of their occurrence estimated.

(b) Sources of genetic contamination are plants of other varieties of the same species or plants of related species which can pollinate the seed crop. Genetic contamination caused by undesirable pollen cannot ordinarily be detected by visual examination except when Xenia as in maize occurs. Such contamination is frequent in cross pollinated species. Mechanical admixture by seed of another variety of the same species leads to genetic impurity. This type of contamination is likely in both self- and cross-pollinated crops. In such an admixture, the genotype of the individual crop seed is however not altered. Though the admixture might be visible

in the harvested seed, removal of offtype seed is nearly impossible. Genetic contamination and mechanical admixture cannot be rectified without tedious purification process over many generations.

(c) Sources of physical contamination are seeds of other crops, weeds and those carrying disease causing pathogens. 'This can often be rectified as it may be possible remove to the contaminating seed mechanically.

(d) Sources of genetic and physical contamination can usually be detected in the field. This may be present within or outside the seed field, but close enough to cross pollinate and cause mechanical admixture with the seed crop. Their ability to contaminate decreases if their distance from the seed field increases. After a certain distance their presence may not cause any significant contamination in the seed crop. This distance is called the ISOLATION distance, and is specific for each crop species. To ensure that the seed crop is not contaminated, it is necessary to look for sources of contamination both in the seed field and within the isolation distance on all sides. **The sources of contamination can broadly be classified as follows:**

(a) **Offtype:** is a plant of the same species as the seed crop variety but deviating in morphological characteristics such as root, bulb or tuber features, plant type, branching, pigmentation, hairiness, stem features, leaf shape and arrangement, colour, shape and size of flower and flower parts, and colour size and shape of fruit and seed characteristics such as duration to flowering and maturity, male sterility, resistance to diseases etc. Plants of different varieties are also included under offtypes, but to designate a plant as offtype is always counted so, irrespective of its growth stage. However if the stage of growth of seed crop and offtype differ so widely that contamination cannot possibly occur at any stage, special note is to be made so that the observation is complete. Yet the producer should be advised for their removal. Offtypes not causing contamination during inspection but likely to do so later, must be counted.

(b) **Pollen Shedder**: This is relevant only where three parental lines i.e. male sterile (A), male fertile maintainer (B), and restorer (R) lines are involved. Plants of "A" and "B" resemble each other in all respect except that "A" line carries cytoplasmic genetic male sterility with dry shrunken, shriveled and thin anthers which shed no pollen and get discoloured soon. "B" line is male fertile with normal, plumb anthers full of pollen grains and retain their colour, shape and size for a longer period. When "A" line is fertilized by "B" line, the seed produced is of male sterile "A" since "A" helps to maintain "A" line, it is known as the maintainer line. In hybrid seed production, "A" and "R" lines are used as the female and male parents respectively. Their progeny i.e. the hybrid is fertile. Since "R" line restores male fertility to "A" line, it is known as restorer line. Plants of "B" line in the "A" line in (A X B) or (A x R) production is called pollen shedder. Plants not of "B" line but shedding pollens are offtypes. Some times the "A" line tends to exhibit symptoms of fertility i.e cars with fertile anthers occur only on main tiller, on one or more side tillers, or on one side or region of ear, and are also classed as pollen shedders.

(c) **Shedding Tassel:** In Hybrid maize seed production involving two parental lines this refers to a maize plant of the female parent which has shed or shedding pollen in the female parent rows. For counting during field inspection, a tassel is considered as one shedding tassel in 5cm, or more of the center spike, or side branches or a combination of both, have anthers exerted from their glumes and are shedding or have shed pollen. Tassels which have come out, but not commenced shedding are not counted, but special mention as "not commenced shedding" is made for subsequent inspections to be done sooner. The producer must be advised for their removal before they commence shedding.

(d) **Inseparable Other Crop Plant**: This is a plant of cultivated crops whose seed are so similar to the seed crop that it is difficult to separate them from the latter economically by mechanical means. It is counted if its growth stage is such that it would bear seed when the seed crop matures and possibly cause mechanical admixture during harvesting and threshing. If its growth stage is so widely difficult that it cannot bear seed by the time the seed crop mature, it need not be counted: but mention to that effect should be made for verification during subsequent inspections and the producer should be advised for their removal.

(e) **Objectionable Weed Plant**: This is a plant of weed species which is harmful in one or more of the following:

- the size and shape of its seed are so similar to crop seed that it is difficult to remove them from the crop seed economically by mechanical means;
- its growth habit has detrimental or competing effects on the crop plant;
- its mode of spread, perpetuation, perennation or growth habit make eradication difficult;
- the plant parts are poisonous or injurious;
- it serves as alternate host for crop pests and diseases, and
- its plant parts are prickly, sticky or thorny interfering in normal agronomical operations.

It is counted if its growth stage is such that it will bear seed when the seed crop matures, and possibly cause mechanical admixture during harvesting and threshing. If its growth stage is widely different it need not be counted; but mention to that effect should be made for verification in subsequent inspections and the producer should be advised for their removal.

(f) **Seed Borne Diseases**: Seed may carry disease causing pathogens internally, externally or as contaminant. Economical and effective measures for prevention and control of seed borne infection are available for some and not available for some others. For the later, an effective method to prevent seed transmission of the pathogen is to ensure that seed suspected to carry

pathogens is not mixed with pathogen free seed. Observations should therefore be made for such diseases.

4.0 Taking Field Count

It may not be possible to examine all the plants in the seed field. Therefore, a system of random check and count is to be followed to derive a representative sample of the crop. The number of counts taken and the method of taking counts vary from crop to crop. However, for all crops, five counts are taken of any area up to two hectares and an additional count is taken for every additional two hectare as given below:

TABLE: 4:1 Number of Counts During Field Inspection

Area of the field (Ha)	Number of counts to be taken
Upto 2	5
Above 2 upto 4	6
Above 4 upto 6	7
Above 6 upto 8	8
Above 8 upto 10	9 and so on

4.1 Procedure for Counting Heads/Plants

4.1.1 Maize Inbred Lines, or Open Pollinated Variety

- Enter the seed field at a randomly selected site from any side and start moving in the direction of rows.

- Start counting from any plant selected at random in any row and count ten plants consecutively in that row.

- Count the number of plants which have one or more ears with receptive silks among these ten plants.

- Count the number of offtypes plants with tassels which are shedding or have shed pollen, among the ten consecutive plants counted.

- Cross over the predetermined number of rows and again start counting ten consecutive plants from a point nearly parallel to the last plant of the previous ten plants counted.

- Count the number of off-type plants with tassels that are shedding or have shed pollen, and the number of plants with one or more ears with receptive silks.

- Repeat the entire process eight more times to count a total of one hundred plants, noting shedding tassels and receptive silks on plants among the one hundred plants counted; this completes one count, and

- Repeat the entire process described above until the number of count required for the size of the field are completed.

4.1.2 Maize Crosses:

- Enter the seed field at a randomly selected site from any side and start moving in the direction of rows.

- start counting from any randomly selected plant in the female parent rows first by examining ten consecutive plants in a randomly selected row.

- Count the number of plants having ears with receptive silks, plants with tassels which are shedding or have shed pollen, and offtypes within the ten plants.

- Cross over to a female parent row according to the pre-determined number of rows and again start counting ten consecutive plants, from a point approximately parallel to the last plant counted in the previous row.

- Repeat this process until one hundred female parent plants have been counted, and note the number of plants with tassels that are shedding or have shed the pollen, plants with ears having receptive silks and off-types; this completes one count.

- Repeat the entire process as many times as required for the field size; and

- Then enter a male parent row from any side of the field and start counting in the same manner only the off-type plants. Make the same number of counts as in the female parent rows.

5.0 Reporting Observations on Field Inspection

Report observations on prescribed field inspection report proforma which are self-explanatory, and also prepare field map if necessary and if there is problem of isolation for the seed crop.

5.1 Comparison of Field Observations with Minimum Seed Certification Standards

5.1.1 Comparison for Isolation Requirements

(a) A seed crop conforms to the prescribed isolation requirements if isolation distance in meters is at least the minimum required. A seed crop does not conform to isolation requirements if any contaminant listed in the NMSCS is found within the isolation distance and at the same or nearly the same stage of growth as the seed crop.

(b) A seed crop with a contaminant within the isolation distance is not rejected if the growth stages are as such that contamination will not occur. The seed crop is rejected in parts or full as may be necessary if the stages favour the likelihood of contamination, such as the flowering stage in cross pollinated crops and the crops affected by designated seed borne diseases, or the pre-harvest stage in self pollinated and vegetatively propagated crops. In such cases the area in the seed pollinated and vegetatively propagated crops. In such cases the area in the seed field within the prescribed isolation distance from the contaminant is liable for rejection.

5.1.2 Comparison for Specific Requirements:

(1) A seed crop conforms to the prescribed requirements when the average percentage of the field counts for each factor is equal or less than the maximum prescribed percentage for that factor. When the percentage for a factor in the first set of counts is more but not more than twice the maximum percentage prescribed, a second set of counts is made and recorded in the inspection report. Example for calculating the average percentage of factors observed by field counts are given below:

(2) Example for calculating the average percentage of factors observed by field counts are given below:

(a) Maize Inbred line, composite or open pollinated varieties

Area of the field : 2ha
Number of counts : 5(100 plants per count)

(i) Receptive silks:

No. of plant counted	**No. of plants with receptive silks**
First set of 5 counts	A
Second set of 5 counts	B
Total of 10 counts	A + B
Percentage =	A + B ---------- x 100 1000 Plants

(ii) Offtypes with shedding tassels

No. of plant counted	**No. of offtypes with shedding tassels**
First set of 5 counts	C
Second set of 5 counts	D
Total of 10 counts	C + D
Percentage =	C + D ---------- x 100 1000 Plants

When the above percentage exceeds the levels prescribed in the MSCS the crop is rejected.

(b) **Maize Crosses**

Area of the field : 2ha

Number of counts : 5(100 plants per count)

(i) Detasselling in female parent (Single inspection)

No. of plants counted	**No. of plants with ears with receptive silks**	**No. of plants with shedding tassels**
First set of 5 counts	A	C
Second set of 5 counts	B	D
Total of 10 counts	A + B	C + D
Percentage =	A + B ---------- x 100 1000 Plants	C + D ---------- x 100 1000 Plants

When these percentages exceed the levels prescribed in the standard the crop is rejected.

(ii) **Detasselling in female parent (Cumulative of three inspections):**

Seed crop is rejected if the total of shedding tassels in any three inspections exceeds 2% Receptive silk in each those inspection should at least be 5%.

Inspection	**Shedding tassel (%)**
First	x
Second	y
Third	z

When the total of (x + y + z) is more than 2%, the crop is rejected provided the receptive silk is at least 5% in each of the three inspections concerned.

(iii) **Off-types in male parent:**

First the percentage of receptive silks in the female parent is calculated as above. Then the percentage of off-types in male parent is calculated as follows.

No. of plant counted male parent	**No. of offtypes in male parent**
First set of 5 counts	A
Second set of 5 counts	B
Total of 10 counts	A + B
Percentage =	C + D ---------- x 100 1000 Plants

The crop is rejected if the percentage of offtypes and receptive silks exceed those prescribed in the standards.

(iv) Off-types in female parents:

Calculation is as described above, but the receptive silks are not considered. If the percentage of off-types in female parent exceeds the maximum permissible level the crop is rejected.

If this percentage exceeds the maximum permitted in the standards, the crop is rejected.

(3) In the above, the percentage for deciding acceptance or rejection is calculated only to the number of decimals in which the standard is expressed, i.e. if the standard for a particular factor is 0.50% (two decimal) the percentage for that factor is also worked out up to two decimals only.

The above procedure is followed when inspection Seed Certification report indicates normal field counts. However, the Inspector may sometimes observe defects which do not come in the field counts. Under such situation, the following procedure is suggested:

(a) When patches or rows of off-types, shedders, shedding tassels, objectionable weeds, inseparable other crop plants or plant/heads affected by designated diseases are noticed but do not come under the field counts, separable observations such as the size of the patch, number of rows, length of row, total number of plants/heads involved etc. should be made and reported and shown in the map. The Certification inspector should exercise judgment and attempt to save the crop from rejection by advising the producer to remove the defective patch. The contaminated portion of the field must be described on the inspection report. The NASC shall consider each situation individually and decide.

(b) If the male and female parents in seed production involving two parents have been irregularly planted and the seed field then is merely an admixture of the two parents, the Certification inspector should note this on the inspection report and show it as liable for rejection.

(c) If the seed crop is sown as mixed, inter or companion crop or as raton, the Certification inspector should note this on the inspection report and show it as liable for rejection, except when permitted.

(d) If the seed crop has failed partially or completely, or is damaged by cattle, flood, drought etc. or the producer has decided to treat it as a commercial crop for any reason, inspection report should still be prepared and distributed as usual. The Certification inspector should confirm in writing on the inspection report from the producer that he is not interested in submitting the seed crop for further inspections. If the producer is not willing to confirm this in writing, continue further inspections; the rejection letter is issued only if the crop does not conform to the prescribed standards. Partial or complete crop failure from agronomic consideration does not make the crop ineligible for approval unless the producer is unwilling or is not interested in further inspections.

(e) When isolation of the seed crop is unsatisfactory, instruct the producer to harvest the affected area, and call the Certification inspector to verify that the area affected due to isolation has been harvested. The producer then harvests the portion with satisfactory isolation without further inspections. If the producer harvests the isolation affected area along with the seed crop or harvest affected areas without

calling for an inspection prior to harvesting the crop, the entire harvested produce is liable to be rejected if admixture is suspected.

7.0 Field Area for Certification

There is no minimum or maximum limit for the area to be offered by a person for certification provided the certified seed production meets all the prescribed requirements.

8.0 Unit of Certification

For the purpose of field inspection, the entire area planted under seed production by an individual shall constitute one unit provided:

8.1 the entire area is under one variety;

8.2 it does not exceed ten hectares;

8.3 it is not divided into field separated by more that fifty metres between them;

8.4 it is planted with or is meant to produce seed belonging to the same class and stage in the generation chain;

8.5 the crop covering the entire area is more or less of the same stage of growth so that the observations made are representative of the entire crop;

8.6 the total area planted, by and large, corresponds to the quantity of seed reported to have been used; and the *NASC's* permission had been obtained to cover a larger area by economizing on seed rate if that be the case;

8.7 it is raised strictly as a single crop and never as mixed crop;

8.8 not so heavily and uniformly lodged that more than the one third population is trailing on the ground leaving no scope for it to stand up again, thus making it impossible for Certification Authority to inspect the seed crop at appropriate stage of growth in the prescribed manner;

8.9 as far as possible, it is so maintained as to show adequate evidence of good crop husbandry thereby improving the reputation of certified seed.

9.0 Field Inspection/Re-Inspection

Field inspection work which required the technically trained personnel shall be performed by the persons who have been so authorized by the *NASC*. The following shall strictly be observed:

- ✓ Field inspection meant to verify those factors which can cause irreversible damage to the genetic purity or seed health shall be conducted without prior notice to the seed producer;

- ✓ Soon after the completion of field inspection, a copy of the report shall be handed over to the seed producer or his representative;

- ✓ Seed fields not conforming to the prescribed standards for certification at any inspection, the *NASC* shall on the request of the producer and after he removes the contamination in the seed field and within the prescribed isolation distance and/or the contaminated plants in the seed field (if so directed by the *NASC*) perform one or more re-inspection provided such removal can ensure conformation of the seed crop to the prescribed standards and provided further that no irreversible damage has been caused to the quality of the seed by the contaminants. The *NASC* may at its discretion, also

perform one or more re-inspection over and above the minimum number of inspections prescribed if considered necessary.

10.0 Harvesting, Threshing and Transportation

Seed crop meeting field standards for certification shall be harvested, threshed and transported to the seed processing plant in accordance with the guidelines issued by the *NASC*. During these operations, the seed producer will take all precautions to safeguard the seed from admixture and other causes of seed deterioration.

11.0 Seed Processing and Packaging Schedule

The *NASC* shall prepare and communicate seed processing and packaging schedule to all the certified seed producers soon after the certification of the crops at field stage. The seed producer shall adhere to the schedule specified by the Certification Authority. However, re-scheduling may be accepted by the Certification Authority on the request of the seed producer on genuine grounds.

11.1 Seed Lot/Lot Size

A seed lot is a physically identifiable quantity of seed which is homogeneous, and would represent any quantity of the agricultural seeds up to a maximum of 20,000kg for the seed of the size of rice or larger (except for maize seed, seed potato, sweet potato and yam for which the maximum size of the lot may be 40,000kg), and 10,000kg for seeds smaller than rice subject to the tolerance limit of 5%. The quantities in excess of the above maximum limits shall be subdivided and separate lot identification shall be given.

11.2 Construction of Seed Lot Number

Each seed lot shall be assigned a specific number in order to facilitate maintaining its identity, tracing back to its origin, handling in store and transit, accounting and inventory maintenance and referring/communicating about a certain quantity of seed.

11.3 Seed Processing

Seed processing means drying, cleaning, grading, treating, packaging and other operations which will improve the physical quality of seeds. Seed from fields which conformed to the standards of certification at field level shall, as soon as possible after the harvest be brought to the processing plant for processing operations. Screen aperture sizes as specified shall be used for cleaning and grading of seeds so that typical contaminants such as weed seeds, small seeds, damaged seeds, broken and shrivelled seeds, straw, chaff, leaves, twigs, stones, soil particles etc. are removed. However, the *NASC* is authorized to deviate under exigencies to use the screen of small aperture size than specified and record the reason there for. Processed seed shall not have seed of the lower size than the bottom screen used beyond 5% by weight.

11.4 Seed Treatment

A variety under certification if susceptible to seed-borne-disease or seeds which are carrying seed-borne pathogen, and if no treatment to control such disease or pathogen is available, the Certification Authority may require to subject such seed lots to seed treatment before certification. In case it is required to treat the seed before sowing by the user the chemical calculated at the recommended dose shall be kept in a plastic packet and

placed inside the seed container with complete instructions and precautions required for treating the seed. The information about the seed treatment shall also be displayed on the seed containers. If the seed is treated the following instructions shall also be compiled with:

a) a statement indicating that the seed has been treated;

b) if the substance of the chemical used is harmful to human beings or other vertebrate animals, a caution statement such as *"Do not use for food, feed or oil purposes"* must be super scribed on containers. The word *POISON* in type size shall be printed on the label prominently in red ink if the seed is treated with mercurial or toxic substances.

11.5 Sampling of Seed Lots

Soon after the completion of seed processing or after the seed treatment, the Certification Authority shall draw a representative composite sample as per the ***ISTA*** procedure of seed sampling. The quantity of seed samples so drawn shall be sufficient to provide three samples of the size of submitted sample. The composite sample will be divided into three equal parts. One shall be sent for analysis in the designated Official Seed Testing Laboratory, the second for preservation as guard sample with the *NASC* and the third to the seed producer.

11.6 Seed Analysis Report

The seed testing laboratory shall analyze the seed sample in accordance with the procedure and deliver the seed analysis report to the *NASC*, but not later than 30 days from the date of receipt of the samples unless the seed is subjected to such tests which require more than 30 days for completion of the test.

11.6.1 Grow Out Test/Seed Standards of Genetic Purity

All certified seed lots shall conform to the following minimum standards for genetic purity, or otherwise prescribed:

Class of Seed	Minimum standard for Genetic purity (%)
Foundation Seed	99.00
Certified Seed - Varieties, composites, synthetics, multiline	98.00
- Hybrids	95.00

The *NASC* shall conduct grow out test to determine the genetic purity of a seed lot wherever it is a prerequisite for grant of certificate, and also on the seed lots where doubt has arisen about.

The *NASC* shall conduct grow out test to determine the genetic purity of a seed lot wherever it is a prerequisite for grant of certificate, and also on the seed lots where doubt

has arisen about the genetic purity. The grow out test can be complemented by related laboratory tests.

11.6.2 Recleaning, Re-Sampling and Retesting

When a seed lot does not meet the prescribed standards, the *NASC* on the request of the seed producer may permit recleaning, re-sampling and retesting only once.

11.6.3 Seed Standard for Insect Damage and Moisture Content

A seed lot under certification shall not have apparent or visible evidence of damage by insects for both foundation and certified seed classes in excess of 1.0% for the seed of maize and legumes and 0.50% for the other kinds of seeds unless otherwise prescribed. Seed standards in respect of moisture content as prescribed shall be met at the time of packaging.

11.6.4 Down Grading Class of Seed

If a seed field or a seed lot is not found meeting prescribed standards for the class of which it has been registered, but conforms to the prescribed standards to the immediate lower class, the *NASC* may accept such seed fields/lots for certification to the lower class provided the request has been made to this effect by the seed producer. However, down grading of the class of seed shall not be applicable in the case of hybrids and their parental lines.

12.0 Packaging, Tagging, Sealing and Issuance of Certificate

On receipt of the seed analysis report and the result of the grow out test wherever applicable, and if a seed lot has met prescribed standards, the NASC shall ensure packaging, tagging, sealing and issuance of certificate expeditiously. An ***authorized official*** of the NASC shall endorse the signature on the reverse of each certification tag and shall affix rubber stamp indicating the official's name and designation. Containers to be used for packing of certified seed shall be vapour or non-vapour proof according to moisture content in seeds, durable and free from defects.

13.0 Refusal for Certification

The *NASC* shall have the authority to refuse certification of any seed production field or any seed lot that does not conform to the minimum standards prescribed for the particular crop either for field standards or seed standards or both. Such refusal will be subject to any appeal made to the

14.0 Validity Period of Certificate

The validity period shall be six months from the date of test for initial certification. The validity period could be further extended for three months provided on retesting seed lot conforms to prescribed standards in respect of physical purity, germination and insect damage for all seeds except vegetatively propagated materials for which the seed lot may be re-examined for the seed standards specified for the respective crop. The seed lot will be eligible for extension of the validity period as long as it conforms to the prescribed standards.

15.0 Revocation of Certificate

(SRR: 36)

If the *NASC* is satisfied, either on reference made to it in this behalf or otherwise that:

a) the certificate granted by it under section 12(3) of the Seeds Act has been obtained by misrepresentation as to essential facts; or

b) the holder of the certificate has, without reasonable cause, failed to comply with the conditions subject to which the certificate has been granted or has contravened any of the provisions of the Act or the rules made there under, without prejudice to any other penalty to which the holder of the certificate may be liable under the Seeds Act the *NASC* may, after giving the holder of the certificate an opportunity of showing cause revoke the certificate, under the provisions of Section 15 of the Seeds Act.